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Abstract–Meteoritical Bulletin No. 87 lists information for 1898 newly classified meteorites, comprising 1048 from Antarctica, 462 from Africa, 356 from Asia (355 of which are from Oman), 18 from North America, 5 from South America, 5 from Europe, and 3 from Australia. Information is provided for 10 falls (Beni M'hira, Elbert, Gasseltepaoua, Hiroshima, Kilabo, Neuschwanstein, Park Forest, Pê, Pétèlkolé, and Thuathe). Two of these—Kilabo and Thuathe—fell on the same day. Orbital characteristics could be calculated for Neuschwanstein. Noteworthy specimens include 8 Martian meteorites (5 from Sahara, 2 from Oman and 1 from Antarctica), 13 lunar meteorites (all except one from Oman), 3 irons, 3 pallasites, and many carbonaceous chondrites and achondrites.

INTRODUCTION

The Meteoritical Bulletin is a compilation of announcements by the Meteoritical Society's Meteorite Nomenclature Committee of newly described and classified meteorites. Several conventions are followed. Shock classification is after Stöffler et al. (1991). The scale of Wlotzka (1993) is used for weathering grades, except as noted. For chondrites, a slash in petrologic type, shock stage or weathering grade, (e.g., H5/6) indicates a transitional assignment. A hyphen in petrologic type assignment (e.g., H5–6) indicates the range of types observed in a breccia. Group names such as "L(LL)" indicate uncertain assignments, with the less probable group in parentheses. "Ungrouped" indicates that a meteorite does not fit existing classifications. "Anomalous" is used if a meteorite can be assigned to an established class, but differs from other members of that class in a significant way. All italicized abbreviations refer to addresses tabulated at the end of this document.

NEWLY DESCRIBED METEORITES

Acfer 056–352, see Saharan meteorites from Algeria

Acfer 328 **27°43′N, 4°13′E**
Algeria
Found 2001 December 22
Carbonaceous chondrite (CV3)
A dark-brown, 180.07 g, roundish stone lacking fusion crust was found by F. Beroud and C. Boucher. Mineralogy and classification (B. Devouard and J.-L. Devidal, *UBP*; B. Zanda and M. Denise, *MNHNP*): large chondrules (~1 mm in diameter), several small CAIs, plus a very large (10 mm) irregular, zoned one. Mean olivine, $Fa_{16.3}$ (range $Fa_{0.6–56.5}$); mean low-Ca pyroxene, $Fs_{16.0}$ (range $Fs_{0.8–60.2}$); shock stage, S3; weathering grade, W2/3. Specimens: type specimen, 20 g, *MNHNP*; main mass with finders.

Acfer 331 **27°35′N, 4°01′E**

Algeria
Found 2001 December 23
Carbonaceous chondrite (CM2)

Many, black, soft, porous and friable fragments totalling 750 g were found by F. Beroud and C. Boucher. Mineralogy and classification (B. Devouard and J.-L. Devidal, *UBP*; B. Zanda and M. Denise, *MNHNP*): matrix is abundant, and chondrules display large fine-grained rims; metal is virtually absent, except for small grains inside chondrules; hydrated phases characteristic of CM2 chondrites, including Fe-rich serpentine and tochilinite (PCPs), are ubiquitous within the matrix. Mean olivine, $Fa_{9.5}$ (range $Fa_{0.7–45.4}$); mean low-Ca pyroxene, $Fs_{5.4}$ (range $Fs_{1.4–20.9}$). Weathering grade, W0. Specimens: main mass with finders; type specimen, 22.6 g, *MNHNP*.

Acfer 332 **27°44′N, 4°08′E**

Algeria
Found 2001 December 23
Carbonaceous chondrite (CO3)

A brown, compact stone of 115.02 g was found by F. Beroud and C. Boucher. Mineralogy and classification (B. Devouard and J.-L. Devidal, *UBP*; B. Zanda and M. Denise, *MNHNP*): sharply defined chondrules from 0.1 to 0.3 mm and rare metal grains; olivine, mean $Fa_{26.2}$ (range $Fa_{2.9–74.0}$), low-Ca pyroxene, mean $Fs_{6.6}$ (range $Fs_{1.3–14.8}$), W2. Specimens: type specimen, 20.1 g, *MNHNP*; main mass with finders.

Acfer 333 **27°34′N, 4°04′E**

Algeria
Found 2001 December 26
Carbonaceous chondrite (CO3)

A dark-grey, slightly friable stone broken in 5 fragments and totalling 489 g was found by F. Beroud and C. Boucher. Mineralogy and classification (B. Devouard and J.-L. Devidal, *UBP*; B. Zanda and M. Denise, *MNHNP*): sharply defined chondrules from 0.1 to 0.3 mm and rare metal grains; olivine, mean $Fa_{23.2}$ (range $Fa_{0.7–81.7}$), low-Ca pyroxene, mean $Fs_{7.4}$ (range $Fs_{1.1–37.6}$), W2. Specimens: type specimen, 25.4 g, *MNHNP*; main mass with finders.

Adrar Bous, see Saharan meteorites from Niger

Aguemour 017, see Saharan meteorites from Algeria

Al Huqf 001, see Oman meteorites

American meteorite finds

(11 meteorites)
North and South America
Found 1999–2002

Several ordinary chondrites have been found at various locations in North and South America. Details are given in Table 1.

Antarctic ANSMET meteorites

(724 meteorites)
Antarctica
Found 1999–2001

Appendix 1 brings up to date the list of officially announced meteorites from the US Antarctic Meteorite Program. Some 10192 ANSMET meteorites have been listed in previous editions of the Meteoritical Bulletin; these meteorites bring the total to 10916. Listed are the classifications, masses, degrees of weathering, olivine and pyroxene compositions, pairing information, ice fields upon which the meteorites were found, and bibliographic information, all sorted by sample name. Meteorites were recovered from Bates Nunatak (BTN), Mount Crean (CRE), Finger Ridge (FIN), Meteorite Hills (MET), O'Dell Glacier (ODE), Queen Alexandra Range (QUE), and Tentacle Ridge (TEN). The meteorites in Appendix 1 were published in the Antarctic Meteorite Newsletter (AMN) issues 25(2) (2002) and 26(1) (2003). Brief descriptions of meteorites other than equilibrated ordinary chondrites are published in AMN. Note meteorite pairings may be tentative.

Antarctic NIPR meteorites

(170 meteorites)
Antarctica
Found 1988, 1998

Appendix 2 describes 170 meteorites from the Japanese National Institute of Polar Research (*NIPR*) program. The meteorites in Appendix 2 were published in the *Meteorite Newsletter of the Japanese Collection of Antarctic Meteorites* volume 11(1) 2002. They include 169 of the Asuka (A-) meteorites collected during the 1988 field season, larger than 10 g in mass, and a Yamato (Y-) Martian meteorite collected during the 1998 field season. Listed are the classifications, masses, degrees of weathering, olivine and pyroxene compositions, and bibliographic information, all sorted by sample name. Additional information, including brief descriptions of some achondrites, is given in the newsletter.

Antarctic PNRA meteorites

(144 meteorites)
Antarctica
Found 2001 December

Table 2 reports the classification of 144 meteorites recovered from the Frontier Mountain (FRO) blue ice field by the Italian Programma Nazionale delle Ricerche in Antartide (*PNRA*) in December 2001. Mineralogy and classification by A. Burroni, C. Ferraris and L. Folco (*MNA-SI*), A. Maras and M. Macrì (*URoma*), and Raul Carampin and Anna Maria Fioretti (*UPad*). Main masses, type specimens, thin sections, *MNA-SI*.

Antarctic PSF meteorites
(10 meteorites)
Antarctica
Found 2000 January

Table 3 reports ten meteorite specimens found in blue ice regions of Moulton Escarpment in the Thiel Mountains (TIL) region of Antarctica. Specimens were collected by various members of the Planetary Studies Foundation's Antarctica 2000 expedition, 2000 January 12–15. TIL 99016 is classified as E6 based on pyroxene composition and texture. Pairing with TIL 91714 is possible. Analyses by G. A. Jerman, *MSFC*; classification by Paul Sipiera, *Harper*. Main masses, reference specimens and probe sections reside at *PSF*. Representative specimens held by R. Hoover, *MSFC*.

Areshima, see Saharan meteorites from Niger

Asuka (A-), see Antarctic NIPR meteorites

Bacqueville **49°19′20″N, 01°21′56″E**
France
Found 1999 August 15
Ordinary chondrite (H6)

A 395 g single stone was found by Mr. Trehour, who was looking for metallic and archaeological objects in a field close to the forest of Bacqueville. A few weeks later, when he cut the stone, he realized it might be a meteorite. Classification (M. Denise, *MNHNP*): olivine, $Fo_{18.96;}$ low Ca-pyroxene $Fs_{17.26}$, shock stage S3, weathering grade W5. Specimens: main mass Thierry Tréhour (finder); type specimen 33.8 g, *MNHNP*.

Ballarat **37°34.25′S, 143°49.52′E**
Victoria, Australia
Found between 1867 and 1874
Iron (IAB)

The 15 g meteorite was found during mining operations by the Park Company in deep lead placer deposits below basalt flows in the West Ballarat goldfield. The meteorite was donated by Henry Rosales to the University of Melbourne in the 1890s. Classification and description (J. Wasson, *UCLA*; W. Birch, *Vic*; L. Samuels, *Monash*): Nickel 6.1–6.3%, Co 0.36%, Ga 95 μg/g, Ge 480 μg/g, Ir 1.1 μg/g. The meteorite consists of subgrains of kamacite crossed by partially resorbed Neumann bands and contains abundant schreibersite. Specimens: main mass and type specimen *Vic*.

Bates Nunatak (BTN), see Antarctic ANSMET meteorites

Beni M'hira **~32°52′N, 10°48′E**
Tataouine, Tunisia
Fell 2001 January 8, 3:00 hrs local time
Ordinary chondrite (L6)

A meteorite was seen to fall in the Beni M'hira region by the inhabitants of Ksar Beni M'hira, a small village ~35 km E of Foum Tataouine, (SE Tunisia). Three fragments weighing 1720, 300, and 200 g were recovered after the fall by local soldiers. An additional 7 pieces totalling >14 kg were later recovered by private finders. Classification (L. Folco, *MNA-SI*; N. Perchiazzi, *MSNP*; N. Laridhi Ouazaa, *Tunis*): olivine $Fa_{24.3}$, orthoenstatite $Fs_{21.4}$, shock stage S5, weathering grade W0. Magnetic susceptibility (P. Rochette, *CEREGE*), expressed as the decimal logarithm of apparent mass specific susceptibility (χ; in $10^{-9}m^3kg^{-1}$), is log χ = 5.01 ± 0.02. Specimens: 2190 g *Tunis*; type specimen, 29.2 g, and two thin sections, *MSNP*, one thin section, *MNA-SI*; 467.7 g, *MNHNP*; remaining mass with private collectors.

Bluewing 008, see American meteorite finds

Camel Donga 040 **30°19′S, 126°37′E**
Western Australia, Australia
Found 1988
Carbonaceous chondrite (C3, ungrouped)

Two stones of 34.5 g and 20.6 g were found by Alex Bevan. Classification and mineralogy (Mike Zolensky, *JSC*): The meteorite is a genomict mixure of two lithologies. Both lithologies contain abundant chondrules up to 1 mm across, some with well-developed, fine-grained rims or igneous rims; abundant smaller fragments, abundant troilite and pentlandite, but no pyrrhotite. Metal ($Fe_{49}Ni_{51}$ to $Fe_{63}Ni_{37}$) is rare due to high weathering grade. No magnetite was observed. Lithology 1 olivine, $Fa_{1–49}$ with peak at Fa_3; low Ca-pyroxene, $Fs_{2–11}$. Lithology 2 olivine, $Fa_{23–42}$ with a pronounced peak at Fa_{35}; pyroxene, $Fs_{2–25}$. Lithology 1 is petrographic type 3, and lithology 2 has been heated briefly to as high as 1100°C. Oxygen isotopes (R. Clayton, *UChi*): both lithologies are identical in oxygen isotopic composition; $\delta^{18}O$ = +0.18 to –0.01‰, $\delta^{17}O$ = –4.39 to –4.48‰. Specimens: main mass and type specimen, *WAM*.

Chuckwalla **35°15′N, 118°06′W**
Kern County, California, USA
Found 1992 November
Iron (IAB)

A single mass of 1.802 kg was found by Mr. Melvin English while quail hunting in the foothills of the Tehachapi Mountains. Classification (J. Wasson, *UCLA*): bulk composition Ni = 65.9 mg/g; Co = 4.61 mg/g, Ga = 100 μg/g, As = 12.4 μg/g, Ir = 2.72 μg/g, Au = 1.468 μg/g; see Wasson et al. (2002). The meteorite contains diamonds, some visible macroscopically, and many visible under the microscope. The diamonds closely resemble those in Allan Hills A77283 described by Clarke et al. (1981). Specimens: type specimens 82.6 g *UCLA*, 38 g *SI*; main mass, *GO*.

Cimarron **37.85°N, 100.35°W**

Gray County, Kansas, USA
Found ~1948
Carbonaceous chondrite (CM2)

A single stone of unknown weight was found by a rancher on a farm 3.4 miles north of Cimarron and sent to the University of Kansas in the early 1950s. A piece was later acquired by a meteorite collector and samples given to *NAU* in 1998 and pieces to *AMNH* in 1992 and 1993. Classification and mineralogy (M. Zolensky *JSC*; T. Bunch *NAU*): olivine ranges from Fa_1 to Fa_{64}, with a peak at $Fa_{1–2}$, average $Fa_{1.2}$, PMD 11%. Low Ca pyroxene ranges from Fs_2Wo_5 to Fs_5Wo_4, also present are diopside, enstatite-diopside, pigeonite, and chromite. Porphyritic olivine, barred olivine and granular olivine crystals are most abundant, maximum chondrule diameter is 2 mm. Chondrules are sparse, matrix and chondrule rims comprise ~85 vol% of the meteorite. The percentage of matrix is similar to that of Bells and Nogoya, but the composition of these is lower in S and Mg, and higher in Si; this could be due to terrestrial weathering. Specimens: type specimen 21 g *AMNH*; 7.1 g *NAU*.

Dar al Gani 664–1022, see Saharan meteorites from Libya

Dar al Gani 879 **27°08′N, 16°28′E**

Libya
Found 2000 November
Achondrite (ureilite)

A dark crusted stone of 26 g was found. Mineralogy and classification (A. Burroni and L. Folco, *MNA-SI*): ureilite with bimodal texture. Large twinned pigeonite ($En_{85}Wo_7$) crystals up to 16 mm in size poikilitically enclose olivine and pigeonite domains with typical, fine-grained (avg. grain size 0.5 mm), granoblastic ureilite texture. In the typical-textured domains, olivine and pigeonite have homogeneous cores (Fo_{92}; $En_{85}Wo_7$) and reduced rims; intergranular carbonaceous material mainly consists of graphite flakes. Moderate undulose extinction in silicates indicates moderate shock (S2). Weathering is moderate. Specimens: type specimen, 5 g and thin section at *MNA-SI;* main mass with anonymous finder.

Dar al Gani 881 **27°26′N, 16°12′E**

Libya
Found 2000 November
Achondrite (howardite)

A crusted stone of 86 g was found by a private collector in the Dar al Gani desert. Mineralogy and classification (A. Burroni and L. Folco, *MNA-SI)*: polymict breccia; clasts (up to several mm in size) interspersed in a fragmental matrix include: 1) fine-grained basaltic eucritic clasts; 2) medium-grained cumulate eucritic clasts (mostly pigeonite $En_{58}Wo_6$ and calcic plagioclase); 3) dark, quench-textured clasts with microporphyritic pigeonite crystals set in cryptocrystalline or glassy matrix; 4) large (up to 1.5 mm in size) single-crystal fragments of low-Ca pyroxene of diogenitic origin ($En_{70}Wo_3$). The rock is cross-cut by discrete shock melt veinlets up to 0.25 mm thick. DaG 881 is possibly paired with DaG 923 and DaG 932. Specimens: type specimen, 17.6 g, and thin section *MNA-SI;* main mass with anonymous finder.

Dar al Gani 896 **~27°45′N, 16°53′E**

Libya
Found 2000 November
Achondrite (primitive, ungrouped)

A 22.6 g, dark, ~50% fusion crusted, stony fragment was found in Dar al Gani by a private collector. The specimen is moderately oxidized and irregularly fractured. On slicing, it shows an homogeneous lithology. Shock veins of dark glass cross-cut the entire specimen. Classification and mineralogy (L. Folco, *MNA-SI*): abundant fine-grained, skeletal olivine crystals (Fo_{82}) are set in a mesostasis mainly consisting of rhyolitic glass plus quench crystallites of pigeonite ($En_{54}Wo_9$). Minor mineral constituents include enstatite ($En_{83}Wo_2$), augite ($En_{37}Wo_{30}$), and traces of chromite, sulfides, Fe-Ni metal and phospates. Undulose extinction and planar fracturing in olivine indicate moderate shock. Thin veins of secondary carbonates are present, most likely due to terrestrial weathering. Major element composition (P. Bland, *OU*) estimated from the mean of 256 broadbeam microprobe analyses (spot size 20 μm,) indicates a komatiitic IUGS composition (SiO_2 = 47.22 wt%, $Na_2O + K_2O$ = 1.53 wt%, MgO = 29.87 wt%) with chondritic Mn/Mg 7.5 × 10^{-3}. Oxygen isotopes (I. A. Franchi, *OU*): $\delta^{17}O$ = +2.547‰, $\delta^{18}O$ = +3.501‰, $\Delta^{17}O$ = +0.726‰, similar to mean H chondrite. Data suggest an affinity with igneous inclusions in ordinary chondrites and impact melt origin. Specimens: main mass with anonymous finder; 5.442 g and four thin sections, *MNA-SI*.

Dar al Gani 915 **27°21′N, 16°11′E**

Libya
Found 2000 November
Achondrite (howardite)

A crusted stone of 740 g was found. Mineralogy and classification (A. Burroni and L. Folco, *MNA-SI*): polymict breccia; with clasts (up to 1 cm in size) set in a fragmental matrix: 1) fine-grained, subophitic and intergranular, calcic plagioclase plus pigeonite-bearing eucritic clasts; 2) fine-grained, granular, pigeonite ($En_{46}Wo_{11}$) and calcic plagioclase-bearing eucritic clasts with various degrees of metamorphic annealing; 3) dark, quench-textured clasts with microporphyritic pigeonite crystals (and calcic plagioclase plus pyroxene relics) set in cryptocrystalline or glassy matrix; 4) large (up to 1.5 mm in size) single-crystal fragments of low-Ca pyroxene of diogenitic origin ($En_{64}Wo_1$). DaG 915 is

possibly paired with DaG 881 and DaG 932. Specimens: type specimen, 23.1 g, and one thin section at *MNA-SI;* main mass with anonymous finder.

Dar al Gani 923 **27°00′N, 16°21′E**

Libya
Found 2000 November
Achondrite (ureilite)

A weathered, crusted stone of 255 g was found. Mineralogy and classification (A. Burroni and L. Folco, *MNA-SI*): olivine and pigeonite-bearing ureilite with typical texture (average grain-size 1 mm). Mafic silicates show homogeneous core compositions (olivine Fo_{80}; pigeonite $En_{77}Wo_{9}$) and wide, strongly reduced rims. Undulose extinction, planar fractures and kinking in both olivine and pigeonite indicate moderate shock deformation. Specimens: type specimen, 21.2 g, and one thin section, *MNA-SI;* main mass with anonymous finder.

Dar al Gani 932 **27°24′N, 16°14′E**

Libya
Found 2000 November
Achondrite (howardite)

A crusted stony fragment of 23 g was found. Classification and mineralogy (A. Burroni and L. Folco, *MNA-SI*): the thin section that was studied (about 20 mm^2) is dominated by medium to large plagioclase and pyroxene crystal fragments of eucritic and diogenitic origin set in a fragmental matrix. A mm-sized fayalitic olivine crystal fragment is also set in the matrix. DaG 932 is possibly paired with DaG 881 and DaG 915. Specimens: type specimen, 3.5 g, and two polished thin sections at *MNA-SI;* main mass with anonymous finder.

Dar al Gani 975 **27°19.63′N, 16°13.00′E**

Libya
Found 1999 August 21
Martian meteorite (basaltic shergottite)

A 27.55 g stone was found on 1999 August 21 in the sand desert of Dar al Gani. Classification and mineralogy (A. Greshake, *MNB*; M. Kurz, *Kurz*): a basaltic shergottite with porphyritic texture; large chemically zoned olivine phenocrysts are set into a fine-grained groundmass consisting mostly of pyroxene and maskelynite; minor phases include chromite, Ti-rich chromite, sulfides, phosphates, and small Fe-rich olivines; olivine phenocrysts contain melt inclusions, small chromites and exsolution lamellae; pyroxenes are mostly chemically zoned pigeonites, some contain orthopyroxene cores; olivine phenocrysts, $Fa_{24.3–38.3}$; pigeonite, $Fs_{21.1–29}Wo_{5.9–13.8}$; orthopyroxene, $Fs_{17.4–21.8}Wo_{1.8–3.4}$; augite, $Fs_{18.5}Wo_{34}$; matrix olivine, $Fa_{35.9–39.8}$; maskelynite, $An_{66.5–71.4}$; shock stage, S4; contains melt veins and melt pockets; low degree of weathering. Possibly paired with DaG 476, 489, 670, 735 and 876. Specimens: main mass with anonymous finder; type specimen, 8.5 g, plus one polished thin section *MNB*.

Dar al Gani 976 **27°03.25′N, 16°23.25′E**

Libya
Found 1999 August 20
Achondrite (ureilite, polymict)

A single stone of 32.03 g was found on 1999 August 20 in the sand desert of Dar al Gani. Classification and mineralogy (A. Greshake, *MNB*; M. Kurz, *Kurz*): a fragmental breccia with lithic and mineral clasts set into a ureilitic matrix dominated by large olivine and pigeonite crystals; olivine core $Fa_{13.4–23.8}$; reduced olivine rims, $Fa_{1–15}$; pigeonite cores, $Fs_{17–19.8}Wo_{10–10.8}$; reduced pigeonite rims, $Fs_{4.3–10.2}Wo_{3.4–6.7}$; pigeonite contains up to 1.2 wt% Cr_2O_3; mineral clasts are plagioclase, $An_{6.4–23.8}$, and orthopyroxene, $Fs_{0.5–10.2}$; lithic clasts include ureilite material and fine-grained more Fe-rich olivine-pyroxene material; several C1-like clasts consisting of magnetites, sulfides and carbonates embedded into a phyllosilicate matrix were encountered; shock stage, S4; low degree of weathering. Specimens: main mass with anonymous finder; type specimen 7.8 g plus one polished thin section, *MNB*.

Dar al Gani 983 **26°44.25′N, 16°53.97′E**

Libya
Found 2002 March 23
Achondrite (eucrite, polymict)

A single stone of 933 g, partially covered with a shiny black fusion crust, was found on the Dar al Gani plateau during a German-Libyan expedition by J. Schlüter, F. Thiedig, L. Schultz and Abd Elfatah M. Abu Agreb. Mineralogy and classification (J. Schlüter, *Hamburg*). The cut stone shows a bright grey surface with strong brecciation with open cracks and some melt veins with vesicles. Cracks and vesicles occasionally contain white aggregates of gypsum microcrystals. The meteorite consists of mineral and lithic clasts set in a fine-grained fragmental matrix. Clasts include: 1) megacrysts of pigeonite, $Fs_{37.9}Wo_{4.4}$ (range $Fs_{31.1–51.1}$; $Wo_{1.5–7.2}$), and plagioclase $An_{94.8}$ (range $An_{92.7–95.4}$) up to 10 mm in size; 2) equigranular, pigeonite, and plagioclase-bearing cumulate eucrite; pigeonite, $Fs_{54.6}Wo_{3.1}$ (range $Fs_{48.5–56.7}$; $Wo_{1.5–9.8}$), with augitic ($Fs_{25.0}Wo_{40.9}$) exsolution lamellae up to 7 micrometers wide and maskelinitized plagioclase, $An_{93.6}$ (range $An_{88.7–96.4}$) are present in equal proportions; 3) dark, recrystallized impact melt with a spinifex-like texture consisting mainly of pigeonite, $Fs_{55.3}Wo_{2.13}$ (range $Fs_{54.1–56.4}$; $Wo_{1.6–3.1}$) and plagioclase, $An_{84.3}$ ($An_{75.5–90.6}$). Diogenitic components have not been found. The opaque components show only slight weathering. Accessory minerals including ilmenite, chromite and troilite have been observed. The bulk composition of the meteorite is similar to Sioux County or Juvinas. Specimens: type specimens 281 g, *Hamburg*, 20 g, *MPI*, main mass, *Industrial Research Center* (*IRC*), Tripoli, Libya.

Dar al Gani 995 **27°10.35′N, 16°23.17′E**

Libya
Found 2001 January 3
Achondrite (eucrite)

A single stone of 56.12 g, partly covered by fusion crust, was found by an anonymous finder in the sand desert of Dar al Gani. Classification and mineralogy (A. Greshake, *MNB*; M. Kurz, *Kurz*): the specimen has subophitic texture with plagioclase laths embedded in exsolved Ca-pyroxene, augite and silica; several areas of the meteorite are recrystallized; plagioclase, $An_{89.5}$ (range $An_{88.4–90.6}$); exsolved Ca-pyroxene with pigeonite lamellae, $Fs_{51.8–60}Wo_{5–15.2}$ and augite lamellae, $Fs_{31–34.2}Wo_{37.3–40.5}$; unexsolved augite $Fs_{30.7}Wo_{40.6}$; minor phases include orthopyroxene, ilmenite and Ti-rich chromite; plagioclase contains small crystallographically orientated inclusions of augite, pigeonite and silica; augite contains small plagioclase and Ti-rich chromite inclusions; the sample appears unbrecciated in thin section; low degree of shock; low degree of weathering. Specimens: type specimen, 11.6 g, plus one polished thin section, *MNB;* main mass with anonymous finder.

Dar al Gani 996

Libya
Found 1999 May 14
Lunar meteorite (fragmental breccia)

A single stone of 12.31 g was found by an anonymous finder in the sand desert of Dar al Gani. Classification and mineralogy (A. Greshake, *MNB*; M. Kurz, *Kurz*): a fragmental breccia with lithic and mineral fragments set into a fine-grained clastic matrix; the clast size is generally ≤1 mm; mafic clasts are by far more abundant than feldspathic clasts; schlieren and vesicles are rare. Plagioclase composition, $An_{96.7}$ (range $An_{94.3–98.3}$); pigeonite, $Fs_{19.7–51.3}Wo_{5.5–14.1}$; augite, $Fs_{24.7–38.7}Wo_{24.7–41.7}$; most Ca-pyroxenes contain pigeonite exsolution lamellae; olivine, $Fa_{30.5}$ (range $Fa_{14.2–43.2}$). Orthopyroxene, Fe,Ni metal, ilmenite, Mg-Al-chromite, and troilite are present as minor phases; crystalline fragments include intersertal impact melt rocks, dark fine-grained and microporphyritic impact melt clasts, olivine, pyroxene and cataclastic feldspar; no regolith component, i.e., glass spherules was found; very strong mosaicism of plagioclase, as well as abundant melt veins and melt pockets attest a high degree of shock; the meteorite is moderately weathered; calcite occurs in cracks. Specimens: main mass with anonymous finder; type specimen, 2.5 g, plus one polished thin section, *MNB*.

Dar al Gani 999 **27°01.55′N, 16°21.23′E**

Libya
Found 2000 April 14
Achondrite (ureilite, polymict)

Numerous fragments totalling 2106 g were found in the sand desert of Dar al Gani. Classification and mineralogy (A. Greshake, *MNB*; M. Kurz, *Kurz*): a fragmental breccia with mineral and lithic clasts set into a ureilitic matrix dominated by large olivines; olivine core, $Fa_{14.3–23.5}$; reduced olivine rims, $Fa_{2.9–13.5}$; mineral clasts are pigeonite, $Fs_{14.3}Wo_{8.5}$ and orthopyroxene, $Fs_{9.3}$; lithic clasts consist of fine-grained olivine (Fa_{22}) and pyroxene ($Fs_{19.3}Wo_{4.5}$) rich material; shock stage, S3; low degree of weathering. Specimens: main mass with anonymous finder; type specimen 20.8 g plus one polished thin section, *MNB*.

Dar al Gani 1000 **27°00.81′N, 16°21.95′E**

Libya
Found 1997
Achondrite (ureilite, polymict)

A single stone of 17.92 g was found in the sand desert of Dar al Gani. Classification and mineralogy (A. Greshake, *MNB*; M. Kurz, *Kurz*): a fragmental breccia with mineral and lithic clasts set into a ureilitic matrix dominated by large olivine and less abundant pyroxene crystals; olivine cores, $Fa_{13.2–21.8}$; reduced olivine rims, $Fa_{5–11.9}$; pyroxene cores, $Fs_{14.9}$; reduced pyroxene rims, $Fs_{4.4}$; mineral clasts are plagioclase, $An_{22.9}$ and orthopyroxene, $Fs_{8.3}$; lithic clasts are fine-grained, more Fe-rich olivine-pyroxene material; shock stage, S3; low degree of weathering. Specimens: main mass with Peter Jäger, Apolda, Germany; type specimen 4.2 g plus one polished thin section, *MNB*.

Dar al Gani 1022 **~27°05′N, 16°15′E**

Libya
Found 2001 April 25
Ordinary chondrite (LL7)

A stone of 33.6 g was found in the Dar al Gani region. Classification and mineralogy (S. Afanasiev, M. Nazarov, *Vernad*): the meteorite shows an equigranular texture; rare chondrule relics are present; plagioclase grain size up to 200 μm. Mineral phases have homogeneous chemical composition: olivine, $Fa_{29.6}$; orthopyroxene, $Fs_{25.0}Wo_{2.42}$ (1.2 wt% CaO); plagioclase, $An_{11.2}Or_{3.6}$; metal is commonly oxidized and contains up to 45 wt% Ni and 2 wt% Co; chromite and troilite are present; shock stage S2; weathering grade W3. Specimens: type specimen, 7 g, and one thin section, *Vernad*; main mass with anonymous owner.

Dar al Gani 1023 **27°1.55′N, 16°23.27′E**

Libya
Found 1999 summer
Achondrite (ureilite, polymict)

A stone of 149 g was found by an anonymous collector in the Dar al Gani desert. Mineralogy and classification (H. Takeda, *Chiba*; T. Ishii and M. Ohtsuki, *UTok*): fragmental breccia, with lithic and mineral clasts embedded in a cataclastic matrix of predominantly ureilitic material. Lithic clasts and fragments include mafic ureilitic material (olivine 86 vol% and pyroxene 12 vol%), Na-rich plagioclase fragments and

rare subrounded, dark brown Na-, K-rich glassy grain (SiO_2 68 wt%, Al_2O_3 13.6 wt%, MgO 5.6 wt%, CaO 5.3 wt%, Na_2O 6.3 wt%, K_2O 0.8 wt%). The pyroxene composition ranges from $En_{79}Wo_6$ to $En_{62}Wo_4$ and $En_{59}Wo_{31}$; olivine composition ranges from Fo_{90} to Fo_{75}. The plagioclase composition ranges from $An_{13}Ab_{85}$ to $An_{33}Ab_{62}$. A slice of a lithic clast of 3.7 × 2.7 cm in size (sub-sample ,02; 6.89 g slice), is one of the most heavily shocked ureilites known. All mafic silicates are converted into very fine grained materials with a granoblastic texture; carbonaceous vein materials are lost from many grain boundaries; glassy shock-vein materials are observed at some parts of the thin section. Olivine (80 vol%) is more abundant than pyroxene (20%). Pyroxene composition ranges from $En_{86}Wo_2$ to $En_{77}Wo_{10}$ and $En_{69}Wo_6$; olivine composition ranges from Fo_{96} to Fo_{66}. The stone is weathered, with a brownish color in hand specimen, but in thin section the weathering grade appears to be very low. Specimens: type specimen, 20.75 g (including sample, 02), *NSMT*, one thin section, *Chiba*; main mass with anonymous finder.

Dhofar 294-837, see Oman meteorites

Dhofar 304 **18°24.2′N, 54°09.0′E**

Oman

Found 2001 April 13

Lunar meteorite (anorthositic impact melt breccia)

A brownish grey stone weighing 10 g was found in the Dhofar region, Oman. Mineralogy and classification (M. Nazarov, *Vernad*; L. Taylor, *UTenn*): fusion crust is absent; meteorite is a clast-rich impact melt breccia; mineral fragments and lithic clasts are embedded in a very fine-grained impact-melt matrix; the lithic clast population is dominated by impact melt breccias; possible igneous rocks and granulites of mostly anorthositic and gabbro-noritic compositions are rare. Mineral compositions are: feldspar, $An_{93–99}$; orthopyroxene, $Wo_{1–5}En_{70–90}$; clinopyroxene, $Wo_{6–42}En_{40–50}$; olivine, $Fo_{60–90}$ (Fe/Mn 87 at). Accessory minerals are Ti-rich chromite, Cr-pleonaste, ilmenite (7–8 wt % MgO), troilite, and FeNi metal (7.8 wt% Ni; 0.6 wt% Co). The composition of the impact-melt matrix (wt%) is SiO_2 = 45.0, TiO_2 = 0.34, Al_2O_3 = 25.3, Cr_2O_3 = 0.17, FeO = 5.71, MnO = 0.12, MgO = 7.09, CaO = 14.8, Na_2O = 0.37, K_2O = 0.04, P_2O_5 = 0.07. The meteorite is moderately weathered; gypsum, calcite, celestite, barite, and Fe hydroxides occur in cracks and holes. Dhofar 304 is possibly paired with Dhofar 025 and Dhofar 301 because the stones were found nearby and they are similar in texture, mineral chemistry and degree of weathering. Specimens: type specimens of 2 g, and a thin section, *Vernad*; main mass with anonymous finder.

Dhofar 305 **19°19.8′N, 54°47.0′E**

Oman

Found 2001 June 28

Lunar meteorite (anorthositic impact melt breccia)

A light-grey stone weighing 34.11 g was found in the Dhofar region of Oman. Mineralogy and classification (M. Nazarov, *Vernad*; L. Taylor, *UTenn*): fusion crust is absent; the meteorite is an impact melt breccia consisting of mineral fragments and lithic clasts set within fine-grained, well-crystallized impact-melt matrix; clasts of impact melt breccias are most common; granulites and possible igneous rocks are rare and have mainly anorthositic and troctolitic compositions; orthopyroxenite clasts are present; feldspar, $An_{87–98}$; orthopyroxene, $Wo_{1–5}En_{40–88}$; clinopyroxene; $Wo_{6–48}En_{30–70}$; olivine, $Fo_{44–90}$ (Fe/Mn = 94 at); accessory minerals are Ti-rich chromite, Cr-pleonaste, ilmenite (1–8 wt% MgO), armalcolite, troilite, and FeNi metal (17–32 wt% Ni; 1.3–2.3 wt% Co); composition of the impact-melt matrix is (wt%) SiO_2 = 43.9, TiO_2 = 0.16, Al_2O_3 = 28.5, Cr_2O_3 = 0.10, FeO = 3.69, MnO = 0.07, MgO = 6.08, CaO = 15.9, Na_2O = 0.36, K_2O = 0.02, P_2O_5 = 0.04; the stone is moderately weathered; calcite, celestite, gypsum, and Fe hydroxides are present. Dhofar 305 is close to Dhofar 303, which was found nearby, in degree of weathering, mineral chemistry, and matrix composition. The meteorites may be paired, but they are very different in texture. Pairing with Dhofar 081/280, 302, 306, and 307 is also possible. Specimens: type specimens of 7 g, and a thin section, *Vernad*; main mass with anonymous finder.

Dhofar 306 **19°19.7′N, 54°47.1′E**

Oman

Found 2001 June 29

Lunar meteorite (anorthositic impact melt breccia)

A light-grey stone weighing 12.86 g was found in the Dhofar region of Oman. Mineralogy and classification (M. Nazarov, *Vernad*; L. Taylor, *UTenn*): fusion crust is absent; the meteorite is an impact melt breccia consisting from mineral fragments and lithic clasts cemented by fine-grained impact-melt matrix; clast population is dominated by impact melt breccias; granulites and cataclastic igneous rocks of anorthositic, troctolitic and noritic compositions are present; devitrified glass fragments occur also; a characteristic feature of the lithic clast population is abundant high mg# lithologies; feldspar, $An_{93–98}$; orthopyroxene, $Wo_{1–5}En_{50–90}$; clinopyroxene; $Wo_{10–48}En_{30–75}$, olivine, $Fo_{48–94}$ (Fe/Mn = 87 at); accessory minerals are Ti-rich chromite, Cr-pleonaste, ilmenite (3–8 wt% MgO), armalcolite, silica, Ca-phosphate, troilite, and FeNi metal (7–68 wt% Ni, 0.3–3.4 wt% Co); composition of the impact-melt matrix is SiO_2 = 44.0, TiO_2 =

0.15, Al_2O_3 = 27.2, Cr_2O_3 = 0.12, FeO = 4.00, MnO = 0.05, MgO = 7.55, CaO = 15.5, Na_2O = 0.33, K_2O = 0.04, P_2O_5 = 0.07 (wt%); the stone is moderately weathered; celestite, calcite, and Fe hydroxides are present. Dhofar 306 is different in texture and mineral chemistry from Dhofar 081/280, 302, 303, 305, and 307, which were found nearby. However, the meteorites may be paired. Specimens: type specimen, 2.6 g and a thin section, *Vernad*; main mass with anonymous finder.

Dhofar 307 **19°19.7′N, 54°46.9′E**

Oman

Found 2001 April 14

Lunar meteorite (anorthositic impact melt breccia)

A light-grey stone weighing 50 g was found in the Dhofar region of Oman. Mineralogy and classification (M. Nazarov, *Vernad*; L. Taylor, *UTenn*): fusion crust is absent; the meteorite is an impact melt breccia; fine-grained impact melt is most abundant; mineral fragments and rare lithic clasts of anorthositic, troctolitic, and gabbro-noritic compositions occur in the impact-melt matrix; the presence of rare dunite fragments is a characteristic feature of the meteorite; glass veins are common; feldspar, $An_{89–98}$; orthopyroxene, $Wo_{1–5}En_{50–90}$; clinopyroxene; $Wo_{6–48}En_{40–75;}$, olivine, $Fo_{38–94}$ (Fe/Mn = 92 at); accessory minerals are Ti-rich chromite, Cr-pleonaste, ilmenite (2–6 wt % MgO), troilite, and FeNi metal (8–49 wt% Ni, 0.3–2.0 wt% Co); composition of the glass veins is SiO_2 = 43.8, TiO_2 = 0.09, Al_2O_3 = 30.8, Cr_2O_3 = 0.09, FeO = 2.58, MnO = 0.05, MgO = 4.06, CaO = 17.3, Na_2O = 0.36, K_2O = 0.01, P_2O_5 = 0.02 (wt%); the stone is moderately weathered; calcite, gypsum, celestite, barite, and Fe hydroxides are present. Dhofar 307 is similar in texture and mineral chemistry to Dhofar 305, found nearby. The meteorites are likely to be paired. Pairing with Dhofar 081/280, 302, 303, and 306 is also possible. Specimens: type specimen, 10 g and thin section, *Vernad*; main mass with anonymous finder.

Dhofar 309 **19°19.6′N, 54°47.3′E**

Oman

Found 2002 January 14

Lunar meteorite (anorthositic impact melt breccia)

A grey, partly fusion-crusted 81.3 g stone was found in the Dhofar region of Oman. Classification and mineralogy (S. Demidova, *Vernad*; G. Kurat, *NHMV*): the meteorite is a clast-poor impact melt breccia; mineral fragments and lithic clasts are embedded in a matrix of devitrified glass. The clast population is dominated by granulite clasts of mainly anorthositic and troctolitic composition; fragments of possible pristine rocks and single mineral fragments are less common. Mineral compositions: plagioclase $An_{93–98}Or_{0.1–0.4}$; olivine $Fo_{75–89}$ (atomic Fe/Mn ≈ 79); orthopyroxene $En_{80–86}Wo_{2–5}$; clinopyroxene $En_{46–82}Wo_{5–46}$; accessory minerals are Ti-poor chromite and Cr-pleonaste, ilmenite (4–9 wt% MgO), troilite, and FeNi metal. The composition (wt%) of the impact melt matrix is MgO 6.2, CaO 16.1, Al_2O_3 29.1, SiO_2 44.3, FeO 3.1; terrestrial weathering is not significant, although celestite and calcite are present in cracks. Dhofar 309 is different in texture and mineral chemistry from Dhofar 081/280, 302, 303, 305, 306, 310 found nearby. However, the meteorites may be paired. Specimens: 16.5 g plus two thin sections, *Vernad*; main mass with anonymous finder.

Dhofar 310 **19°19.7′N, 54°47.1′E**

Oman

Found 2002 January 15

Lunar meteorite (anorthositic fragmental breccia)

A grey 10.8 g stone was found in the Dhofar region of Oman. Classification and mineralogy mineralogy (S. Demidova, *Vernad*; G. Kurat, *NHMV*): fusion crust is almost absent; the meteorite is a fragmental regolith breccia containing numerous mineral fragments and clasts of feldspathic rocks embedded in a devitrified glassy matrix; clasts of granulites and possible igneous rocks are abundant and have mainly anorthositic and troctolitic-noritic compositions, impact melt breccias and pyroxenitic clasts are also present; plagioclase $An_{96–99}Or_{0.1–0.2}$; olivine $Fo_{44–86}$ (atomic Fe/Mn ≈ 79); orthopyroxene $En_{59–88}Wo_{1–5}$; clinopyroxene $En_{33–77}Wo_{5–47}$; accessory minerals are Ti-rich chromite, ulvöspinel, pleonaste, ilmenite (2–7 wt% MgO), armalcolite, silica, troilite, FeNi metal; composition of the impact melt matrix is MgO 4.8, CaO 18.5, Al_2O_3 29.1, SiO_2 43.5, FeO 3.0 (wt%); the stone is moderately weathered: calcite and gypsum veins and celestite inclusions are present. Dhofar 310 was found closely to Dhofar 302, 303, 305, 306, 307, 081/280, and may be paired with some of these meteorites. Specimens: 2.5 g plus a thin section, *Vernad*; main mass with anonymous finder.

Dhofar 311 **19°19.6′N, 54°47.0′E**

Oman

Found 2001 April 14

Lunar meteorite (anorthositic impact melt breccia)

A small light-grey stone weighing 4 g was found in the Dhofar region of Oman. Mineralogy and classification (S. Demidova, *Vernad*; L. Taylor, *UTenn*): fusion crust is absent; mineral fragments and rounded lithic clasts occur within a fine-grained to cryptocrystalline impact-melt matrix; the lithic clast population comprises impact-melt breccias, as well as cataclastic granulitic and igneous rocks of anorthositic and troctolitic compositions; clasts of impact-melt breccias are most abundant and typically show breccia-in-breccia textures; feldspar, $An_{95–98}$; orthopyroxene, $Wo_{2–5}En_{45–85}$; clinopyroxene; $Wo_{6–45}En_{40–74}$, olivine, $Fo_{57–88}$ (Fe/Mn ≈ 91 at); accessory minerals include: Cr-pleonaste, Al-chromite, troilite, and FeNi metal (3–27 wt% Ni; 0.2–1.9 wt% Co); the stone is moderately weathered; calcite, gypsum, celestite, barite, and Fe hydroxides are present. Dho 311 was found 25 m from Dho 280, but the meteorites are very different in weathering grade and lithology. Dho 311 is most similar in texture and mineral chemistry to Dho 303 found nearby. The meteorites may be paired. Pairing with Dho 302, 305, 306,

307, 309, 310, 730, and 731 is also possible. Specimens: type specimen of 1.7 g plus a thin section, *Vernad*; main mass with anonymous finder.

Dhofar 490 **18°43.00′N, 54°27.00′E**

Oman

Found 2001 March 17

Lunar meteorite (anorthositic fragmental breccia)

A dark grey, crusted stone weighing 34.05 g was found in the Dhofar region of Oman. Classification and mineralogy (A. Greshake, *MNB*; M. Kurz, *Kurz*): meteorite is an anorthositic fragmental breccia consisting of clasts of various lithologies embedded into a glassy, partly devitrified fine-grained matrix; the clast size is generally below 3 mm; vesicles are abundant; feldspar: $An_{96.0–99.3}$; pyroxene: $Fs_{11.5–35.7}Wo_{8.2–44.9}$ and olivine: $Fa_{30.6–50.0}$; augites dominate over Ca-poor pyroxenes and often contain pigeonite exsolution lamellae; accessory phases are Fe-Ni metal and ilmenite; crystalline fragments include microporphyritic impact melt breccias, intersertal impact melt clasts, gabbroic anorthosites, and large feldspar; no mare basalt clasts and no glass spherules have been identified; feldspar generally shows pronounced undulatory extinction and sometimes mosaicism indicating strong shock metamorphism; the meteorite is moderately weathered; gypsum, celestite and calcite occur in cracks and holes; Dho 490 may be paired with Dho 280, since they were found nearby and have similar mineralogical characteristics. Specimens: 7 g and one thin section, *MNB*; main mass with anonymous finder.

Dhofar 500 **18°23.2′N, 54°12.2′E**

Oman

Found 2000 January 24

Achondrite (ungrouped)

A stone weighing 116 g was found in the Dhofar region of Oman. Mineralogy and classification (C. Lorenz and M. Ivanova, *Vernad.*): the rock is a metabreccia and consists of at least three different lithologies: pyroxene-feldspar, pyroxene-olivine and pyroxene-olivine-feldspar. In texture the lithologies vary from medium to coarse-grained, poikiloblastic to equigranular. Mineral chemistry: olivine $Fa_{4.8}$; CaO 0.13 wt%, Cr_2O_3 0.42 wt%; orthopyroxene is $En_{95}Wo_2$, Fe/Mn ratio is 6 (at); feldspar is $An_{13–34}$. Olivine and pyroxene are of the same compositions in the lithologies. The minor phases are Ca-rich augite $En_{52}Wo_{44}$; Cr-rich troilite (up to 3.11 wt% Cr), chromite and rare minute grains of Fe-Ni metal. Weathering grade is W3. The oxygen isotope composition (R. N. Clayton, *UChi*): $\delta^{18}O = +9.21‰$; $\delta^{17}O = +4.29‰$; $\Delta^{17}O = –0.49‰$, is not in the range of known meteorite groups but close to the winonaite-IAB-IIICD trend and ureilites. Mineralogically the meteorite may have some links to primitive achondrites but compositions of olivine and troilite are close to those in polymict ureilites. However, this meteorite lacks a carbon-rich matrix. Specimens: a type specimen of 23.5 g and a thin section, *Vernad*; main mass with anonymous finder.

Dhofar 535 **19°20.0′N, 54°47.7′E**

Oman

Found 2000 January 16

Chondrite (ungrouped)

Many stones weighing a total of 204 g were found in the Dhofar region of Oman. Mineralogy and classification (M. Ivanova, *Vernad*; L. Taylor, *UTenn*): the meteorite consists of chondrules, 0.08–3.2 mm in diameter, (0.86 mm in average) of different types, PO, POP, BO, RP, CC, and their fragments embedded in a fine-grained matrix. Chondrule/matrix ratio is 1.1. Olivine and low-Ca pyroxene have large compositional ranges: olivine has $Fa_{1–50}$, CaO 0.2 wt%; Al_2O_3 0.06 wt%, Cr_2O_3 0.09 wt%, PMD of Fa 42%; low-Ca pyroxene is $Wo_{2–3.5}En_{53–95}$; chondrules contain glassy mesostasis. Accessory minerals include: pigeonite, chromite, troilite, rare hydroxides, and rare FeNi metal (Ni 5 wt%; Co 0.4 wt%). Thermoluminescence studies (A. I. Ivliev, *Vernad*) indicate petrologic type 3.2/3.3. The meteorite is heavily weathered, and some silicates are altered. Weathering grade is W5; shock stage is S1. Based on the very low abundance of FeNi metal and hydroxides, Dho 535 could belong to either the LL or R chondrite groups but with very abundant matrix. The average size of chondrules is consistent with LL chondrites. A histogram showing the distribution of olivine is similar to unequilibrated ordinary chondrites. FeNi metal is mostly kamacite, typical for H chondrites and unusual for R chondrites. Sulfide assemblages and chromite chemistry are also unusual for R chondrites. The absence of refractory objects and olivine chemistry distinguish Dho 535 from C3 chondrites. Oxygen isotope composition (R. N. Clayton, *UChi*): $\delta^{18}O = +8.56‰$; $\delta^{17}O = +4.96‰$, $\Delta^{17}O = 4.51‰$ is unusual for any chondrite type. Specimens: type specimen of 46.8 g and thin section, *Vernad*; main mass with anonymous finder.

Dhofar 622 **19°13.672′N, 54°51.221′E**

Oman

Found 2001 January 15

Ordinary chondrite (H4, anomalous)

The sample (working and find number: OM 1.01–24) was found as a single fragment of 60 g in the Dhofar region. Mineralogy and classification (A. Bischoff and A. Sokol, *Mün*): Although the chemical analyses of olivine ($Fa_{18.5}$) and pyroxene ($Fs_{16.8 \pm 1.2}$) are similar to those of H-chondrites, this rock is not a typical H-chondrite, and consists of much more matrix than typical ordinary chondrites. R.N. Clayton (*UChi*) states that Dhofar 622 "has a lower $\Delta^{17}O$ than any ordinary chondrite we have measured (typical H-chondrites have $\Delta^{17}O = +0.7$)." The oxygen isotope data are: $\delta^{18}O = +5.15$; $\delta^{17}O =$

+2.92; $\Delta^{17}O = +0.25‰$. The meteorite is very weakly shocked (S2) and moderately to heavily weathered (W3-4). Specimens: main mass with anonymous finder; thin sections and type specimen, 12 g, *Mün*.

Dhofar 700 **19°18.5′N, 54°33.1′E**

Oman

Found 2002 November 15

Achondrite (diogenite)

Twelve dark-grey stones totalling 2770 g were found in the Dhofar region of Oman. Classification and mineralogy (S. Demidova, *Vernad*; G. Kurat, *NHMV*): fusion crust is absent. The meteorite has an equigranular texture, and consists dominantly of orthopyroxene ($Wo_{2.5–7}En_{62–71}$; Fe/Mn ≈ 25 at.). Accessory minerals are clinopyroxene $Wo_{8–25}En_{55–66}$, olivine $Fo_{63–68}$, plagioclase $An_{89–95}$, silica, chromite, troilite and FeNi metal (0.2–3.8 wt% Ni, 0.3–0.8 wt% Co); terrestrial weathering is not significant; rare Fe hydroxide is present. The mafic silicates in Dho 700 have the low mg# that is a characteristic feature of diogenites. Specimens: 350 g plus thin section, *Vernad*; main mass with anonymous finder.

Dhofar 730 **19°19.5′N, 54°47.5′E**

Oman

Found 2002 November 9

Lunar meteorite (anorthositic impact melt breccia)

A light-grey stone weighing 108 g was found in the Dhofar region of Oman. Mineralogy and classification (M. Nazarov, *Vernad*; L. Taylor, *UTenn*): fusion crust is absent; lithic clasts and mineral fragments set within a fine-grained impact melt matrix; the lithic clast population is dominated by impact-melt breccias and cataclastic granulitic and igneous rocks of anorthositic and troctolitic compositions; rare dunite fragments are present; feldspar, $An_{86–98}$; orthopyroxene, $Wo_{2–4}En_{56–85}$; clinopyroxene; $Wo_{6–46}En_{14–71}$; olivine, $Fo_{55–92}$ (Fe/Mn ≈ 86 at). Accessory minerals include: chromite, Cr-pleonaste, armalcolite, ilmenite, silica, troilite, and FeNi metal (6–48 wt% Ni; 1–2.4 wt% Co); the stone is moderately weathered; calcite, gypsum, celestite, barite, and Fe hydroxides are present. The meteorite may be paired with Dho 302, 303, 305, 306, 307, 309, 310, 311, and 731 found nearby. Specimens: type specimens of 22 g, and a thin section, *Vernad*; main mass with anonymous finder.

Dhofar 731 **19°20.0′N, 54°47.7′E**

Oman

Found 2002 November 11

Lunar meteorite (anorthositic impact melt breccia)

A light-grey stone weighing 36 g was found in the Dhofar region of Oman. Mineralogy and classification (M. Nazarov, *Vernad*; L. Taylor, *UTenn*): fusion crust is absent; lithic clasts and mineral fragments occur within a fine-grained impact melt matrix; the lithic clast population consists mainly of impact melt breccias of anorthositic and troctolitic compositions; feldspar, $An_{95–97}$; orthopyroxene, $Wo_{2–5}En_{53–85}$; clinopyroxene; $Wo_{6–45}En_{30–81}$, olivine, $Fo_{52–87}$ (Fe/Mn ≈ 84 at). Accessory minerals include: Cr-pleonaste, chromite, ilmenite, troilite and FeNi metal (0.5–66 wt% Ni; 0.2–2 wt% Co); Cr-pleonast is most common; the stone is moderately weathered; calcite, gypsum, celestite, barite, smectite, and Fe hydroxides are present. Dho 731 may be paired with Dho 302, 303, 305, 306, 307, 309, 310, 311, and 730. Specimens: type specimens of 7.5 g, and a thin section, *Vernad*; main mass with anonymous finder.

Dhofar 732 **19°24.3′N, 54°34.7′E**

Oman

Found 2002 November 15

Achondrite (ungrouped, orthopyroxene-rich)

A small brownish stone weighing 17 g was found in the Dhofar region of Oman. Mineralogy and classification (S. Demidova, *Vernad*; G. Kurat, *NHMV*): fusion crust is absent. The coarse-grained rock consists mainly of lath-shaped, zoned orthopyroxene ($Wo_{0.4–5}En_{82–96}$) and interstitial mesostasis (5–10%); minor rounded olivine ($Fo_{93–95}$) grains are present; the mesostasis consists of clinopyroxene ($Wo_{12–40}En_{54–81}$) and silica set within Ca, Al-rich, Na-poor glass; accessories are chromite, troilite, and FeNi metal (1.6–8.1 wt% Ni; 0.3–0.6 wt% Co); Fe/Mn of orthopyroxene (5–17 at.) is very low and clearly distinguishes the meteorite from diogenites; the stone is moderately weathered; there are abundant Fe hydroxide inclusions and holes in the rock. Oxygen isotope composition (R. N. Clayton, *UChi*): $\delta^{17}O = +2.77‰$, $\delta^{18}O = +6.64‰$ indicate a possible relation of the meteorite with silicate inclusions from IAB irons, winonaites or ureilites. Specimens: type specimens of 3.5 g, and a thin section, *Vernad*; main mass with anonymous finder.

Dhofar 733 **18°35.3′N, 54°13.8′E**

Oman

Found 2002 November 12

Lunar meteorite (anorthositic granulitic breccia)

A brownish grey stone weighing 98 g was found in the Dhofar region of Oman. Mineralogy and classification (S. Demidova, *Vernad*; G. Kurat, *NHMV*): fusion crust is absent; the rock contains relics of mineral and lithic clasts and shows granoblastic or poikiloblastic textures; anorthositic, troctolitic and gabbro-noritic lithologies are present. Mineral compositions: feldspar, $An_{89–96}$; orthopyroxene, $Wo_{4–5}En_{73–76}$; clinopyroxene, $Wo_{36–40}En_{48–52}$; olivine, $Fo_{71–76}$ (Fe/Mn ≈ 87 at). Accessory minerals are armalcolite, ilmenite, Al-chromite, Ca-phosphate, troilite, and FeNi metal (31–43 wt% Ni; 1.3–1.7 wt% Co); lath-shaped armalcolite is most common; the stone is moderately weathered; smectite, gypsum, and Fe hydroxides

are present. Dho 733 was found far away from other lunar stones collected in the Dhofar region and has a distinctly different texture. It is probably not paired with any other Dhofar lunar finds known so far. Specimens: type specimens of 20 g, and a thin section, *Vernad*; main mass with anonymous finder.

Dhofar 735 **19°04.1′N, 54°46.8′E**
Oman
Found 2002 November 9
Carbonaceous chondrite (CM2)

Two stones weighing 304 g and 77 g were found on November 2002 in the Dhofar region of Oman. Mineralogy and classification (M. Ivanova, *Vernad*; L. Taylor, *UTenn*): fusion crust is present, the meteorite consists of altered chondrules, sometimes with a halo around, olivine aggregates, and fragments of matrix material set within a phyllosilicate matrix. Olivine, $Fa_{0.3–22}$, CaO 0.35 wt%, Cr_2O_3 0.28 wt%. No orthopyroxene is present. Refractory inclusions are rare and consist of anorthite, Al-rich pyroxene and forsterite. The minor phases are kamacite, taenite, and tetrataenite (Ni, up to 60 wt%), troilite, rare pentlandite, chromite, Mg-ilmenite, schreibersite, and Ca-carbonates. The matrix is composed mainly of serpentine. Tochilinite was not found. Weathering grade is W1. Oxygen isotope composition is in the range of metamorphosed CM chondrites (R. N. Clayton, *UChi*): $\delta^{18}O$ = +21.99‰; $\delta^{17}O$ = +10.85‰; $\Delta^{17}O$ = –0.58‰. Specimens: a type specimen of 58.8 g and a thin section, *Vernad*; main mass with anonymous finder.

Dhofar 836 **18°20.92′N, 54°12.84′E**
Oman
Found 2000 August 15
Achondrite (ureilite)

A single stone weighing 995 g, and split into two pieces was found by an anonymous finder in the Dhofar region of Oman. Mineralogy and classification (H. Takeda, *Chiba*; T. Ishii and M. Ohtsuki, *UTok*.): medium-grained (1–2 mm), equigranular olivine (Fo_{79} core; Fo_{90} rim) and pigeonite ($Ca_{10}Mg_{74}Fe_{16}$ to $Ca_{11}Mg_{71}Fe_{19}$). Carbonaceous matter occurs as narrow, intergranular veins. Weakly shocked (S1), with rare mosaicism in olivine. The sample is weathered to brownish color in hand specimen, W1. Dho 836 was found only 6 km NW of Dho 837, but the two specimens differ in composition and texture, and so may not be paired. Specimens: type specimen 20.2 g *NSMT*; thin section, *Chiba*; main mass with anonymous finder.

Dhofar 837 **19°35.30′N, 54°57.10′E**
Oman
Found 2000 spring
Achondrite (ureilite)

A single stone weighing 900.1 g, and split into two pieces was found by an anonymous finder in August 2000 in the Dhofar region of Oman. Mineralogy and classification (H. Takeda, *Chiba*; T. Ishii and M. Ohtsuki, *UTok*): A few medium-grained olivine and pigeonite grains (up to 2.1 × 1.5 mm in size) are set in a texture of smaller grained minerals with carbonaceous material and fine metal veins at grain boundaries. Olivine grains (75 vol%) are more abundant than pigeonite (20%). The metal veins are less than 5 vol%. The pigeonite composition $Ca_5Mg_{76}Fe_{19}$ is uniform and the Fo values of olivine range from 78 to 79. Weakly shocked (S1-2). The sample is weathered to brownish color in hand specimen, W1. Dho 837 was found only 6 km SE of Dho 836, but the two specimens differ in composition and texture, and so may not be paired. Dho 837 has some textural similarities to Dho 295, but as the two specimens have very different Fe atomic %, and were found around 113 km apart, they are not necessarily paired. Specimens: type specimen 20.8 g *NSMT*; thin sections, Chiba, *KyuU*; main mass with anonymous finder.

Elbert **39°14.8′N, 104°35.29′W**
Elbert County, Colorado, USA
Fell 1998 January 11
Ordinary chondrite (LL6)

A fireball was observed over Elbert County and reported in several local newspapers. A single 680.5 g stone was found in a field on 2000 March 4, by Dustin Riffel, a five-year-old boy, while walking with his mother on their family property. Classification (A. Rubin, *UCLA*): Olivine, $Fa_{30.5 \pm 0.44}$, shock stage S2, weathering grade W0. Specimens: type specimen, 19 g, *UCLA*; main mass with Riffel family.

Finger Ridge (FIN), see Antarctic ANSMET meteorites

Fortuna **35°08′S, 65°22′W**
Fortuna, Province San Luis, Argentina
Found 1998 May 27
Achondrite (winonaite)

A single 312 g stone of elongated form partly covered by fusion crust was found on 1998 May 27 near the village of Fortuna, Province San Luis, Argentina. Classification and mineralogy (A. Greshake, *MNB*; M. Kurz, *Kurz*): the meteorite exhibits an equigranular texture with abundant triple junctions, the average grain size is about 115 μm; it contains low-Ca pyroxene, Ca-pyroxene, olivine, plagioclase, Fe,Ni metal, and troilite with low-Ca pyroxene being the dominant silicate phase. The composition of the silicates is quite reduced: low-Ca pyroxene, $Fs_{5.5–6.7}Wo_{1.1–1.7}$; Ca-pyroxene, $Fs_{2.4–2.9}Wo_{45.6–46.5}$; olivine, $Fa_{4.3–5.1}$; plagioclase, $An_{14.5–16}$. Fe, Ni metal and troilite veins up to 1.5 mm wide and extending over several cm are prominent; no relict chondrules were found. Oxygen isotope composition (R. Clayton and T. Mayeda, *UChi*): $\delta^{17}O$ = +1.61‰, $\delta^{18}O$ = +4.68‰; shock stage S2; degree of weathering W0/1. Specimens: main mass with anonymous finder; type specimen 23 g plus one polished thin section *MNB*.

Frontier Mountain (FRO), see Antarctic PNRA meteorites

Frontier Mountain 01012 72°58′16″S, 160°20′02″E
Antarctica
Found 2001 December 9
Achondrite (ureilite)
A weathered, 30 % fusion crusted meteorite fragment of 19.2 g was recovered. Mineralogy and classification (R. Carampin and A. M. Fioretti, *UPad*): FRO 01012 shows mosaicized texture and consists of olivine Fo_{78} (with Fo_{94} reduced rims) and pigeonite $En_{75}Wo_7$ with interstitial carbonaceous materials. Abundant diamond is present as small grains within carbonaceous material, as revealed by its cathodoluminescence (strong blue-red dispersion) under the beam of the electron microprobe. Olivine shows a very strong mosaicism, and pigeonite is polysynthetically twinned indicating shock stage S5. Main mass, type specimen, thin section, *MNA-SI*.

Frontier Mountain 01088 72°57′08″S, 160°27′19″E
Antarctica
Found 2001 December 16
Achondrite (ureilite)
A crusted stone of 11.1 g was recovered. Mineralogy and classification (R. Carampin and A. M. Fioretti, *UPad*): FRO 01088 shows poikilitic texture and consists of olivine Fo_{75}, pigeonite $En_{76}Wo_{10}$, and interstitial carbonaceous materials with oriented graphite lamellae. The pigeonite includes rounded crystals of olivine and flakes of graphite. Abundant, small diamond grains occur in the carbonaceous material, as revealed by its cathodoluminescence (strong blue-red dispersion) under the beam of the electron microprobe. Most olivine shows a very strong mosaicism, and locally hints of incipient solid-state recrystallization, corresponding to a shock stage S5/6. Secondary reduction has affected most silicate crystals. Weathering is minor, with thin limonite veins in fractures. Main mass, type specimen, thin section, *MNA-SI*.

Frontier Mountain 01089 72°57′08″S, 160°27′20″E
Antarctica
Found 2001 December 16
Achondrite (ureilite)
A weathered stony fragment of 2.1 g was recovered. Mineralogy and classification (R. Carampin and A. M. Fioretti, *UPad*): FRO 01089 shows typical texture and consists of olivine Fo_{77} (with Fo_{85} reduced rims), pigeonite En_{70} Wo_{13} and interstitial carbonaceous materials. Silicate mineral mode is olivine 91 vol% and pigeonite 9 vol%. Weathering is minor, with thin limonite veins in fractures. Main mass, type specimen, thin section, *MNA-SI*.

Frontier Mountain 01147 72°58′25″S, 160°20′17″E
Antarctica
Found 2001 December 21
Achondrite (ureilite)
A weathered, stony fragment of 0.5 g was recovered. Mineralogy and classification (A. Burroni and L. Folco, *MNA-SI*): Olivine and pigeonite ureilite with typical texture (average grain size 1 mm). Mafic silicates show homogeneous core compositions (olivine Fo_{80}; pigeonite $En_{75}Wo_8$) and wide, strongly reduced rims. Graphite forms large intergranular flakes up to 1 mm in maximum elongation. Undulose extinction, planar fractures and kinking in both olivine and pigeonite indicate moderate shock deformation. Main mass, type specimen, thin section, *MNA-SI*.

Gasseltepaoua 14°9.05′N, 2°2.50′W
Soum, Djibo, Burkina Faso
Fell 2000 August 22
Ordinary chondrite (H5)
A fist-sized stone (weight unknown) was seen to fall by farmers working outdoors in the village of Gasseltepaoua, northern Burkina Faso. Mineralogy and classification (M. Bourot-Denise, *MNHNP*): Ordinary chondrite, H5 ($Fa_{19.2}$ $Fs_{17.1}$), S4, W1. Specimens: type specimen, 16.7 g, *MNHNP*; main mass, Museum of Bureau of Mines and Geology of Burkina Faso in Ouagadougou.

Great Sand Sea 019, see Saharan meteorites from Egypt

Hammadah al Hamra 291–327, see Saharan meteorites from Libya

Hammadah al Hamra 294, correction
The latitude of the place of find was listed incorrectly in *Meteoritical Bulletin* 86 (2002). The correct latitude is 29°06′ N.

Hammadah al Hamra 298, correction
The latitude of the place of find was listed incorrectly in *Meteoritical Bulletin* 86 (2002). The correct latitude is 29°05′ N.

Hammadah al Hamra 317 11°35.58′N, 29°21.06′E
Libya
Found 2001 spring
Enstatite chondrite (EL4)
Two dark brown stones, a larger one of 103 g and a smaller one of 2 g were found in the Hammadah al Hamra region. Classification and mineralogy (G. Pratesi, V. Moggi Cecchi, *MSP*): the partly fusion-crusted stone is shield-shaped; well-

defined chondrules and 50 μm sized enstatite crystals indicate petrologic type 4. Major phases are enstatite ($En_{98.5}Wo_{0.9}$), kamacite (Fe = 90.46, Ni = 7.51, Si = 0.57, P = 0.53, Co = 0.47 wt%) and troilite; other minor phases are diopside ($En_{52.91}Wo_{46.85}$) and plagioclase ($An_{26.60}$) in very small grains (<5 μm). Neither niningerite nor alabandite was found. The plagioclase composition, as well as the presence of diopside, is unusual compared with other known EL chondrites. Inside the chondrules, which have an average size ranging from 600 to 1200 μm, very small rounded grains containing a calcium chloride phase (1–3 μm size) have been observed. Based on texture, mineralogy and chemistry (mainly An content of plagioclase >13 mol% and Si content of kamacite <1.9 wt%; Keil, 1968; Zhang et al., 1995) the meteorite is classified as an EL4 chondrite. Terrestrial weathering grade is rather low (W1); optical features (undulatory extinction of enstatite) indicate that the sample is weakly shocked (S3). Specimens: main mass, type specimen and thin section, *MSP*.

Harper Dry Lake 001–008, see Americas meteorite finds

Hart Camp, classification
Hart Camp (Lamb County, Texas: found 1970) has now been classified as an H6 chondrite (olivine, mean $Fa_{20.8}$; low-Ca pyroxene, mean $Fs_{18.2}Wo_{1.5}$). Classification: R. Jones, *UNM*.

Hiroshima **34°27′N, 132°23′E**
Japan
Fell 2003 February 1–3
Ordinary chondrite (H5)
A 414 g stone was discovered on February 4, 2003 in the delivery center of a pharmacutical company by workers searching for the cause of a leaking roof. The meteorite penetrated the steel sheet roofing and plasterboard and hit a roller conveyor belt then fell to the floor. The fall must have occurred after the center closed on the evening of February 1. Several people in Hiroshima observed a fireball around 22:30 on February 1. Classification (A. Okada, *RIKEN*; S. Yoneda, *NSM*): olivine, $Fa_{17.0–18.7}$; pyroxene $Fs_{15.7–18.6}$ CaO 0.56–1.01%. Noble gas analysis (J. Park, N. Ebisawa, and K. Nagao, *UTok*): ^{21}Ne exposure age about 90 Myr. Specimens: main mass in possession of the finder and on long-term loan at the Hiroshima City Childrens Culture and Science Center; type specimen, 27 g, *NSM*.

Jalu, see Saharan meteorites from Libya

Jiddat al Harasis 022–073, see Oman meteorites

Jiddat al Harasis 026, reclassification
On the basis of a TL sensitivity of 0.0046–0.01 (A. I. Ivliev, *Vernad*), JaH 026 is assigned to metamorphic subtype L3.1.

Jiddat Arkad, see Oman meteorites

Khatiyah **25.43°N, 50.78°E**
Dukhan, Qatar
Found 2000 May
Ordinary chondrite (H5)
A 1.5 kg single stone was found by Colin Wade while out with a running club. Classification (R. Jones, *UNM*): olivine, $Fa_{18.0 \pm 0.7}$; pyroxene, $Fs_{15.9 \pm 0.2}Wo_{0.9 \pm 0.2}$. Shock stage, S3. Specimens: type specimens 20 g *NHM*, ~13.6 g and a thin section, *UNM*; main mass C. Wade.

Kilabo **12°46′N, 9°48′E**
Nigeria
Fell 2002 July 21, 19:30 hrs local time
Ordinary chondrite (LL6)
Mr. Mallam Yahava Muhammad of Hadejia, Nigeria, observed a brilliant fireball moving south to north. Two loud detonations were heard several minutes later. Mr. Mallam Audu and several neighbours in Kilabo heard the stone fall and later recovered it. The meteorite was found in the crater measuring 35 cm wide by 20 cm deep in sandy soil. The meteorite had fragmented on impact into many pieces, the largest of which was 2.2 kg. A total weight of ~19 kg was recovered. Stones were recovered in five villages in the region, with the largest piece in Kilabo. Classification (P. Sipiera, *Harper*; M. Zolensky, *JSC*): olivine, $Fa_{31.1}$, CaO <0.09, predominantly <0.05. Low Ca-pyroxene, $Fs_{27.1}$ PMD = 0.02. Abundant coarse-grained plagioclase, mainly $An_{84}Or_5$, ranges from $An_{61}Or_{25}$ to $An_{86}Or_3$. Coarse-grained diopside and troilite are abundant; pentlandite is a minor phase. The meteorite is brecciated, with thick black shock veins present. Shock stage is S3, weathering grade is W0. Specimens: type specimen, 30 g, *PSF*; main mass Mr Avraham Wysznski, SIMAT USA Inc., New York, NY, USA.

Kilbabo, synonym for Kilabo

Kufra, see Saharan meteorite from Libya

Meteorite Hills (MET), see Antarctic ANSMET meteorites

Milton **40°17′15″N, 95°22′36″W**
Atchison County, Missouri, USA
Found 2000 October
Pallasite
A single mass of 2040 g was found in a bean field by Ben Rogers and Gary Wennihan. Initial identification was made by C. Rohs and J. Reese at Northwest Missouri State University. Classification and mineralogy (R. Jones, *UNM*; J. Wasson, *UCLA*): Small, angular olivines (73 vol%), mean $Fa_{17.2}$; molar Fe/Mn = 123; metal composition, Ni = 151 mg/g, Co, 9.6 mg/g,

Ga, 15.3 μg/g; As, 10.1 μg/g; Ir, 50.4 μg/g, Au, 1.16 μg/g. Mean oxygen isotope ratios of olivine (T. Larson and Z. Sharp, *UNM*): $\delta^{18}O = +0.52$ ‰, $\delta^{17}O = -2.87$‰. Specimens: main mass with finder; type specimen, 69.7 g, plus polished thin section, *UNM*; 73.5 g at Northwest Missouri State University.

Mount Crean (CRE), see Antarctic ANSMET meteorites

Myrtle Springs **30° 27′13.8″S, 137°59′24.6″E**
South Australia
Found 2002 July 11
Ordinary chondrite (H4)

A single stone of 52.99 g was found by Mr. Don McColl while searching for tektites. Classification (M. Zbik *University of South Australia*; A. Pring *SAM*): olivine, $Fa_{19.6 \pm 0.6}$; pyroxene, $Fs_{18.2 \pm 0.7}Wo_{1.3 \pm 0.8}$. Shock stage S2, the meteorite contains extensive iron oxide staining. See Zbik and Pring (2003). Specimens: Main mass and type specimen, *SAM*.

Neuschwanstein **47°31.5′N, 10°48.5′E**
Bavaria, Germany
Fell 2002 April 6; 20:20 hrs (UT)
Enstatite chondrite (EL6)

A brilliant fireball, shaking the ground and rattling windows, was reported by many eyewitnesses in Austria and Germany. The fall circumstances were well documented by the European Fireball Network (EFN). Reduction of the EFN photographs allowed calculation of the orbit and impact area (Spurny et al. 2002) which ultimately led to the recovery of a single stone of 1.75 kg on July 14, 2002. Gamma spectrometry (G. Heusser and H. Neder, *MPI-K*) of the stone indicates a small pre-atmospheric radius of less than 20 cm mainly from the low ^{60}Co activity of 1.2 ± 0.5 dpm/kg. Short-lived radionuclides strongly indicate that the recovered meteorite was indeed the object that fell on the above date. Classification and mineralogy (A. Bischoff, *Mün* and J. Zipfel, *MPI*): the meteorite has a metamorphic texture with a small number of chondrule relics. Major phases are enstatite (FeO <0.1 wt%), plagioclase (Ab_{82}), and metal (~1.5 wt% Si). Large crystals of sinoite (up to 200 μm) and graphite (up to 700 × 200 μm) are present. Additional phases so far observed are schreibersite ($(Fe,Ni)_3P$), troilite (FeS), oldhamite (CaS), daubreelite ($FeCr_2S_4$), alabandite, ((Mn,Fe)S), and an SiO_2-phase (containing 1–2 wt% Al_2O_3). Bulk chemistry: abundances of moderately volatile lithophile elements are typical for EL chondrites, low Mn/Mg = 0.010 and Na/Mg = 0.045, and low Zn concentration (Zn <20 ppm); high concentrations of siderophile elements, e.g., Ni = 1.94% and Ir = 0.76 ppm, reflect higher than usual metal contents for EL chondrites. Based on texture, mineralogy and chemistry the meteorite is classified as an EL6 chondrite. Optical features indicate that the rock is very weakly shocked (S2). The residence time of about three months on the ground resulted in the first signs of weathering (W0/1). The exposure age is ~48 Ma; trapped subsolar noble gases are present (L. Franke and L. Schultz, *MPI*). Specimens: type specimen, 20 g, *MPI*; thin sections: *Mün*; main mass, unknown.

Northwest Africa 167–1814, see Saharan meteorites from Morocco and surrounding countries

Northwest Africa 998
Algeria or Morocco
Purchased 2001 September
Martian meteorite (nakhlite)

A. and G. Hupé (*Hupé*) purchased, from dealers at the Tucson Gem and Mineral Show in 2002 February, the main mass from a 456 g stone that had been acquired at an unspecified site in western Algeria or eastern Morocco in 2001 September. Dimensions before cutting: 72 mm by 65 mm by 48 mm. Classification and mineralogy (A. Irving and S. Kuehner, *UWS*): a friable, dark green rock with minor orange-brown alteration products that probably are of pre-terrestrial origin. It is composed mainly of subhedral, olive-green, complexly zoned subcalcic augite ($Fs_{22}Wo_{39}$) with subordinate yellow olivine (Fa_{64}), orthopyroxene ($Fs_{49}Wo_4$), interstitial plagioclase ($Ab_{61}Or_4$ containing 0.1 wt% SrO, and exhibiting normal birefringence), titanomagnetite, chlorapatite and pyrrhotite. The overall texture is that of a hypabyssal, adcumulate igneous rock, and the apparent crystallization sequence is olivine, orthopyroxene, titanomagnetite, augite, apatite, plagioclase. There is a weak preferred orientation of prismatic pyroxene crystals, many of which have very distinctive zoning, with cores of augite surrounded by irregular, inverted pigeonite rims (now consisting of orthopyroxene with fine augite lamellae). Trains of tiny melt inclusions are present along healed fractures within pyroxene; microprobe study confirms that most of these are K-Na-Al-bearing silicate glass, but some are intergrowths of glass and Fe-bearing carbonate, which may represent quenched immiscible silicate-carbonate liquids. Symplectitic intergrowths of titanomagnetite and low-Ca pyroxene are present at grain boundaries between large, discrete olivine and titanomagnetite grains, but are not present around chromian titanomagnetite inclusions within olivine. These observations suggest that a pre-terrestrial oxidation process produced the symplectites, and involved high temperature, deuteric fluid infiltration along grain boundaries; such fluids also may have produced the irregular pigeonitic rims on augite crystals. Secondary (probably pre-terrestrial) ankeritic carbonate, K-feldspar (some Fe-bearing), serpentine (?), calcite and a Ca sulfate are present on grain boundaries and within cracks in augite. Oxygen isotope composition (D. Rumble, *CIW*): replicate analyses of acid-washed augite by laser fluorination gave $\delta^{18}O = +3.9 \pm 0.2$‰; $\delta^{17}O = +2.4 \pm 0.1$‰; $\Delta^{17}O = +0.30 \pm 0.02$‰. Specimens: type specimens, 20 g, *UWS*, 20 g, *FMNH*, and two polished thin sections, *UWS*; main mass, *Hupé*.

Northwest Africa 1109

Morocco
Purchased 2001 October/December
Achondrite (eucrite, polymict)

A. and G. Hupé (*Hupé*) purchased four stones totalling 2.54 kg from a Moroccan dealer in 2001 October and December, but the total weight of this material including that held by other collectors is estimated to be nearly 6 kg. The stones show distinctive white and grey mineral and lithic clasts in a light tan matrix Classification and mineralogy (A. Irving and S. Kuehner, *UWS*): polycrystalline clasts include basaltic eucrite (ophitic texture, variable grain size, mainly anorthite + pigeonite $Wo_{16}Fs_{57}$, FeO/MnO = 30); cumulate eucrite (coarse grained, equigranular, mainly anorthite + exsolved pigeonite with accessory silica); rare eucritic breccias and distinctive ferroan intergrowths (fayalite + hedenbergite + silica ± troilite). Mineral clasts include homogeneous pigeonite grains ($Wo_{15}Fs_{31}$, FeO/MnO = 26), pigeonite grains with clinopyroxene exsolution lamellae (FeO/MnO = 30–33), anorthitic plagioclase (Ab_6-Ab_{10}) and a silica polymorph. Accessory minerals in clasts and matrix include ilmenite, Fe metal, chromite, baddeleyite and apatite. Specimens: type specimen, 20 g, and four polished thin sections, *UWS*; main mass, *Hupé*.

Northwest Africa 1195

Morocco
Purchased 2002 March/April
Martian meteorite (basaltic shergottite)

A. and G. Hupé (Hupé) purchased a 50 g fragment of a broken stone with a distinctive, thin weathering rind collected by nomads near Safsaf, Morocco in 2002 March, and subsequently purchased the remainder of the same elongated stone (total weight 315 g). Dimensions of the reassembled stone are 133 mm × 43 mm × 37 mm. Classification and mineralogy (A. Irving and S. Kuehner, *UWS*): olivine megacrysts (up to 4 mm) are set in a groundmass of low-Ca pyroxene and maskelynite ($Ab_{37}Or_{0.5}$ to $Ab_{41}Or_{0.7}$) with minor Ti-chromite, pyrrhotite, ilmenite and Mg-bearing merrillite. The euhedral to subhedral shapes of most of the olivine grains suggest that they are phenocrysts rather than xenocrysts. Olivine exhibits strong compositional zoning (cores Fa_{19}, FeO/MnO = 54; rims Fa_{40}, FeO/MnO = 62) and contains abundant inclusions of chromite, clinopyroxene, orthopyroxene, and pyrrhotite. The groundmass low-Ca pyroxenes are zoned from cores of pigeonite (Wo_7Fs_{26}, FeO/MnO = 37.1) or, less commonly, orthopyroxene (Wo_4Fs_{23}, FeO/MnO = 37.0) to rims of more Fe-rich pigeonite ($Wo_{12}Fs_{33}$, FeO/MnO = 36.6). Occurring very rarely on groundmass pyroxene grains are patchy overgrowths of an Fe-rich mineral (possibly related to chamosite or chlorite, with 35 wt% FeO, 5 wt% Al_2O_3, 1.5 wt% MgO and a low oxide sum of 85 wt%, suggesting the presence of water or hydroxyl). Calcite occurs sparsely along grain boundaries and as thin veinlets. Texture and mineral compositions are similar to those in olivine-phyric basaltic shergottite DaG 476/670, but olivine is much more magnesian than in other olivine-phyric basaltic shergottites SaU 005/008 and NWA 1068/1110. Specimens: type specimen, 20 g, and two polished thin sections, *UWS*; main mass, *Hupé*.

Northwest Africa 1296

Morocco
Found 2001 spring
Achondrite (angrite)

The single stone weighs 810 g and appears quite fresh with a very thin and shiny, dark-grey, typical fusion crust. It was found in Morocco in spring 2001 by an anonymous finder and afterwards bought by a dealer in Bouarfa (Morocco). Petrography, mineralogy, chemistry and classification (A. Jambon, *UPVI*; J.-A. Barrat, *UAng*; O. Boudouma, *UPVI*): The rock has a fine-grained magmatic texture, indicating rapid cooling, and is significantly different from other angrites. Numerous small vesicles are present, some of which filled with carbonate. Olivine ($\approx Fo_{50}$) was the first phase to crystallize, as feathery chains a few micrometers in thickness. It is closely associated with anorthite ($An_{98–100}$) overgrowing the olivine crystals. These composite chains are separated from one another by intergrown elongated Al, Ti-rich diopside. Both olivine and pyroxene are normally zoned up to mg# <0.01. The most magnesian pyroxene and olivine have mg# of 0.52. The Fe-rich olivines also contain up to 12 wt% CaO, a typical feature of angrites; they appeared after plagioclase crystallization stopped at the end of the crystallization sequence when co-crystallization of olivine with sub-calcic kirschsteinite is observed. Minor phases are pyrrhotite, Ca-phosphate, a silico-phosphate similar to that found in d'Orbigny and titanomagnetite. The bulk rock analysis is that of a typical angrite like d'Orbigny or Sahara 99555, with a $(Ca/Al)_{CI}$ of 1.52. Extensive trace element data confirm that alkali elements are strongly depleted. Ba is slightly enriched probably as a result of terrestrial alteration; Sr is not. All refractory lithophile incompatible elements exhibit a flat chondrite normalized pattern with an enrichment of 13 × CI. Specimens: main mass, Moroccan Import, Asnières, France; type specimen, 49 g, *UPVI*.

Northwest Africa 1457

Morocco
Purchased 2001 December
Achondrite (winonaite)

Seven small stones with a total weight of 52 g were purchased from a Moroccan dealer by A. and G. Hupé (*Hupé*) in 2001 December. Classification and mineralogy (A. Irving and S. Kuehner, *UWS*): medium-grained, equilibrated metamorphic texture with triple junctions among mineral grains. Abundant enstatite ($Fs_6Wo_{1.5}$, FeO/MnO = 15) and forsteritic olivine (Fa_5, FeO/MnO = 18) with subordinate diopside ($Fs_{2.8}Wo_{44}$,

FeO/MnO = 8), sodic plagioclase ($Ab_{82}Or_4$), Ni-poor Fe-Ni metal, troilite, schreibersite, Cr-rich chromite, and Cl-rich apatite. Daubreelite occurs as blades within some troilite grains. Rare chromite grains (up to 20 μm; 66 wt% Cr_2O_3; Cr/(Cr+Al) = 0.870; Mg/(Mg+Fe) = 0.682) are associated with troilite. Grain boundaries are veined by heterogeneous Ni-free iron oxides and/or hydroxides. Oxygen isotope composition (D. Rumble, *CIW*): analyses of two whole rock fragments by laser fluorination gave $\delta^{18}O = +5.1 \pm 0.1‰$; $\delta^{17}O = +2.3 \pm 0.1‰$; $\Delta^{17}O = -0.40 \pm 0.03‰$. The texture, mineralogy and oxygen isotopic composition of this sample match the criteria for winonaites given by Benedix et al. (1998). Specimens: type specimen, 10 g, and one polished thin section, *UWS*; main mass, *Hupé*.

Northwest Africa 1459

Morocco
Purchased 2002 March
Achondrite (diogenite, olivine-bearing)

A small complete stone (49 g) found near Iriqui, Morocco was purchased from a Moroccan dealer by A. and G. Hupé (*Hupé*) in 2002 March. The interior of the stone is dark yellow-green, and the exterior is coated by a thin, weathered fusion crust with protruding subhedral chromite grains (up to 4 mm). Classification and mineralogy (A. Irving and S. Kuehner, *UWS*): coarse-grained cataclastic protogranular texture. Subequal amounts of orthopyroxene ($Fs_{28}Wo_{4.7}$ to $Fs_{30}Wo_{6.5}$, FeO/MnO = 28–32) and olivine (Fa_{36}; FeO/MnO = 46.5), with minor chromite (Cr/(Cr + Al) = 0.62 cores to 0.66 rims), anorthitic plagioclase ($Ab_{6.8}$-$Ab_{9.3}$), troilite, and metal (0.06 wt% Ni). Some orthopyroxene grains (up to 10 mm) have sparse exsolution lamellae of clinopyroxene ($Fs_{10}Wo_{46}$ to $Fs_{11}Wo_{45}$, FeO/MnO = 28–32). Some olivine grains (up to 8 mm) have multiple tilt-boundaries. Irregular areas along grain boundaries are composed of symplectitic intergrowths of chromite and orthopyroxene. Oxygen isotope composition (D. Rumble, *CIW*): $\delta^{18}O = +3.62 \pm 0.02‰$; $\delta^{17}O = +1.72 \pm 0.04‰$; $\Delta^{17}O = -0.19 \pm 0.02‰$. Specimens: type specimen, 10 g, and one polished thin section, *UWS*; main mass, *Hupé*.

Northwest Africa 1500

Morocco?
Purchased 2000
Achondrite (ureilite)

A nearly complete individual of about 3.3 kg with fusion crust patches was bought by meteorite hunters in Zagora. During the Tucson mineral show it was sold to a mineral dealer and traded to R. Bartoschewitz in April 2002. Mineralogy and classification (R. Bartoschewitz, *Bart*; F. Wlotzka, *MPI*): This monomict rock has a typical ureilite texture of equigranular olivines (0.2–0.5 mm, Fo_{72}, CaO, and $Cr_2O_3 < 0.1\%$) set in black vein material with finely dispersed metal. Minor components are augite ($Wo_{45}En_{44}$) and orthopyroxene ($Wo_{2.2}En_{70}$), plagioclase (An_{37}), chromite (0.2–0.3 mm, 5% MgO, 12% Al_2O_3) and metal (1.5% Ni, 0.3% Si). The plagioclase grains are 0.5 to 3 mm across and in igneous contact with olivine, the larger ones poikilitically enclose rounded olivine grains. Oxygen isotope composition (R.N. Clayton and T. Mayeda, *UChi*): $\delta^{18}O = +4.56‰$; $\delta^{17}O = +1.58‰$ plot away from other ureilites. But $\Delta^{17}O$ versus mg-number extends the ureilite trend. Specimens: type specimen, 20 g *MPI*; main mass, *Bart*.

Northwest Africa 1569

Morocco
Found 2000
Achondrite (ureilite)

A 614 g partially crusted stone was purchased in Erfoud, Morocco in 2001. Classification and mineralogy (T. Bunch and J. Wittke, *NAU*): typical ureilite texture; olivine grain size up to 1.5 mm with triple junctions, poorly developed lineation, low-Ni metal (mostly oxidized) interstitial to olivine; low-Ca pyroxene is <1 mm and tends to occur in clusters with interstitial carbonaceous matter. Olivine cores are Fa_{18}, dusty rims are reduced to Fs_{10}; (Cr_2O_3 up to 0.62 wt%; CaO up to 0.41 wt%); low-Ca pyroxene is $Fs_{18}Wo_8$ to $Fs_{23}Wo_9$; metal, 0.47 to 5.3 wt% Ni, 0.55 wt% Cr_2O_3, 0.4 wt% P and 0.29 wt% Si; sulfides contain up to 1.4 wt% Cr. Shock level, S2; weathering grade, W1. Specimens: main mass with anonymous buyer; type specimen, 20.5 g, and thin section, *NAU*.

Northwest Africa 1583

Northwest Africa
Found 2001/2002 winter
Rumuruti chondrite (R3.9)

Several small pieces totalling 78 g were found in winter 2001/2002 by an anonymous finder in the Western Sahara. Classification and mineralogy (A. Greshake, *MNB*; M. Kurz, *Kurz*): an unbrecciated type 3.9 R chondrite; olivine, $Fa_{37.3 \pm 2.6}$ (range $Fa_{28.2–40.2}$); low-Ca pyroxene, $Fs_{18.0 \pm 4.6}$ (range $Fs_{12.4–25.3}$); augite, $Fs_{8.2–10.2}Wo_{30.2–48.4}$; plagioclase, $An_{7.8–12.1}$; shock stage, S2; degree of weathering, W1/2. Main mass with anonymous finder; type specimen 15.6 g plus one polished thin section *MNB*.

Northwest Africa 1586

Northwest Africa
Found 2002 June
Achondrite (ureilite)

A 400 g stone was collected by nomads in the Sahara and later on purchased from a dealer in Morocco. Classification and mineralogy (S. Singletary, *MIT*): typical monomict ureilite texture with abundant triple junctions and curved intergranular boundaries. Grain sizes are 1–2 mm on average. Mineral modes are 75% olivine, 25% pyroxene. Homogeneous olivine cores (Fo_{79}, n = 61) have reduction rims that contain finely dispersed grains of metal and olivine (Fo_{97}). The predominant pyroxene is pigeonite with mg# of 80 and Wo_{11} (n = 103). Pigeonite grains have “swaths” (melt

veins?) that contain a metal and three-pyroxene assemblage consisting of augite (mg# 90, Wo_{32}, n = 17), orthopyroxene (mg# 86, Wo_5, n = 8) and pigeonite (mg# 86, Wo_9, n = 6). Specimens: main mass, *Bessey*; type specimen, 21.9 g, and one thin section, *TCU*.

Northwest Africa 1644

Morocco
Purchased 2001 spring
Achondrite (eucrite, polymict)

A mass of 214 g was purchased by *Bessey* from a dealer in Morocco. Mineralogy and classification (S. Singletary, *MIT*): brecciated texture with several large lithic and mineral clasts in a fragmental matrix. The clasts resemble diogenites, cumulate and basaltic eucrites in mineral composition and texture. Medium-grained cumulate eucrite clasts of ophitic texture consist of plagioclase ($An_{91–94}$) and pigeonite ($Wo_{5–10}$, $En_{37–52}$), minor orthopyroxene (Wo_3, En_{53}) and Ti-rich chromite. Basaltic eucrite clasts with a sub-ophitic texture contain extremely iron-rich augite (possibly pyroxferroite; $Wo_{16–31}$, $En_{3–8}$), plagioclase ($An_{82–87}$), a silica phase and Ti-rich chromite. Sparse (<5 vol%) diogenitic clasts consist of orthopyroxene ($Wo_{2–5}$). Pyroxene Fe/Mn ranges from 27–33. The possible pyroxferroite grains have Fe/Mn 27–45. Matrix is pyroxene (pigeonite, augite, and orthopyroxene), minor olivine, Fe-rich sulfides, Ti-rich chromite and rare spherules of glass; one zircon grain was observed; one symplectitic grain composed of silica, augite and fayalite is interpreted to be the result of pyroxferroite breakdown. Specimens, type specimen, 20 g, *TCU*; main mass, *Bessey.*

Northwest Africa 1646

Morocco
Purchased 2002 October
Achondrite (eucrite, cumulate)

A complete fusion-crusted stone (259 g) was purchased from a Moroccan dealer by A. and G. Hupé (*Hupé*). Classification and mineralogy (A. Irving and S. Kuehner, *UWS*): Fine-grained with clasts of anorthite, exsolved pigeonite, chromite, ilmenite, metal, troilite and silica in a complex matrix which has the texture of a eutectoid melt of plagioclase + pyroxene. FeO/MnO is 32.8 for orthopyroxene and 34.8 for clinopyroxene. Veinlets of glass probably are quenched impact melt. Specimens: type specimen, 20 g, and one polished thin section, *UWS*; main mass, *Hupé*.

Northwest Africa 1647

Morocco
Purchased 2002 September
Achondrite (eucrite)

A complete fusion-crusted stone (313 g) acquired from a Moroccan dealer was subsequently purchased at the Denver Mineral Show in 2002 September by A. and G. Hupé (*Hupé*). Classification and mineralogy (A. Irving and S. Kuehner, *UWS*): fine grained with subophitic texture; most grains are fractured. Composed of a single lithology that has cross-cutting veinlets of very fine grained, comminuted crystalline debris. The meteorite contains anorthite laths (Ab_5), exsolved pigeonite (clinopyroxene lamellae in orthopyroxene), some larger orthopyroxene grains, silica polymorph, ilmenite, troilite and chromite. Minor calcite occurs in a veinlet. Mineral composition: orthopyroxene ($Wo_{2.3}Fs_{61.7}$, FeO/MnO = 32.0) and clinopyroxene ($Wo_{43.8}Fs_{22.8}$, FeO/MnO = 29.6). Specimens: type specimen, 20 g, and one polished thin section, *UWS*; main mass, *Hupé*.

Northwest Africa 1648

Morocco
Purchased 2002 October
Achondrite (diogenite, polymict)

A complete fusion-crusted stone (803 g) was purchased from a Moroccan dealer by A. and G. Hupé (*Hupé*). Classification and mineralogy (A. Irving and S. Kuehner, *UWS*): Heterogeneous breccia composed of multiple clast types of varying size. Angular mineral clasts are predominantly orthopyroxene with subordinate anorthite (Ab_5), silica, exsolved pigeonite, ilmenite and troilite. The orthopyroxene clasts are homogeneous and have low Ca contents, but range widely in Fe/Mg ratio (FeO = 12.6–22.5 wt%, FeO/MnO = 28.2–34.8), suggesting multiple diogenitic parent rocks. Sparse polycrystalline clasts include cumulate eucrites, basaltic eucrites, a quench-textured clast consisting of dendritic olivine grains in glass, and fine grained ferroan inter-growths (breakdown of former pyroxferroite) composed of hedenbergite + fayalite + silica ± ilmenite ± troilite attached to anorthite laths. Breccia consisting of various diogenites (>80% by volume), sparse cumulate eucrites and rare basaltic eucrites. Specimens: type specimen, 22 g, and thin section, *UWS*; main mass, *Hupé*.

Northwest Africa 1653

Northwest Africa
Found 2002
Achondrite (howardite)

A single stone of 376 g partly covered by fusion crust was found in 2002 by an anonymous finder in the Western Saharan desert and purchased in Zagora in 2002. Classification and mineralogy (A. Greshake, *MNB*; M. Kurz, *Kurz*): basaltic eucrite and diogenitic clasts are set into a clastic matrix; dark impact melt fragments are abundant and often show quench textures with radial or skeletal shaped aggregates; eucrite clasts contain plagioclase, $An_{91.9}$ (range $An_{86.2–95.7}$); pigeonite, $Fs_{35.8–59.2}Wo_{5.8–17.6}$ and augite, $Fs_{29.9–55.6}Wo_{22.8–31.1}$; minor phases include silica, chromite, and ilmenite; diogenite clasts are composed mainly of orthopyroxene, $Fs_{25–41.4}Wo_{3.1–4.9}$ and olivine, $Fa_{27.7}$ (range $Fa_{26.2–30.2}$); chromite

and ilmenite are among the accessory phases; low degree of shock; low degree of weathering. Main mass with anonymous finder; type specimen 21.0 g plus two polished thin sections, *MNB*.

Northwest Africa 1654

Northwest Africa
Found 2002
Achondrite (eucrite)

A single stone of 49 g partly covered by fusion crust was found in 2002 by an anonymous finder in the Western Saharan desert and purchased in Zagora in 2002. Classification and mineralogy (A. Greshake, *MNB*; M. Kurz, *Kurz*): the meteorite is dominated by a recrystallized matrix of 10–20 μm-sized plagioclase, pigeonite with augite exsolution lamellae, and opaque phases; embedded into the matrix are large mineral fragments of plagioclase and Ca-pyroxene and basaltic clasts; plagioclase contains pigeonite and troilite inclusions; plagioclase composition, $An_{88.5}$ (range $An_{85.2–92.3}$); pigeonite composition, $Fs_{50.3–60.6}Wo_{5.6–15.2}$; augite composition, $Fs_{29.7–47.4}Wo_{20.2–41.5}$; minor phases include orthopyroxene ($Fs_{57.9}Wo_{4.3}$), silica, ilmenite, troilite, and Al-Ti-chromite. A low degree of shock and only a moderate degree of weathering. Main mass with the anonymous finder; type specimen, 11.3 g plus one polished thin section, *MNB*.

Northwest Africa 1658

Northwest Africa
Found 2002
Ordinary chondrite (L3–6)

Six individual stones totalling 1345.5 g were found in 2002 by an anonymous finder in Western Sahara and purchased in Zagora in 2002. Classification and mineralogy (A. Greshake, *MNB*; M. Kurz, *Kurz*): a brecciated meteorite partly covered by fusion crust; it consists of light-grey, dark-grey and almost black angular clasts of different petrologic types. The black fragments resemble impact melt clasts; unequilibrated fragments: olivine composition, $Fa_{2–24.2}$; pyroxene composition, $Fs_{8.2–18.8}$; equilibrated fragments: olivine composition, $Fa_{23.8}$; pyroxene composition, $Fs_{19.8}$; moderate shock stage, S3/4; a low degree of weathering, grade W1. Main mass with the anonymous finder; type specimen, 20.5 g plus one polished thin section, *MNB*.

Northwest Africa 1664 **~29°23′N, ~3°11′W**

Algeria
Find 2002
Achondrite (howardite)

A very fresh, fully fusion-crusted single stone of 6310 g was found by local people in the desert of the Hamadah Tounassine region in Algeria near the town Tabelbala. Later on, it was purchased by A. Pani (*Pani*). Mineralogy and classification (F. Brandstätter and C. Lorenz, *NHMV*): the meteorite is a polymict breccia consisting mainly of mineral fragments, lithic clasts (diogenitic and eucritic), chondrule-like objects and (devitrified) glass fragments embedded in a fine-grained clastic matrix. Pyroxenes ($En_{13–80}Wo_{1–40}$) and feldspars ($An_{80–95}$) cover the compositional range typical for howardites. Chondrule-like objects and glass fragments have sizes up to 1 cm. Specimens, type specimen, 258 g, *NHMV*; main mass, *Pani*.

Northwest Africa 1666

Morocco
Purchased 2002 October
Achondrite (eucrite, polymict)

A complete fusion-crusted stone (320 g) was purchased from a Moroccan dealer by D. Gregory (*Gregory*). Classification and mineralogy (A. Irving and S. Kuehner, *UWS*): Angular mineral clasts consist of anorthitic plagioclase ($An_{95}Ab_5$), exsolved pigeonitic pyroxene, silica, ilmenite and troilite. The pyroxenes contain exsolution lamellae of clinopyroxene (FeO/MnO = 34.8) within orthopyroxene ($Wo_{4.2}Fs5_{6.9}$, FeO/MnO = 32.3–35.9). Polycrystalline clasts include various basaltic eucrites, cumulate eucrites and derivative fragments (containing anorthite with pyroxene or silica), a 2 cm quench-textured basaltic eucrite clast (containing larger, elongate grains of low-Ca pyroxene in a finer-grained matrix of pigeonite and anorthite), and an individual breccia clast. Specimens: type specimen, 20 g, and one polished thin section, *UWS*; main mass, *ROM*.

Northwest Africa 1669

Morocco
Purchased 2001 January
Martian meteorite (basaltic shergottite)

A single stone weighing 36 g was bought in Erfoud by Bruno Fectay (*Fectay*). The location of its find is unknown but Al Mala'ika was used as working name. The sample is mostly covered with desert varnish with a few remnants of fusion crust. Classification and mineralogy (A. Jambon and O. Boudouma, *UPVI*; J.–A. Barrat, *UAng*; M. Bohn, *Brest*): fine-grained basaltic rock consisting mainly of zoned pyroxenes with intergrowths of pigeonite $En_{58–25}Wo_{9–19}Fs_{32–61}$ and augite $En_{19–47}Wo_{39–24}Fs_{54–18;}$ FeO/MnO ratio of 34 (n = 312). Maskelynite ($Ab_{41–53}Or_{1–6}An_{58–42}$) appears to be injected between pyroxene phenocrysts. Accessory minerals include pyrrhotite, merrilite, apatite, ulvöspinel, ilmenite, silica, and baddeleyite. Small melt pockets with stishovite occuring as submicrometer-sized needles. Pyroxene cores are cut by large- and medium-sized fractures, whereas their rims are

affected by numerous small fractures. Maskelynite is only affected by a few major fractures. Terrestrial calcite is present mainly as veins cross-cutting the meteorite, as in many other Saharan finds. Oxygen isotope composition (I. A. Franchi, *OU*)**:** $\delta^{18}O$ = +0.30‰; $\delta^{17}O$ = +2.85‰; $\Delta^{17}O$ = +4.91‰. Specimen; main mass, *Fectay;* type specimen, 7.4 g, *ENSL*.

Northwest Africa 1695

Morocco
Found 2001
Achondrite (howardite)

A 614 g, fully crusted stone, was purchased in Morocco in 2001. Classification and mineralogy (J. Wittke and T. Bunch, *NAU*): clast size, <0.5 cm; clast modal analyses on 14 cm^2 yield: subophitic basalts with large areas of symplectite crystallization, 80 vol%; diogenites, 9 vol%; fine-grained (< 0.2 mm) subophitic basalts, 6 vol%; other, 5 vol%. Orthopyroxene, $Fs_{17–26}$ with exsolved pigeonite, $Fs_{28–32}Wo_{7–10}$. Common, Fe-rich subophitic clasts of plagioclase, An_{78}, and ferroaugite, $Fs_{40}Wo_{39}En_{21}$, with symplectic mesostasis of fayalite, ferrohedenbergite, sulfides, and SiO_2 glass. Shock stage, S1, weathering grade, W1. Specimens: main mass with buyer, type specimen, 21 g with one thin section, *NAU*.

Northwest Africa 1701

Morocco
Found 2002 spring
Ordinary chondrite (LL5, impact melt breccia)

A dark brown stone of 225 g was bought in Erfoud (Morocco) by M. Chinellato (*Chin*). Classification and mineralogy (G. Pratesi, V. Moggi Cecchi, *MSP*): composed of fine-grained and coarse-grained lithologies. Fine-grained area has a re-crystallization texture with few grains of residual metal and olivine in a matrix of feldspathic glass ($An_{31.1}Ab_{54.7}$), containing very fine grained (10 μm) olivine and pyroxene crystals, rimmed by fringes of metal pools and droplets. Pyroxenes in matrix are zoned, bronzite cores, $En_{86.1}Wo_{1.9}$ to pigeonite rims, $En_{66.2}Wo_{10.7}$. The coarse-grained portion presents a typical chondritic texture: olivine, $Fa_{27.2}$, pyroxene, $En_{22.6}Wo_{1.6}$, metal and troilite. Terrestrial weathering grade W2; shock stage S4. Specimens: main mass, *Chin*; type specimen, 20.4 g, and thin section, *MSP*.

Northwest Africa 1813

Western Sahara
Found 2001/2002 winter
Achondrite (eucrite, polymict)

One stone of 70 g was found in Western Sahara. Mineralogy (C. Lorenz, *Vernad*): the polymict breccia consists of a number of mineral and rock fragments, embedded in a fine-grained clastic matrix. The lithic clasts are coarse- to medium-grained, poikilitic and poikilo-ophitic pyroxene-plagioclase rock clasts (~40 vol%), minor fine-grained granoblastic pyroxene-plagioclase rock clasts (~5 vol%), melt rocks and breccias. Mineral chemistry: pyroxene is $En_{37.5}Wo_{3.1}$ with lamellae of $En_{30.5}Wo_{42.2}$; feldspar is $An_{88–92}$. Accessory phases are silica, chromite, ilmenite, troilite and Fe-metal. Specimens: one section and 14 g, *Vernad*; main mass with anonymous finder.

Northwest Africa 1814

Morocco
Purchased after 1999
Bencubbin-like meteorite

One moderately oxidized, partially crusted stone, weighing 156 g, was purchased in Morocco. It is said to have been found in April 1999 in the region between Taouz and Ouzina. Mineralogy and classification (C. Fiéni and C. Perron, *MNHNP*): very similar to Bencubbin and Weatherford. It consists of large clasts (up to about 1 cm in size) of Fe-Ni metal (about 60 vol%) and barred or cryptocrystalline silicates. Olivine $Fa_{2.8}$, CaO 0.25 wt%, Cr_2O_3 0.37 wt%; low-Ca pyroxene $En_{94}Wo_{1.4}$; high-Ca pyroxene $En_{49}Wo_{47.5}$; feldspathic mesostasis. Clasts are embedded in a metal-silicate impact melt, whose silicate portion has FeO ~20 wt%. Specimens: type specimen, 21 g, *MNHNP*, main mass, *Fectay*.

Oman meteorites

(355 meteorites)
Oman
Found 2000–2002

Table 4 reports 355 meteorites that were found during fieldwork in the desert of Oman by people searching for meteorites.

Park Forest 41°29′05″N, 87°40′45″W

Cook County, Illinois, USA
Fell 2003 March 26, approx. 23:50 hrs local time
Ordinary chondrite (L5)

A bright fireball was seen by numerous observers in parts of Illinois, Indiana, Wisconsin and Ohio around midnight of March 26, 2003. Numerous stones fell, mostly concentrated in the area of the village of Park Forest. At least two houses in Park Forest were struck, as was the Fire Station. Dozens of other stones or fragments of stones were recovered in the area in the hours and days following the fall. Total mass recovered is more than 18 kg, largest stone ~3 kg in possession of finder. Description and classification (S. Simon, *UChi*; M. Wadhwa, *FMNH*; P. Sipiera, *PSF*): Most stones are partly to fully fusion-crusted. Some broken faces show brecciated texture, angular clasts. Cross-cutting dark veins and dark pockets may be of impact melt origin. No visible chondrules in hand sample. Abundant troilite and metal visible in some broken faces. Chondrules and maskelynite are visible in thin section.

Mean olivine composition $Fa_{24.7}$, mean low-Ca pyroxene $Fs_{20.7}Wo_{1.6}$. Shock stage S5. Specimens: type specimen 515 g (hit fire station), *FMNH*. Other stones at *FMNH*: 1200 g, 529 g, 183 g, 159 g, 125 g.

Pê **11°20.02′N, 3°32.53′W**

Houndé, Burkina Faso
Fell 1989 June 14, 7:30 local time
Ordinary chondrite (L6)

A fist-sized stone (weight unknown) was seen to fall by farmers working in a field near to Pê, southwestern Burkina Faso. The chief of the village threw the stone away because it was thought to be a bad omen; later, however, geologists from Bureau of Mines and Geology of Burkina Faso in Ouagadougou managed to retrieve few fragments. Mineralogy and classification (M. Bourot-Denise, *MNHNP*): Ordinary chondrite, L6 ($Fa_{25.4}Fs_{22.1}$), S1, W0, very friable. Specimens: type specimen, 11.1 g, *MNHNP*; some fragments, Museum of Bureau of Mines and Geology of Burkina Faso in Ouagadougou.

Pétèlkolé **14°3.12′N, 0°25.20′E**

Téra, Niger
Fell 1995 April 10
Ordinary chondrite (H5)

The fall occurred in the afternoon and was eye-witnessed by a shepherd in the campground of Garauol Olo, near Pétèlkolé, Téra district, not far from the border with Burkina Faso. One stone of 189 g was collected just after the impact, under few centimetres of sand. An investigation in Pétèlkolé led by Ama Salah Issack (Department of Geological and Mining Research) confirmed that only one stone was collected and provided the coordinates of the fall. Mineralogy and classification (L. Latouche, *MNHNP*): Ordinary chondrite, H5 ($Fa_{18}Fs_{16}$), S2, W0. Specimens: type specimen, 30 g, *MNHNP*, 60 g Africa Museum, Brussels, Belgium; main mass, University of Niamey, Niger.

Pitino, see American meteorite finds

Point Berliet, see Saharan meteorites from Niger

Queen Alexandra Range (QUE),see Antarctic ANSMET meteorites

Rebiana, see Saharan meteorites from Libya

Saharan meteorites from Algeria

(33 meteorites)
Algeria
Found 1989–2001

A number of different finders recovered these meteorites from several regions of the Algerian Sahara (Table 5).

Saharan meteorites from Egypt

(1 meteorite)
Egypt
Found 1999 December

Louis Carion and others found this meteorite from the Great Sand Sea region of the Egyptian Sahara (Table 6).

Saharan meteorites from Libya

(94 meteorites)
Libya
Found 1998–2001

A number of different finders recovered these meteorites from several regions of the Libyan Sahara (Table 7).

Saharan meteorites from Morocco and surrounding countries

(298 meteorites)
Northwest Africa
Purchased or found 1999–2002

Many meteorites lacking first-hand documentation of the find location are being sold by Moroccan rock and mineral dealers, and by people from other countries who have collected material in Morocco. These meteorites are all sold as Moroccan finds, but there are plausible reports that some were actually collected in Algeria or Western Sahara. Other meteorites have been reported from this region with what appear to be precise find locations. The reliability of locality information associated with these meteorites is difficult to assess owing to the anonymity of all of the finders and most of the original sellers, and because the Nomenclature Committee lacks the resources to investigate. All meteorites found in this region are numbered in a "Northwest Africa" (NWA) series. The Nomenclature Committee considers it possible that differently numbered specimens are paired with each other or with other named meteorites and some may even be derived from the same individual object. Table 8 lists 298 specimens of this type.

Saharan meteorites from Niger

(8 meteorites)
Niger
Found 1999, 2001, 2002

A number of different finders found these meteorites from several regions of the Sahara of the Republic of Niger (Table 9).

Saharan meteorites from unknown locations

(20 meteorites)
Sahara, country unknown
Found 1998–2000

A number of different anonymous finders recovered these meteorites from unknown locations within the Sahara (Table 10).

Sahara 00177 **+0°09.25′, z+0°06.87′W**

Found 2000

Carbonaceous chondrite (C3/4, CV-like)

A 12 g stone was found by *Labenne*. Mineralogy and classification (M. Bourot-Denise, *MNHNP*): related to reduced CVs, similar to Coolidge and Loongana 001. Chondrules, chondrule fragments and CAIs make up ~75 vol% of the meteorite. Overall, chondrules are smaller than in Allende, with a mean size ~500 µm. CAIs (~10 vol%) are large, up to 1 mm in size. The largest and most abundant chondrules are type-I, porphyrytic olivine-pyroxene chondrules, often of irregular shape, with olivine crystals in the 10–40 µm size range, and abundant opaque beads. Less abundant metal-poor barred olivine, radial pyroxene and other chondrules are generally smaller (100–300 µm) and more rounded. Olivine, $Fa_{8.0 \pm 1.0}$ (range: 5.0–9.6); low-Ca pyroxene $Fs_{7.6 \pm 2.4}$ (range: 3.4–10.5). Chondrule mesostasis is completely devitrified. A few chondrules are partially rimmed with silica (as is the case in Coolidge). Fe-Ni metal is kamacite, with minor taenite. Weakly shocked, metal is not warped, troilite is monocrystalline. Moderately weathered; metal grains, especially those in the matrix or on chondrules edges, have a 2–5 µm-wide limonite rims; veins in chondrules silicates are also filled with limonite; troilite is unaltered. Type specimen, 4 g, *MNHNP*, main mass with *Labenne*.

Saint-Aubin **48°29′N, 3°35′E**

Aube Champagne, France

Found 1968

Iron, octahedrite (ungrouped)

Five masses of total weight 472 kg were found by farmers while ploughing, within a strewn field a few miles across. Classification (E. Dransart and M. Baron, *EMTT*): kamacite bandwidth 0.4 mm; bulk composition Ni = 11.5 ± 1%, Co = 4 mg/g, P = 2 mg/g, Ir = 0.02 µg/g, Ga = 28 µg/g, Ge = 83 µg/g. The meteorite contains sarcopside and/or graftonite and needles of schreibersite up to 6 cm in length. It shows typical shock features (Neumann lines and shock-hatched kamacite). Specimens: type specimen 86 g *MNHNP*; 500 g *EMTT*; main mass with finders.

San Juan 001 **25°34.5′S, 69°47.7′W**

Taltal, Antofagasta, Chile

Found 2001 December 1

Ordinary chondrite (L5)

Three stones of 1229 g total mass were found within 1 km of each other. Classification (M. Zolensky, *JSC*): Olivine, $Fa_{24.5}$; pyroxene, $Fs_{21.6}$, shock stage S1/2, weathering grade W2. Specimens: type specimen 60 g, *SI*; main mass, Rodrigo Martinez.

San Juan 002 **25°34.5′S, 69°47.7′W**

Taltal, Antofagasta, Chile

Found 2002 February 20

Ordinary chondrite (H6)

Thirty four masses of the meteorite were found by Rodrigo Martinez during a desert search, with a total weight of 345 g. Classification (M. Zolensky, *JSC*): Olivine, $Fa_{19.25}$ PMD 0.004, low Ca-pyroxene, Fs_{19} PMD 0.008, contains abundant coarse-grained plagioclase, $Ab_{79}Or_8$ to $Ab_{83}Or_4$. Shock stage S1, weathering grade W3. Specimens: main mass Mr. R. Martinez; type specimen 21g, *SI*.

Sandy Creek **40°26′N, 98°04′W**

Clay County, Nebraska, USA

Found 1999 July 6

Ordinary chondrite (L5)

One stone of 1330 g was found on an airport runway while it was being graded. Classification (A. Rubin, *UCLA*): Olivine, $Fa_{25.2 \pm 0.6}$, shock stage S4, weathering grade W4. Specimens: type specimen 55.7 g, *UCLA*; 37.6 g, *DMNH;* main mass *Jensen*.

Sayh al Uhaymir 085–169, see Oman meteorites

Sayh al Uhaymir 085 **21°04.1′N, 57°16.2′E**

Oman

Found 2002 January 11

Carbonaceous chondrite (CV3)

Three stones of 112 g total were found on the surface of the desert. Mineralogy and classification (M. Ivanova, M. Nazarov, *Vernad)*: The meteorite consists of matrix, olivine aggregates, chondrules, their fragments, and CAIs. The matrix/chondrule ratio is 0.8. Olivine, $Fa_{0.7–80.5}$; low-Ca pyroxene, $Fs_{0.7–22.6}$; pigeonite, augite, diopside, and Al-diopside are also present. Mesostasis in chondrules is altered; accessories are kamacite and taenite, magnetite, chromite, sulphides and sulphates. Two observed CAIs are 0.9 × 1.0 mm and 1.7 × 1.9 mm in size, mostly fine-grained, consisting of melilite, spinel, Al-diopside, and anorthite. Matrix is fine grained and altered, with development of phyllosilicates. Microprobe analyses were performed at *UTenn*. Specimens: type specimen, 25 g, and thin section, *Vernad*; main mass with anonymous finder.

Sayh al Uhaymir 089 **20°52.9′N, 57°12.0′E**

Oman

Found 2001 January 17

Ordinary chondrite (L/LL3.6/3.7)

One complete stone of 2618 g was found on the surface of the desert. Classification (S. Afanasiev*, Vernad)*: chondrules are

well defined (up to 7 mm in diameter), fine-grained, of different types: porphyritic olivine-pyroxene and olivine, radial pyroxene, barred olivine, granular and cryptocrystalline. Shock stage S2; weathering grade W2. The composition of olivine is $Fa_{25.0}$; the pyroxene composition is $Fs_{6.25–23.4}$ (n = 20); PMD of Ni content in kamacite is 5.58 (n = 30), and TL sensitivity measurements are in the range of 0.46–1.0 (A. I. Ivliev, *Vernad*). Microprobe analyses were done by N. Kononkova, *Vernad*. Bulk iron content is $Fe^0 = 4.2$ wt%. Specimens: type specimen, 350 g, and a thin section, *Vernad*; main mass with anonymous finder.

Sayh al Uhaymir 120 **21°00.2′N, 57°19.3′E**
Oman
Found 2002 November 17
Martian meteorite (basaltic shergottite)

A stone of 75 g was found in the area of previous shergottite finds. This stone has a well-preserved black fusion crust. It is a grey-greenish stone with porphyritic texture; large olivine phenocrysts are embedded in a groundmass consisting of maskelynite and pigeonite. SaU 102 is paired with SaU 005/008/051/060/090/094. Classification (S. Afanasiev, *Vernad*). Specimens: type specimen, 15.8 g, *Vernad*; main mass with anonymous finder.

Sayh al Uhaymir 150 **20°59′31.3′′N, 57°19′11,7′′E**
Al Ghaba, Oman
Found 2002 October 8
Martian meteorite (basaltic shergottite)

A 107.7 g olive-brown colored stone of relatively angular shape with one small area of thin black-brown fusion crust was recovered on a Miocene fresh-water limestone gravel plateau about 43 km south of Al Ghaba by Rainer and Sven Bartoschewitz. Mineralogy and classification (R. Bartoschewitz, *Bart,* P. Appel and B. Mader, *Kiel*): porphyritic texture with olivine phenocrysts up to 2 mm ($Fo_{67–64}$) set in a matrix consisting of feldspathic glass ($An_{53–66}Or_{0.3–0.8}$) and pigeonite ($En_{62–69}Wo_{7–11}$) with minor Ca-poor pyroxene ($En_{65–66}Fs_{34–35}$). Shock melt veins and pockets are partly recrystallized. Shock stage, S5. Oxygen isotopic composition (R.N. Clayton, *UChi*): $\delta^{17}O = +2.78‰$, $\delta^{18}O = +4.74‰$, they fall in the SNC field. SaU 005, 008, 051, 060, and 094 were found in the same area and may be paired. Specimens: 17.7 g *Muzeum Ziemi PAN, al. Na Skarpie 27, PL- Warszawa*, 2.7 g *Kiel*, main mass *Bart*.

Sayh al Uhaymir 169 **20°34.391′N, 57°19.400′E**
Oman
Found 2002 January 16
Lunar meteorite (KREEP-rich mafic impact melt breccia and adhering regolith)

A complete, light grey-greenish rounded stone (70 × 43 × 40 mm) weighing 206.45 g was found in the Sayh al Uhaymir region of Oman. Finders, mineralogy and classification: E. Gnos, B. A. Hofmann, and A. Al-Kathiri (*UniBern*): dark brown fusion crust is only locally preserved. The impact melt breccia (87 vol% of the stone, based on 8 X-ray tomographic sections) contains 25–40 vol% of strongly shocked igneous rocks and crystal clasts (up to 17 mm) derived from norites, evolved magmatites, and granulites set in a fine-grained (<0.1 mm) crystalline matrix. Most crystal fragments are shocked plagioclases, locally associated with enstatite. In addition to plagioclase metallic iron, spinel, olivine, and orthopyroxene clasts are present. The fine-grained impact melt matrix consists mainly of short prismatic low-Ca pyroxene ($En_{61–64}$, $Wo_{2–4}$), interstitial plagioclase ($An_{75–81}$) intergrown with potassium feldspar. The remaining minerals are poikilitic ilmenite, whitlockite, olivine ($Fo_{58–59}$), zircon, and traces of troilite, kamacite and tridymite. The regolith (13 vol%) present one one side of the meteorite comprises crystalline and glassy volcanic rocks, igneous lithic fragments, breccia fragments, fragments of mafic granulites, and crystal fragments. The impact melt breccia contains 32 ppm Th and 8.5 ppm U, 0.47% K (K/U = 553), indicating a lunar origin. This is further confirmed by fusion-crust Fe/Mn of 75.1 (microprobe, n = 14) and impact melt bulk Fe/Mn of 79. Oxygen isotope composition (I. A. Franchi, *OU*) are also consistent with a lunar origin ($\Delta^{17}O = 0.001 \pm 0.032‰$). This impact melt breccia is the most strongly KREEP-eriched lithology among all known lunar rocks. Weathering: W1 (Fe metal shows only little oxidation). Specimens: All in *NMB*.

Séguédine, see Saharan meteorites from Niger

Shalim 002–003, see Oman meteorites

Shişr 006–021, see Oman meteorites

Souslovo **55°25.770′N, 55°47.236′E**
Bashkortostan, Russia
Found 1997 July
Ordinary chondrite (L4)

In late July 1997, Ismagil Gaysin and his son Radik were loading hay on to a cart near Souslovo village, 10 km N of Birsk town. The cart was not safe on the sloping track, and the father asked his son to find a stone to secure the wheel. Radik found a stone buried in soil in the nearest ditch. When the work was finished, they decided to bring the stone home because it had an unusual color and shape. Later, they thought that the stone (weighing 19.3 kg) could be a meteorite, and in 2002 sent a piece to the Vernadsky Institute, Moscow for identification. In 1966 March 30, 15:45 UT, a bright fireball was observed in the region and it could be that the meteorite find might be related to the fireball. Classification and mineralogy (S. Afanasiev, *Vernad*): olivine, $Fa_{23.5}$; pyroxene, $Fs_{23.2}Wo_{1.3}$; shock stage, S2; Weathering grade, W0/1. Specimens: 6147 g, *Vernad*; main mass with anonymous owner.

Southampton **44°30.385′N, 81°22.33′W**
Bruce, Ontario, Canada
Found 2001 April 26
Pallasite

A single 3.58 kg stone was recovered by Mr. Carl Young while walking along the beach of Lake Huron. Classification (N. MacRae, S. Kissin, *UWO*): olivine, $Fo_{87.5}$; metal Ni 94.7 mg/g, Co 5.15 mg/g, As 18.5 µg/g, Au 2.12 µg/g, Cr <2 µg/g, Cu 144 µg/g, Ga 17.2 µg/g, Ge 77.8 µg/g, Ir 0.137 µg/g, Pt <0.4 µg/g, Re <5.6 ng/g, Sb <30 ng/g, W 190 ng/g. Specimens: main mass property of finder and currently held at *UWO*, type specimen, 175.6 g, *UWO*.

Spade **34°00′04″N, 102°07′42″W**
Lamb County, Texas, USA
Found October 2000
Ordinary chondrite (H6)

A single mass of 8.86 kg was found in a grass field by Mr. J. Talbert while farming. Classification and mineralogy (R. Jones, *UNM*; A. Rubin, *UCLA*): Olivine, mean Fa_{19}; Low-Ca pyroxene, mean $Fs_{17}Wo_{3.75}$; Plagioclase, mean $Ab_{79.9}Or_{5.8}$; kamacite, mean Ni 6.9 wt%, Co 0.46 wt%. Shock stage S2, weathering grade W2. Spade is an annealed impact melt rock. It has very low abundances of relict chondrules and coarse mafic silicates; heterogeneous plagioclase; high Wo contents of low-Ca pyroxene; chromite-plagioclase assemblages; and extensive silicate darkening. Specimens: main mass with finder; type specimen, 81 g, plus thin section, *UNM*.

Tambo del Meteorito **23°58.86′S, 68°18.78′W**
San Pedro de Atacama, Antofagasta, Chile
Found 2002 January 27
Ordinary chondrite (H6)

A single 13.84 g stone was found by Mr. Lorenzo Villalobos on the desert surface while searching for Inca pottery fragments. Classification (M. Zolensky, *JSC*): Olivine, $Fa_{17.0}$. Low Ca-pyroxene, $Fs_{20.4}$, CaO >1%. Augite, plagioclase, pentlandite, and troilite are abundant. Shock stage S1, weathering grade W5. Specimens: main mass Edmundo Martinez, type specimen 3 g, *SI*.

Tanezrouft 003–061, see Saharan meteorites from Algeria

Tanezrouft 057 **25°16′N, 0°09′E**
Algeria
Found 2002 December 23
Carbonaceous chondrite (C4)

A large (5.4 kg), dark grey, moderately compact stone, lacking fusion crust was found by F. Beroud and C. Boucher. Mineralogy and classification (B. Devouard and J.-L. Devidal, *UBP*; B. Zanda and M. Denise, *MNHNP*): large chondrules (around 1mm in diameter), matrix around 50% but locally more abundant (~70%), numerous irregular whitish inclusions up to 3 mm, and occasional zoned CAIs up to 17 mm. In addition, several large (up to 2.5 cm) dark grey inclusions show a finer grained petrology, with no (or extremely rare) chondrules or CAIs. More of these fine-grained inclusions are visible at the surface of the hand sample. The meteorite is nearly equilibrated: olivines are around $Fa_{30 \pm 4}$ except for a few unequilibrated chondrules; OPX range from Fs_3 to Fs_{30}, with a mean at Fs_{19}. The groundmass is highly recrystallized, with homogeneous olivine, orthopyroxene and plagioclase grains around 100 µm in size. The groundmass is texturally equilibrated, although most grains seem to be porous. Magnetite is the dominant opaque mineral, associated with minor FeS, Ni-rich monsulfide, minor pentlandite and possibly pyrite. Outside chondrules, small magnetite grains and minute sulfide grains are scatterred within the matrix. No metal was observed. However, iron hydroxides patches are visible, and metal or sulfides may be have been obliterated by terrestrial weathering. The numerous irregular inclusions retain a fine-grained texture made of plagioclase and clinopyroxene that may be metamorphosed CAIs. The overall characteristics of this meteorite are consistant with a C4 classification, with affinities to the CV oxidized subgroup and/or the CK group. Specimens: type specimen, 110 g, *MNHNP*; main mass with finders.

Tassédet 001–003, see Saharan meteorites from Niger

Tentacle Ridge (TEN), see Antarctic ANSMET meteorites

Thiel Mountains (TIL), see Antarctic PSF meteorites

Thuathe **~29°20′S, 27°35′E**
Lesotho
Fell 2002 July 21, ~13:49 GMT
Ordinary chondrite (H4/5)

A meteorite travelling east to west exploded over Lesotho producing an elliptical strewn field extending 7.4 by 1.9 km (bearing: ~276°) on the westernmost lobe of the Thuathe (or Berea) Plateau, ~12 km east of the capital city of Maseru (approximate strewnfield apex coordinates: (W) 29°19′31″S, 27°34′37″E; (E) 29°19′54″S, 27°39′19″E; (N) 29°19′11″S, 27°37′2″E; (S) 29°20′14″S, 27°36′54″E). The explosion was accompanied by an extraordinarily loud, 15 s long noise which was heard over a large (100 km radius) area of Lesotho; the fall was eye-witnessed by several people who reported sightings of dust trails of “sparkling objects” over Lesotho and the southern part of the Free State Province of South Africa. Many villagers of Ha Ralimo, Boqate Ha Majara, and Boqate Ha Sofonia reported falls of stones close to themselves and onto their homes. The estimated total mass of recovered material is ~30 kg, including 418 stones in the 2 g to 2.4 kg mass range for a total of 24.673 kg which were collected and catalogued by A. Ashworth and David P. Ambrose (National University of Lesotho), one stone of

1.020 kg held by Dr. Molisana Molisana (National University of Lesotho), 5 stones acquired by the National Museum of Lesotho in Maseru, some were collected by the Geology Department, Free State University, Bloemfontein, and several others purchased by members of the public. Mineralogy and classification (W. U. Reimold, *Wits*; P. C. Buchanan, *NIPR*): most freshly cut slices from several stones show a homogeneous beige to light-grey lithology speckled with abundant and heterogeneously distributed (20% to, in exceptional cases, >50 vol%) metal particles; some are cross-cut by dark shock veinlets and show brecciated structure with light grey matrix surrounding lighter colored, well-rounded inclusions; chondrules distinctly recognizable; olivine $Fa_{17.4 \pm 0.8}$; shock stage S2/3. Specimens (numbers in brackets refer to the catalog by A. Ashworth and David P. Ambrose): 207 g (stone #58), Bleloch Museum, School of Geosciences, University of the Witwatersrand; 294 g (stone #59), 309 g (stone #60), 342 g (stone #61) plus four thin sections, one thin section of stone #58, Wolf Uwe Reimold (*Wits*); 67 g (stone #54), 45 g (stone #111), 110 g (stone #56), 146 g (stone #193), 16 g (stone #356), 15 g (stone #359), one thin section of stone #59 and #60, Paul C. Buchanan (*NIPR*); 127 g (stone #57), Christian Koeberl (*UVienna*); 5 stones of unknown weights, National Museum of Lesotho in Maseru; additional material at the Geology Department, Free State University, Bloemfontein.

Tifariti **26°30′N, 10°30′W**
Western Sahara
Found 2002 January 2
Ordinary chondrite (L6)

A 5.4 g stone devoid of fusion crust was found near the Tifariti army post by Mr. Valentino Luppi, a member of an Italian humanitarian mission in the Saharawi territories. Classification and analyses (R. Serra, *OAM*; L. Folco, *MNA-SI*): granoblastic texture; olivine, Fa_{24}, pyroxene, $Fs_{21}Wo_{1.5}$; shock stage, S3; weathering grade, W5. Specimens: main mass *OAM*; thin section *MNA-SI*.

Tiffa 007, see Saharan meteorites from Niger

Twodot, see American meteorite finds

Umm as Samim, see Oman meteorites

Yamato (Y), see Antarctic NIPR meteorites

Zinder **~13°47′N, 8°58′E**
Niger
Found 1999
Pallasite (pyroxene-rich)

A 46 g, mostly crusted meteorite, was found in a field outside Zinder, Niger and purchased in 2001 by a mineral collector. Precise site location is unknown. Description and classification (J. Wittke and T. Bunch, *NAU*): Unusually high abundance of orthopyroxene; modal analyses: opx, 28 vol%; ol, 27 vol%; metal, 44 vol%; sulfide, 1.0 vol%; chromite, < 0.1 vol%. Olivine, mg# = 89, molar Fe/Mn = 32; opx, mg# = 87, $Wo_{2.2}$; molar Fe/Mn = 20. Metal, Ni = 7.15 wt%; Co = 0.58 wt%. Chromite, Cr_2O_3 = 60.1 wt%; molar Cr/(Cr + Al) = 0.85. Weathering grade, W1. Specimens, main mass with owner; type specimen 5.8 g, one polished mount, and one thin section, *NAU* (original weight was 9.54 g)

Zlin **49°15′N, 17°40′E**
South Moravia, Czech Republic
Ordinary chondrite (H4)

A 3.3 g stone was found in Zlin in the collection of Mr. Jaroslav Novak, purchased before 1939. Its provenance is unknown. Classification (Jakuba Haloda and Patricie Tycova, *PCU*): Olivine, $Fa_{18.5}$, Ca in olivine 0.04 wt%, MnO in olivine 0.4%. Pyroxene, $Fs_{16.3}Wo_{1.2.}$ Accessory minerals include chromite, merillite, chlorapatite, troilite, and cristobalite-bearing objects. Specimens: main mass Mr. Novak; type specimen 1.8 g plus a thin section, *PCU*.

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REFERENCES

Benedix G. K., McCoy T. J., Keil K., Bogard D. D., and Garrison D. H. 1998. A petrologic and isotopic study of winonaites: Evidence for early partial melting, brecciation, and metamorphism. *Geochimica et Cosmochimica Acta* 62:2535–2553.

Clarke R. S. Jr., Appleman D. E., Ross, D. R. 1981. An Antarctic iron meteorite contains preterrestrial impact-produced diamond and lonsdaleite. *Nature* 291:396–398.

Keil K. 1968. Mineralogical and chemical relationships among enstatite chondrites. *Journal of Geophysical Research* 73:6945–6976.

Rocchette P., Sagnotti L., Bourot-Denise M., Consolmagno G., Folco L., Gattacceca J., Osete M. L., and Pesonen L. 2003. Magnetic classification of stony meteorites: 1. Ordinary chondrites. *Meteoritics & Planetary Science* 38(2):251–268.

Spurny P., Oberst J., and Heinlein D. 2003. Photographic observation of Neuschwanstein, a second meteorite from the orbit of the Pribram chondrite. *Nature* 423:151–155.

Stöffler D., Keil K., and Scott E. R. D. 1991. Shock metamorphism of ordinary chondrites. *Geochimica et Cosmochimica Acta* 55: 3845–3867.

Wasson J. T. and Kallemeyn G. W. 2002. The IAB iron-meteorite complex: A group, five subgroups, numerous grouplets, closely related, mainly formed by crystal segregation in rapidly cooling melts. *Geochimica et Cosmochimica Acta* 66:2445–2473.

Wlotzka F. 1993. A weathering scale for the ordinary chondrites (abstract). *Meteoritics* 28:460.
Zhang Y., Benoit P. H., Sears D. W. G. 1995. The classification and complex thermal history of the enstatite chondrites. *Journal of Geophysical Research* 100:9417–9438.
M. Zbik and A. Pring. Forthcoming. The Myrtle Springs meteorite: An H4 chondrite from South Australia. *Transactions of the Royal Society of South Australia.*

ABBREVIATIONS FOR ANALYSTS AND SPECIMEN LOCATIONS

These abbreviations are used in the "Info" columns of tables in *The Meteoritical Bulletin*. Unless specifically noted, all type specimens are at the home institution of the first listed analyst and main masses are with anonymous finders.

Bart1: Classified: *Bart;* purchased U. Eger; type specimen, *Vernad*; specimen, *Bart;* main mass, U. Eger.
Bart2: Classified: Wlotzka, *MPI* and *Bart;* purchased. *Fectay*; type specimen, *MPI*; main mass, *Bart*.
Bart3: Classified: *Bart;* purchased *Fectay*; type specimen, *Vernad*; main mass, *Bart*.
Bart4: Classified: F. Melcher, *Hanover* and *Bart;* type specimen, *Vernad*
Bart5: Classified: *Bart* and P. Appel, *Kiel*; type specimen, *Vernad*
Bart6: Classified: A. Pack, *Köln* and *Bart;* type specimen, *Vernad*
Bart7: Classified: F. Melcher, *Hanover* and *Bart;* type specimen, *Wits*
Bart8: Classified: *Bart;* type specimens, *Mün* (6 g); *Vernad* (15 g); main mass, *Bart*.
Bart9: Classified: *Bart;* type specimens, *Mün* (10 g); *Vernad* (11 g); main mass, *Bart*.
Bart10: Classified: *Bart;* type specimen, *Vernad* (20 g); main mass, 300 g, *Gehler*; 140 g, *Bart*.
Be1: Classified: A. Greshake, *MNB* and M. Kurz, *Kurz*; main mass, *Kurz*.
Be2: Classified: A. Greshake, *MNB* and M. Kurz, *Kurz*.
Be3: Classified: A. Greshake, *MNB* and M. Kurz, *Kurz*; main mass, E. Sommer, 68809 Neulussheim.
Be4: Classified: A. Greshake, *MNB*; main mass, Stefan Ralew, Kunibertstraße 29, 12524 Berlin.
Be5: Classified: A. Greshake, *MNB*, J. Otto, Industriestraße 33, 79194 Gundelfingen, Germany, and M. Kurz, *Kurz*.
Be6: Classified: A. Greshake, *MNB* and M. Kurz; main mass, Peter Jäger, Apolda, Germany.
Be7: Classified: A. Greshake, *MNB*.
Bern1: Classified: E. Gnos, B. Hofmann and A. Al-Kathiri, *NMB*.
CU1: Classified: M. Weisberg, *KCCU*; type specimen, *AMNH*.
Frei1: Classified: J. Otto and A. Ruh, *Frei*.
Ha1: Classified: P. Sipiera and K. J.Cole, *Harper*; type specimen, *PSF*; found by Pelison; main mass, Pelison.
Ha2: Classified: P. Sipiera and K. J. Cole, *Harper*; type specimen, *PSF*; found by *Gomet* on sandy soil while crossing erg Rebiana between Koufra and Tazurbu; main mass, *Gomet*.
Ha3: Classified: P. Sipiera, *Harper*; main masses and type specimens, *PSF*
Ham1: Classified: J. Schlüter, *Ham*; main mass, Industrial Research Center, Tripoli, Libya
Ham2: Classified: J. Schlüter, *Ham*; main mass, Dr. S. Buhl, Berlin; finder Tuareg Souleymane Icha.
JSC1: Classified: M. Zolensky, *JSC*; type specimen, *SI*; main mass, *Bessey.*
K1: Classified: G. Weckwerth, *Köln*, and *Bart;* type specimen, *NHMV*; other specimens, 20 g, *Gehler*; 10 g, *Bart*.
La1: Classified: A. Rubin, *UCLA*; main mass, *Hupé*.
La2: Classified: J. Wasson, *UCLA*; main mass, *Cilz*.
La3: Classified: P. Warren, *UCLA*; main mass, *Cilz*.
La4: Classified: A. Rubin, *UCLA*; purchased by *Gessler* from Mike Pimentel (who directed a local search in Morocco); main mass, *Gessler.*
La5: Classified: A. Rubin, *UCLA*; purchased by *Gessler* from *Bessey*; main mass, *Gessler.*
La6: Classified: A. Rubin, *UCLA*; purchased by *Gessler* from the finder *Labenne*; main mass, *Gessler.*
La7: Classified: A. Rubin, *UCLA* and G. Benedix, *WashU*; purchased by Gregory; type specimen, *ROM*, and 18 g, *UCLA*.
La8: Classified: A. Rubin, *UCLA*; main mass, R. Matson
La9: Classified: A. Rubin, *UCLA*; main mass, R. Verish
La10: Classified: A. Rubin, *UCLA*; main mass, *Cilz*, J. Schwade
MIT1: Classified: S. Singletary, *MIT*; type specimen, *TCU*; main mass, *Bessey.*
MP1: Classified: J. Zipfel, *MPI*; main mass, Kraus.
MP2: Classified: J. Zipfel, *MPI*; main mass, R. and A. Adnane.
Mün1: Classified: A. Sokol and A. Bischoff, *Mün*; purchased by *Chin* from *Bessey*; main mass, *Chin*.
Mun2: Classified: A. Sokol and A. Bischoff, *Mün*.
Mün3: Classified: A. Sokol and A. Bischoff, *Mün,* data ±1 mol. %; main mass *JNMC*.
NAU1: Classified: T. Bunch and J. Wittke, *NAU*; main mass, purchaser.
NAU2: Classified: T. Bunch and J. Wittke, *NAU*; main mass, *Hupé*.
NAU3: Classified: T. Bunch and J. Wittke, *NAU*.
Pa1: Classified: M. Bourot-Denise, *MNHNP* and R. Rochette, *CEREGE*; main mass, *Chin*.
Pa2: Classified: M. Bourot-Denise, *MNHNP*; main mass, P. Thomas.
Pa3: Classified: M. Bourot-Denise, *MNHNP*; main mass, Fectay.
Pa4: Classified: M. Bourot-Denise, *MNHNP*; main mass, G. Merlier.
Pa5: Classified: M. Bourot-Denise, *MNHNP*; main mass, *MNHNP.*

Pa6: Classified: M. Bourot-Denise, *MNHNP*; finder *Carion*.
Pa7: Classified: C. Fieni andC. Perron, *MNHNP*; main mass, *Fectay.*
Pa8: Classified: B. Devouard and J.-L. Devidal, *UBP*, and B. Zanda, *MNHNP*; type specimen, *MNHNP*; main masses with finders, F. Beroud and C. Boucher.
Pa9: Classified: B. Devouard and J.-L. Devidal, *UBP*, B. Zanda and M. Denise, *MNHNP*; main mass with finders, F. Beroud and C. Boucher.
Pa10: Classified: M. Bourot-Denise, *MNHNP*; finder, Mr. and Mrs Letallec.
Pa11: Classified: M. Bourot-Denise, *MNHNP*; finder, B. Dejonghe.
Pa12: Classified: M. Bourot-Denise, *MNHNP*; finder Labenne.
Pad1: Classified: R. Carampin and A. M. Fioretti, *UPad*; specimens at *MNA-SI*.
PCU1: Classified: J. Haloda and P. Tycova, *PCU*.
Pr1: Classified: V. Moggi Cecchi and G. Pratesi, *MSP*; main mass, *Chin*.
Pr2: Classified: V. Moggi Cecchi and G. Pratesi, *MSP.*
Pr3: Classified: V. Moggi Cecchi and G. Pratesi, *MSP*; finder, G. Pratesi, *MSP.*
Rom1: Classified: A. Maras and M. Macrì, *URoma*; specimens at *MNA-SI*.
Sn1: Classified: A. Burroni and L. Folco, *MNA-SI*.
Sn2: Classified: A. Burroni, L. Folco, *MNA-SI*; thin section, *MNA-SI*, type specimen, *OAM*.
Sn3: Classified: A. Burroni, L. Folco, *MNA-SI*; thin section, *MNA-SI*, main mass, *OAM*.
Sn4: Classified: A. Burroni, C. Ferraris and L. Folco; all specimens at *MNA-SI*.
UPVI1: Classified: A. Jambon, *UPVI*, J.-A. Barrat, *UAng* and O. Boudouma, *UPVI*; main mass with dealer (Moroccan Import, Asnieres, France).
UPVI2: Classified: A. Jambon and O. Boudouma, *UPVI*, J.-A. Barrat, *UAng* and M. Bohn, *Brest*; type specimen, *ENSL*; main mass, *Fectay.*
UWS1: Classified: A. Irving, *UWS*; main mass, *ROM*.
UWS2: Classified: A. Irving and S. Kuehner, UWS; main mass, *Hupé*.
Vn1: Classified: F. Brandstätter and M. Bukovanska, *NHMV*; main mass, *Fectay.*
Vn2: Classified: F. Brandstätter, *NHMV*; main mass, Pani.
Vr1: Classified: S. Afanasiev, *Vernad*, analyzed by N. Kononkova, *Vernad*.
Vr2: Classified: S. Afanasiev, *Vernad*, analyzed by A. Ulianov, *MwSU*; additional type specimen at *MwSU*.
Vr3: Classified: M. Nazarov, *Vernad*, L. Taylor, *UTenn*.
Vr4: Classified and analyzed by D. Badyukov, *Vernad*
Vr5: Classified: S. Afanasiev, *Vernad*, analyzed by A. Ulianov, *MwSU*. TL measurements A. I. Ivliev, *Vernad*.
Vr6: Classified: S. Afanasiev, *Vernad*, analyzed by N. Kononkova, *Vernad*. TL measurements, A. I. Ivliev, *Vernad*.
Vr7: Classified: S. Afanasiev, *Vernad*, analyzed by C. Lorenz, *Vernad*.
Vr8: Classified: C. Lorenz, *Vernad*.
Vr9: Classified: S. Demidova, *Vernad*.
Vr10: Classified: S. Demidova, *Vernad*, L. Taylor, *UTenn*.
Vr11: Classified: S. Demidova, *Vernad*, G. Kurat, *NHMV.*
Vr12: Classified: M. Ivanova, *Vernad*, L. Taylor, *UTenn*.
Vr13: Classified: C. Lorenz, M. Ivanova, *Vernad*.
Vr14: Classified: M. Ivanova, *Vernad*.
Vr15: Classified at *Vernad*.
Vr16: Classified: *Bart;* type specimen, *Vernad*, main mass, *Bart*.
Vr17: Classified: *Bart;* type specimen, *Vernad*, main mass, A. Gehler (Wolfburg, Germany).
Vr18: Classified: S. Afanasiev, M. Nazarov, *Vernad*.
Vr19: Classified: S. Afanasiev, *Vernad*; main mass, *Farmer.*

ADDRESSES OF METEORITE COLLECTIONS AND RESEARCH FACILITIES

AMNH: American Museum of Natural History, New York, NY 10024, USA.
Bart: Bartoschewitz Meteorite Laboratory, Lehmweg 53, D-38518 Gifhorn, Germany.
Bessey: Dean Bessey, Box 6306, Stn A, Toronto Ontario, Canada, M5W 1P7.
Brest: IFREMER, Brest BP 7029280 Plouzane, France.
Carion: Alain Carion, 6 rue Jean du Bellay, 75004 Paris, France.
CEREGE: Centre Européende Recherche et d'Enseignement de Géosciences de l'Environment, Aix en Provence, Cedex 4, France.
Chiba: Chiba Institute of Technology, Tsudanuma, Narashino, Chiba 275–0016, Japan.
Chin: Matteo Chinellato, Via Triestina, 126/A-30030 Tessera, Venezia, Italy.
Cilz: Marlin Cilz, Montana Meteorite Lab, Box 1063, Malta, MT 59538, USA.
CIW: Carnegie Insitution Washington, Geophysical Laboratory, 5251 Broad Branch Rd., NW, Washington DC 20015, USA.
DMNH: Denver Museum of Natural History, City Park, Denver, CO 80205, USA.
EMTT: Etudes Métallurgiques et de Traitement Thermique, Parc du Chater-Bât. B, 1, avenue du Chater, 69340 Francheville, France.
ENSL: Ecole Normale Supérieure de Lyon, Laboratoire de Sciences de la Terre, 46 allée d'Italie 69364 Lyon Cedex, France.
Farmer: Mike Farmer, 1001 W. St Mary, Tucson, AZ 85745, USA.
Fectay: Bruno Fectay and Carine Bidaut, La Memoire de la Terre SARL Rue de la Mairie, 39240 La Boissiere, France.

FMNH: Field Museum of Natural History, Chicago, IL 60605, USA.

Frei: Institut für Mineralogie, Universität Freiburg, Albertstrasse 23b, 79104 Freiburg, Germany.

Gehler: Reichhenberger Ring 3, D-38440 Wolfsburg, Germany.

Gessler: N. Gessler, Box 706, 22148 Monte Vista Road, Topanga, CA 90290–0706, USA.

GO: Griffith Observatory, 2800 East Observatory Road, Los Angeles, CA 90027–1255 USA.

Gomet: D. Gomet, lieu dit Lahouratte, 40180 Herm, France.

Ham: Mineralogical Museum, Universität Hamburg, Grindelallee 48, D-20146 Hamburg, Germany.

Harper: Planetary Studies Foundation, c/o Harper College, Schmitt Meteorite Research Group, 1200 W. Algonquin Rd., Palatine, IL 60067, USA.

Hupé: G. and A. Hupe, 2616 Lake Youngs Court SE, Renton, WA 98058, USA.

Jensen: Jensen Meteorites, 16730 E Ada Pl., Aurora, CO 80017–3137, USA.

JSC: Johnson Space Center, Houston, TX 77058, USA.

KCCU: Kingsborough College, City University of New York, Brooklyn, NY 11235, USA.

Kiel: Mineralogy Department, Universität Kiel, D-24098, Kiel, Germany.

Köln: Universität zu Köln, Institut für Mineralogie und Geochemie, Zülpicher Straße 49 b, 50674 Köln, Germany.

Kraus: Thomas Kraus, German-Space-Shop, Büchelstr. 87, 53227 Bonn, Germany.

Kurz: M. Kurz, Schillerstrasse 7, D-34626 Neukirchen, Germany.

KyuU: Department of Earth and Planetary Science, Kyushu University Hakozaki, Higashi-ku, Fukuoka-shi 812–8581, Japan.

Labenne: Labenne Meteorites, 16 Boulevard Gambetta, 02700 Tergnier, France.

Matson: Rob Matson, 8 Merano Ct., Newport Coast, CA 92657, USA.

MIT: Department of Earth and Planetary Sciences, 54–1224, Massachusetts Institute of Technology, Cambridge, MA 02139, USA.

MNA-SI: Mus. Naz. dell'Antartide, Univ. di Siena, Via Laterina 8, I-53100 Siena, Italy.

MNB: Museum für Naturkunde, Invalidenstrasse 43, D-10115 Berlin, Germany.

MNHNP: Museum National d'Histoire Naturelle, Paris, France.

Monash: School of Geosciences, Monash University, Victoria, 3800 Australia.

MPI: Max-Planck-Inst. Chemie, Abt. Kosmochem, Postf. 3060, D-55020 Mainz, Germany.

MPI-K: Max-Planck-Institut Kernphysik, Saupfercheckweg 1, D-69117 Heidelberg, Germany.

MSNP: Museo di Storia Naturale, Univ. di Pisa, Via Roma 53, I-56100 Calci (Pisa), Italy.

MSP: Museo di Scienze Planetarie, Via Galcienese, I-59100 Prato, Italy.

MwSU: Department of Geology, Moscow State University, Vorobjovy Gory, Moscow, 119899, Russia.

Mün: Institut für Planetologie, Wilhelm-Klemm-Str. 10, 48149 Münster, Germany.

NAU: Northern Arizona University, Flagstaff, AZ 86011, USA.

NHM: Natural History Museum, Cromwell Road, London SW7 5BD, UK.

NHMV: Naturhistorisches Museum, Postfach 417, A-1014 Wien, Austria.

NIPR: National Institute of Polar Research, 9–10, Kaga 1-chome, Itabashi-ku, Tokyo 173–8515 Japan.

NMB: Bern Natural History Museum, Bernastrasse 15, CH-3005 Bern, Switzerland.

NSMT: National Science Museum, 3–23–1 Hyakunin-cho, Shinjuku-ku, Tokyo, 169–0073, Japan.

OAM: Osservatorio Astronomico e Museo "Giorgio Abetti" in San Giovanni in Persiceto, Bologna, Italy.

OU: Planetary and Space Science Research Institute, Open University, Milton Keynes, UK.

Pani: A. Pani, Meteorites-Minerals-Fossils, Lassallestr. 4/20, A-1020 Vienna, Austria.

PCU: Charles University, Faculty of Science, Institute for Cheochemistry, Mineralogy and Mineral Resources, Albertov 6, 128 43 Prague 2, Czech Republic.

Pelisson: Richard and Roland Pelisson, 270 Rue de la Cascade, 38660 La Terrasse, France.

PSF: James M. DuPont Collection, Planetary Studies Foundation, 4405 Three Oaks Road, Suite B, Crystal Lake, Illinois 60014, USA.

RIKEN: Institute of Phys. and Chem. Research, 2-1 Hirosawa, Wako Saitama 351–0198, Japan.

ROM: Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario M5S 2C6, Canada.

SAM: Department of Mineralogy, South Australian Museum, North Terrace, Adelaide South Australia 5000.

SI: Department of Mineral Sciences, NHB-119, National Museum of Natural History, Smithsonian Institution, Washington, DC 20560, USA.

Tunis: Départment du Geologie, Faculté de Sciences de Tunis, Campus Universitaire, 1060 Tunis, Tunisie.

TCU: Oscar E. Monnig Collection, Dept. of Geology, Texas Christian University, Ft. Worth, Texas 76129.

UAng: Université d'Angers, Faculté des Sciences, 2 bd Lavoisier, 49045 Angers Cedex, France.

UChi: Enrico Fermi Institute, University of Chicago, Chicago, IL 60637, USA.

UCLA: Institute of Geophysics and Planetary Physics, University of California, Los Angeles, CA 90095–1567, USA.

UNM: Institute of Meteoritics, Department of Earth and Planetary Sciences, University of New Mexico, Albuquerque, NM 87131, USA

UPad: C. N. R., I-35122, Padova, Italy.

UBP: Université Blaise Pascal, Clermont-Ferrand, France.

UPVI: Université Pierre & Marie Curie (Paris VI), 4 Place Jussieu, 75005 Paris, France.

URoma: Dpt. di Scienze della Terra, Università di Roma "La Sapienza," I-00185, Italy.

UTenn: Planetary Geosciences Institute, Department of Geological Sciences, University of Tennessee, Knoxville, TN 37996, USA.

UTok: 7–3–1 Hongo, Bunkyo-ku, Tokyo 113–0033, Japan

UVienna: Institute of Geochemistry, University of Vienna, A-1090 Vienna, Austria.

UWO: University of Western Ontario, London, Ontario N6A 3KT, Canada.

UWS: Department of Geological Sciences, University of Washington, Box 351310, Seattle, Washington 98195, USA.

Verish: Meteorite Recovery Foundation, PO Box 237, Sunland, CA 91040, USA.

Vernad: Vernadsky Institute of Geochemistry and Analytical Chemistry, Russian Academy of Sciences, Kosygin Str. 19, Moscow 117975, Russia

Vic: Museum Victoria, GPO Box 666E, Melbourne, Victoria 3001, Australia.

WAM: Western Austr. Museum, Francis Street, Perth, Western Australia 6000, Australia.

WashU: McDonnell Center for Space Sciences, Washington Univ., One Brookings Drive, St. Louis, MO 63130, USA.

Wits: Department of Geology, University of Witwatersrand, P. O. Wits 2050 Johannesburg, South Africa.

Table 1. Ordinary chondrite finds from the Americas.

Name	Find site	County, State	Latitude	Longitude (W)	Mass (g)	Date found	Pcs	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Wo (mol%)	Finder	Type spec (g)	Info[a]
North America (USA)																
Bluewing 008	desert	Pershing, NV	40°16.774′N	118°56.785′	451.7	08/13/2001	1	H5	S2	W3	18.8	–	–	Matson	21.7	La8
Harper Dry Lake 001	dry lake	San Bernardino, CA	35°3.061′N	117°18.403′	13.0	09/17/1999	1	LL3	S2	W3	29 pk	–	–	Verish	3.8	La9
Harper Dry Lake 002	dry lake	San Bernardino, CA	35°3.04′N	117°18.057′	12.0	09/17/1999	1	H6	S3	W3	19.4	–	–	Verish	3.6	La9
Harper Dry Lake 003	dry lake	San Bernardino, CA	35°2.55′N	117°18.502′	95.0	09/17/1999	1	L6	S3	W3	24.9	–	–	Verish	20.9	La9
Harper Dry Lake 004	dry lake	San Bernardino, CA	35°3.31′N	117°18.154′	37.0	10/07/1999	1	LL3	S2	W2	29 pk	–	–	Verish	10.1	La9
Harper Dry Lake 005	dry lake	San Bernardino, CA	35°3.038′N	117°18.113′	24.0	10/07/1999	1	H6	S3	W3	19.4	–	–	Verish	5.2	La9
Harper Dry Lake 006	dry lake	San Bernardino, CA	35°2.833′N	117°18.451′	26.0	11/12/1999	1	H6	S2	W5	19.4	–	–	Verish	6.5	La9
Harper Dry Lake 007	dry lake	San Bernardino, CA	35°2.972′N	117°15.814′	166.7	09/03/2000	1	H5	S2	W4	18.4	–	–	Verish	24.2	La9
Harper Dry Lake 008	dry lake	San Bernardino, CA	35°3.116′N	117°15.683′	12.5	09/03/2000	2	H6	S4	W3	20.0	–	–	Verish	2.5	La9
Twodot	hillside	Wheatland, MT	46°42′N	110°08′	21400	10/25/1999	1	H6	S2	W3	18.9	–	–	Elk hunter	239	La10
South America (Argentina)																
Pitino	Campo del Cielo strewn field	Santiago del Estero	27°28′S	60°35′	1667.0	2002	1	H5	S4	W2	15.8	14.9	1.4	Farmer	42.4	Vr19

[a]See "Abbreviations for analysts and specimen locations."

Table 2. Meteorites from Frontier Mountain collected by the Italian PNRA in December 2000.

Name	Latitude (S)	Longitude (E)	Mass (g)	Pieces	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Comments[a]	Info[b]
FRO 01006	72°57′06″	160°30′33″	5.6	1	H5	S1	W1	19	16	–	Pad1
FRO 01007	72°57′07″	160°30′34″	2.6	1	L4	S2	W0	23	17	–	Pad1
FRO 01008	72°57′07″	160°30′34″	3.2	1	L3	S2	W0	22	12–20	–	Pad1
FRO 01009	72°57′10″	160°30′41″	6.7	1	H6	S2	W2	18	16	–	Pad1
FRO 01010	72°57′09″	160°30′27″	0.7	1	H5	S2	W1	19	16	–	Pad1
FRO 01011	72°57′49″	160°32′12″	11.6	1	H5	S4	W0	19	16	–	Pad1
FRO 01012	72°58′16″	160°20′02″	19.2	1	Ure	–	–	–	–	See separate entry	Pad1
FRO 01013	72°59′14″	160°24′23″	11.4	1	H3	S2	W2	19	16	–	Pad1
FRO 01014	72°59′20″	160°24′18″	3.6	1	H3/4	S3	W1	19	15	–	Pad1
FRO 01015	72°59′20″	160°24′21″	1.2	1	H5	S4	W1	19	17	–	Pad1
FRO 01016	72°59′21″	160°24′21″	1.6	1	H3	S4	W2	1–22	1–31	–	Pad1
FRO 01017	72°59′20″	160°24′19″	1.5	1	H3–4	S4	W1	2–29	4–22	br	Pad1
FRO 01018	72°59′20″	160°24′17″	1.2	1	H5	S3	W1	19	17	br	Pad1
FRO 01019	72°59′24″	160°24′12″	1.9	1	H3–6	S3/4	W1	19	17	br	Pad1
FRO 01020	72°59′23″	160°24′12″	2.3	1	H6	S2	W1	20	17	–	Pad1
FRO 01031	72°59′24″	160°24′14″	9.0	1	H3–6	S2	W1	18–23	17–22	br	Rom1
FRO 01032	72°59′27″	160°24′12″	27.0	2	H3	S2	W1	8–31	7–25	–	Rom1
FRO 01033	72°59′25″	160°24′07″	6.2	1	H3–6	S2	W2	19–24	17–24	br	Rom1
FRO 01034	72°59′20″	160°24′19″	1.0	1	H3	S3	W2	19–22	16–18	–	Rom1
FRO 01035	72°59′20″	160°24′19″	2.6	1	H3	S3	W1	16–22	8–19	br	Rom1
FRO 01036	72°59′20″	160°24′19″	0.8	1	H3-6	S2	W2	16–32	4–22	br	Rom1
FRO 01037	72°59′20″	160°24′19″	18.2	1	H3-6	S4	W2	17–22	10–16	br	Rom1

Table 2. Meteorites from Frontier Mountain collected by the Italian PNRA in December 2000. *Continued.*

Name	Latitude (S)	Longitude (E)	Mass (g)	Pieces	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Comments[a]	Info[b]
FRO 01038	72°59′20″	160°24′19″	3.1	2	H3	S3	W2	9–19	9–23	br	Rom1
FRO 01039	72°59′22″	160°24′26″	22.0	1	H3/4	S3	W2	16	17	–	Rom1
FRO 01040	72°59′20″	160°24′19″	13.6	1	H3/4	S2	W1	15	16	br	Rom1
FRO 01041	72°59′27″	160°24′27″	4.9	1	H3–6	S4	W3	12–19	6–17	br	Rom1
FRO 01042	72°59′21″	160°24′26″	2.0	1	H3–5	S4	W3	19	16	v, br	Rom1
FRO 01044	72°59′21″	160°24′19″	26.6	1	H5	S2	W2	18	17	–	Sn4
FRO 01045	72°59′21″	160°24′19″	8.9	1	H4	S2	W1	18	16	–	Sn4
FRO 01046	72°59′22″	160°24′10″	5.1	1	H4	S2	W2	18	16	–	Sn4
FRO 01047	72°59′23″	160°24′16″	0.9	1	H4/5	S2	W2	20	18	–	Sn4
FRO 01048	72°59′22″	160°24′22″	6.8	1	H3/4	S2	W1/2	20–23	10–21	–	Sn4
FRO 01049	72°59′22″	160°24′22″	44.1	1	H3/4	S1	W1/2	1–25	5–18	–	Sn4
FRO 01050	72°59′24″	160°24′26″	3.2	1	H4–6	S1	W1/2	16–26	12–17	br	Sn4
FRO 01051	72°59′21″	160°24′18″	10.6	1	H4	S2	W2	19	17	–	Sn4
FRO 01053	72°59′23″	160°24′20″	8.4	1	H3	S1/2	W1	14–35	14–35	–	Sn4
FRO 01054	72°59′18″	160°24′26″	1.3	1	H3	S1/2	W2	1–15	1–15	–	Sn4
FRO 01055	72°57′12″	160°27′29″	14.0	1	L3	S4	W1	11–19	11–19	–	Sn4
FRO 01056	72°59′17″	160°24′22″	0.8	1	H3	S1/2	W1	3–24	3–24	–	Sn4
FRO 01057	72°59′19″	160°24′23″	15.2	1	H3–6	S1-4	W1	6–17	2–18	br	Sn4
FRO 01058	72°59′20″	160°24′21″	1.3	1	H4	S3	W2	18	16	–	Sn4
FRO 01059	72°59′20″	160°24′22″	5.4	1	H3	S1	W1	8–17	14–16	–	Sn4
FRO 01060	72°59′22″	160°24′16″	1.8	1	H6	S1	W1	19	17	–	Sn4
FRO 01061	72°59′24″	160°24′26″	4.1	1	H3	S2	W1	5–17	4–16	br	Sn4
FRO 01063	72°59′16″	160°24′31″	0.7	1	H3	S2	W1	8–19	3–18	br	Sn4
FRO 01064	72°59′17″	160°24′30″	1.2	1	L6	S5	W2	24	22	v	Sn4
FRO 01065	72°59′17″	160°24′30″	1.7	1	H3	S2	W1	10–20	7–18	br	Sn4
FRO 01066	72°59′19″	160°24′26″	5.6	1	H3	S2	W1	8–18	9–15	br	Sn4
FRO 01067	72°59′21″	160°24′24″	8.4	1	H3	S2	W2	2–30	16–20	–	Sn4
FRO 01068	72°59′23″	160°24′18″	13.6	1	H3–6	S2	W1	8–18	3–31	br	Sn4
FRO 01069	72°59′24″	160° 24′23″	5.4	1	H5	S1	W1	17,1	17,8	–	Sn4
FRO 01070	72°59′24″	160°24′23″	6.6	1	H3	S1	W2	5–23	5–21	br	Sn4
FRO 01071	72°59′23″	160°24′09″	1.7	1	H4–6	S2	W2	20	18	br	Sn4
FRO 01072	72°59′24″	160°24′14″	6.5	1	H5	S1	W2	20	18	–	Sn4
FRO 01073	72°59′24″	160°24′11″	1.0	1	H3–6	S1	W1	1–29	5–19	br	Sn4
FRO 01074	72°59′24″	160°24′10″	3.0	1	H3	S1	W2	1–23	7–19	br	Sn4
FRO 01075	72°59′26″	160°24′22″	5.5	1	H3	S1–3	W2	17–20	6–17	br	Sn4
FRO 01076	72°59′26″	160°24′18″	2.1	1	H4/5	S2	W2	21	19	v	Sn4
FRO 01077	72°57′10″	160°24′46″	9.7	1	H6	S4	W2	18	16	–	Sn4
FRO 01078	72°57′15″	160°27′07″	15.0	1	L6	S5	W2	27	23	–	Sn4
FRO 01079	72°57′09″	160°26′59″	0.9	1	L6	S4	W2	26	22	–	Sn4
FRO 01080	72°57′07″	160°27′15″	0.4	1	H6	S3	W2	20	19	br	Sn4
FRO 01081	72°59′23″	160°24′26″	3.4	1	H3–6	S1	W2	18–22	5–18	br	Sn4

Table 2. Meteorites from Frontier Mountain collected by the Italian PNRA in December 2000. *Continued.*

Name	Latitude (S)	Longitude (E)	Mass (g)	Pieces	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Comments[a]	Info[b]
FRO 01082	72°59′23″	160°24′26″	5.0	1	H3–6	S3–5	W1	18	13	v, br	Pad1
FRO 01083	72°59′23″	160°24′24″	11.1	1	H5–6	S3	W1	20	18	br	Pad1
FRO 01085	72°59′20″	160°24′28″	4.2	1	H4	S2	W1	18	16	–	Pad1
FRO 01086	72°58′24″	160°28′29″	9.8	1	H5	S4	W0	19	16	–	Pad1
FRO 01087	72°57′15″	160°26′51″	76.4	1	H5	S3	W1	19	17	–	Pad1
FRO 01088	72°57′08″	160°27′19″	11.1	1	Ure	–	–	–	–	See separate entry	Pad1
FRO 01089	72°57′08″	160°27′20″	2.1	1	Ure	–	–	–	–	See separate entry	Pad1
FRO 01090	72°57′08″	160°27′37″	9.9	1	LL(L)3	S2	W0	0.5–35	1–32	–	Pad1
FRO 01091	72°57′07″	160°27′16″	1.6	1	L4	S2	W0	25	20	–	Pad1
FRO 01092	72°57′07″	160°27′16″	4.9	1	H3–6	S4	W0	19	17	br	Pad1
FRO 01093	72°57′07″	160°27′20″	26.4	1	L6	S4	W0	25	22	–	Pad1
FRO 01095	72°57′12″	160°27′39″	21.6	1	H6	S4	W1	19	16	v, br	Pad1
FRO 01096	72°57′12″	160°27′43″	3.3	1	H6	S3	W1	20	17	br	Pad1
FRO 01097	72°57′15″	160°26′18″	0.9	1	L6	S4	W1	26	21	–	Pad1
FRO 01098	72°57′06″	160°30′42″	10.1	1	L6	S5	W1	26	22	–	Pad1
FRO 01099	72°57′06″	160°30′42″	3.7	1	H5–6	S2	W2	17	16	br	Sn4
FRO 01100	72°57′06″	160°30′42″	11.3	1	H4	S2	W2	16	15	–	Sn4
FRO 01102	72°57′08″	160°27′41″	17.4	1	H4	S2	W2	17	15	–	Sn4
FRO 01103	72°57′15″	160°24′47″	2.0	1	L4	S4	W2	23	19	–	Sn4
FRO 01104	72°57′06″	160°30′40″	13.9	1	H4/5	S3	W2	17	16	–	Sn4
FRO 01105	72°57′01″	160°30′43″	2.5	1	H6	S3	W2	18	16	br	Sn4
FRO 01106	72°57′07″	160°30′30″	9.5	1	H5	S3	W2	16	15	–	Sn4
FRO 01107	72°57′08″	160°30′22″	9.2	1	L4	S1	w2	23	19	–	Sn4
FRO 01108	72°57′10″	160°27′55″	11.7	1	H6	S2	w2	17	15	v	Sn4
FRO 01109	72°57′10″	160°27′49″	4.7	1	H6	S3	W1	17	15	br	Sn4
FRO 01110	72°57′08″	160°27′45″	0.8	1	H6	S2	W1	17	15	–	Sn4
FRO 01111	72°57′06″	160°30′42″	5.0	1	L4	S2	W1	24	20	–	Sn4
FRO 01112	72°57′11″	160°29′55″	37.0	1	L4	S2	W1	23	19	–	Sn4
FRO 01113	72°57′15″	160°27′44″	31.2	1	H6	S2	W2–3	20	17–22	br	Sn4
FRO 01114	72°57′07″	160°27′33″	0.3	1	H6	S1	W2	20	18	–	Sn4
FRO 01115	72°57′10″	160°31′14″	3.4	1	H3	S1	W1	19	6–16	–	Sn4
FRO 01116	72°59′40″	160°24′02″	4.6	1	H3	S1	W1–2	11–36	5–25	–	Sn4
FRO 01117	72°58′14″	160°31′23″	11.2	1	H3/4	S1	W2	19–24	18	–	Sn4
FRO 01118	72°59′27″	160°24′16″	4.7	1	H6	S2	W2	20	18	br	Sn4
FRO 01119	72°59′31″	160°24′00″	7.2	1	H3	S2–3	W2	21	13–23	–	Sn4
FRO 01120	72°59′31″	160°24′01″	0.5	1	H3	S1–2	W2	8–20	16–19	–	Sn4
FRO 01121	72°57′08″	160°27′45″	5.1	1	H5	S1–2	W2	20	18	–	Sn4
FRO 01122	72°57′07″	160°27′49″	3.5	1	H4–5	S2–3	W2	20	18	–	Sn4
FRO 01123	72°57′06″	160°27′47″	0.7	1	H3	S1–2	W2	20	19	–	Sn4
FRO 01124	72°57′09″	160°27′54″	3.2	1	H3	S1–2	W2	20	19	–	Sn4
FRO 01125	72°57′07″	160°28′02″	0.3	1	H3	S1	W2	20	19	–	Sn4

Table 2. Meteorites from Frontier Mountain collected by the Italian PNRA in December 2000. *Continued.*

Name	Latitude (S)	Longitude (E)	Mass (g)	Pieces	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Comments[a]	Info[b]
FRO 01126	72°57′06″	160°27′47″	1.3	1	H3	S5	W2	26	23	–	Sn4
FRO 01127	72°57′07″	160°27′34″	2.9	1	H6	S1	W2	19	17	–	Sn4
FRO 01128	72°57′08″	160°27′33″	0.8	1	L3	S1	W1	9–41	7–32	–	Sn4
FRO 01129	72°57′11″	160°27′24″	0.3	1	H6	S1–2	W2–3	19	18	br	Sn4
FRO 01130	72°59′32″	160°23′59″	3.6	1	H3	S1	W1–2	18–22	4–20	–	Sn4
FRO 01131	72°59′32″	160°23′59″	2.0	1	H3	S1–3	W2	17–32	13–21	br	Sn4
FRO 01132	72°59′33″	160°24′00″	4.6	1	L6	S5	W2–3	26	22–26	–	Sn4
FRO 01134	72°59′32″	160°24′00″	18.2	1	H5	S2	W2	20	18	–	Sn4
FRO 01135	72°59′33″	160°24′06″	1.9	1	H5	S2	W2	21	19	–	Sn4
FRO 01137	72°59′32″	160°23′46″	19.6	1	H5	S2	W3	16	14	–	Sn4
FRO 01138	72°59′41″	160°23′59″	4.2	1	H3	S3	W2	16	6–17	–	Sn4
FRO 01139	72°59′41″	160°23′59″	2.2	1	H6	S2	W2	18	16	br	Sn4
FRO 01140	72°58′39″	160°30′39″	38.2	1	H6	S2	W2	17	16	–	Sn4
FRO 01141	72°59′32″	160°24′01″	13.9	1	H5/6	S2	W2	16	15	–	Sn4
FRO 01142	72°59′32″	160°24′00″	0.8	1	H4	S3	W2	18	15	–	Sn4
FRO 01143	72°59′32″	160°24′00″	1.4	1	H3	S2	W2	5–47	2–16	br	Sn4
FRO 01144	72°59′35″	160°24′01″	8.4	1	H3	S3	W2	11–27	3–15	br	Sn4
FRO 01145	72°59′35″	160°24′02″	12.3	1	H4	S2	W2	17	16	–	Sn4
FRO 01146	72°59′34″	160°24′25″	1.0	1	H6	S1	W2	17	16	–	Sn4
FRO 01147	72°58′25″	160°20′17″	0.5	1	Ure	–	–	–	–	Ssee separate entry	Sn4
FRO 01150	72°57′35″	160°38′56″	11.0	1	H6	S1	W1	17	15	–	Sn4
FRO 01151	72°59′16″	160°24′03″	3.6	1	H3	S3	W1	6–19	3–17	br	Sn4
FRO 01152	72°59′17″	160°23′57″	1.5	1	H4	S2	W2	16	16	–	Sn4
FRO 01153	72°59′18″	160°24′05″	6.7	1	H3	S2	W1	17–22	14–16	–	Sn4
FRO 01154	72°59′18″	160°24′05″	8.9	1	H3–5	S1–4	W1	10–15	8–17	br	Sn4
FRO 01155	72°59′18″	160°24′05″	0.3	1	H3	S3	W2	15–19	14–18	–	Sn4
FRO 01156	72°59′22″	160°24′08″	0.1	1	H3/4	S3	W2	16	6–13	–	Sn4
FRO 01157	72°59′22″	160°24′08″	0.7	1	H5	S3	W2	19	17	–	Sn4
FRO 01158	72°59′22″	160°24′08″	0.6	1	H5/6	S2	W2	17	15	–	Sn4
FRO 01159	72°59′22″	160°24′08″	0.6	1	H3	S2	W2	18	6–21	br	Sn4
FRO 01160	72°59′23″	160°24′11″	0.9	1	H3	S3	W1	3–19	10–16	br	Sn4
FRO 01161	72°59′33″	160°23′43″	0.3	1	H5	S2	W2	17	16	–	Sn4
FRO 01162	72°59′36″	160°24′00″	2.5	1	H3	S2	W2	17–40	3–21	br	Sn4
FRO 01163	72°59′36″	160°24′00″	0.9	1	H3	S2	W2	1–18	2–16	br	Sn4
FRO 01164	72°59′22″	160°24′10″	0.8	1	H4	S4	W2	18	17	–	Sn4
FRO 01165	72°59′21″	160°24′15″	4.5	1	H3/4	S2	W2	17	12–16	–	Sn4
FRO 01166	72°59′13″	160°24′30″	5.5	1	H5	S2	W1	18	15	–	Sn4
FRO 01167	72°57′07″	160°31′20″	3.9	1	H6	S1	W2	17	16	–	Sn4
FRO 01168	72°57′06″	160°31′17″	4.0	1	H5	S2	W1	18	16	–	Sn4
FRO 01169	72°57′10″	160°31′20″	6.2	1	H6	S5	W1	17	16	–	Sn4

[a]See "Abbreviations for analysts and specimen locations."
[b]Abbreviations: br = brecciated; v = veined.

Table 3. Meteorites collected from the Thiel Mountains, Antarctica by the Planetary Science Foundation (PSF) in January 2001.

Name	Latitude (S)	Longitude (E)	Mass (g)	Pieces	Class	Shock	WG[a]	Fa (mol%)	Fs (mol%)	Info[b]
TIL 99010	85°09.924′	94°47.841′	116.8	1	H5	S2	A	18.7	17.9	Ha3
TIL 99011	85°09.511′	94°37.275′	473	1	L5	S2	A	24.6	20.7	Ha3
TIL 99012	85°09.281′	94°35.378′	159	1	L4	S3	A	23.6	20.3	Ha3
TIL 99013	85°09.921′	94°43.472′	248.5	1	L4	S2/3	A	23.5	20.8	Ha3
TIL 99014	85°10.069′	94°43.673′	371.3	1	L5	S3	A	23.7	19.9	Ha3
TIL 99015	85°09.914′	94°44.025′	78.6	1	H5	S3	A	16.8	15.5	Ha3
TIL 99016	85°09.906′	94°46.627′	43	1	E6	–	A/B	–	0.5	Ha3
TIL 99017	85°09.807′	94°51.417′	1527.6	1	L4	S3	A	24.2	21.1	Ha3
TIL 99018	85°09.908′	94°50.771′	436.9	1	H4	S3	A/B	18.5	16.8	Ha3
TIL 99019	85°09.629′	94°47.481′	136	1	L5	S4	A	26.0	22.0	Ha3

[a]Weathering grade system follows that for ANSMET Antarctic meteorites.
[b]See "Abbreviations for analysts and specimen locations."

Table 4. Meteorites from Oman.

Name	Date found	Latitude (N)	Longitude (E)	Mass (g)	Pcs	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Wo (mol%)	Comments[a]	Type[b]	Info[c]
Al Huqf (AH)														
AH 001	04/30/00	19°25.2′	57°11.3′	41.5	1	L4	S5	W2	25	22.1	1.5	i.m.	10	Vr1
Dhofar (Dho)														
Dho 294	04/13/01	18°36.8′	54°30.0′	5988	68	H3.9	S1	W2	16.5–18.0	6.26–24.1	0.5–4.6	–	609	Vr2
Dho 296	10/03/00	19°19.7′	54°42.0′	1412	1	L5	S2	W4	24.8	21.7	1.4	–	488	Vr2
Dho 297	04/14/01	18°28.3′	54°09.2′	698	1	L6	S2	W3/4	24.8	22.1	1.3	–	33.2	Vr2
Dho 298	08/04/01	18°10.6′	54°15.8′	677	1	H6	S1	W3	18	16.8	1.6	–	112	Vr2
Dho 299	05/04/01	18°32.8′	54°18.6′	410	1	L3.9	S3	W4	11.3–26.3	1.84–23.4	0.3–2.7	–	99.5	Vr2
Dho 304	04/13/01	18°24.2′	54°09.0′	10	1	Lunar	–	–	–	–	–	See separate entry	2	Vr3
Dho 305	06/28/01	19°19.8′	54°47.0′	34.11	1	Lunar	–	–	–	–	–	See separate entry	7	Vr3
Dho 306	06/29/01	19°19.7′	54°47.1′	12.86	1	Lunar	–	–	–	–	–	See separate entry	2.6	Vr3
Dho 307	04/14/01	19°19.7′	54°46.9′	50	1	Lunar	–	–	–	–	–	See separate entry	10	Vr3
Dho 308	04/13/01	18°24.2′	54°09.0′	2	1	Lunar	–	–	–	–	–	pr Dho 025, 301, 304	0.64	Vr3
Dho 309	01/14/02	19°19.6′	54°47.3′	81.3	1	Lunar	–	–	–	–	–	See separate entry	16.5	Vr11
Dho 310	01/15/02	19°19.7′	54°47.1′	10.8	1	Lunar	–	–	–	–	–	See separate entry	2.5	Vr11
Dho 311	04/14/01	19°19.6′	54°47.0′	4	1	Lunar	–	–	–	–	–	See separate entry	1.7	Vr10
Dho 313	10/04/01	18°27.1′	54°01.9′	200	1	H5	S1	W3	17.7	17.1	1.2	–	60	Vr2
Dho 314	11/12/01	19°19.1′	54°43.8′	501	4	L6	S2	W3–4	24.3	21	1.4	–	348	Vr2
Dho 315	11/12/01	19°21.2′	54°49.5′	411.25	9	H5	S3	W3	17.3	15.5	1.3	–	236	Vr2
Dho 316	12/12/01	19°09.3′	54°47.2′	3215	1	L6	S1	W1	24.8	21.2	1.6	–	591	Vr2
Dho 317	12/14/01	18°35.3′	54°01.1′	2897	1	L5	S4	W1	24.3	21.6	1.6	–	736	Vr2
Dho 318	06/23/01	18°10.8′	54°10.5′	522	15	L6	S3	W4	25.4	21.4	1.7	–	256	Vr2
Dho 319	01/25/00	18°34.2′	54°17.2′	416	1	H5	S4	W3	18.7	17	1.3	–	126	Vr2
Dho 320	04/04/01	19°02.3′	54°36.7′	413	1	L6	S4	W3	24.5	22.1	1.5	–	64	Vr2
Dho 321	04/04/01	18°20.9′	54°17.2′	594	1	H4	S2	W3	18.8	17.7	1.5	–	82	Vr2

Table 4. Meteorites from Oman. *Continued.*

Name	Date found	Latitude (N)	Longitude (E)	Mass (g)	Pcs	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Wo (mol%)	Comments[a]	Type[b]	Info[c]
Dho 322	03/04/00	18°20.2′	54°13.3′	658	1	H5	S1	W4	18	17.7	1.1	–	130	Vr2
Dho 323	03/04/01	18°13.1′	54°06.4′	688	1	H5	S1	W4	19.6	18.2	1.5	–	106	Vr2
Dho 324	07/04/01	18°54.2′	54°34.7′	448	1	H6	S3	W3	18.5	17	1.3	probably pr Dho 346	94	Vr2
Dho 325	05/04/01	18°28.9′	54°08.1′	584	1	L3.5	S2	W4	1.66–45.3	0.7–22.0	0.5–5.5	Fe0 8.02 wt%	79.2	Vr6
Dho 326	01/26/00	19°02.0′	54°30.9′	618	1	H5	S4	W3	18.8	17.7	1.1	–	242	Vr2
Dho 327	04/04/01	18°23.3′	54°08.0′	421	1	L6	S4	W4	25.1	21.9	1.4	–	70	Vr2
Dho 328	01/25/00	18°58.8′	54°24.3′	536	7	LL5	S4	W4	31.8	26.4	1.9	–	120	Vr2
Dho 329	03/11/00	18°55.1	54°34.7′	475	3	H6	S3	W3	18.8	17	1	–	194	Vr2
Dho 330	01/17/02	19°22.9′	54°35.6′	156	1	L4	S3	W3	23.6	20.8	1.4	–	42	Vr1
Dho 331	06/03/00	18°08.5′	54°05.2′	946	1	H5	S3	W4	18.3	17.2	1.4	–	202	Vr2
Dho 332	06/03/00	18°16.1′	54°07.3′	794	1	H5	S3	W2	19.4	17.8	1.7	–	166	Vr2
Dho 333	06/03/00	18°22.5′	54°08.3′	410	1	L6	S2	W3	25.1	22.1	1.5	–	88.6	Vr2
Dho 335	04/25/00	18°58.4′	54°41.3′	555	1	L6	S3	W1	24.5	21.6	1.5	–	88.4	Vr2
Dho 336	08/04/01	18°45.3′	54°34.8′	468	1	L6	S3	W3	24.9	21.8	1.5	–	99.6	Vr2
Dho 337	04/13/01	18°43.6′	54°40.5′	580	5	L5	S3	W3	25.1	23	1.6	–	80.4	Vr2
Dho 338	04/14/01	18°45.7′	54°42.2′	1140	1	H4	S1	W3	17.5	16.5	1.4	–	198	Vr2
Dho 339	04/14/01	18°38.4′	54°33.6′	94	1	L6	S2	W1	23.8	21.3	1.6	–	28.1	Vr1
Dho 340	04/27/00	18°53.3′	54°45.4′	236	1	L4	S2	W3	25.7	22.4	1.5	–	47.9	Vr1
Dho 341	04/28/00	19°19.7′	54°42.3′	116	1	H5	S2	W3	18.8	17.7	1.3	–	31.9	Vr1
Dho 342	04/13/01	18°19.7′	54°02.1′	58	1	H5	S1	W2	18.2	16.8	2	–	16.4	Vr1
Dho 343	11/04/01	18°20.7′	54°11.8′	62	1	H5	S2	W3	18.2	16.8	1.3	–	21.4	Vr1
Dho 344	04/13/01	18°26.6′	54°13.0′	76	1	H5	S3	W3	17.9	17.6	1.1	br, big metal veins	23.4	Vr1
Dho 345	04/27/00	19°07.0′	54°48.5′	31	1	H4	S2	W2	16.8	16.6	1.4	–	13.14	Vr1
Dho 346	07/04/01	18°54.9′	54°36.0′	1345	5	H5	S3	W3	18.6	17.4	1.2	probably pr Dho 324	279	Vr2
Dho 347	04/14/01	18°34.4′	54°27.4′	62	1	L6	S2	W4	25.2	21.7	1.6	–	17.4	Vr1
Dho 348	04/14/01	18°29.0′	54°19.5′	419	1	L5	S2	W3	23.9	20.2	1.3	–	220	Vr1
Dho 349	04/14/01	18°27.3′	54°16.8′	412	1	L6	S2	W4	24.4	21.2	1.4	–	243	Vr1
Dho 350	04/14/01	18°49.3′	54°13.6′	112	1	H5	S1	W3	18.5	16.6	1.3	–	47.3	Vr1
Dho 382	03/19/01	19°06.380′	54°49.040′	151	3	H5/6	S3	W3–4	18.5	16	–	–	21	Mün2
Dho 383	03/19/01	19°06.438′	54°49.051′	139	2	H5	S3	W3	18.5	17	–	sv, calc. v.	21	Mün2
Dho 385	03/20/01	19°06.722′	54°48.354′	480	1	H5	S3	W3	18.5	16.5	–	sv	24	Mün2
Dho 386	03/2001	19°06.193′	54°47.660′	138	1	H5/6	S2	W3	18.5	16	–	sv	22	Mün2
Dho 389	03/20/01	19°06.508′	54°47.967′	160	5	H5	S3	W3–4	19.5	17.5	–	–	20	Mün2
Dho 402	03/22/01	19°18.010′	54°32.143′	140	1	H6	S2	W4	19.5	17.5	–	–	26	Mün2
Dho 409	03/25/01	18°42.233′	54°12.191′	162	1	H5	S2	W3–4	19	17.5	–	–	26	Mün2
Dho 417	03/26/01	18°45.835	54°13.879′	161	1	H4/5	S2	W2–3	17.5	15.5	–	–	21	Mün2
Dho 425	03/28/01	18°37.623′	54°42.560′	248	1	L5	S2	W4	24.5	20.5	–	br	26	Mün2
Dho 426	03/28/01	18°42.497′	54°34.491′	196	1	L6	S3	W3–4	24.5	21	–	–	22	Mün2
Dho 430	03/28/01	18°54.206′	54°38.340′	182	1	L5/6	S3	W4	23.5	20.5	–	–	22	Mün2
Dho 440	03/31/01	18°45.078′	54°21.805′	108	1	H5/6	S2	W4	18	16.5	–	–	20	Mün2
Dho 450	01/04/01	18°54.810′	54°29.028′	104	1	L6	S4	W4	25	21.5	–	partly S5	23	Mün2
Dho 469	01/20/01	19°14.454″	54°51′313″	309	1	H3–4	S2	W3	15.3 (max 18)	14.7 (max 17)	1.6	–	23	Frei1
Dho 471	01/20/01	19°15.33″	54°39′669″	158	1	L6	S3	W3	23.7	21.3	1.5	–	20	Frei1
Dho 473	01/20/01	19°10.558″	54°39′411″	145	1	L6	S3	W3	23.9	21.5	1.5	–	20	Frei1
Dho 476	01/2001	19°06.614″	54°49′247″	160	1	L6	S4	W3	24.3	21.4	1.5	–	21	Frei1
Dho 480	01/20/01	19°08.297″	54°41′776″	101	1	Euc	S4	W2	–	64.9	2.3	Plag: An 89-91, br	20	Frei1

Table 4. Meteorites from Oman. *Continued.*

Name	Date found	Latitude (N)	Longitude (E)	Mass (g)	Pcs	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Wo (mol%)	Comments[a]	Type[b]	Info[c]
Dho 481	01/20/01	19°09.951′′	54°43′128′′	120	1	H5	S3	W2	16.9	15.9	1.2	–	20	Frei1
Dho 484	01/20/01	19°06.627′′	54°47′326′′	383	1	H3/4	S2	W3	16.6	15.2	1	–	20	Frei1
Dho 486	01/20/01	19°06.661′′	54°43′736′′	855	1	H5	S3	W3	18.3	17	1.3	–	21	Frei1
Dho 488	02/20/01	19°06.371′′	54°47′945′′	652	1	H6	S3	W4	18.9	17.4	1.4	–	22	Frei1
Dho 490	03/17/01	18°43.00′	54°27.00′	34.05	1	Lunar	–	–	–	–	–	See separate entry	7	Be2
Dho 491	04/13/01	18°35.2′	54°23.8′	310	3	H (5?)	S6	W3	18.6	16.7	–	abundant shock m.v.	95.8	Vr4
Dho 492	04/05/01	18°42.7′	54°39.2′	281	1	H		W3	18.5	17	–	whole impact melt rock	81	Vr4
Dho 493	06/25/01	19°08.8′	54°34.8′	32	1	LL4	S1	W1	29.3	25	1.8	–	12	Vr1
Dho 494	06/29/01	19°09.0′	54°35.0′	31	1	H5	S2	W3	18.7	17.5	1.8	–	14	Vr1
Dho 495	06/25/01	19°09.5′	54°34.5′	3184	2	H4	S1	W3	–	–	–	pr Dhofar 224	3184	Vr1
Dho 496	03/04/00	18°09.3′	54°06.7′	354	3	L4	S4	W3	24.7	23.2	1.4	–	65.8	Vr1
Dho 497	04/26/00	18°58.0′	54°38.5′	710	1	L4	S2	W3	24.3	24	–	–	252	Vr1
Dho 498	04/27/00	18°43.4′	54°51.9′	476	8	H5	S4	W3	19.7	18.4	–	–	116.2	Vr1
Dho 499	01/11/01	19°01.7′	54°32.9′	87	1	L6	S2	W3	24.9	21.4	–	–	36.5	Vr1
Dho 500	01/11/00	18°23.2′	54°12.2′	116	1	Achond Ung	–	–	–	–	–	See separate entry	23.5	Vr13
Dho 501	01/16/00	18°21.0′	54°11.7′	104	1	H4	S2	W3	18.6	16.9	1.5	–	44.5	Vr2
Dho 502	01/25/00	18°23.3′	54°17.5′	240	1	H5	S3	W4	19	18	1.3	–	98	Vr2
Dho 503	01/25/00	18°34.9′	54°24.3′	320	1	H3.9	S3	W3	19.8	19.4	1.2	PMD Ol 8.5	162	Vr2
Dho 504	01/26/00	18°44.1′	54°22.1′	331	1	H4	S4	W3	18.8	18.6	1.5	–	60	Vr2
Dho 505	10/17/00	18°17.9′	54°11.6′	375	1	L5	S3	W4	24.7	22.7	1.7	–	188	Vr2
Dho 506	01/18/00	18°18.5′	54°10.4′	340	1	H4	S4	W4	18.9	17.1	1.5	–	176	Vr2
Dho 507	01/22/00	18°19.7′	54°11.6′	288	1	H5	S4	W3	19.5	18.7	1.4	i.m. br prob pr Dho 010	76.2	Vr2
Dho 508	01/22/00	18°54.7′	54°28.5′	270	1	L6	S4	W2	25.5	22.9	1.5	–	78	Vr2
Dho 509	01/24/00	18°08.4′	54°04.2′	238	1	L6	S4	W2	24.5	22.3	1.4	–	64.8	Vr2
Dho 510	01/25/00	18°54.8′	54°21.7′	186	1	H4	S4	W3	18.3	17.2	1.5	–	52.6	Vr2
Dho 511	01/25/00	18°57.4′	54°23.1′	52	1	H4	S4	W3	17.8	17.2	1.4	–	25.8	Vr2
Dho 512	01/26/00	18°48.6′	54°15.7′	263.5	6	L5	S3	W2	24.9	22	1.7	–	62	Vr2
Dho 513	01/19/00	18°20.1′	54°12.0′	434	1	H5	S4	W3	18.6	17.1	1.7	–	98	Vr2
Dho 514	01/25/00	18°48.0′	54°14.9′	160	1	L5	S3	W2	25.3	22.1	1.5	–	29.5	Vr2
Dho 515	01/25/00	19°00.4′	54°23.6′	315	20	H5	S4	W4	19.6	17.4	1.3	–	95.7	Vr2
Dho 516	03/05/00	18°52.5′	54°28.0′	145	1	LL6	S4	W2	26.2	22.9	1.4	–	16.5	Vr2
Dho 517	03/05/00	18°55.5′	54°27.5′	260	1	L6	S3	W4	24.5	22.8	1.5	–	51.4	Vr2
Dho 518	03/11/00	18°42.4′	54°22.8′	247	1	H6	S3	W3	17	16.1	1.2	–	164	Vr2
Dho 519	03/11/00	18°53.8′	54°32.3′	98	1	H6	S3	W3	18.3	17.8	1.4	–	23.6	Vr2
Dho 520	03/13/00	18°51.5′	54°42.8′	48	1	H5	S2	W3	18.3	17.1	1.1	–	14.4	Vr2
Dho 521	03/14/00	19°10.4′	54°52.2′	386	2	L4	S3	W3	22.5	20	0.8	–	195.1	Vr2
Dho 522	03/07/00	18°14.4′	54°10.1′	186	1	H4	S3	W3	19.1	17.4	1.1	–	70.8	Vr2
Dho 523	03/10/00	19°23.8′	54°43.7′	74	1	H4	S3	W3	18.2	17.1	1.3	–	13.1	Vr2
Dho 524	03/11/00	19°05.9′	54°30.0′	204	1	L5	S2	W2	24.7	19.7	1.4	–	68.2	Vr2
Dho 525	03/06/00	18°14.3′	54°08.2′	50	1	L5	S4	W3	25.1	22.1	1.5	–	10	Vr2
Dho 526	03/11/00	19°20.3′	54°40.6′	346	1	L6	S2	W3	25.2	22.5	1.5	–	26	Vr2
Dho 527	04/04/01	18°16.6′	54°08.1′	172	1	H4	S2	W4	19.4	17.4	1.5	–	48.5	Vr7
Dho 528	04/04/01	18°22.0′	54°09.1′	374	1	L5	S2	W3	20.7	18.1	1.4	–	128	Vr7

Table 4. Meteorites from Oman. *Continued.*

Name	Date found	Latitude (N)	Longitude (E)	Mass (g)	Pcs	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Wo (mol%)	Comments[a]	Type[b]	Info[c]
Dho 529	04/04/01	18°22.4′	54°07.8′	368	3	H5	S2	W3	21.2	18.6	1.4	–	359.1	Vr7
Dho 530	04/04/01	18°22.2′	54°14.0′	240	1	L4	S2	W3	24.8	21.5	1	–	56	Vr7
Dho 531	04/05/01	18°26.0′	54°06.5′	258	1	L6	S2	W4	21.2	18.3	1.4	–	59.8	Vr7
Dho 532	04/08/01	18°25.2′	54°14.8′	86	1	H5	S3	W4	18.7	16.4	1.3	–	22	Vr7
Dho 533	03/12/00	18°10.7′	54°10.9′	308	2	L6	S3	W4	24.8	21.9	–	Probably pr Dho 005	173	Vr2
Dho 534	01/11/01	19°11.8′	54°42.2′	173	1	H5	S2	W3	17.7	17	1.3	–	41.6	Vr1
Dho 535	01/11/00	19°20.0′	54°47.7′	204	Many	Chond Ung	–	–	–	–	–	See separate entry	49.5	Vr12
Dho 536	01/14/01	18°19.0′	54°08.9′	5	1	H5	S2	W3	18.6	17	1.5	–	4.2	Vr1
Dho 537	01/16/01	18°53.9′	54°42.3′	14	1	H5	S1	W2	18.4	17.5	1.7	–	6	Vr1
Dho 538	01/18/02	19°20.3′	54°36.3′	230	1	L5	S2	W3	24.3	20.5	1.5	–	59.7	Vr4
Dho 539	06/23/01	18°11.3′	54°10.0′	102	1	H5	S3	W3	18.7	16.4	0.8	Ca-Px: Fs5–6, Wo38–45	48	Vr4
Dho 540	04/04/01	18°33.6′	54°06.3′	104	4	E4	S3	W3	0.2	0.6	–	–	28	Vr4
Dho 541	2000	18°20.06′	54°10.84′	1233.3	1	H4	S2	W3	16.9	14.9	–	–	22.1	Be2
Dho 542	2000	18°48.50′	54°28.33′	43.3	1	H4/5	S2	W3	16.9	15.3	–	–	8.7	Be2
Dho 551	11/07/01	18°43.037′	54°21.541′	181	1	H5/6	S3	W4	18	16.5	–	–	20	Mün2
Dho 580	07/13/01	18°42.903′	54°11.809′	812	5	LL6	S2	W3	30.5	24.5	–	br	20	Mün2
Dho 599	07/15/01	18°41.452′	54°42.288′	465	1	L6	S4	W4	24.5	21.5	–	–	20.5	Mün2
Dho 601	07/15/01	18°41.283′	54°40.724′	226	1	H6	S3	W3	20	18	–	sv	20	Mün2
Dho 614	01/13/01	19°15.465′	54°46.915′	197	2	L6	S3	W3	25	21	–	–	17	Mün2
Dho 622	01/15/01	19°13.672′	54°51.221′	60	1	H4-an	S2	W3–4	18.5	16.8	–	See separate entry	12	Mün2
Dho 638	01/19/01	19°12.166′	54°39.337′	103	1	L6	S6	W4	25.5	21.5	–	sv, ringw., calc. v.	15	Mün2
Dho 691	03/02/01	19°24.403′	54°45.493′	428	1	L5	S3	W2–3	23.5	21.5	–	sv	18.5	Mün2
Dho 695	01/16/02	19°16.9′	54°49.8′	702	1	H3.9	S1	W2	15.9	15.7	1.4	br with i.m.	104	Vr2
Dho 696	01/17/02	19°14.2′	54°45.5′	233	1	L6	S3	W4	25.3	22.8	1.4	–	55.4	Vr2
Dho 697	01/17/02	19°23.0′	54°35.7′	409	1	L6	S2	W3	25.4	22.4	1.6	–	175	Vr2
Dho 699	11/10/02	19°06.2′	54°49.7′	444	3	H4	S2	W1	18.5	16.8	1.4	br with i.m. clasts	110.3	Vr2
Dho 700	11/15/02	19°18.5′	54°33.1′	2770	12	Dio	–	–	–	–	–	See separate entry	350	Vr9
Dho 701	01/15/02	19°08.9′	54°48.2′	220	2	L5	S3	W4	24.9	21.6	0.9	–	101.3	Vr2
Dho 702	01/15/02	19°09.9′	54°46.6′	2878	1	H4	S2	W3/4	18.7	16.8	1.6	–	606	Vr2
Dho 703	04/06/01	19°10.4′	54°52.5′	205	1	L5	S3	W4	22.3	21.2	0.8	–	43.1	Vr2
Dho 704	04/08/01	18°53.5′	54°35.2′	280	1	L4	S2	W3	24.9	22.3	1.5	–	57.5	Vr2
Dho 705	04/10/01	18°49.0′	54°15.7′	283	1	L6	S1	W1	24.7	21.5	1.4	–	39.7	Vr2
Dho 706	04/10/01	19°03.2′	54°32.0′	255	1	H5	S3	W2	18.5	17	1.2	–	69.2	Vr2
Dho 707	04/04/01	18°25.5′	54°09.6′	205	1	L5	S3	W1	24.8	21.9	1.5	–	48	Vr2
Dho 709	04/11/01	18°23.1′	54°08.1′	336	2	LL6	S3	W4	26.1	23.8	1.5	–	83.9	Vr2
Dho 710	04/13/01	18°27.6′	54°00.4′	182	1	L6	S2	W4	25.3	22.4	1.5	–	37	Vr2
Dho 711	04/13/01	18°29.9′	54°02.6′	370	1	L5	S2	W4	24.4	22.1	1.6	–	94	Vr2
Dho 712	04/05/01	18°41.9′	54°36.8′	577	3	L6	S2	W2	25.1	21.9	1.4	–	179.2	Vr2
Dho 713	04/14/01	18°42.9′	54°21.5′	362	3	H6	S3	W3	18.2	16.5	1.3	–	121.8	Vr2
Dho 714	04/25/00	18°15.1′	54°25.5′	207	1	H5	S2	W3	17.7	16.3	1.5	–	42.8	Vr2
Dho 715	04/27/00	18°54.0′	54°24.0′	252	1	LL4	S3	W3	26.7	22	1.4	–	42	Vr2
Dho 716	06/25/01	19°10.0′	54°35.0′	361	1	LL5	S2	W3	28.8	24.7	1.5	–	200	Vr1
Dho 717	06/28/01	19°19.6′	54°47.1′	6	1	L6	S6	W3	23.9	19.8	1.7	sv, rw	4.3	Vr4
Dho 718	01/14/02	19°18.8′	54°51.1′	38	1	L5	S6	W3	24.5	18.9	1.4	–	24.9	Vr4

Table 4. Meteorites from Oman. *Continued.*

Name	Date found	Latitude (N)	Longitude (E)	Mass (g)	Pcs	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Wo (mol%)	Comments[a]	Type[b]	Info[c]
Dho 719	01/16/02	19°15.3′	54°48.0′	12	1	L4	S4	W3	23.1	19.2	–	–	5	Vr4
Dho 720	04/27/00	18°56.7′	54°53.7′	392	1	H4	S3	W4	17	15.6	1.2	–	102.7	Vr2
Dho 721	04/10/01	18°47.5′	54°09.2′	13605	1	H4	S2	W3	18.8	17.9	1.4	–	250	Vr2
Dho 722	01/15/01	18°41.2′	54°32.0′	230	4	H3.9	S2	W4	16.3	15.6	1.2	PMD Ol 5.6	40.3	Vr1
Dho 723	01/15/01	18°41.0′	54°13.1′	166	1	H5	S2	W3	18.6	17.5	1.2	–	47.7	Vr1
Dho 724	06/25/01	19°08.8′	54°35.2′	48	1	LL5	S1	W2	29.1	24.7	1.4	–	21.7	Vr1
Dho 725	06/25/01	19°09.0′	54°34.6′	14	1	H4	S2	W3	19.1	17.1	1.2	–	4.9	Vr1
Dho 726	06/25/01	19°20.5′	54°44.0′	262	2	L6	S2	W4	25	20.8	1.7	–	79.3	Vr1
Dho 727	06/25/01	19°20.6′	54°44.0′	329	1	H5	S2	W2	19.4	16.6	1.4	–	113.7	Vr1
Dho 730	11/09/02	19°19.5′	54°47.5′	108	1	Lunar	–	–	–	–	–	See separate entry	22	Vr3
Dho 731	11/11/02	19°20.0′	54°47.7′	36	1	Lunar	–	–	–	–	–	See separate entry	7.5	Vr3
Dho 732	11/15/02	19°24.3′	54°34.7′	17	1	Achond Ung	–	–	–	–	–	See separate entry	3.5	Vr11
Dho 733	11/12/02	18°35.3′	54°13.8′	98	1	Lunar	–	–	–	–	–	See separate entry	20	Vr11
Dho 735	11/09/02	19°4.1′	54°46.8′	304 + 77	2	CM2	–	–	–	–	–	See separate entry	58.8	Vr12
Dho 745	10/2000	18°53.182′	54°39.271′	3600	1	H4	S1	W3	18.1	16.4	1.1	–	20	Frei1
Dho 746	10/2000	18°16.537′	54°19.309′	969	1	H6	S2	W3	19.4	17.3	1.3	–	21	Frei1
Dho 747	10/2000	18°47.739′	54°44.372′	1555	Many	L3	S2	W4	19.4 (max 23)	13.5 (4.0–22.6)	1.2	–	27	Frei1
Dho 748	10/2000	18°46.291′	54°42.983′	1030	Many	H6	S2	W3	18.7	17.4	1.4	–	27	Frei1
Dho 749	10/2000	18°52.638′	54°46.821′	1730	Many	LL6	S3	W3	30.2	25	1.9	–	22	Frei1
Dho 750	10/2000	18°50.270′	54°40.270′	742	2	L6	S2	W4	24.6	22.3	4	–	20	Frei1
Dho 751	10/2000	18°53.528′	54°42.771′	1155	Many	H6	S3	W3	19.8	15.9	1	–	23	Frei1
Dho 752	10/2000	18°43.646′	54°46.023′	444	1	L6	S4	W4	23.9	21.2	1.7	–	20	Frei1
Dho 753	10/2000	18°15.951′	54°19.264′	550	1	H3/4	S2	W4	18	16.1	0.6	–	20	Frei1
Dho 754	10/2000	18°51.220′	54°38.823′	538	1	H4	S2	W4	17.6	16.6	0.9	–	21	Frei1
Dho 755	10/2000	18°19°208′	54°14.147′	547	1	L6	S4	W3	24.3	21.6	1.6	–	21	Frei1
Dho 756	10/2000	18°25.267′	54°35.312′	362	1	H5	S2/3	W3	18.8	17.5	1.5	–	20	Frei1
Dho 757	10/2000	18°51.230′	54°38.820′	471	1	H5	S2	W4	18.3	17.2	0.9	–	21	Frei1
Dho 758	10/2000	18°57.870′	54°45.433′	253	2	L6	S3	W3	24.3	21.5	1.6	–	20	Frei1
Dho 759	10/2000	18°43.876′	54°49.202′	441	3	H4/5	S2	W3	17.3	16.3	1.4	–	20	Frei1
Dho 760	10/2000	18°56.673′	54°40.442′	163	1	L5	S4	W2	24.2	21.2	1.5	–	21	Frei1
Dho 761	10/2000	19°03.635′	54°31.268′	107	3	H6	S3	W3	18.1	16.9	1.3	–	20	Frei1
Dho 762	10/2000	18°45.080′	54°43.145′	235	1	H6	S2	W4	18.4	17	1.5	–	20	Frei1
Dho 763	10/2000	18°51.895′	54°38.983′	190	1	L5	S2	W2	22.8	20.4	1.4	–	20	Frei1
Dho 764	10/2000	18°49.837′	54°45.987′	195	5	H5	S3	W4	17.9	16.5	1.3	–	22	Frei1
Dho 765	10/2000	18°56.617′	54°40.240′	135	1	L5	S4	W3	24	21.2	1.5	–	20	Frei1
Dho 766	10/2000	18°16.656′	54°19.415′	152	2	H6	S4	W3	16.9	16.2	1.1	–	20	Frei1
Dho 767	10/2000	18°49.938′	54°45.950′	317	8	H6	S3	W3	17.9	16.6	1.3	–	20	Frei1
Dho 768	10/2000	18°49.157′	54°36.856′	195	1	H5/6	S2	W3	18	16.8	1.5	–	20	Frei1
Dho 769	10/2000	18°57.759′	54°45.065′	250	3	L6	S4	W3	24.7	21.6	1.7	–	20	Frei1
Dho 770	10/2000	18°14.700′	54°24.547′	376	2	H5/6	S2	W4	18.6	17.2	1.3	–	21	Frei1
Dho 771	10/2000	18°51.007′	54°37.396′	114	1	H5	S2	W3	17.4	16.2	1.4	–	20	Frei1
Dho 772	10/2000	19°05.130′	54°45.746′	9187	2	L6	S5	W3	24.2	21.3	1.5	–	21	Frei1
Dho 773	10/2000	18°50.838′	54°32.123′	295	1	H5	S2	W3	18.6	17.1	1.5	–	20	Frei1
Dho 774	10/2000	18°41.535′	54°35.471′	115	2	L6	S4	W3	23.6	20.8	1.6	–	21	Frei1
Dho 775	10/2000	18°54.200′	54°42.271′	212	2	H5	S4	W3	17.4	16.3	1	–	20	Frei1

Table 4. Meteorites from Oman. *Continued.*

Name	Date found	Latitude (N)	Longitude (E)	Mass (g)	Pcs	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Wo (mol%)	Comments[a]	Type[b]	Info[c]
Dho 776	10/2000	18°51.725′	54°40.762′	121	1	L5	S3	W2	25.7	22.7	1.4	–	21	Frei1
Dho 777	10/2000	18°50.473′	54°45.384′	102	2	LL6	S4	W3	30.5	26.3	2.2	–	20	Frei1
Dho 778	10/2000	18°43.525′	54°43.829′	156	1	Dio	S4	W1	27.8	22.7	1.9	Plag: An69–79, sv	20	Frei1
Dho 779	10/2000	18°56.482′	54°41.727′	126	2	L5	S4	W4	23.9	21.1	1.5	–	21	Frei1
Dho 780	09/27/00	19°43.282′	54°40.738′	1856	1	H5/6	S2	W4	18.5	17	–	heavy calc. v.	25	Mün2
Dho 781	02/10/00	18°34.281′	54°42.887′	1200	19	H5	S3	W3/4	18.5	16	–	calc. v.	36	Mün2
Dho 782	01/10/00	18°24.727′	54°37.736′	708	2	L6	S4	W3/4	24	20	–	–	37	Mün2
Dho 783	01/10/00	18°37.228′	54°42.927′	426	1	H6	S3	W4	18.5	16.5	–	sv	24	Mün2
Dho 784	04/10/00	18°57.283′	54°48.281′	590	1	H5	S2	W4	20	18	–	–	32	Mün2
Dho 785	01/26/01	19°4.941′	54°27.137′	98.449	1	H4/5	S3	W3	18.9	17.4	1.3	–	–	Bern1
Dho 786	01/26/01	19°4.016′	54°31.159′	36.334	1	H4/5	S2/3	W3	19.3	17.5	1.2	–	–	Bern1
Dho 787	01/27/01	19°1.753′	54°32.684′	382.497	18	H4	S1/2	W4	17.8	16.4	1.1	–	–	Bern1
Dho 788	01/27/01	19°1.769′	54°32.662′	274.38	1	H4	S4	W3	18.5	16.2	1	–	–	Bern1
Dho 789	01/27/01	19°2.275′	54°32.222′	430.539	6	L6	S5	W4	25.1	21.1	1.5	–	–	Bern1
Dho 790	01/27/01	19°3.979′	54°31.318′	20.445	1	H6	S3/4	W4	20.1	16.2	1.3	pr Dho 032, 036, 130, 132, 137, 139, 141, 142	–	Bern1
Dho 791	01/27/01	19°4.166′	54°31.281′	146.519	1	H6	S3	W3	19.9	8.9	0.7	pr Dho 030, 036, 130, 132, 137, 139, 141, 142	–	Bern1
Dho 792	01/27/01	19°4.106′	54°32.101′	519.016	1	H5	S3	W3	19.1	16.7	1.3	–	–	Bern1
Dho 793	01/27/01	19°2.510′	54°33.388′	151.132	1	H6	S3	W4	19.1	17.1	1.3	pr Dho 030, 032, 130, 132, 137, 139, 141, 142	–	Bern1
Dho 794	01/28/01	19°3.097′	54°27.803′	431.811	1	H6	S1	W4	18.2	15.9	1.2	–	–	Bern1
Dho 795	01/28/01	19°2.922′	54°31.746′	32.182	1	L6	S4	W3	25.7	21	1.6	–	–	Bern1
Dho 796	01/28/01	19°3.544′	54°32.216′	246.377	1	H4	S3	W4	17.5	16.2	1	–	–	Bern1
Dho 797	01/28/01	19°3.624′	54°32.203′	132.189	1	H6	S3	W2/3	19.4	17.1	1	–	–	Bern1
Dho 798	01/28/01	19°3.630′	54°32.206′	18.425	1	H6	S3	W4	20.1	17.2	1.4	pr Dho 030, 32, 36, 130, 137, 139, 141, 142	–	Bern1
Dho 799	01/28/01	19°4.224′	54°32.303′	56.11	1	H4	S2	W3	18.5	17.4	1.4	–	–	Bern1
Dho 800	01/28/01	19°3.751′	54°33.029′	55.884	1	L4	S2	W4	25.5	20.9	1.6	–	–	Bern1
Dho 801	01/28/01	19°3.341′	54°33.065′	119.149	2	H6	S2	W4	18.8	16.6	1.1	pr Dho 30, 032, 036, 130, 132, 139, 141, 142	–	Bern1
Dho 802	01/28/01	19°3.140′	54°32.517′	199.433	1	H6	S3	W2	19.8	18.2	1.4	pr Dho 30, 032, 036, 130, 132, 137, 141, 142	–	Bern1
Dho 803	01/28/01	19°3.516′	54°32.102′	22.427	1	H6	S3	W4	20.3	17.2	1.5	pr Dho 30, 032, 036, 130, 132, 137, 139, 142	–	Bern1
Dho 804	01/28/01	19°3.693′	54°32.077′	44.404	2	H6	S3	W4	19.5	16.5	1.3	pr Dho 30, 032, 036, 130, 132, 137, 139, 141	–	Bern1
Dho 805	01/29/01	18°55.155′	54°16.015′	237.941	1	L6	S3	W3/4	25.3	21.4	1.6	–	–	Bern1
Dho 806	01/29/01	18°33.917′	54°4.842′	117.237	1	L5	S3	W4	23.7	19.8	1.5	–	–	Bern1
Dho 807	01/29/01	18°30.257′	54°5.154′	1260	1	H5	S1	W2	19.8	17.9	1.3	–	–	Bern1
Dho 808	01/30/01	18°10.799′	54°12.220′	2.496	1	L6	S5	W4	24.2	20.3	1.5	–	–	Bern1

Table 4. Meteorites from Oman. *Continued.*

Name	Date found	Latitude (N)	Longitude (E)	Mass (g)	Pcs	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Wo (mol%)	Comments[a]	Type[b]	Info[c]
Dho 809	01/31/01	18°33.870′	54°5.776′	25.424	1	L4	S2	W3	24.2	20.1	1.6	–	–	Bern1
Dho 810	01/31/01	18°33.657′	54°5.990′	82.573	1	H4	S2	W4	19.7	16.1	1.2	–	–	Bern1
Dho 811	01/31/01	18°33.486′	54°6.234′	19.324	1	H5	S2	W2	18.9	16	1.3	–	–	Bern1
Dho 812	01/31/01	18°33.744′	54°6.537′	24.867	1	L5	S4	W4	24.4	21.1	1.7	–	–	Bern1
Dho 813	01/31/01	18°32.982′	54°7.214′	75.869	1	L5	S4	W3	23.5	20.2	1.7	–	–	Bern1
Dho 814	02/11/01	18°57.732′	54°35.407′	99.805	1	H5	S2	W2	17.2	14.8	1.3	–	–	Bern1
Dho 815	02/11/01	18°57.732′	54°35.407′	89.451	1	H5	S1	W2	17.8	16.9	1.1	–	–	Bern1
Dho 816	02/12/01	18°58.754′	54°37.691′	23.858	1	H5	S2	W2	20.4	20.1	1.3	–	–	Bern1
Dho 817	02/12/01	19°1.189′	54°30.839′	164.753	8	H4	S3	W4	19.3	17.3	1.1	–	–	Bern1
Dho 818	02/12/01	19°1.525′	54°30.380′	82.427	1	H 6	S1	W3	19	16.4	1.7	–	–	Bern1
Dho 819	02/12/01	19°2.417′	54°29.632′	72.135	1	H4	S2	W3	19.2	16.3	1.3	–	–	Bern1
Dho 820	02/12/01	19°2.752′	54°29.671′	49.304	1	H4	S4	W3	19.4	17	1.2	–	–	Bern1
Dho 821	02/12/01	19°2.736′	54°29.640′	133.216	5	H4	S4	W4	18.8	16.5	1.3	–	–	Bern1
Dho 822	02/12/01	19°2.935′	54°29.560′	39.296	11	L5	S3	W4	25	21.5	1.6	–	–	Bern1
Dho 823	02/12/01	19°3.015′	54°29.545′	23.329	1	H4	S4	W3	19.7	17.2	1	–	–	Bern1
Dho 824	02/12/01	19°3.608′	54°31.909′	12.052	1	H6	S3	W4	19.3	16.8	1.3	–	–	Bern1
Dho 825	02/12/01	19°3.616′	54°32.609′	50.441	1	H6	S3	W3	20.2	16.3	1.4	–	–	Bern1
Dho 826	02/12/01	19°3.627′	54°32.620′	63.975	1	H6	S2/3	W3	18.9	16.4	1.2	–	–	Bern1
Dho 827	02/12/01	19°3.526′	54°32.843′	134.987	1	H6	S2	W3	19.1	12.9	1.3	–	–	Bern1
Dho 828	02/12/01	19°3.587′	54°33.761′	225.861	1	H5	S2	W3	18.1	16.4	1.3	–	–	Bern1
Dho 829	02/12/01	19°3.602′	54°34.728′	19.677	1	H6	S3	W4	20	18.8	1.4	–	–	Bern1
Dho 830	02/13/01	19°2.696′	54°28.582′	15.676	1	H5	S3	W4	18.4	17.3	1.1	–	–	Bern1
Dho 831	02/13/01	19°2.878′	54°29.347′	22.291	1	H4	S3	W4	21.7	17.3	1	–	–	Bern1
Dho 832	02/13/01	19°3.024′	54°29.436′	7.839	1	H4/5	S3	W4	19.1	16.1	1.3	–	–	Bern1
Dho 833	02/13/01	19°3.201′	54°29.594′	4.583	1	H4/5	S3	W4	18.9	16.8	0.8	–	–	Bern1
Dho 834	02/13/01	19°3.737′	54°29.841′	4.036	1	H4	S4	W4	18.4	16.1	1.2	–	–	Bern1
Dho 835	02/15/01	18°38.689′	54°0.236′	160.091	1	H5	S1/2	W4	17.8	15.5	1.5	–	–	Bern1
Dho 836	08/15/00	18°20.92′	54°12.84′	995	1	Ure	S1	W1	21 (core) 10 (rim)	–	–	See separate entry	20.2	NSMT
Dho 837	2000	18°18.35′	54°08.98′	900.1	1	Ure	S1-2	W1	78	–	–	See separate entry	20.8	NSMT
Jiddat al Harasis (JaH)														
JaH 022	04/30/00	19°25.8′	56°59.0′	654	1	L5	S4	W4	23.3	20.6	2.7	–	87.7	Vr2
JaH 023	04/29/00	19°25.8′	56°18.9′	73.7	1	H4	S4	W2	19.2	17.7	1.2	–	17.6	Vr1
JaH 024	04/30/00	19°26.2′	56°49.6′	832	1	L5	S3	W3	24.1	22.5	–	–	129	Vr1
JaH 025	04/30/00	19°25.9′	56°53.9′	388	1	H5	S3	W2	18.5	16.9	1.4	–	77.1	Vr2
JaH 052	01/13/02	19°13.9′	55°11.0′	220	1	H6	S1	W3	18.9	17.7	1.3	–	61.5	Vr2
JaH 058	10/2000	19°48.371′	56°41.224′	4180	Many	L6	S4	W3	25	21.5	1.5	–	23	Frei1
JaH 059	10/2000	19°56.304′	56°47.341′	884	1	H6	S3	W3	18.6	17.3	1.3	–	21	Frei1
JaH 060	10/2000	19°45.762′	56°41.282′	840	1	L3	S2	W4	19.3 (max 22)	16.4 (2.7–40.1)	1.1	–	20	Frei1
JaH 061	10/2000	19°46.537′	56°38.429′	141	1	Euc	S2	W1	–	61.1	2.5	Plag: An 89–91	20	Frei1
JaH 062	10/2000	19°45.351′	56°40.021′	903	1	L6	S2	W3	24.6	21.8	1.6	–	21	Frei1
JaH 063	10/2000	19°45.684′	56°38.675′	444	1	H5	S2	W3	18.4	17.2	1.5	–	20	Frei1
JaH 064	09/24/00	19°38.174′	55°38.636′	1140	8	L6	S3	W3	24.5	20.5	–	–	45	Mün2
JaH 065	04/10/00	19°15.124′	56°21.820′	1253	1	L6	S2	W4	24.5	20.5	–	–	46	Mün2

Table 4. Meteorites from Oman. *Continued.*

Name	Date found	Latitude (N)	Longitude (E)	Mass (g)	Pcs	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Wo (mol%)	Comments[a]	Type[b]	Info[c]
JaH 066	09/24/00	19°04.827′	55°19.243′	810	1	L6	S3	W2	24	20.5	–	–	25	Mün2
JaH 067	09/25/00	19°16.249′	56°41.828′	557	6	L6	S4	W4	25	22	–	sv, rw, partly S6	21	Mün2
JaH 068	09/27/00	19°39.226′	55°48.275′	686	1	H6	S2	W3	18	16.5	–	sv, br	24	Mün2
JaH 069	01/25/01	19°20.751′	56°9.940′	250.948	10	H5	S1/2	W4	19.8	17.7	2	–	–	Bern1
JaH 070	01/25/01	19°20.802′	56°8.947′	79.841	2	H5	S3	W3/4	18.9	17.5	1.5	–	–	Bern1
JaH 071	01/25/01	19°19.996′	56°10.494′	415.134	1	H6	S1	W3	18.4	17.2	1.4	–	–	Bern1
JaH 072	01/25/01	19°20.705′	56°19.988′	254.507	1	H5	S2	W3	17.9	16.6	1.2	–	–	Bern1
JaH 073	01/17/02	19°42′	55°44′	550000	2768	L6	S4	W2-4	25.3	22.4	1.2	–	–	Bern1
Jiddat Arkad (JA)														
JA 001	03/10/00	18°43.727′	56°23.239′	672	1	L6	S4	W4	25	21.5	–	sv	39	Mün2
JA 002	02/10/00	18°25.524′	56°49.357′	581	1	H3–5	S2	W2	18.7 ± 2.2	16.6 ± 1.5	–	br	34	Mün2
Sayh al Uhaymir (SaU)														
SaU 085	11/01/02	21°04.1′	57°16.2′	112	3	CV3	–	–	–	–	–	See separate entry	25	Vr14
SaU 086	03/16/00	20°42.6′	57°01.3′	710	1	L5	S4	W3	25.1	22.1	1.5	–	117.2	Vr2
SaU 087	04/24/00	20°19.2′	57°13.9′	1736	1	H5	S1	W2	18.3	17.2	1.5	–	210	Vr2
SaU 088	01/04/00	20°31.8′	56°39.9′	49.2	1	L6	S2	W2	24.2	21.5	1.6	–	15.2	Vr1
SaU 089	01/17/01	20°52.9′	57°12.0′	2618	1	L/LL3.6/3.7	S2	W2	25	18.6 (6.3–23.4)	0.3–4.5	See separate entry	315	Vr6
SaU 102	02/04/00	20°56.1′	57°00.7′	119.5	1	L5	S4	W2	23.1	21.3	1.4	–	39.7	Vr1
SaU 103	04/15/01	20°59.0′	57°19.6′	50	1	L6	S2	W2	24.3	22	1.9	–	24.5	Vr1
SaU 104	04/01/01	21°01.1′	57°18.8′	136	1	H5	S4	W3	18.8	16.9	–	shock m.v.	36	Vr4
SaU 105	01/04/01	21°03.5′	57°17.5′	34	1	H5		W3	18.3	16	–	shock-melted impact br	9.4	Vr4
SaU 106	03/17/00	20°32.5′	56°41.3′	190	1	L4	S3	W3	24.4	21.7	1.4	–	32.8	Vr2
SaU 107	04/01/01	20°55.6′	57°15.3′	258	1	LL6	S4	W4	28	24.6	1.6	–	65.5	Vr7
SaU 108	03/31/01	21°04.0′	57°19.0′	16	1	H6	S4	W3	17.7	15.5	1.2	–	13.3	Vr4
SaU 109	01/12/02	21°05.1′	57°16.8′	66	1	H5	S3	W3	17.5	15.3	1.1	–	46.8	Vr4
SaU 110	01/12/02	20°59.4′	57°18.4′	660	1	H6	S2	W3	17.8	16.2	1.5	–	117	Vr2
SaU 111	01/12/02	20°59.1′	57°17.8′	90	1	H6	S4	W3/4	17.9	16.9	1.4	–	59.5	Vr2
SaU 112	01/19/02	21°02.6′	57°17.8′	233	1	H5	S4	W3/4	17.4	15.7	1	–	56.9	Vr2
SaU 113	03/31/01	21°03.6′	57°15.9′	326	1	H5	S2	W4	17.4	16.3	1.4	–	93.3	Vr2
SaU 114	04/02/01	21°02.8′	57°15.3′	191	4	L5	S4	W4	25	21.7	1.5	–	54	Vr2
SaU 115	04/02/00	20°27.6′	56°40.5′	224	1	H6	S3	W3	17.7	16.6	1	–	58	Vr2
SaU 116	04/30/00	20°32.5′	56°40.8′	314	1	L6	S3	W1	25	21.1	1.5	–	69.4	Vr2
SaU 120	11/17/02	21°00.2′	57°19.3′	75	1	Martian	–	–	–	–	–	See separate entry	15.8	Vr2
SaU 132	12/28/01	21°04′05.9″	57°18′56.3″	12.34	1	H5	–	W3	18.2	16.1	1.8	i.m.	2.6	Bart4
SaU 133	12/28/01	20°59′55.2″	57°17′40.8″	853	1	L5	S3-4	W1	24.9	20.8	1.8	i.m.	20.5	Bart5
SaU 134	12/28/01	21°02′01.1″	57°19′14.3″	190.58	2	H5/6	S3	W4	18	15.8	1	–	25.3	Bart5
SaU 135	12/29/01	21°03′53.3″	57°16′24.8″	7.76	1	L5	–	W3	25.4	21.1	1.5	i.m.	1.5	Bart4
SaU 136	12/29/01	21°03′58.9″	57°16′03.3″	129	1	H5	–	W4	17.9	15.8	1.2	–	18.7	Bart6
SaU 137	12/29/01	21°04′16.6″	57°06′06.3″	8.07	1	L6	–	W3	24.7	20.8	1.5	i.m.	1.5	Bart4
SaU 138	12/30/01	21°11′01.4″	57°12′36.3″	57.37	1	H5	S4	W2	18.8	16.6	1.9	i.m. br	11.4	Bart5
SaU 139	12/30/01	21°11′13.1″	57°12′31.2″	101.18	1	H4/5	S4	W4	18.8	16.1	1.6	–	29.1	Bart5
SaU 140	12/30/01	21°12′27.7″	57°12′40.9″	2517	1	L4/5	S6	W1	24.7	21.4	1.5	i.m., rw	–	Bart7
SaU 141	01/01/02	21°03′46.4″	57°18′56.2″	9.87	1	H5	S2	W3	18.9	16.4	1.1	–	1.9	Bart5

Table 4. Meteorites from Oman. *Continued.*

Name	Date found	Latitude (N)	Longitude (E)	Mass (g)	Pcs	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Wo (mol%)	Comments[a]	Type[b]	Info[c]
SaU 142	01/01/02	21°02′33.5″	57°17′51.6″	137.36	1	L4	S4	W2	25	20.4	1.7	metal/sulfide melt	24.7	Bart5
SaU 143	01/01/02	21°03′25.3″	57°17′59.0″	142.43	2	L4	S2	W4	25	22	1.9	–	19.6	Bart5
SaU 144	01/03/02	21°00′26.7″	57°15′59.7″	135.2	2	L5	S2–3	W4	24.7	20.8	1.8	i.m.	20.6	Bart5
SaU 145	01/04/02	21°02′54.0″	57°18′33.0″	70.29	1	H5	S4	W3	18.9	16.3	2.2	i.m.	13	Bart5
SaU 146	01/04/02	21°03′05.7″	57°18′41.2″	33.25	2	H4	S6	W2	18.5	16.3	1.2	i.m. br	7	Bart5
SaU 148	01/04/02	21°02′20.7″	57°18′36.6″	131.5	1	L4	S4	W2	24.5	20.5	1.2	i.m.	22.6	Bart5
SaU 149	01/04/02	21°02′18.9″	57°17′37.8″	19.55	1	H4	S3–4	W2	18.8	19	1.3	i.m.	4.4	Bart5
SaU 150	08/10/02	20°59′31.3″	57°19′11.7″	107.7	1	Martian	S5	–	–	–	–	See separate entry	17.7	Bart5
SaU 151	01/05/02	21°02′14.0″	57°17′24.7″	87.9	1	L4/5	S 6	W1	25.4	21.8	1.4	m.v., rw, mask	18	Bart5
SaU 152	01/05/02	21°02′12.9″	57°17′23.6″	963	1	L4	S 4	W1	24.9	21.5	1.6	i.m.	20.7	Bart5
SaU 153	01/04/02	21°02′16.8″	57°17′34.2″	103.28	1	L4/5	S 3	W1	25.5	21.1	1.5	–	19	Bart5
SaU 159	2001	21°01.03′	57°19.22′	163	1	H4	S1	W3	16.7	15.4	–	–	21.9	Be5
SaU 160	10/2000	20°09.144′	56°42.174′	185	2	L6	S4	W4	23.4	20.9	1.5	–	20	Frei1
SaU 161	10/2000	20°09.473′	56°43.229′	263	1	H6	S2	W3	18.6	17.3	1.3	–	20	Frei1
SaU 162	10/2000	20°07.379′	56°43.424′	38	7	L6	S4	W3	22.7	19.9	5	–	8	Frei1
SaU 163	01/22/01	21°2.222′	57°19.611′	1877.301	36	H5	S1/2	W3/4	18.8	16	1.4	–	–	Bern1
SaU 164	01/22/01	20°59.012′	57°12.061′	331.469	3	H6	S1/2	W4	10.2	17.4	1.8	–	–	Bern1
SaU 165	01/23/01	21°1.211′	57°12.688′	457.152	3	L5	S3	W4	27.1	20.7	1.3	–	–	Bern1
SaU 166	01/23/01	21°1.238′	57°12.786′	385.201	2	H5	S1/2	W4	19.3	16.8	1.1	–	–	Bern1
SaU 167	02/10/01	21°10.073′	56°32.482′	68.035	2	L6	S4	W3/4	24.2	21.1	1.2	–	–	Bern1
SaU 168	02/10/01	21°6.310′	56°59.778′	24.726	3	H4	S4	W4	19.1	18.5	1.1	–	–	Bern1
SaU 169	01/16/02	20°34.391′	57°19.4′	206.454	1	Lunar	–	–	–	–	–	See separate entry	–	Bern1
Shalim														
Shalim 002	09/23/00	18°42.437′	55°43.281′	1248	1	L6	S4	W4	24.5	21	–	br, sv	36	Mün2
Shalim 003	03/21/01	18°10.940′	55°30.110′	10350	50	H5	S1/2	W3	18.6	16.7	1.4	–	–	Bern1
Shişr														
Shişr 006	08/03/00	18°24.9′	53°59.3′	432	1	L3.9	S3	W3	11.3–27.9	8.2–27.7	1.1	–	172	Vr2
Shişr 008	01/18/02	18°32.5′	53°59.9′	244	1	L5	S3	W3	25.4	21.7	1.5	Prob. pr Shi 010	30.9	Vr2
Shişr 009	10/04/01	18°33.8′	53°55.6′	185	1	H4	S2	W3	17.8	16.5	1.2	–	55	Vr2
Shişr 010	12/2001	18°33.0′	53°58.2′	17604	16	L4/6	S3	W3	24.1	21.4	1.5	Prob. pr Shi 008	3501	Vr2
Shişr 011	10/04/01	18°33.5′	53°54.8′	478	19	L4	S2	W3	25	22	2.1	–	133	Vr2
Shişr 015	02/02/01	18°32.945′	53°55.374′	3409.297	20	L5	S2	W4	24.4	21.1	1.5	–	–	Bern1
Shişr 016	02/02/01	18°26.304′	53°58.135′	84.481	1	H5	S3	W4	18.8	16.7	1.4	–	–	Bern1
Shişr 017	02/14/01	18°25.393′	53°36.543′	12.83	1	H4	S5	W4	19	16.7	1.2	–	–	Bern1
Shişr 018	02/15/01	18°32.240′	53°55.987′	116.538	1	L6	S1	W4	25.5	21.2	1.4	–	–	Bern1
Shişr 019	02/15/01	18°32.850′	53°53.610′	1332.725	4	H4	S3	W3	19.7	17	1.3	–	–	Bern1
Shişr 020	02/15/01	18°33.556′	53°53.493′	2200.715	4	H4–6	S1	W3	19.1	17.4	1.3	br; pr Shi 021	–	Bern1
Shişr 021	02/15/01	18°36.272′	53°53.254′	135.226	1	H4–6	S1	W4	18.7	16.1	1.1	br, pr Shi 020	–	Bern1
Umm as Samim (UaS)														
UaS 002	02/04/01	21°19.4′	56°25.3′	1048	1	H5	S1	W2	18.3	17	1.4	–	52	Vr2
UaS 003	04/01/01	21°19.2′	56°25.0′	991	1	H3.7	S1	W4	16.1	13.97	1.1	–	156	Vr5

[a]Abbreviations: br = brecciated; calc = calcite; i.m. = impact melt; mask = maskelynite; mv = melt veins; pr = paired; rw = ringwoodite; sv = shock veined; v = veins.
[b]Where no type specimen weight is given, the entire mass is at the institute where the classification was made.
[c]See "Abbreviations for analysts and speciment locations."

Table 5. Saharan meteorites from Algeria.[a]

Name	Date found	Latitude (N)	Longitude (E)	Mass (g)	Pcs.	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Wo (mol%)	Comments	Type	Info
Acfer														
Acfer 056	–	27°28′	3°53′	129	1	L4	S3	W1/2	23.5	20	–	–	20	Mün3
Acfer 321	2001	27°32.73′	4°03.67′	157	1	H5	S5	W3	17.1	15.1	1.4	–	22	Ha1
Acfer 322	2001	27°33.55′	4°05.58′	25	1	L5	S4	W1	20.5	18	1.3	–	7	Ha1
Acfer 323	2001	27°30.18′	3°52.77′	117	1	LL5	S3	W3	29.5	25.3	1.8	–	30	Ha1
Acfer 327	12/21/01	27°44′	4°26′	745.22	3	H5	–	W2	20.3	18.2	–	–	36.3	Pa8
Acfer 328	12/22/01	27°44′	4°13′	180.07	1	CV3	–	–	–	–	–	see separate entry	20.0	Pa9
Acfer 329	12/23/01	27°35′	4°06′	30000	6	L4/5	–	W0	24.1	21.5	–	–	123.7	Pa8
Acfer 330	12/23/01	27°39′	4°02′	490	1	L6	–	W1	25.6	22.1	–	–	25.4	Pa8
Acfer 331	12/23/01	27°35′	4°01′	750	10	CM2	–	–	–	–	–	see separate entry	22.6	Pa9
Acfer 332	12/23/01	27°44′	4°08′	115.02	1	CO3	–	–	–	–	–	see separate entry	20.1	Pa9
Acfer 333	12/26/01	27°34′	4°04′	489	5	CO3	–	–	–	–	–	see separate entry	25.4	Pa9
Acfer 334	05/09/02	27°39′	4°23′	211.25	1	L6	S5/6	W0	24.5	21.7	–	–	27.0	Pa8
Acfer 335	05/09/02	27°44′	4°26′	261	1	H4	S5	W1	18.3	16.8	–	–	27.2	Pa8
Acfer 336	05/10/02	27°37′	4°04′	19400	4	L3.8	S3	W3	6–23	2–20	–	–	21.0	Pa9
Acfer 337	05/10/02	27°41′	4°16′	360	1	L3.8		W1	0.5–23	3–29	–	–	21.0	Pa9
Acfer 338	05/11/02	27°43′	4°16′	377.6	4	H6	S5/6	W1	19.9	17.9	–	–	41.8	Pa8
Acfer 339	05/11/02	27°33′	4°12′	400	1	H5		W0	19.0	16.9	–	–	25.7	Pa9
Acfer 340	05/12/02	27°35′	4°18′	173.15	1	L5		W0	24.1	20.5	–	–	25.9	Pa9
Acfer 347	12/2001	27°41′	4°18′	1165	1	L3	S2	W4	1–26	1–29	–	–	1165	Sn3
Acfer 348	12/24/01	27°58.76′	4°16.69′	8750	1	L5	S2	W2	24.6	20.7	–	–	8750	Pr3
Acfer 349	12/25/01	27°50.44′	4°18.86′	298	1	H6	S3	W3	18.0	16.1	–	–	298	Pr3
Acfer 350	12/26/01	27°40.32′	4°31.58′	128	1	H4	S3	W2	19.9	16.8	–	–	128	Pr3
Acfer 351	12/2001	27°42′	4°08′	211	1	L6	S3	W4	25.1	20.6	–	–	211	Pr3
Acfer 352	12/2001	27°46′	4°01′	873	1	L5	S4	W4	24.6	20.6	–	–	873	Pr3
Aguemour														
Aguemour 017	12/25/01	27°24′	4°21′	1000	1	L6	–	W1	25.6	22.1	–	–	48.7	Pa8
Tanezrouft (Tnz)														
Tnz 003	11/11/89	~25°27′	~0° 33′	142	1	H4	S1	W3	16.8	16.5	–	–	19.83	Vr1
Tnz 054	05/15/02	25°26′	0°24′	576.4	3	H5	–	W2	18.3	16.0	–	–	98.0	Pa8
Tnz 055	05/16/02	25°24′	0°25′	251.4	1	H4	–	W3	18.2	16.5	–	–	21.0	Pa8
Tnz 056	05/16/02	25°29′	0°09′	151.1	2	H6	–	W3	20.3	18.3	–	–	20.7	Pa8
Tnz 057	15/16/02	25°16′	0°09′	5400	1	C4	–	–	–	–	–	–	110.0	Pa9
Tnz 059	15/18/02	25°13′	0°13′	156.4	2	L5	S5/6	W1	25.8	21.4	–	–	26.1	Pa8
Tnz 060	15/19/02	25°17′	0°12′	3650	1	LL4	S5	W3	28.6	24.4	–	–	49.0	Pa8
Tnz 061	15/19/02	25°18′	0°12′	65	1	L3.9	–	W0	0–32	4–36	–	–	13.1	Pa9

[a]See “Abbreviations for analysts and specimen locations.”

Table 6. Saharan meteorites from Egypt.[a]

Name	Date found	Latitude (N)	Longitude (E)	Mass (g)	Pcs.	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Type	Info
Great Sand Sea (GSS)												
GSS 019	12/1999	25°32′12″	25°39′28″	12000	>80	LL6	S2	W3/4	27.4	22.5	153.6	Pa6

[a]See "Abbreviations for analysts and specimen locations."

Table 7. Saharan meteorites from Libya.[a]

Name	Date found	Latitude (N)	Longitude (E)	Mass (g)	Pcs.	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Wo (mol%)	Comments[a]	Type	Info[b]
Dar al Gani (DaG)														
DaG 664	11/00	27°14′	16°07′	137	2	L4	S2/3	W2	23.5	21	–	–	20.6	Sn1
DaG 673	11/00	27°14′	16°07′	96	1	L4/5	S3	W3	24	21	–	–	19	Sn1
DaG 870	2000	26°54.66′	16°27.41′	262	1	H3/4	S3	W3	19.1	15.7	1.2	–	20	Ha1
DaG 871	1998	27°00.76′	16°16.67′	166	2	L6	S3	W2	25.1	22.2	1.3	–	21	Ha1
DaG 873	1999	27°21.89′	16°10.42	136	1	L6	S3	W3	24.3	19.7	1.7	–	22	Ha1
DaG 874	2000	27°02.51′	16°24.30	64.6	1	Ure	S3	medium	19.0	12	5.8	brecciated lithology	11	Ha1
									17.5	16.4	6.1	granular lithology		
DaG 875	1998	26°55.17′	16°40.80′	585	1	H5	S3	W3	19.1	16.4	1.4	–	20	Ha1
DaG 878	11/00	27°14′	16°07	58	1	L4	S3	W2	24	21	–	–	11.3	Sn1
DaG 879	11/00	27°08′	16°28′	26	1	Ure	–	–	–	–	–	See separate entry	5	Sn1
DaG 880	11/00	27°05′	16°07	131	1	H6	S5	W1	17	16	–	i.m. br	20.1	Sn1
DaG 881	11/00	27°26′	16°12′	86	1	How	–	–	–	–	–	See separate ntry	17.6	Sn1
DaG 882	11/00	27°14′	16°06′	42	1	LL5-6	S3	W2	30	26	–	br	8.3	Sn1
DaG 894	11/00	27°14′	16°06′	78	1	L3/4	S3	W2	26	22	–	–	14.9	Sn1
DaG 896	11/00	~27°45′	~16°53′	22.6	1	Achondung	–	–	–	–	–	See separate entry	5.442	Sn1
DaG 915	11/00	27°21′	16°11′	740	1	How	–	–	–	–	–	See separate entry	23.1	Sn1
DaG 916	11/00	27°15′	16°08′	183	3	L4/5	S4	W1	25	21	–	–	22.4	Sn1
DaG 917	11/00	27°15′	16°08′	52	2	H4/5	S2	W2	20	18	–	–	11.8	Sn1
DaG 918	11/00	27°12′	16°05′	200	11	H3–5	S3	W2	2–17	3–15	–	br	38.6	Sn1
DaG 919	11/00	27°13′	16°08′	106	1	H5	S2	W2	18	16	–	–	16.1	Sn1
DaG 920	11/00	27°13′	16°09′	106	1	H4	S2	W2	17	13	–	–	24.2	Sn1
DaG 921	11/00	27°08′	16°12′	123	1	H5	S3	W1	20	18	–	br, v	17.4	Sn1
DaG 922	11/00	26°57′	16°23′	253	2	L6	S4	W1	26	23	–	v	20.4	Sn1
DaG 924	11/00	27°02′	16°21′	54	1	L6	S3	W3	25	22	–	–	10.8	Sn1
DaG 925	11/00	27°05′	16°15′	93	1	H4	S2	W3	17	15	–	–	21.5	Sn1
DaG 926	11/00	27°11′	16°16′	243	1	H6	S1	W4	18	15	–	br	26.4	Sn1
DaG 927	11/00	26°59′	16°35′	367	1	H6	S1	W4	19	17	–	–	21	Sn1
DaG 928	11/00	26°54′	16°36′	96	1	H3/4	S1	W3	17–18	10–18	–	–	15.9	Sn1
DaG 929	11/00	26°57′	16°27′	119	1	H3	S1	W2	17–19	10–18	–	–	17.3	Sn1
DaG 930	11/00	27°02′	16°26′	560	1	H5	S3	W2/3	19	17	–	–	25	Sn1

Table 7. Saharan meteorites from Libya. *Continued.*

Name	Date found	Latitude (N)	Longitude (E)	Mass (g)	Pcs	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Wo (mol%)	Comments	Type	Info
DaG 931	11/00	27°07′	16°28′	140	4	L6	S3	W3	23	19	–	–	21.6	Sn1
DaG 932	11/00	27°24′	16°14′	23	2	How	–	–	–	–	–	See separate entry	3.5	Sn1
DaG 933	11/00	27°05′	16°04′	170	1	H4	S3	W2	18	16	–	–	21.4	Sn1
DaG 934	11/00	27°05′	16°01′	54	2	H6	S2/3	W5	20	19	–	–	15.8	Sn1
DaG 935	11/00	27°08′	16°01′	376	1	H5	S2	W4	19	17	–	–	21.3	Sn1
DaG 936	11/00	27°13′	16°07′	522	1	H3–5	S2–3	W2	18	16–2	–	br, v	20.2	Sn1
DaG 937	11/00	27°14′	16°09′	136	1	L4	S4	W1	22	19	–	–	19.6	Sn1
DaG 938	11/00	27°15′	16°11′	54	1	H6	S1	W2	20	18	–	–	11.5	Sn1
DaG 939	11/00	27°23′	16°03′	367	1	L6	S3	W2	23	20	–	v	25.7	Sn1
DaG 940	11/00	27°30′	16°12′	210	1	L6	S3/4	W2/3	26	22	–	–	16.2	Sn1
DaG 941	11/00	27°34′	16°12′	57	1	H6	S3	W1	17	16	–	–	10.7	Sn1
DaG 957	1998	26°53.73′	16°34.99′	369	2	L4	S4	W2	24	20.2	1.6	–	20	Ha1
DaG 958	1999	26°57.40′	16°20.85′	542	Many	L5	S4	W3	25.9	21.7	1.5	–	21	Ha1
DaG 959	1999	26°57.95′	16°20.88′	164	1	H4	S3	W3	18.4	15.9	1.1	–	17	Ha1
DaG 960	1999	26°52.54′	16°40.82′	392	1	L6	S3	W3	25	21	2.8	–	20	Ha1
DaG 965	1998	26°56.49′	16°25.27′	216	1	LL5	S3	W2	26.7	23.0	1.4	–	31	Ha1
DaG 966	1998	26°53.78′	16°34.77′	204	1	L4	S3	W2	24.5	20.9	1.9	–	25	Ha1
DaG 967	1998	26°53.35′	16°33.04′	468	1	L5	S4	W2	25.6	22.8	2.5	–	25	Ha1
DaG 968	1999	26°53.56′	16°34.60′	351	1	L5	S4	W2	25.6	22.2	2.0	–	26	Ha1
DaG 975	1999	27°19.63′	16°13.00′	27.55	1	Martian	–	–	–	–	–	See separate entry	8.5	Be2
DaG 976	1999	27°03.25′	16°23.25′	32.03	1	Ure pm	–	–	–	–	–	See separate entry	7.8	Be2
DaG 977	2000	27°05.00′	16°22.00′	17	1	Ure	S3	mod	15.1 (8.6–22.0)	16	–	–	3.6	Be5
DaG 978	1999	27°16.84′	16°24.34′	44.4	1	C3	S1	W0/1	29.1 (17.4–31.8)	12.4 (2.9–21.7)	–	–	9.5	Be2
DaG 979	12/12/00	27°27.01′	16°11.20′	2483	6	L6	S2	W1	25.1	20.8	1.7	–	25	PCU1
DaG 980	3/2001	26°50.24′	16°36.82′	93	3	H4	S1	W2	19.1	16.8	1.7	–	38	PCU1
DaG 982	10/11/00	27°12.69′	16°25.92′	177	1	H5	S3	W3	19.8	17.4	–	–	19.6	Ham1
DaG 983	03/23/02	26°44.25′	16°53.97′	933	1	Euc pm	–	–	–	–	–	See separate entry	281	Ham1
DaG 995	01/03/01	27°10.35′	16°23.17′	56.12	1	Euc	–	–	–	–	–	See separate entry	11.6	Be2
DaG 996	05/14/99	–	–	12.31	1	Lunar	–	–	–	–	–	See separate entry	2.5	Be2
DaG 997	1999	~26°55′	~16°40′E	500	1	H6	S5	W4	20	18	–	br	182	Sn2
DaG 998	1999	27°10.46′	15°55.23′	3522	6	CO3	S2	W3	0.3–80	1–48	–	–	33.4	Be2
DaG 999	4/14/00	27°01.55′	16°21.95′	2106	Many	Ure pm	–	–	–	–	–	See separate entry	20.8	Be2

Table 7. Saharan meteorites from Libya. *Continued.*

Name	Date found	Latitude (N)	Longitude (E)	Mass (g)	Pcs	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Wo (mol%)	Comments[a]	Type	Info[b]
DaG 1000	1997	27°00.81′	16°21.95′	17.92	1	Ure pm	–	–	–	–	–	See separate entry	4.2	Be6
DaG 1001	1999	27°22.61′	16°18.14′	132	1	H6	S2	W3	18.8	16.5	–	–	132	Pr2
DaG 1002	1999	27°21.08′	16°15.22′	370	1	H5	S2	W3	18.8	16.5	–	–	370	Pr2
DaG 1003	1999	27°16.70′	16°16.63′	236	2	H5	S1	W4	19.3	17.2	–	–	236	Pr2
DaG 1004	1999	27°15.51′	16°05.54′	287	1	H5	S1	W2	19.6	17.2	–	–	132	Pr2
DaG 1005	1999	27°11.41′	16°18.50′	477	5	H4	S3	W3	18.7	16.8	–	–	477	Pr2
DaG 1011	3/2/99	27°02′35″	16°24′42″	38.05	2	L5	–	W1	25.7	20.2	–	–	7.0	Vr16
DaG 1012	3/3/99	27°09′08″	16°28′59″	14.8	1	H5	–	W1	18.9	16.7	–	–	3.0	Vr17
DaG 1013	3/3/99	27°09′08″	16°31′02″	20.32	2	L4-5	–	W2	24.1	19.4	–	br	1.0	Vr16
DaG 1014	3/5/99	27°34′17″	16°10′30″	239	1	H5	–	W3	18.6	16.5	–	–	20	Vr16
DaG 1015	3/7/99	27°25′35″	16°16′27″	247	1	H5	–	W3	19.5	16.7	–	–	20	Vr17
DaG 1018	3/9/99	27°37′54″	16°05′13″	181.88	2	H5	–	W1	18.1	16.0	–	–	20	Vr16
DaG 1019	3/9/99	27°34′17″	16°05′00″	104.1	1	L5	–	W2	24.2	21.3	–	–	20	Vr16
DaG 1022	4/25/01	~27°05′	~16°15′	33.6	1	LL7	–	–	–	–	–	See separate entry	7	Vr18
DaG 1023	1999	27°1.55′	16°23.27′	149	1	Ure pm	–	–	–	–	–	See separate entry	20.75	NSMT
Hammadah al Hamra (HaH)														
HaH 291	2000	29°04.71′	13°07.87′	130	1	L5	S3	W3	25.83	21.74	1.62	–	25	Ha1
HaH 314	2001	28°39.28′	13°27.53′	1470	Many	LL6	S5	W1/2	29.8	24.7	–	br	21.9	Be2
HaH 315	2/2001	29°16.23′	11°32.40′	609	1	L6	S2	W3	24.9	20.7	–	–	609	Pr3
HaH 316	2/2001	29°20.38′	11°37.46′	176	1	L6	S5	W3	24.9	21.2	–	–	176	Pr3
HaH 317	2001	29°21.06′	11°35.58′	105	2	EL4	–	–	–	–	–	See separate entry	105	Pr3
HaH 318	2/2001	29°22.71′	11°32.78′	14	1	L5	S2/3	W3	24.8	21.9	–	–	14	Pr3
HaH 319	2/2001	29°08.43′	11°53.77′	303	1	H5	S1	W2	18.9	17.0	–	–	303	Pr3
HaH 320	2/2001	28°58.24′	12°12.36′	7823	104	H6	S3	W3	18.1	17.1	–	–	7823	Pr3
HaH 321	2/2001	29°02.17′	11°30.39′	100	1	H5	S2	W3	18.9	17.0	–	–	100	Pr3
HaH 322	2/2001	29°05.36′	12°25.62′	152	2	H6	S2	W3	19.6	17.1	–	–	152	Pr3
HaH 323	2/2001	29°10.95′	12°15.71′	358	5	H4	S3	W2	17.5	15.9	–	–	358	Pr3
HaH 324	1999	28°51.24′	12°31.34′	307	1	L4	S3	W3	25.0	21.1	–	–	307	Pr2
HaH 325	1999	28°46.07′	12°43.59′	129	3	H5	S1	W3	18.9	17.8	–	–	129	Pr2
HaH 326	1999	28°39.14′	12°23.13′	97	8	L4	S2	W2	25.0	20.7	–	–	97	Pr2
HaH 327	1999	–	–	29	1	H5	S3	W4	18.4	16.4	–	–	29	Pr2
Jalu	11/1/00	27°57.5′	21°41.0′	150000	Many	L6	S3	W1	25.4	21.5	–	–	86	Pa6
Kufra	10/99	24°28.40′	23°02.60′	344	1	H5	S3	W3	19.3	18.6	1.2	–	22	Ha2
Rebiana	10/99	24°58.70′	21°53.10′	459	1	L/LL5	S3	W3	26.2	22.4	1.4	–	29	Ha2

[a]Abbreviations: br = brecciated; im br = impact melt breccia; mos = mosaicized; sv = shock veins; pm = polymict; ung = ungrouped.
[b]See "Abbreviations for analysts and specimen locations."

Table 8. Meteorites from Morocco and surrounding countries.[a]

Name	Possible origin/ pseudonym[b]	Latitude (N)[c]	Longtitude (W)[c]	Date found[d]	Mass (g)	Pcs.	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Comments	Mag Sus[e]	Place purchased	Type Spec (g)	Info[f]
Northwest Africa (NWA)																
NWA 167	Azhakan, Algeria	–	–	P 1999	61	1	H4	S2	W3	17.7	17.1	prob. paired with NWA 168	–	Tagounite	25.4	Vr15
NWA 168	Azhakan, Algeria	–	–	P 1999	58	1	H4	S2	W3	18.9	17.2	prob. paired with NWA 167	–	Tagounite	23	Vr15
NWA 173	Anbdur	–	–	P 2000	68.1	1	H5	S3	W2	18.5	18.1		–	Tagounite	33.3	Vr15
NWA 174	Anbdur	–	–	P 2000	177.6	1	H4	S3	W2	18.6	17.9	–	–	Tagounite	72	Vr15
NWA 175	Anbdur	–	–	P 2000	74	1	L5	S3	W4	25.3	21.3	–	–	–	25	Vr1
NWA 426	Sahara	–	–	1999	1260	1	L6	S3	W1	25.0 ± 0.1	–	–	–	–	32	La1
NWA 427	Algeria	–	–	P 2001	4120	1	L6	S3	W2	24.8 ± 0.2	–	–	–	–	139	La2
NWA 428	Morocco	–	–	P 2001	655	1	L6	S1	W1	24.5 ± 0.8	–	–	–	–	29	La2
NWA 429	Morocco	–	–	P 2001	911	1	L6	S2	W3	24.8 ± 0.2	–	–	–	–	31	La2
NWA 430	Morocco	–	–	P 2001	323	1	L6	S4	W4	24.4 ± 0.4	–	–	–	–	35	La2
NWA 455	–	26°47.04′	12°50.01′	2001	81	1	H4	S2	W2	12.5	15.4	–	–	–	16.3	Be1
NWA 456	–	26°47.04′	12°50.01′	2001	359	1	H5/6	S3	W3	19.2	15.9	–	–	–	25.4	Be1
NWA 457	–	31°22.09′	04°01.01′	2001	175	2	H6	S4	W0/1	19.3	16.5	–	–	–	20.8	Be1
NWA 458	–	26°47.04′	12°50.01′	2001	387	4	L6	S4	W2	25	21.1	–	–	–	22.7	Be1
NWA 459	–	31°22.09′	04°01.01′	2001	300	1	H3	S2	W3	16.3 0.3–27.8	15 3.3–20.3	–	–	–	21.5	Be1
NWA 460	–	31°22.09′	04°01.01′	2001	655	1	H6	S2	W3	18.5	16.6	–	–	–	20.8	Be1
NWA 461	–	26°47.04′	12°50.01′	2001	171	1	H5	S2	W3	18.1	16.2	–	–	–	20.9	Be1
NWA 462	–	26°47.04′	12°50.01′	2001	40.5	1	L6	S6	W2	24.9	21	sv, rw	–	–	9	Be1
NWA 463	–	26°47.04′	12°50.01′	2001	15	1	L6	S6	W3	24.5	21.1	sv, rw	–	–	3.3	Be1
NWA 464	–	31°22.09′	04°01.01′	2001	159	1	H3	S2	W2/3	15.4 1.0–24.4	14.3 4.1–16.7	–	–	–	21.7	Be1
NWA 465	–	26°47.04′	12°50.01′	2001	413.5	1	H5	S1	W3	19.1	16.9	–	–	–	23.7	Be1
NWA 466	–	31°22.09′	04°01.01′	2001	46	1	L6	S5	W3	24.5	20.8	–	–	–	9.2	Be1
NWA 779	Boudnib	~31°50′	~3°40′	1999	~200	1	CV3	–	–	2.2–46.2	1–20	See note 1	–	–	10	K1
NWA 821	Ksar es Souk	31°58′	4°25′	P 10/2000	5.1	1	H3.8	S2	W1	9.7 ± 1.5	–	–	–	–	1.2	La3
NWA 822	Ksar es Souk	31°58′	4°25′	P 10/2000	64.5	1	H6	S2	W3	20.2	–	–	–	–	17.7	La3
NWA 823	Ksar es Souk	31°58′	4°25′	P 10/2000	71.2	1	L4	S1	W2	25.6 ± 0.3	–	–	–	–	16	La3
NWA 863	–	–	–	2000	139	1	H5	–	–	18.4	17.0 ± 1.3	–	–	–	24	CU1
NWA 900	–	–	–	2001	616	1	L3–6	S2	W1	25 ± 4.5	21 ± 2	br, sv	–	Erfoud	31	Mün3
NWA 904	–	–	–	P 6/2001	26399	50	L5	S3	W1	24.9 ± 0.4	–	–	–	Zagora	21	La4
NWA 924	–	–	–	P 6/2001	355	5	H5	S2	W2	18.2 ± 0.5	–	–	–	M'hamid	23.1	La4
NWA 925	–	–	–	P 6/2001	897	3	H3.8	S1	W2	18.2 ± 0.1	–	–	–	M'hamid	20.5	La4
NWA 998	Morocco/ Algeria	–	–	09/2001	456	1	Martian	–	–	–	–	See separate entry	–	Tucson, AZ	40	UWS1
NWA 1053	–	–	–	P 2001	108	1	L6	S2	W2–3	26.5	22.5	–	–	Erfoud	20	Mün1
NWA 1058	–	–	–	P 2001	180	1	Prim. achond	S2	W2	6.5	8	See note 2	–	Erfoud	22	Mün1
NWA 1062	–	–	–	P 2001	112	1	H4	S2	W2–3	15.5	14	–	–	Erfoud	20.5	Mün1
NWA 1067	–	–	–	P 2001	118	1	E6	–	W4	–	<1	no relic chondrules	–	Erfoud	20.5	Mün1
NWA 1109	–	–	–	P 11/2001	1530	3	Euc pm	–	–	–	–	See separate entry	–	Erfoud	21	UWS2
NWA 1175	–	–	–	P 01/2002	590	1	L5	S3	W2–3	25.5	21	–	–	Guelmim	23	Mün2
NWA 1176	–	–	–	P 01/2002	150	1	L5	S2	W3	25.5	20.5	–	–	Zagora	23	Mün2
NWA 1177	–	–	–	P 01/2002	10	1	CR2	S2	W1–2	1–3 (Peak)	1–3 (Peak)	calc. v.	–	Zagora	2.1	Mün2
NWA 1185	Morocco	–	–	P 2001	105	1	H5	S4	W1/2	19.1	19.6	sv, mp	5.35	Erfoud	25.9	Pa1

Table 8. Meteorites from Morocco and surrounding countries.[a] *Continued.*

Name	Possible origin/ pseudonym[b]	Latitude (N)[c]	Longtitude (W)[c]	Date found[d]	Mass (g)	Pcs.	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Comments	Mag Sus[e]	Place purchased	Type Spec (g)	Info[f]
NWA 1186	Morocco	–	–	P 2001	196	1	H~5/6	S4	W4	–	–	–	5.01	Erfoud	22.2	Pa1
NWA 1187	Morocco	–	–	P 2001	190	1	H4/5	S2	W2	20.6	18.2	See note 3; native Cu	5.22	Erfoud	21.6	Pa1
NWA 1188	Morocco	–	–	P 2001	82.6	1	H~4/5	S2	W3	–	–	–	4.99	Erfoud	21.3	Pa1
NWA 1189	Morocco	–	–	P 2001	114	1	L~3.8–6	S2/3	W1	–	–	See note 4	4.62	Erfoud	26.8	Pa1
NWA 1190	Morocco	–	–	P 2001	22.9	1	CR2	–	W5	–	–	–	4.66	Erfoud	5.3	Pa1
NWA 1195	Safsaf	–	–	P 02/2002	315	1	Martian	–	–	–	–	See separate entry	–	Zagora	10	UWS1
NWA 1196	–	30°48.48′	5°51.35′	2001	43	1	L4/5	S5	W0/1	24	21.1	–	–	–	12.4	Be1
NWA 1198	Kem Kem	–	–	2001	14	1	Euc	–	W0/1	–	42.2	Plag: An91.8	–	–	3.4	Be1
NWA 1243	Morocco	–	–	P 2002	35.9	1	L~5	–	W4	–	–	–	4.55	Erfoud	7.6	Pa1
NWA 1244	Morocco	–	–	P 2002	25.6	1	L~3.8–6	S2/3	W1	24	14.8–21.5	See note 4	4.69	Erfoud	7.3	Pa1
NWA 1245	Morocco	–	–	P 2002	40.4	1	L~3.8–6	S2/3	W1	–	–	See note 4	4.75	Erfoud	16	Pa1
NWA 1246	Morocco	–	–	P 2002	44.3	1	L~3.8–6	S2/3	W1	–	–	See note 4	4.69	Erfoud	8.3	Pa1
NWA 1247	Morocco	–	–	P 2002	27.6	1	L3.8	S2	W1	24	20.2–24.3	abundant chondrules	4.66	Erfoud	4.5	Pa1
NWA 1248	Morocco	–	–	P 2002	102	1	L~3.8–6	S2/3	W1	–	–	See note 4	4.70	Erfoud	21.6	Pa1
NWA 1249	Morocco	–	–	P 2002	64.8	1	L~3.8–6	S2/3	W1	–	–	See note 4	4.74	Erfoud	14.2	Pa1
NWA 1251	Morocco	–	–	P 2002	122	1	H5/6	S2	W2	18.5	17.4	See note 5; native Cu	5.29	Erfoud	28.5	Pa1
NWA 1252	Morocco	–	–	P 2002	92	1	H5/6	S2	W2	17.2	16	See note 5	5.33	Erfoud	19.6	Pa1
NWA 1253	Morocco	–	–	P 2002	50	1	H~4/5	S2	W2	–	–	See note 3	5.29	Erfoud	13	Pa1
NWA 1255	Morocco	–	–	P 2002	794	1	L~6	S4	W4	–	–	–	4.76	Erfoud	54.4	Pa1
NWA 1256	Morocco	–	–	P 2002	42	1	Ure	–	W4	9.1–17.9	–	br; Cpx: Fs12.4–14.7 Wo12.2–7.9	4.52	Erfoud	7.7	Pa1
NWA 1257	Morocco	–	–	P 2002	172	1	H~4/5	S2	W2	–	–	–	5.25	Erfoud	41.8	Pa1
NWA 1258	Morocco	–	–	P 2002	72	1	L~5/6	–	W4	–	–	–	4.43	Erfoud	15.5	Pa1
NWA 1259	Morocco	–	–	P 2002	120	1	L3.8–6	S2/3	W1	24.5	20.3	See note 4	4.57	Erfoud	30.2	Pa1
NWA 1260	Morocco	–	–	P 2002	2518	27	L3.8–6	S6	W1	24.5	20.9	See note 4	4.66	Erfoud	58.2	Pa1
NWA 1261	Morocco	–	–	P 2002	118	1	L~5	S3	W2	–	–	–	4.84	Erfoud	23.2	Pa1
NWA 1262	Morocco	–	–	P 2002	180	1	L~5	S3	W2	–	–	–	4.76	Erfoud	23.2	Pa1
NWA 1263	Morocco	–	–	P 2002	74.4	1	L~4	S1	W2	–	–	–	4.77	Erfoud	20.5	Pa1
NWA 1264	Morocco	–	–	P 2002	80	1	L4–6	S4	W1	24.9	21.5	sv	4.80	Erfoud	15	Pa1
NWA 1265	Morocco	–	–	P 2002	198	1	L~6	S2	W3	–	–	–	4.53	Erfoud	27.5	Pa1
NWA 1266	Morocco	–	–	P 2002	95.2	1	L3.8	S2/3	W1	16.9-25.7	7.8–28.8	br	4.66	Erfoud	19.9	Pa1
NWA 1267	Morocco	–	–	P 2002	200	1	L~5	S3	W2	–	–	–	4.84	Erfoud	24.7	Pa1
NWA 1268	Morocco	–	–	P 2002	236	1	L~5	S3	W2	–	–	–	4.74	Erfoud	23.6	Pa1
NWA 1269	Morocco	–	–	P 2002	62.2	1	L5	S3	W1	26.2	21.9	–	4.85	Erfoud	11.3	Pa1
NWA 1270	Morocco	–	–	P 2002	204	1	L~4/5	S4	W1	–	–	–	4.88	Erfoud	23.3	Pa1
NWA 1271	Morocco	–	–	P 2002	94.2	1	L~6	S2	W3	–	–	–	4.59	Erfoud	20.9	Pa1
NWA 1273	Morocco	–	–	P 2002	220.48	1	H~5	S3	W3	–	–	–	5.13	Erfoud	24.8	Pa1
NWA 1274	Morocco	–	–	P 2002	138.4	1	H~5	S3	W3	–	–	–	5.12	Erfoud	28.4	Pa1
NWA 1275	Morocco	–	–	P 2002	597.1	1	L~6	S4	W4	–	–	–	4.77	Erfoud	25.8	Pa1
NWA 1276	Morocco	–	–	P 2002	266	1	L~6	S1	W4	–	–	–	4.67	Erfoud	20	Pa1
NWA 1296	Morocco	–	–	Spring 2001	810	1	Angr	–	–	–	–	See separate entry	–	Bouarfa	49	UPVI1
NWA 1430	Tata	–	–	2001	113 kg	1	IIIAB	–	–	–	–	See note 6	–	Morocco	152	La5
NWA 1431	–	–	–	2001	213	1	Euc pm	–	–	–	–	See note 7	–	Morocco	20	La6
NWA 1457	–	–	–	P 02/2002	52	7	Win	–	–	–	–	See separate entry	–	Zagora	10	UWS2

Table 8. Meteorites from Morocco and surrounding countries.[a] *Continued.*

Name	Possible origin/ pseudonym[b]	Latitude (N)[c]	Longtitude (W)[c]	Date found[d]	Mass (g)	Pcs.	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Comments	Mag Sus[e]	Place purchased	Type Spec (g)	Info[f]
NWA 1459	–	–	–	P 04/2002	53	1	Dio	–	–	–	–	See separate entry	–	Zagora	10	UWS2
NWA 1463	–	–	–	P 11/27/00	1001	3	Win	–	–	3.2 ± 0.1	7.4 ± 0.4	Opx: Wo1.2 ± .2; Plag: An12.6Or4.6	–	Erfoud	975	La7
NWA 1464	Zagora	–	–	2001	1800	1	Ure	S2	low	9.3 1.1–22.7	16 7.9–17.9	–	–	–	22.4	Be2
NWA 1466	Sac	–	–	2001	56	Many	Euc ub	–	very low	–	49.2	unbrecciated; Plag: An87.3; sv	–	–	12	Be2
NWA 1467	–	–	–	P 06/2002	111	1	H4	S3	W3/4	18	16.5	calc. v.	–	Sainte-Marie	22	Mün2
NWA 1468	–	–	–	P 06/2002	167	1	H5/6	S3	W3/4	19	16.5	calc. v.	–	Sainte-Marie	21	Mün2
NWA 1469	–	–	–	P 06/2002	119	1	H5/6	S4	W1/2	19.5	17	br, partly S5	–	Sainte-Marie	20	Mün2
NWA 1470	–	–	–	P 06/2002	659	1	L4	S2	W2	26.5	21.5 ± 1.5	br, sv	–	Sainte-Marie	21	Mün2
NWA 1471	–	–	–	P 2001	53.3	1	R3/4	S3	W3/4	40 ± 1.6	–	See note 8	–	Morocco	11.5	Mün3
NWA 1472	–	–	–	P 2001	108	1	R3/4	S3	W3/4	40 ± 2	–	See note 8	–	Morocco	21	Mün3
NWA 1473	–	–	–	P 2001	928	1	L6	S4	W1/2	25	22	br, partly S5	–	Morocco	25	Mün3
NWA 1474	–	–	–	P 2001	54.2	1	H4–6	S2	W2	19.5	15	br, sv	–	Morocco	11	Mün3
NWA 1475	–	–	–	P 2001	220	1	L6	S3	W2/3	25.5	21.5	sv	–	Morocco	21	Mün3
NWA 1476	–	–	–	P 2001	20.6	2	R3	S3	W1	41 ± 2.2 (mx) 8 ± 11 (chond)	–	–	–	Morocco	4.5	Mün3
NWA 1477	–	–	–	P 2001	35	1	R3	S3	W3/4	37 ± 7.8	–	sv	–	Morocco	7	Mün3
NWA 1478	–	–	–	P 2001	28	1	R3	S3	W1/2	39 ± 4.6	–	sv	–	Morocco	6	Mün3
NWA 1479	–	–	–	P 2001	79.3	1	L6	S5	W2	26	21	sv	–	Morocco	16	Mün3
NWA 1480	–	–	–	P 2001	29.3	1	L6	S3	W2/3	25.5	21.5	–	–	Morocco	6	Mün3
NWA 1481	–	–	–	P 12/2001	242	1	L6	S3	W1/2	26	21.5	–	–	Hamburg	20	Mün3
NWA 1482	–	–	–	P 12/2001	68.8	1	L6	S3	W1/2	25.5	21.5	–	–	Hamburg	14	Mün3
NWA 1483	–	–	–	P 12/2001	10.4	1	H5	S3	W2	19.5	17.5	–	–	Hamburg	2.2	Mün3
NWA 1484	–	–	–	P 12/2001	16.4	1	H5	S3	W1	19.5	17.5	–	–	Hamburg	3.4	Mün3
NWA 1485	–	–	–	P 01/2002	~30 kg	Many	L5–6	S4	W1	25.5	21	sv, br, impact melt breccia clasts	–	Rissani	26	Mün3
NWA 1486	–	–	–	P 01/2002	6000	1	H4	S2	W3/4	17.5	16	calc. v.	–	Rissani	25.5	Mün3
NWA 1487	–	–	–	P 01/2002	1142	1	L6	S3	W1	25.5	21.5	sv	–	Rissani	29	Mün3
NWA 1488	–	–	–	P 01/2002	325	1	L6	S3	W1	26	22.5	–	–	Rissani	22	Mün3
NWA 1489	–	–	–	P 01/2002	191	1	Impact melt br.	S2	W1	22 ± 6.5	29.5 ± 4.5	probably LL-group: frags ~Fa30	–	Rissani	22	Mün3
NWA 1490	–	–	–	P 01/2002	85.4	1	L6	S3	W1	25.5	21.5	sv	–	Rissani	20	Mün3
NWA 1491	–	–	–	P 01/2002	155	1	H4	S2	W2/3	19.5	17.5	–	–	Rissani	26	Mün3
NWA 1492	–	–	–	P 01/2002	72.2	1	H4	S2	W1/2	17 ± 0.8	15.5 ± 1.9	–	–	Rissani	14.5	Mün3
NWA 1493	–	–	–	P 01/2002	148	1	L6	S4	W1	26	23.5	partly S5	–	Rissani	24	Mün3
NWA 1494	–	–	–	P 01/2002	141	1	H5	S4	W1/2	19	16.5	sv, calc. v.	–	Rissani	24	Mün3
NWA 1495	–	–	–	P 10/2001	6560	1	L4–5	S4	W1	24.5	20.5	–	–	Munich	22	Bart1
NWA 1496	–	–	–	P 10/2001	268	1	H5	S4	W1	18.6	16.5	–	–	Munich	22.6	Bart1
NWA 1497	–	–	–	P 10/2001	1890	1	L5	S4	W1	24.6	21.4	–	–	Munich	20.2	Bart1
NWA 1498	–	–	–	P 10/2001	357	1	H4	S3	W1	19.1	17.3	–	–	Munich	20.4	Bart1
NWA 1499	–	–	–	P 10/2001	1002	1	L5	S3	W1	24.2	20.4	–	–	Munich	20.1	Bart1
NWA 1500	–	–	–	P 2000	3300	1	Ure	–	–	–	–	See separate entry	–	Zagora	20	Bart2
NWA 1501	–	–	–	P 10/2001	542	1	H5	S3	W1	18.9	16.5	–	–	Munich	21.4	Bart1
NWA 1502	–	–	–	P 10/2001	1150	1	L4–5	S5	W2	24.5	21.1	–	–	Munich	19.9	Bart1
NWA 1503	–	–	–	P 10/2001	255	1	L4	S4	W2	25.6	24.8	–	–	Munich	19.9	Bart1

Table 8. Meteorites from Morocco and surrounding countries.[a] *Continued.*

Name	Possible origin/ pseudonym[b]	Latitude (N)[c]	Longtitude (W)[c]	Date found[d]	Mass (g)	Pcs.	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Comments	Mag Sus[e]	Place purchased	Type Spec (g)	Info[f]
NWA 1504	–	–	–	P 10/2001	748	1	L5	S4	W2	24.5	21	–	–	Munich	22.3	Bart1
NWA 1505	–	–	–	P 10/2001	277	1	L/LL5	S6	W2	26	22.3	metal/sulfide veins, sv	–	Munich	20.2	Bart1
NWA 1507	–	–	–	P 10/2001	668	1	L5	S4	W1	25	21.2	–	–	Munich	23.2	Bart1
NWA 1508	–	–	–	P 10/2001	502	1	L5–6	S2	W1	24.6	20.9	–	–	Munich	23.1	Bart1
NWA 1510	–	–	–	P 10/2001	562	1	L5	S5	W2	24.8	20.8	–	–	Munich	19.5	Bart1
NWA 1511	–	–	–	P 10/2001	198	1	L5	S3	W1	24.7	20.6	–	–	Munich	19.9	Bart1
NWA 1512	–	–	–	P 10/2001	485	1	L5	S3	W4	24.4	20.6	–	–	Munich	30.3	Bart1
NWA 1513	–	–	–	P 10/2001	596	1	H4	S3	W1	18.2	16.2	–	–	Munich	20.5	Bart1
NWA 1514	–	–	–	P 10/2001	540	1	L5	S3	W2	24.4	20.6	–	–	Munich	23.4	Bart1
NWA 1515	–	–	–	P 10/2001	423	1	H4	S2	W2	20.7	14.9	–	–	Munich	22.7	Bart1
NWA 1516	–	–	–	P 10/2001	530	1	L5	–	–	24.5	20.3	–	–	Munich	21.2	Bart1
NWA 1517	–	–	–	P 10/2001	271	1	L5	–	–	24.5	20.9	–	–	Munich	19.3	Bart1
NWA 1520	–	–	–	P 10/2001	406	1	L4/5	–	–	24.2	18	–	–	Munich	20.4	Bart1
NWA 1522	–	–	–	P 10/2001	302	1	H5	S2	W2	18.5	16.3	–	–	Munich	20.4	Bart1
NWA 1525	–	–	–	P 10/2001	4889	1	L5	S2	W1	24.9	20.7	–	–	Munich	22.3	Bart1
NWA 1535	–	–	–	P 2000	285	1	H5	S2	W2	18.6	16.7	–	–	Zagora	20	Bart3
NWA 1536	–	–	–	P 2000	276	1	H4	S2	W1	18.9	16.8	–	–	Zagora	20	Bart3
NWA 1537	–	–	–	P 2000	528	1	L5	S4	W1	25.1	21	impact melt clast	–	Zagora	20	Bart3
NWA 1538	–	–	–	P 2000	280	1	LL4	S2	W2	26.9	21.9	–	–	Zagora	23.6	Bart3
NWA 1539	–	–	–	P 2000	156.2	1	L4	S3	W2	25	20.8	–	–	Zagora	24.2	Bart3
NWA 1540	–	–	–	P 2000	130	1	L5	S3	W2	24.7	21.1	–	–	Zagora	20.1	Bart3
NWA 1541	–	–	–	P 2000	54.7	1	L5	S3	W2	24.7	20.9	–	–	Zagora	11	Bart3
NWA 1542	–	–	–	P 2000	66	1	L5	S2	W2	24	21.4	–	–	Zagora	12	Bart3
NWA 1543	–	–	–	P 2000	58.1	1	H4	S1	W1	19.4	17.1	–	–	Zagora	12.3	Bart3
NWA 1545	–	–	–	P 2000	209	1	H5	S1	W2	18.6	16.7	–	–	Zagora	21.8	Bart3
NWA 1547	Morocco/ Algeria	–	–	P 2002	164.5	1	LL4	S2	W3	29.7	24.2	–	–	–	33.2	MP1
NWA 1548	Morocco/ Algeria	–	–	P 2002	331.6	1	LL4	S2	W3	29.6	24.1	calc. v.	–	–	31.4	MP1
NWA 1549	Morocco/ Algeria	–	–	P 2002	482.7	1	LL5–6	S2	W3	31.3	25.6	br	–	–	31.1	MP1
NWA 1550	SW Algeria	–	–	P 2002	~8 kg	Several	LL5	S4	W0/1	31.3	25.7	sv	–	–	>20	MP1
NWA 1551	NW of Zagora	–	–	P 2002	809.2	1	LL5	S4	W2	26.5	22	sv	–	–	32.3	MP1
NWA 1558	Aoufous	–	–	1998	385	1	CK5/6	–	–	29	–	Ol: 0.5–0.6 wt% NiO; Mt: ~4 wt% Cr2O3	20	Vn1	–	–
NWA 1559	Morocco	–	–	P 2000	284	1	CK3	–	–	1–40	–	See note 9	–	Zagora	20	Vn1
NWA 1560	Morocco	–	–	P 1999	822	1	CK4/5	–	–	37	–	mt; refractory inclusion	–	Erfoud	20	Vn1
NWA 1561	Morocco	–	–	P 1999	198	1	H5	–	high	19.1	17	–	–	Zag	20	Vn1
NWA 1562	Morocco	–	–	P 2000	380	1	LL6	–	high	32.8	26.7	–	–	Erfoud	20	Vn1
NWA 1563	Hamara	–	–	2000	2950	4	CK5	–	–	29.8	–	See note 10	–	–	20	Vn1
NWA 1564	–	–	–	1998	500	1	L5	S4	W2	23.7	22	–	–	–	21.22	Vr1
NWA 1565	–	–	–	1999	200	6	H4	S2	W1	17.8	15.2	–	–	–	19.39	Vr1
NWA 1566	–	–	–	P 12/2001	159	1	R3.8	S2	W4	41 ± 3	24 ± 6	–	–	Erfoud	23	Mün2
NWA 1567	–	–	–	P 1/2002	22	1	CR2	S2	W2	0–4 (Peak)	0–4 (Peak)	–	–	Erfoud	4.5	Mün2
NWA 1568	–	–	–	P 1/2002	37	1	LL6	S2	W2	31	26	br, sv	–	Erfoud	10	Mün2
NWA 1569	–	–	–	P 2001	614	1	Ure	–	–	–	–	See separate entry	–	Erfoud	20.4	NAU1
NWA 1570	Zagora	–	–	2001	28	1	Euc	mod.	very low	–	56.6	Plag: $An_{93.5}$, monomict brecciated	–	–	4.8	Be2

Table 8. Meteorites from Morocco and surrounding countries.[a] *Continued.*

Name	Possible origin/ pseudonym[b]	Latitude (N)[c]	Longtitude (W)[c]	Date found[d]	Mass (g)	Pcs.	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Comments	Mag Sus[e]	Place purchased	Type Spec (g)	Info[f]
NWA 1571	Zagora	–	–	2001	832	1	L5	S2	W1/2	24.1	20.5	–	–		22.5	Be2
NWA 1572	Zagora	–	–	2001	382	1	L6	S4	W2	24.7	20.9	–	–	–	20.5	Be2
NWA 1573	Morocco	–	–	2002	78	1	L	S5	W1	24.3	20.4	impact melt rock	–	–	17.7	Be2
NWA 1574	Zagora	–	–	2001	210.5	1	H5	S4	W1	18.3	16.4	–	–	–	20.5	Be2
NWA 1575	Mauritania	–	–	2002	230	1	L6	S4	W2	23.4	20.4	–	–	–	21.2	Be2
NWA 1576	Mauritania	–	–	2002	550	1	L6	S4	W2	24.1	20.4	sv, mp	–	–	21.7	Be2
NWA 1577	Zagora	–	–	2002	112	6	L6	S6	W2	24	20.3	rw, sv	–	–	21.1	Be2
NWA 1578	Erfoud	31°36′	04°23′	2001	1549	1	L6	S4	W3	23.9	20	–	–	–	23.6	Be3
NWA 1579	Erfoud	31°30′	04°51′	2001	5200	1	L5	S4	W2	24.2	20.4	–	–	–	22.6	Be3
NWA 1580	Erfoud	31°20′	04°00′	2001	5700	1	L6	S4	W2	24.2	20.8	sv	–	–	25.2	Be3
NWA 1581	Erfoud	31°23′	04°15′	2001	50200	1	L6	S4	W2	24.4	20.2	–	–	–	21.1	Be3
NWA 1582	Morocco	–	–	2002	3451	Many	L6	S4	W3	23.5	20.4	–	–	–	31.2	Be2
NWA 1583	Morocco	–	–	2001/2002	78	Many	R3.9	–	–	–	–	See separate entry	–	–	15.6	Be2
NWA 1584		–	–	P 2002	3250	1	LL5	S2	W1	28.3	25.2	Plag: $Ab_{76}Or_8$; Met: $Fe_{63}Ni_{39}$	–	Morocco	50	JSC1
NWA 1585		–	–	P2002	77	1	R5	S2	W1	38.8	32.4	Plag: $Ab_{86}Or_8$	–	Erfoud	15	JSC1
NWA 1586		–	–	P 06/2002	400	1	Ure	–	–	–	–	See separate entry	–	Morocco	21.9	MIT1
NWA 1587		–	–	P 2000	50	Many	H4	S2	W1/2	18.2	14.9	–	–	–	10.7	Vr1
NWA 1588		–	–	P 2000	300	1	H3.8	S3	W0/1	17.4	16.6	Ol: PMD 12.7	–	–	21	Vr1
										5.4–20.3	6.0–21.6					
NWA 1589		–	–	P 2000	73	1	H5	S3	W1	18.1	14.9	–	–	–	15.7	Vr1
NWA 1590	Zagora	–	–	2001	125.4	1	LL5–6	S2	W3	28.7	23.7	–	–	–	32.9	MP2
NWA 1591	Tagounite	–	–	2001	254.8	1	LL5–6	S3	W3	28.6	23.7	sv	–	–	24.2	MP2
NWA 1592	Aouli	–	–	2001	1127	1	L4	S2	W2	21.3	15.9	–	–	–	43.3	MP2
NWA 1593	Talsint	–	–	2001	187.4	1	L5/6	S1	W2	24.2	20.3	–	–	–	23.9	MP2
NWA 1594	Boumia	–	–	2001	285.7	1	L6	S4	W2	24.2	20.3	–	–	–	29.9	MP2
NWA 1595	Talsint	–	–	2001	80.3	1	L6	S4	W1	23.7	20.2	–	–	–	14.9	MP2
NWA 1596	Zagora	–	–	2001	133.2	1	L6	S5	W2	24	20.1	sv	–	–	27.6	MP2
NWA 1597	Zagora	–	–	2001	267.7	1	L6	S4	W1/2	24.1	20.8	sv	–	–	33.6	MP2
NWA 1598	Zagora	–	–	2001	246.1	1	L6	S4	W1/2	24.4	20.8	–	–	–	31.1	MP2
NWA 1599	Tata	–	–	2001	222.1	1	H4	S4	W1	18.1	16.2	sv	–	–	31.4	MP2
NWA 1600	Tagounite	–	–	2001	165.9	1	H5	S2	W3	18	15.4	–	–	–	28.9	MP2
NWA 1601	Zagora	–	–	2001	116.7	1	H5	S4	W	17.9	16.4	–	–	–	31.3	MP2
NWA 1602	Bourfa	–	–	2001	143.8	1	H5–6	S3	W2	17.8	15.8	–	–	–	25.6	MP2
NWA 1603	Tata	–	–	2001	102	1	H5–6	S3	W2	18.5	16.5	–	–	–	23.6	MP2
NWA 1604	Talsint	–	–	2001	129.6	1	H5	S2	W2	17.6	15.2	br, sv	–	–	27.6	MP2
NWA 1605	Tata	–	–	2001	100.4	1	H6	S4	W0	18.3	15.7	–	–	–	20.3	MP2
NWA 1606		–	–	2001	119.9	1	H4	S2	W1	18.8	12.7	–	–	–	26.8	MP2
NWA 1607	Bourfa	–	–	2001	266.3	1	H6	S4	W1	18.4	16.6	–	–	–	28.9	MP2
NWA 1608	Bourfa	–	–	2001	273.4	1	H4–6	S1	W2	11.8	15.8	–	–	–	22.7	MP2
NWA 1609	Tagounite	–	–	2001	359.4	1	H4–6	S1	W2	16.7	15.9	–	–	–	32.8	MP2
NWA 1610	Gourama	–	–	2001	158.8	1	H6	S4	W0	18.2	15.8	–	–	–	29.3	MP2
NWA 1644	–	–	–	P 2001	214	1	Euc pm	–	–	–	–	See separate entry	–	–	20	MIT1
NWA 1646	–	–	–	P 9/2002	259	1	Euc cm	–	–	–	–	See separate entry	–	Zagora	20	UWS2
NWA 1647	–	–	–	P 9/2002	313	1	Euc ub	–	–	–	–	See separate entry	–	Erfoud	20	UWS2

Table 8. Meteorites from Morocco and surrounding countries.[a] *Continued.*

Name	Possible origin/ pseudonym[b]	Latitude (N)[c]	Longtitude (W)[c]	Date found[d]	Mass (g)	Pcs.	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Comments	Mag Sus[e]	Place purchased	Type Spec (g)	Info[f]
NWA 1648	–	–	–	P 10/2002	803	2	Dio pm	–	–	–	–	See separate entry	–	Zagora	20	UWS2
NWA 1651	–	–	–	P 2002	19.8	1	LL6	S4	W1	28.6	24	–	–	Morocco	4	Be4
NWA 1652	–	–	–	P 2002	68.3	1	L	–	W1	24.2	21	impact melt rock	–	Morocco	14.40	Be4
NWA 1653	–	–	–	P 2002	376	1	How	–	–	–	–	See separate entry	–	Zagorra	21	Be2
NWA 1654	–	–	–	P 2002	49	1	Euc ub	–	–	–	–	See separate entry	–	Zagorra	11.30	Be2
NWA 1655	–	–	–	P 2002	50.9	1	CO3	S2	W2	21.7 0.8–55.2	2.9 0.9–5.5	–	–	Zagorra	14.1	Be2
NWA 1656	–	–	–	P 2002	43	1	L6	S4	W1	24.4	21	sv	–	Zagorra	11.5	Be2
NWA 1657	–	–	–	P 2002	468	1	L6	S4	W2	24.5	20.4	–	–	Ourgla, Algerien	21.5	Be2
NWA 1658	–	–	–	P 2002	1345.50	6	L3–6	–	–	–	–	See separate entry	–	Zagorra	20.5	Be2
NWA 1659	–	–	–	P 2002	30	1	H5	S4	W1	18.7	16.3	–	–	Zagorra	6.6	Be2
NWA 1660	–	–	–	P 2002	287	1	H4	S2	W1/2	18.2	16.1	–	–	Mahbes	21.6	Be2
NWA 1661	–	–	–	P 2002	123.4	1	L3/4	S2	W3	22.6	15.8 10–20.2	–	–	Mahbes	20.3	Be2
NWA 1662	–	–	–	P 2002	124.6	1	L6	S6	W1/2	24.6	20.7	rw, sv	–	Mahbes	20.6	Be2
NWA 1663	–	–	–	P 2002	80.1	1	H5	S2	W3	18.8	16.6	–	–	Mahbes	16.5	Be2
NWA 1664	Tabelbala, Algeria	~29°32′	~3°11′	2002	6310	1	How	–	–	–	–	See separate entry	–	–	258	Vn2
NWA 1666	–	–	–	P 10/2002	320	1	Euc pm	–	–	–	–	See separate entry	–	Denver	20	UWS1
NWA 1667	–	–	–	P 10/2002	1005	1	Dio	–	–	29.3–30.2	22.6–25.0	Chro: Cr(Cr+Al) = 0.89	–	Denver	20.8	UWS1
NWA 1668	–	–	–	P 10/2002	710	1	R5	–	–	38.9	30.2	awaruite: 72% Ni	–	Denver	23.6	UWS1
NWA 1669	Al Mala'ika	–	–	P 01/01/03	36	1	Martian	–	–	–	–	See separate entry	–	Erfoud	7.4	UPVI2
NWA 1672	–	–	–	P 9/10/02	12.75		Euc ub	–	–	–	59.6	fine-grained	–	Denver	2.6	UWS1
NWA 1692	–	–	–	P 10/2002	857	1	H5	S1	W1	17.8	17	–	–	Safsaf	21	NAU2
NWA 1693	–	–	–	P 10/2002	83	1	H5	S1	W2/3	19.1	17.5	–	–	Safsaf	15	NAU2
NWA 1695	–	–	–	P 2001	614	1	How	–	–	–	–	See separate entry	–	Morocco	21	NAU1
NWA 1698	–	–	–	P 3/2002	698.0	1	L5	S1	W2	25.1	20.8	–	–	Erfoud	50.4	Pr1
NWA 1699	–	–	–	P 3/2002	350.0	1	L4/5	S2	W3	25	21	–	–	Erfoud	34.9	Pr1
NWA 1700	–	–	–	P 3/2002	95.0	1	L5	S4	W3	23.4	19.8	–	–	Erfoud	32.1	Pr1
NWA 1701	–	–	–	P 3/2002	225.0	1	LL5	–	–	–	–	See separate entry	–	Erfoud	20.4	Pr1
NWA 1702	–	–	–	P 3/2002	220.0	1	H6	S4	W3	17.7	18.2	–	–	Erfoud	35.0	Pr1
NWA 1703	–	–	–	P 3/2002	264.0	1	L6	S4	W3	24.7	20.7	–	–	Erfoud	23.7	Pr1
NWA 1704	–	–	–	P 3/2002	166.0	1	H5	S3	W4	17.7	17.1	–	–	Erfoud	20.3	Pr1
NWA 1705	–	–	–	P 3/2002	110.0	1	L5	S2	W3	22.6	19.8	–	–	Erfoud	19.2	Pr1
NWA 1706	–	–	–	P 3/2002	148.0	1	L6	S3	W3	23.7	20.2	–	–	Erfoud	23.5	Pr1
NWA 1707	–	–	–	P 3/2002	522.0	1	L4	S2	W3	24.8	20.7	–	–	Erfoud	26.5	Pr1
NWA 1708	–	–	–	P 3/2002	11.1	1	L5	S2	W3	24.2	20.4	–	–	Erfoud	2.2	Pr2
NWA 1713	–	–	–	P 01/2002	1073	1	L6	S4	W1	25.5	21.5	sv	–	Rissani	31	Mün3
NWA 1714	–	–	–	P 01/2002	697	1	H4/5	S3	W1	19	17	sv	–	Rissani	27	Mün3
NWA 1715	–	–	–	P 01/2002	361	1	L6	S4	W1	25	21.5	sv, rw, partly S6	–	Rissani	24	Mün3
NWA 1716	–	–	–	P 01/2002	185	1	L5/6	S4	W1	25.5	21.5	–	–	Rissani	26	Mün3
NWA 1717	Atar, Mauritania	~21°N	~13°W	P 12/2002	6032	1	LL5–6	S4	W1	30.5	25	sv, br, frags of impact melt breccias	–	Hamburg	21	Mün3
NWA 1718	–	–	–	P 12/2002	858	1	L6	S5	W1/2	25.5	21.5	sv	–	Hamburg	25	Mün3

Table 8. Meteorites from Morocco and surrounding countries.[a] *Continued.*

Name	Possible origin/ pseudonym[b]	Latitude (N)[c]	Longtitude (W)[c]	Date found[d]	Mass (g)	Pcs.	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Comments	Mag Sus[e]	Place purchased	Type Spec (g)	Info[f]
NWA 1757	Morocco/ Algeria border	–	–	2001	361	1	CO3.5	S1	W3	0.5–51.8	1.04–30.18	~30% matrix, many small CAIs	37.5	Erfoud	–	Pa2
NWA 1758	Boudnib area, Morocco	–	–	08/2001	66.4	1	CM2	S1	W1	0.5–47.2	1.6	troilite + pentlandite	–	Erfoud	11.1	Pa2
NWA 1759	Boudnib area, Morocco	–	–	06/2001	10.1	1	Euc pm	S3	W0	27.8–39.5	–	See note 11	–	Erfoud	2	Pa2
NWA 1760	Boudnib area, Morocco	–	–	10/2001	20.3	2	Euc m	S4	W0	–	–	See note 12	–	Erfoud	4	Pa2
NWA 1761	Rich area, Morocco	–	–	2001	4560	1	H6	S3	W3	19.9	17.4	oriented stone	–	Erfoud	20	Pa2
NWA 1762	Rich area, Morocco	–	–	2001	205.5	1	L5	S3	W1	25.5	21.4	native Cu	–	Erfoud	25.2	Pa2
NWA 1763	Boudnib area, Morocco	–	–	10/2001	57.1	1	CV3	S0	W0	0.3–34.9	0.7–2.3	many CAIs	–	Erfoud	11	Pa2
NWA 1764	Zelmou, Algeria	–	–	10/2001	255	17	Euc m	S3	W1	–	–	See note 13; br	–	Erfoud	20.8	Pa2
NWA 1765	Rissani area, Morocco	–	–	2001	395	2	LL5	S5	W1	28.9	23.3	sv	–	Erfoud	21.2	Pa2
NWA 1766	Talsint area, Morocco	–	–	09/2001	3694	28	L6	S4	W1	24.3	20.1	largest stone 645 g	–	Erfoud	37	Pa2
NWA 1767	Tarda, Morocco	–	–	2001	13	Several	Euc m	S4	W1	–	63.1	See note 14; mp	–	Erfoud	2.6	Pa2
NWA 1768	Morocco	–	–	2002	9.4	1	Euc pm	S3/4	W1	–	25.1	See note 15	–	Erfoud	1.8	Pa2
NWA 1770	Morocco	–	–	2002	22	1	LL3.3	S2	W2	1.3–35.5	2.8–29.1	interlocked chondrules, rare matrix	–	Erfoud	4.5	Pa2
NWA 1771	Morocco, Algeria	–	–	2001	7.5	Several	Euc m	S3	W1	–	–	See note 16	–	Erfoud	1.5	Pa2
NWA 1774	Morocco	–	–	2002	714	1	R3.8–6	S4	W3	7.6–40.1	0.4–39.8	See note 17; br	–	Erfoud	20	Pa2
NWA 1775	Morocco	–	–	2002	25	Several	Martian		W1/2	36.7-50.6	–	See note 18	–	Erfoud	4.7	Pa2
NWA 1776	Zagora, Morocco	–	–	2002	80	Several	CR2	S1	W2/3	1.1–33.7	1.9–35.6	See note 19	–	Erfoud	16	Pa2
NWA 1777	Sobti, Algeria	–	–	2002	1055	1	Euc pm	S3	W1	–	26.5–50.7	See note 20; br	–	Erfoud	20	Pa2
NWA 1778	Dakhla, Western Sahara,Morocco	–	–	2002	95000	Several	L6	S1	W3	24.4	22.3	10 stones over 1 kg	–	Erfoud	20.6	Pa2
NWA 1779	Morocco/ Algeria border	–	–	2002	857	1	L5	S5	W0	24.6	20.5	sv	–	Erfoud	20	Pa2
NWA 1780	Morocco	–	–	2002	25.57	1	Ure		W2	21.5	–	see Note 21	–	Erfoud	5.5	Pa2
NWA 1781	Morocco	–	–	04/01/00	102	1	H6	S5	W2	18.8	16.3	–	–	Rissani	39	Pa3
NWA 1782	M'Hammid, Morocco	–	–	11/2000	163	1	Ure	–	W3	21.7	–	see Note 22	–	Morocco	20.5	Pa3
NWA 1783	Tafhraout area, Morocco	–	–	11/01/00	413	1	L3.7	S4	W4	31.1–36.9	16.2-24.8	sv	–	Morocco	20	Pa3
NWA 1784	Morocco	–	–	04/01/00	184	1	R4/5	S1	W3	40	–	Ol: NiO 0.21%	–	Taouz	20.5	Pa3
NWA 1787	Morocco	–	–	02/02	655.7	1	L3.8–5	S2	W2	25.8	20.5–26.4	–	–	Morocco	25.9	Pa4
NWA 1788	Morocco	–	–	2001	35.4	1	L3.8–5	S3/4	W2	22–27.6	21–23.4	br	–	Morocco	35.4	Pa5
NWA 1791	Morocco	–	–	2000	900	1	L6	S2	W3	24.8	20.7	–	–	Sainte-Marie	48.42	Pa6
NWA 1792	–	–	–	10/2002	39	1	H5	S1	W2	18.9	16.8	–	–	Safsaf	9.4	NAU3
NWA 1793	–	–	–	10/2002	585	1	L3	S3	W1	23.4	19.5	–	–	Safsaf	21.1	NAU3
NWA 1794	–	–	–	10/2002	398	1	LL5	S2	W1	30.2	24.3	–	–	Safsaf	20.0	NAU3
NWA 1795	Mauritania	–	–	2002	33000	Many	H5	S2	W4	18.3	16	–	–	–	21.9	Be2
NWA 1796	Mauritania	–	–	2002	22000	Many	H5	S3	W3	17.4	15.6	–	–	–	20.6	Be2
NWA 1797	Mauritania	–	–	2002	18000	Many	H5	S2	W1	18	16	–	–	–	21	Be2

Table 8. Meteorites from Morocco and surrounding countries.[a] *Continued.*

Name	Possible origin/ pseudonym[b]	Latitude (N)[c]	Longtitude (W)[c]	Date found[d]	Mass (g)	Pcs.	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Comments	Mag Sus[e]	Place purchased	Type Spec (g)	Info[f]
NWA 1798	Mauritania	–	–	2002	14000	Many	H6	S3	W2	17.1	15.3	–	–	–	20.6	Be2
NWA 1799	Mahbes, Morocco	–	–	2002	173.7	1	L6	S4	W3	24.5	20.2	–	–	–	20.6	Be2
NWA 1800	Mahbes, Morocco	–	–	2002	62.8	1	H4/5	S3	W3	17.9	12.7	–	–	–	12.9	Be2
NWA 1801	Mahbes, Morocco	–	–	2002	264	1	L4	S2	W1	22.2	18.7	–	–	–	20.7	Be2
NWA 1802	Mahbes, Morocco	–	–	2002	518	1	H6	S2	W1	18.3	16	br	–	–	20.9	Be2
NWA 1803	Zagora	–	–	2002	98.5	5	H5	S2	W1	17.9	16		–	–	21.7	Be2
NWA 1804	Erfoud	–	–	2002	1.4	1	H5/6	S4	W2	18.3	16.1	br, sv, mp	–	–	22.9	Be2
NWA 1805	Morocco	–	–	2002	102.4	1	L6	S2	W2	23.8	19.8	–	–	–	21.6	Be4
NWA 1806	Morocco	–	–	2002	40.01	1	H3	S2	W2	19.2 0.4–84.2	9.7 1.2–27.9	br	–	–	8.3	Be2
NWA 1811	Morocco	–	–	Unk	300	1	LL6	S3	W1	28	24	–	–	–	24	Vr1
NWA 1812	Western Sahara	–	–	Winter 2002	13.1	1	LL3.8	S1	W3	27.3 (18.3– 1.0)	4.2–23.1	Ol: PMD 11.3	–	–	2.9	Vr1
NWA 1813	Western Sahara	–	–	Winter 2001/2	70	1	Euc pm	–	–	–	–	See separate entry	–	–	14	Vr1
NWA 1814	–	–	–	1999	156	1	Bencub-bin-like	–	–	–	–	See separate entry	–	–	21.0	Pa7

[a]Most of these meteorites were purchased from Moroccan dealers. If information was supplied by a dealer about where the specimen may have been collected, this is noted instead of the latitude and longitude. Most of the collection locations cannot be verified.

[b]Meteorites may have been sold under some of these names or numbers. These are NOT recognized by the Nomenclature Committee and some are not uniquely associated with the meteorite classified in this table. Only the NWA number should be used.

[c]Coordinates of place of supposed origin; not all reports may be trustworthy, and the Nomenclature Committee lacks the resources to investigate.

[d]"P" indicates a date of purchase, others are reported dates of find.

Abbreviations: br = brecciated; calc. v. = calcite veins; mp = melt pockets; rw = ringwoodite; sv = shock veins.

(1) Olivine compositions in type 1 chondrules, $Fa_{2.2–20}$, mean $Fa_{2.22 \pm 2.9}$ (n = 120); in type 2 chondrules, $Fa_{30–40}$, mean $Fa_{34.8 \pm 7.6}$ (n = 80); olivine in matrix is $Fa_{46.2 \pm 3.6}$ (n = 114); Ni in metal up to 30 wt%; bulk chemistry very similar to Allende except for depletion of Ni and Co; few small CAIs; very well defined chondrules. (2) probably a winonaite but with O isotopes that are more ^{16}O-rich than typical: $^{18}O = 3.57‰$, $^{17}O = 1.33‰$, $^{17}0 = –0.53‰$; many relict chondrules. (3) NWA 1187 and NWA 1253 are probably paired. (4) NWA 1189, NWA 1244, NWA 1245, NWA 1246, NWA 1248, NWA 1249, NWA 1259 and NWA 1260 are probably paired. (5) NWA 1251 and 1252 are probably paired. (6) Co 5.02 mg/g, Ni 78.9 mg/g, Cu 167 µg/g, Ga 18.5 µg/g, As 4.45 µg/g, W 1.01 µg/g, Ir 3.90 µg/g, Pt 12.3 µg/g, Au 0.664 µg/g. (7) low-Ca px: $Wo_{3.3–13.4}$, mg# = 36–68 mol% high-Ca px, $En_{31}Wo_{44}$; Plag, $An_{84.7–92.0}$; ilmenite, MgO = 0.57–0.62 wt.%. (8) NWA 1271 and 1272 are probably paired. (9) Mt; Ol: <0.1–0.4 wt% NiO; CAIs and fluffy olivine aggregates. (10) Mt; Ol: ~0.5 wt% NiO; fluffy olivine aggregates; calc. v. (11) Cpx: $Fs_{22.2–48.5}Wo_{9.1–41.3}$; Plag: $An_{94.7}$;SiO_2; coarse gabbroic texture. (12) Cpx: $Fs_{48.6–53.2}Wo_{7.4–13.7}$; Plag: $An_{90.9}$; SiO_2; fine-grained. (13) Cpx: $Fs_{30.6–60.4}Wo_{4–40.6}$; Plag: $An_{88.1}$. (14) Cpx: $Fs_{27.3–59.6}Wo_{5.4–46.6}$; Plag: $An_{90.4}$. (15) Cpx: $Fs_{43.2–27.8}Wo_{24.5–42.9}$; Plag: $An_{93.6}$. (16) Cpx: $Fs_{60.4–31.2}Wo_{4.2–37.4}$; Plag: $An_{89.5}$. (17) Cpx: $Fs_{29.6–15.7}Wo_{9.3–39.5}$; Ol: NiO 0.12. (18) basaltic shergottite; zoned olivine phenocrysts in a fine-grained groundmass of complexly zoned pigeonite and homogenous maskelynite; Cpx: $Fs_{24.33–36.38}Wo_{8.89–28.78}$; maskelynite: $An_{51.23}Ab_{46.49}$; paired with NWA 1068, 1110 and 1183. (19) metal-rich chondrules, small CAIs in sulfide-rich matrix; paired with NWA 801 Plag: $An_{85.2}$. (20) Cpx: $Fs_{28.2–57.1}Wo_{42.5–7}$; Plag: Ab_{92}. (21) Cpx: $Fs_{6.7–18.1}Wo_{12.5–4.4}$, Cr_2O_3 1.0–1.3; Ol: Cr_2O_3 0.66–0.81, CaO 0.34. (22) Cpx: $Fs_{9.4}Wo_{8.2}$, Cr_2O_3 1.1; Ol: CaO 0.28–0.32, Cr_2O_3 0.51–0.75.

[e]Mag Sus: gives the decimal logarithm of magnetic susceptibility (in $10^{-9}m^3kg^{-1}$). According to Rochette et al. (2003), this parameter (a measure of the amount of metal) should be in the range 5.1–5.5 for H, 4.6–5.0 for L, 3.6–4.5 for LL. On the other hand, a decrease of about 0.1 per WG is observed.

[f]See "Abbreviations for analysts and specimen locations."

Table 9. Saharan meteorites from Niger.

Name	Date found	Latitude (N)	Longtitude (E)	Mass (g)	Pieces	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Comments	Type spec (g)	Info[a]
Adrar Bous	11/2001	~20°30′	~9°00′	360	1	EL5	–	W2	–	1.23	–	41.3	Pa10
Areshima	03/02/99	18°12.74′	10°10.66′	114.3	1	LL3.7	S3	W1	5–31	10–26	–	114.3	Pa11
Tassédet													
001	10/12/01	18°04.10′	6°40.10′	560	1	H5	S3	W1	17.3	15.1	001, 002, and 003 are probably paired	27.5	Ham2
002	10/14/01	18°14.22′	6°31.19′	9.4	1	H5	S3	W1	17.6	15.6	–	2.16	Ham2
003	10/14/01	18°18.02′	6°30.41′	12.5	1	H5	S3	W1	17.8		–	3.54	Ham2
Point Berliet	11/2001	20°32.22′	9°32.27′	42000	1	H5	S1	W2	19.0	17.2	–	24.3	Pa10
Séguédine	2002	20°49.10′	12°58.40′	444	1	H6	S3	W1	18.1	16.3	–	14.2	Be7
Tiffa 007	02/15/01	20°12.07′	11°35.22′	9250	1	H5	S1/2	W1	18.6	17.1	–	102.2	Pa11

[a]See “Abbreviations for analysts and specimen locations.”

Table 10. Meteorites from the Sahara, locations unknown.

Name	Found	Latitude[a]	Longitude[a]	Mass (g)	Pieces	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Comments[b]	Type spec (g)	Info[c]
Sahara													
98120	1998	z+0°04′10″	w+0°16′02″	138	1	L6	S2	W4	26.0	22.3	–	19.7	Pa12
98154	1998	z+0°07′32″	w+0°17′46″	817	1	H5	S2	W3	17.5	16.2	–	278.3	Pa12
98328	1999	z+0°05′05″	w+0°23′04″	187	1	L4	S4	W2	25.5	20.3	–	26.7	Pa12
98465	1998	z+0°08′54″	w+0°28′21″	226	1	L4	S3/S4	W2	24.7	21.3	–	22	Pa12
98532	1998	z+0°08′19″	w+0°28′38″	258	1	L4	S2	W1	25.5	20.7	–	20.6	Pa12
98573	1998	z+0°06′10″	w+0°16′01″	175	1	L3.8	S3	W1	25.9	19.7	br	20.3	Pa12
98804	1998	z+0°06′32″	w+0°16′15″	62	1	H4	S1	W3/4	17.7	17.2	–	13.0	Pa12
99029	1999	z+0°08′41″	w+0°08′20″	250	1	L6	S4	W1	24.8 ± 0.9	20.3 ± 0.2	br, v	21	Bart8
99067	1999	z+0°09′50″	w+0°28′02″	207	1	H3.8	S2	W2	20.1	12.5	–	19.5	–
99070	1999	z+0°09′52″	w+0°29′13″	1780	1	H3.8–6	S2	W2	18.7	21.1	br	27	Pa12
99162	1999	z+0°09′42″	w+0°29′01″	144	1	H6	S2	W1/2	20.8	17.8	v	21.7	Pa12
99209	1999	z+0°11′33″	w+0°02′01″	230	1	L5–6	S4	W1	24.6 ± 0.6	20.3 ± 0.6	br, v	21	Bart9
99327	1999	z+0°09′30″	w+0°28′16″	3320	1	H6	S1	W3	19.6	17.2	–	25	Pa12
99330	1999	z+0°09′40″	w+0°28′36″	14.7	1	LL3.5	S1	W2/3	0.7–21	1–20	–	3.0	Pa12
99550	1999	z+0°06′15″	w+0°16′06″	213	1	L4	S3	W2	25.6	22.4	–	21.2	Pa12
99572	1999	z+0°06′31″	w+0°15′51″	730	1	H6	S1	W1/2	19.8	17.7	–	44	Pa12
99603	1999	z+0°04′08″	w+0°20′39″	476	1	L6	S4	W1	24.0 ± 1.1	20.3 ± 0.8	br, v	20	Bart10
00019	2000	z+0°12′00″	w+0°26′30″	1665	1	L3.8	S3	W3	24.4	21.0	–	30	Pa12
00177	2000	z+0°06′87″	w+0°09′25″	12	1	C3/4	–	–	–	–	See separate entry	4	Pa12
00181	2000	z+0°07′02″	w+0°09′26″	191	1	H4-6	S3	W2	20.8	17.2	br	22	Pa12

[a]The geographic coordinates of these meteorites have not been disclosed by the finder. Listed are the offsets relative to a secret origin.
[b]Abbreviations: br–brecciated; v–veined.
[c]See "Abbreviations for analysts and specimen locations."

Appendix 1. Recently described meteorites from the U.S. ANSMET expeditions.[a]

Name[b]	Class	Mass (g)	Weath	%Fa	%Fs	Pairing	Ice[c]	Ref
BTN 00301	H3.3	33.77	B	8–38	5–21	(3)	25	25(2)
BTN 00302	H3.3	37.06	B	1–32	4–19	00301	25	25(2)
BTN 00303	H3.3	15.81	B	1–30	2–19	00301	25	25(2)
BTN 00304	LL6	709	A	–	–	–	25	26(1)
BTN 00305	L5	316.4	B	–	–	–	–	26(1)
BTN 00306	L5	66.95	B/C	–	–	–	25	26(1)
BTN 00307	L6	130.05	B	–	–	–	–	26(1)
BTN 00308	L5	10.69	C	–	–	–	25	25(2)
BTN 00309	L5	24.08	B	–	–	–	25	25(2)
BTN 00310	LL6	20.61	A/B	–	–	–	–	26(1)
CRE 01400	HOW	141.3	B	–	21–53	–	–	26(1)
FIN 00100	H5	39.61	B	18	16	–	–	26(1)
FIN 00101	H4	121.79	B	18	16	–	–	26(1)
FIN 00102	H5	78.11	B	19	16	–	–	26(1)
FIN 01600	H5	876.2	B	18	16	–	–	26(1)
FIN 01601	L6	287.5	B	24	20	–	–	26(1)
FIN 01602	H5	94.84	B	19	16	–	–	26(1)
FIN 01603	L5	583.8	A	24	20	–	–	26(1)
FIN 01604	H5	186.17	B	18	16	–	–	26(1)
FIN 01605	H5	102.59	B	19	16	–	–	26(1)
MET 00429	CV3	30.49	B	1–28	1–3	(2)	–	25(2)
MET 00430	CV3	151.7	B	0–9	0–2	00429	–	25(2)
MET 00449	LL6	1192.3	C	–	–	–	–	26(1)
MET 00450	LL6	691.1	Be	–	–	–	–	26(1)
MET 00451	LL6	767.2	Be	–	–	–	–	26(1)
MET 00452	H3.5	774.9	B/Ce	2–19	7	–	–	25(2)
MET 00453	LL6	265.6	B/C	–	–	–	–	26(1)
MET 00454	LL6	487	B/C	–	–	–	–	26(1)
MET 00455	L5	489	B	25	21	–	–	25(2)
MET 00456	H5	575.5	A/B	18	16	–	–	25(2)
MET 00456	LL5	575.5	A/B	–	–	–	–	26(1)
MET 00457	LL6	709.4	B/C	–	–	–	–	26(1)
MET 00458	LL6	687.5	B	–	–	–	26	26(1)
MET 00459	LL6	1118.7	B	–	–	–	–	26(1)
MET 00460	H5	700.5	B	19	17	–	–	25(2)
MET 00461	L6	518	B/C	–	–	–	–	25(2)
MET 00462	L5	590.7	C	–	–	–	–	26(1)
MET 00463	L6	369.9	A/B	–	–	–	–	26(1)
MET 00464	LL6	418.9	A/B	–	–	–	–	26(1)
MET 00465	L5	516.4	B/C	–	–	–	–	26(1)
MET 00466	LL5	296.8	B	–	–	–	–	26(1)
MET 00467	L5	422.5	B	–	–	–	–	26(1)
MET 00468	L5	361.7	B	–	–	–	–	26(1)
MET 00469	L5	273	B/C	–	–	–	–	26(1)
MET 00470	LL6	456.2	B/C	–	–	–	–	26(1)
MET 00471	L5	367.1	A/B	–	–	–	–	26(1)
MET 00472	L6	348.3	Ce	–	–	–	–	26(1)

Appendix 1. Recently described meteorites from the U.S. ANSMET expeditions.[a] *Continued.*

Name[b]	Class	Mass (g)	Weath	%Fa	%Fs	Pairing	Ice[c]	Ref
MET 00473	LL6	270	B	–	–	–	–	26(1)
MET 00474	LL5	153.26	A/B	–	–	–	–	26(1)
MET 00475	LL6	367.8	B/C	–	–	–	–	26(1)
MET 00476	L5	433.3	B/C	–	–	–	–	26(1)
MET 00477	LL6	474.2	A/B	–	–	–	–	26(1)
MET 00478	L5	343	A/B	–	–	–	–	26(1)
MET 00479	LL6	315	B/C	–	–	–	–	26(1)
MET 00480	L5	190.49	B	–	–	–	–	26(1)
MET 00781	CM2	5.36	B	0–30	3–6	00431	–	26(1)
MET 00782	H6	10.59	C	–	–	–	–	26(1)
MET 00783	EH4	26.25	C	–	0–1	00636	–	26(1)
MET 00784	H4	7.51	B	–	–	–	–	26(1)
MET 00785	L5	21.25	C	–	–	–	–	26(1)
MET 00786	L5	15.63	B	–	–	–	–	26(1)
MET 00787	H6	38.11	C	–	–	–	–	26(1)
MET 00788	L5	35.27	B	–	–	–	–	26(1)
MET 00789	LL6	13.85	B/C	–	–	–	–	26(1)
MET 00790	L5	35.78	B/C	–	–	–	–	26(1)
MET 00791	L5	9.89	A/B	–	–	–	–	26(1)
MET 00792	L5	49.59	B/C	–	–	–	–	26(1)
MET 00793	H6	40.05	B/C	–	–	–	–	26(1)
MET 00794	LL6	60.88	B	–	–	–	–	26(1)
MET 00795	H6	41.7	C	–	–	–	–	26(1)
MET 00796	L5	44.7	A/B	–	–	–	–	26(1)
MET 00797	LL6	44.57	B	–	–	–	–	26(1)
MET 00798	H6	28.1	Ce	–	–	–	–	26(1)
MET 00799	L5	51.42	B/C	–	–	–	–	26(1)
MET 00800	HOW	1.72	A	–	24–60	96500	–	26(1)
MET 00801	LL6	37.23	A	–	–	–	–	26(1)
MET 00802	H6	81.20	C	–	–	–	–	26(1)
MET 00803	L5	15.41	B/C	–	–	–	–	26(1)
MET 00804	LL6	19.35	B	–	–	–	–	26(1)
MET 00805	H6	46.50	C	–	–	–	–	26(1)
MET 00806	L5	13.62	B	–	–	–	–	26(1)
MET 00807	LL6	38.57	A/B	–	–	–	–	26(1)
MET 00808	LL6	30.69	B/C	–	–	–	–	26(1)
MET 00809	LL6	35.89	B/C	–	–	–	–	26(1)
MET 00810	CM2	5.91	B	0–28	2	00431	–	26(1)
MET 00812	IIIAB	4.96	–	–	–	00400	–	26(1)
MET 00820	LL6	32.68	B/C	–	–	–	–	26(1)
MET 00821	H6	18.14	C	–	–	–	–	26(1)
MET 00822	L5	5.97	C	–	–	–	–	26(1)
MET 00823	LL5	21.02	B	–	–	–	–	26(1)
MET 00824	H5	50.92	C	–	–	–	–	26(1)
MET 00825	L5	40.35	C	–	–	–	–	26(1)
MET 00826	LL6	38.11	C	–	–	–	–	26(1)
MET 00827	LL5	6.96	B	–	–	–	–	26(1)

Appendix 1. Recently described meteorites from the U.S. ANSMET expeditions.[a] *Continued.*

Name[b]	Class	Mass (g)	Weath	%Fa	%Fs	Pairing	Ice[c]	Ref
MET 00828	LL5	2.78	B	–	–	–	–	26(1)
MET 00829	L6	13.91	B	–	–	–	–	26(1)
MET 00834	IIIAB	7.05	–	–	–	00400	–	26(1)
MET 00855	DIO	9.09	B/C	–	27	–	–	26(1)
MET 00864	IIIAB	38.03	–	–	–	00400	–	26(1)
MET 00880	L5	13.07	B/C	–	–	–	–	26(1)
MET 00881	H6	23.83	C	–	–	–	–	26(1)
MET 00882	LL6	36.33	B/C	–	–	–	–	26(1)
MET 00883	LL6	40.61	B/C	–	–	–	–	26(1)
MET 00884	H6	9.40	C	–	–	–	–	26(1)
MET 00885	L5	30.99	C	–	–	–	–	26(1)
MET 00886	LL6	8.75	C	–	–	–	–	26(1)
MET 00887	H6	19.16	C	–	–	–	–	26(1)
MET 00888	L5	21.66	C	–	–	–	–	26(1)
MET 00889	LL6	36.12	C	–	–	–	–	26(1)
MET 00890	L5	37.63	C	–	–	–	–	26(1)
MET 00891	H6	1.43	C	–	–	–	–	26(1)
MET 00892	LL5	25.53	A	–	–	–	26	26(1)
MET 00893	L5	4.99	B	–	–	–	–	26(1)
MET 00894	H6	15.08	C	–	–	–	–	26(1)
MET 00895	H6	17.97	C	–	–	–	–	26(1)
MET 00896	L5	20.75	C	–	–	–	–	26(1)
MET 00897	L5	20.94	C	–	–	–	–	26(1)
MET 00898	H6	23.28	C	–	–	–	–	26(1)
MET 00899	H5	18.01	C	–	–	–	–	26(1)
MET 00900	L5	23.7	B/C	–	–	–	–	26(1)
MET 00901	H6	6.96	B/C	–	–	–	–	26(1)
MET 00902	H6	20.95	B/C	–	–	–	–	26(1)
MET 00903	H5	21.82	B/C	–	–	–	–	26(1)
MET 00904	L5	44.95	B/C	–	–	–	–	26(1)
MET 00905	IIIAB	3.53	–	–	–	00400	–	26(1)
MET 00906	H5	7.89	B/C	–	–	–	–	26(1)
MET 00907	LL6	39	B/C	–	–	–	–	26(1)
MET 00908	L5	13.05	B/C	–	–	–	–	26(1)
MET 00909	H5	7.44	B/C	–	–	–	–	26(1)
MET 00910	LL6	5.06	A/B	–	–	–	–	26(1)
MET 00911	H6	33.48	B/C	–	–	–	–	26(1)
MET 00912	H6	27.62	B/C	–	–	–	–	26(1)
MET 00913	H6	17.72	B/C	–	–	–	–	26(1)
MET 00914	LL6	12.95	B/C	–	–	–	–	26(1)
MET 00915	LL6	11.43	B/C	–	–	–	–	26(1)
MET 00916	H6	15.29	C	–	–	–	–	26(1)
MET 00917	LL5	43.93	B	–	–	–	–	26(1)
MET 00918	L5	15.03	B/C	–	–	–	–	26(1)
MET 00919	LL6	7.41	B/C	–	–	–	–	26(1)
MET 00944	L4	19.07	A	23	19	–	–	26(1)
MET 00968	L4	9.63	B	23	10–20	–	–	26(1)

Appendix 1. Recently described meteorites from the U.S. ANSMET expeditions.[a] *Continued.*

Name[b]	Class	Mass (g)	Weath	%Fa	%Fs	Pairing	Ice[c]	Ref
MET 001012	CM2	7.1	A/B	0–23	4–5	00431	–	26(1)
MET 001038	Iron-Ung	3.69	–	–	–	00428	–	26(1)
MET 001060	DIO	9.84	C	–	19	–	–	26(1)
MET 001087	CM2	1.60	A	0–41	0–1	–	–	26(1)
MET 001136	IIIAB	3.21	–	–	–	00400	–	26(1)
MET 01070	CM1	40.59	Be	–	–	(3)	–	25(2)
MET 01071	CM2	4.50	B	0–61	2–4	(4)	–	25(2)
MET 01072	CM2	38.50	B	0–12	–	01071	–	25(2)
MET 01073	CM1	15.72	B	–	–	01070	–	25(2)
MET 01074	CV3	46.20	B	0–9	0–2	(2)	–	25(2)
MET 01075	CM2	29.94	B	0–46	–	01071	–	25(2)
MET 01076	CM2	9.21	B	1–36	1–16	(2)	–	25(2)
MET 01077	CM2	18.91	C	0–53	1–8	01076	–	25(2)
MET 01078	CM2	19.46	B	1–41	–	01071	–	25(2)
MET 01079	CM1	11.51	B	–	–	01070	–	25(2)
MET 01080	CV3	3.45	B	0–24	1–2	01074	–	25(2)
MET 01081	EUC-Ubr	27.40	A/B	–	26–56	(2)	–	26(1)
MET 01082	HOW	22.14	B/C	–	21–57	96500	–	26(1)
MET 01083	URE	12.62	B	8	8	–	–	25(2)
MET 01084	DIO	4.29	B	30	26	–	–	26(1)
MET 01085	URE-An	30.61	B	–	11	–	–	25(2)
MET 01086	EUC-Ubr	2.73	A/B	–	28–56	01081	–	26(1)
MET 01087	HOW	28.41	B	26	19–52	96500	–	26(1)
MET 01090	L4	3.52	C	25	21	–	–	26(1)
MET 01091	LL6	8.60	A	–	–	–	–	26(1)
ODE 01500	H5	5208.9	B/C	19	17	–	–	26(1)
ODE 01501	H5	20.92	B/C	18	16	–	–	26(1)
QUE 99420	LL5	2.08	B	–	–	–	F	26(1)
QUE 99421	LL5	1.97	B	–	–	–	F	26(1)
QUE 99422	LL5	2.81	B/C	–	–	–	F	26(1)
QUE 99423	L6	0.68	C	–	–	–	F	26(1)
QUE 99424	LL5	4.46	B/C	–	–	–	F	26(1)
QUE 99425	H4	0.25	C	18	15	–	22	26(1)
QUE 99426	LL5	2.19	B/C	–	–	–	22	26(1)
QUE 99427	LL5	0.15	B	–	–	–	F	26(1)
QUE 99428	LL5	4.66	A/B	–	–	–	F	26(1)
QUE 99429	LL5	3.19	B	–	–	–	F	26(1)
QUE 99473	EH	0.27	B/C	–	1–2	–	F	25(2)
QUE 99610	L6	59.52	A/B	–	–	–	24	25(2)
QUE 99611	L5	89.58	B/C	–	–	–	F	25(2)
QUE 99612	LL5	64.30	A/B	–	–	–	F	25(2)
QUE 99613	LL5	37.55	A/B	–	–	–	F	25(2)
QUE 99614	LL5	31.17	A/B	–	–	–	F	25(2)
QUE 99615	LL5	46.92	A/B	–	–	–	F	25(2)
QUE 99616	LL5	27.82	A/B	–	–	–	F	25(2)
QUE 99617	LL5	36.32	A/B	–	–	–	F	25(2)
QUE 99618	LL5	27.04	A/B	–	–	–	F	25(2)

Appendix 1. Recently described meteorites from the U.S. ANSMET expeditions.[a] *Continued.*

Name[b]	Class	Mass (g)	Weath	%Fa	%Fs	Pairing	Ice[c]	Ref
QUE 99619	LL5	51.83	A/B	–	–	–	F	25(2)
QUE 99620	LL5	29.32	A/B	–	–	–	F	25(2)
QUE 99621	LL5	21.63	B	–	–	–	F	25(2)
QUE 99622	LL5	29.79	B/C	–	–	–	F	25(2)
QUE 99623	LL5	5.51	B/C	–	–	–	F	25(2)
QUE 99624	LL5	4.31	B	–	–	–	F	25(2)
QUE 99625	LL5	5.84	B	–	–	–	F	25(2)
QUE 99626	LL5	4.863	B/C	–	–	–	F	25(2)
QUE 99627	LL5	3.429	B	–	–	–	F	25(2)
QUE 99628	LL5	9.45	A/B	–	–	–	F	25(2)
QUE 99629	LL5	6.155	B/C	–	–	–	F	25(2)
QUE 99650	LL5	1.335	B	–	–	–	F	25(2)
QUE 99651	LL5	3.636	B	–	–	–	F	25(2)
QUE 99652	LL5	2.242	B	–	–	–	F	25(2)
QUE 99653	LL5	4.845	B	–	–	–	F	25(2)
QUE 99654	LL5	5.085	B	–	–	–	F	25(2)
QUE 99655	LL5	2.292	B	–	–	–	F	25(2)
QUE 99656	LL5	3.364	B/C	–	–	–	F	25(2)
QUE 99657	LL5	1.436	B	–	–	–	F	25(2)
QUE 99659	LL5	7.339	B	–	–	–	F	25(2)
QUE 99660	LL5	10.1	A/B	–	–	–	F	25(2)
QUE 99661	LL5	2.643	A/B	–	–	–	F	25(2)
QUE 99662	LL5	12.787	A/B	–	–	–	F	25(2)
QUE 99663	LL5	24.91	A/B	–	–	–	F	25(2)
QUE 99664	LL5	4.613	B/C	–	–	–	F	25(2)
QUE 99665	LL5	6.561	B/C	–	–	–	F	25(2)
QUE 99666	LL5	10.298	A/B	–	–	–	F	25(2)
QUE 99667	LL5	10.086	A/B	–	–	–	F	25(2)
QUE 99668	LL5	14.96	A/B	–	–	–	F	25(2)
QUE 99669	LL5	34.206	A/Be	–	–	–	F	25(2)
QUE 99670	H5	2.397	C	–	–	–	F	25(2)
QUE 99671	LL5	1.015	B/C	–	–	–	F	25(2)
QUE 99672	LL5	1.011	B	–	–	–	F	25(2)
QUE 99673	LL5	2.188	B	–	–	–	F	25(2)
QUE 99674	LL5	1.144	B/C	–	–	–	F	26(1)
QUE 99680	CK5	15.677	Ce	29	21	(2)	F	25(2)
QUE 99681	CK5	3.952	Ce	29	23	99680	F	25(2)
QUE 99682	LL5	33.425	B/C	–	–	–	F	25(2)
QUE 99683	H5	43.255	C	–	–	–	F	25(2)
QUE 99684	L5	63.824	C	–	–	–	F	25(2)
QUE 99685	LL5	9.034	B/C	–	–	–	F	25(2)
QUE 99686	LL5	18.1	B/C	–	–	–	F	25(2)
QUE 99687	LL5	11.088	B/C	–	–	–	F	25(2)
QUE 99688	LL6	10.586	B	–	–	–	F	25(2)
QUE 99689	LL5	7.211	B	–	–	–	F	25(2)
QUE 99870	LL5	4.198	B	–	–	–	F	25(2)
QUE 99871	LL5	7.428	B	–	–	–	F	25(2)
QUE 99872	LL5	7.027	B	–	–	–	F	25(2)
QUE 99873	LL5	0.201	B	–	–	–	F	25(2)
QUE 99874	LL5	4.174	B	–	–	–	F	25(2)
QUE 99875	LL5	0.8	B	–	–	–	F	25(2)
QUE 99876	LL5	7.319	B	–	–	–	F	25(2)
QUE 99877	LL5	16.791	B	–	–	–	F	25(2)
QUE 99878	LL5	2.198	B/C	–	–	–	F	25(2)
QUE 99879	LL5	4.018	B/C	–	–	–	F	25(2)
QUE 99880	LL5	5.095	B	–	–	–	F	25(2)
QUE 99881	LL5	7.309	B	–	–	–	F	25(2)
QUE 99882	H5	30.9	B/C	–	–	–	F	25(2)
QUE 99883	LL5	4.938	A/B	–	–	–	F	25(2)
QUE 99884	LL6	0.514	A/B	–	–	–	F	25(2)
QUE 99885	LL5	8.869	A/B	–	–	–	F	25(2)
QUE 99886	CM2	15.31	B	0–43	1	–	F	25(2)
QUE 99887	LL5	13.842	B/C	–	–	–	F	25(2)
QUE 99888	LL5	6.102	A/B	–	–	–	F	25(2)
QUE 99889	LL5	12.332	B	–	–	–	F	25(2)
QUE 99890	LL5	41.863	B/C	–	–	–	F	25(2)
QUE 99891	LL5	46.975	B/C	–	–	–	F	25(2)
QUE 99892	LL5	11.387	B	–	–	–	F	25(2)
QUE 99893	LL5	22.162	B/C	–	–	–	F	26(1)
QUE 99894	LL5	14.633	B	–	–	–	F	25(2)
QUE 99895	LL5	9.933	B	–	–	–	F	25(2)
QUE 99896	LL6	8.796	B/C	–	–	–	F	25(2)
QUE 99897	LL5	8.33	B	–	–	–	F	25(2)
QUE 99898	LL5	6.948	B	–	–	–	F	25(2)
QUE 99899	LL5	12.516	B	–	–	–	F	25(2)
QUE 99900	L5	11.511	B	–	–	–	F	25(2)
QUE 99901	LL5	7.736	B	–	–	–	F	25(2)
QUE 99902	LL5	1.34	B/C	–	–	–	F	25(2)
QUE 99903	LL5	0.337	B/C	–	–	–	F	25(2)
QUE 99904	LL5	3.732	A/B	–	–	–	F	25(2)
QUE 99905	LL5	7.005	A/B	–	–	–	F	25(2)
QUE 99906	LL5	3.043	B	–	–	–	F	25(2)
QUE 99907	LL5	3.244	A/B	–	–	–	F	25(2)
QUE 99908	LL5	0.364	C	–	–	–	F	25(2)
QUE 99909	LL5	1.396	A/B	–	–	–	F	25(2)
QUE 99910	LL5	0.496	B/C	–	–	–	F	25(2)
QUE 99911	LL5	0.757	B/C	–	–	–	F	25(2)
QUE 99912	LL5	1.013	B/C	–	–	–	F	25(2)
TEN 00001	L6	11.143	B/C	24	21	–	–	25(2)
TEN 00002	L6	19.847	B/C	24	21	–	–	25(2)

[a] See "Notes to Table 2" in the Meteoritical Bulletin 79 (1996) for explanation of columns.

[b] Abbreviations for meteorite names: BTN = Bates Nunataks; CRE = Mt. Crean; FIN = Finger Ridge; MET = Meteorite Hills; QUE = Queen Alexandra Range; TEN = Tentacle Ridge.

[c] Ice field names: 22 = W. Foggy Bottom Moraine; 24 = North Tail's End Icefield; 25 = Bates North; 26 = Lower Vee; F = Goodwin Nunataks Icefields; S = Mare Meteoriticas.

Appendix 2. Recently described meteorites from Japanese NIPR expeditions.

Name	Class	Mass (g)	Weath	Fa	Fs	Ref
A-880036	L6	14.33	B/C	24.2	20.1	NIPR MN 11(1)
A-880042	L6	10.86	A/B	24.0	20.6	NIPR MN 11(1)
A-880055	L6	11.29	A/B	25.2	20.8	NIPR MN 11(1)
A-880067	H5	61.40	C	19.2	16.3	NIPR MN 11(1)
A-880068	H5	37.98	C	18.6	16.5	NIPR MN 11(1)
A-880069	H5	43.30	C	18.6	16.1	NIPR MN 11(1)
A-880070	H5	100.55	C	18.8	16.2	NIPR MN 11(1)
A-880071	H5	57.45	C	18.7	16.0	NIPR MN 11(1)
A-880072	H5	25.66	C	18.8	16.2	NIPR MN 11(1)
A-880073	H5	54.97	C	18.7	16.3	NIPR MN 11(1)
A-880601	H4	28.70	A	18.3	16.0	NIPR MN 11(1)
A-880602	H4	91.36	B	17.5	15.4	NIPR MN 11(1)
A-880604	H5	24.19	C	18.2	15.9	NIPR MN 11(1)
A-880605	H6	79.20	B	18.9	16.2	NIPR MN 11(1)
A-880606	H5	19.14	B/C	18.6	16.1	NIPR MN 11(1)
A-880609	H4	62.10	B	17.2	15.3	NIPR MN 11(1)
A-880613	H3	190.86	A/B	9.5–20.7	1.0–31.4	NIPR MN 11(1)
A-880614	H5	11.93	C	18.4	16.3	NIPR MN 11(1)
A-880615	H5	496.51	B	18.4	16.2	NIPR MN 11(1)
A-880616	H5	74.39	B	19.6	16.8	NIPR MN 11(1)
A-880617	L6	35.47	A	24.9	20.8	NIPR MN 11(1)
A-880618	H4	16.07	B/C	17.6	15.7	NIPR MN 11(1)
A-880620	H3	99.57	A/B	7.6–28.3	3.4–20.7	NIPR MN 11(1)
A-880621	Euc	48.62	A	–	30.2–37.0	NIPR MN 11(1)
A-880622	H4	59.48	B	17.6	15.4	NIPR MN 11(1)
A-880623	H5	12.65	B	18.9	16.4	NIPR MN 11(1)
A-880624	H3	91.68	A/B	4.3–26.8	4.2–23.0	NIPR MN 11(1)
A-880625	L6	47.26	A/B	24.7	20.5	NIPR MN 11(1)
A-880626	H6	23.58	A/B	19.4	16.9	NIPR MN 11(1)
A-880627	H6	30.60	B	18.1	15.9	NIPR MN 11(1)
A-880628	H4	10.62	B	17.8	15.5	NIPR MN 11(1)
A-880630	H3	11.72	A/B	16.6–27.0	14.6–26.3	NIPR MN 11(1)
A-880632	LL6	16.61	B	30.0	24.8	NIPR MN 11(1)
A-880633	H4	553.61	B/C	18.1	15.7	NIPR MN 11(1)
A-880634	H5	41.24	B/C	18.7	16.4	NIPR MN 11(1)
A-880635	H5	14.74	B/C	18.0	15.7	NIPR MN 11(1)
A-880636	H4	149.15	B/C	18.5	16.1	NIPR MN 11(1)
A-880637	H4	107.84	B	17.3	15.3	NIPR MN 11(1)
A-880638	H4	99.31	B	17.4	15.3	NIPR MN 11(1)
A-880639	H4	88.68	B/C	17.2	15.1	NIPR MN 11(1)
A-880640	L6	7.18	A/B	24.0	20.1	NIPR MN 11(1)
A-880641	H3	154.23	A/B	17.5–22.5	2.7–23.0	NIPR MN 11(1)
A-880642	H4	36.49	B/C	18.4	16.0	NIPR MN 11(1)
A-880644	H4	99.38	B	17.4	15.3	NIPR MN 11(1)
A-880645	H4	40.10	B	17.5	15.1	NIPR MN 11(1)
A-880647	H4	53.13	B	17.4	15.3	NIPR MN 11(1)
A-880648	H4	41.01	B/C	17.3	15.2	NIPR MN 11(1)

Appendix 2. Recently described meteorites from Japanese NIPR expeditions. *Continued.*

Name	Class	Mass (g)	Weath	Fa	Fs	Ref
A-880649	H4	65.98	B/C	17.3	15.5	NIPR MN 11(1)
A-880652	Dio	29.35	B	–	22.9–26.4	NIPR MN 11(1)
A-880653	H4	16.79	B/C	18.5	16.4	NIPR MN 11(1)
A-880654	H4	21.16	B/C	18.5	16.4	NIPR MN 11(1)
A-880655	H4	30.20	B/C	18.4	16.7	NIPR MN 11(1)
A-880656	H4	133.17	B/C	17.4	15.5	NIPR MN 11(1)
A-880658	H4	34.56	B	18.0	15.9	NIPR MN 11(1)
A-880659	L6	83.42	A/B	24.7	20.6	NIPR MN 11(1)
A-880660	L6	11.50	B	24.1	20.2	NIPR MN 11(1)
A-880661	H4	128.91	B/C	17.2	15.4	NIPR MN 11(1)
A-880662	H5	27.64	C	17.9	15.7	NIPR MN 11(1)
A-880663	LL6	20.35	B	29.3	23.6	NIPR MN 11(1)
A-880664	H6	18.96	B/C	18.5	16.0	NIPR MN 11(1)
A-880665	H5	33.77	B/C	18.3	16.0	NIPR MN 11(1)
A-880666	L4	17.84	A/B	25.1	20.6	NIPR MN 11(1)
A-880667	L6	38.32	A/B	25.0	20.5	NIPR MN 11(1)
A-880668	H4	14.10	B	17.5	15.4	NIPR MN 11(1)
A-880669	L6	20.42	A/B	24.7	20.4	NIPR MN 11(1)
A-880671	LL4	20.35	A/B	27.6	22.4	NIPR MN 11(1)
A-880672	H4	19.92	B/C	18.4	16.4	NIPR MN 11(1)
A-880673	H6	18.00	B/C	18.4	16.5	NIPR MN 11(1)
A-880674	H5	18.90	B/C	18.8	16.2	NIPR MN 11(1)
A-880675	H4	385.28	A/B	16.9	14.9	NIPR MN 11(1)
A-880676	H3	112.96	B	1.1–26.4	2.4–29.3	NIPR MN 11(1)
A-880679	H4	38.77	B	18.5	15.9	NIPR MN 11(1)
A-880684	H3	60.26	A/B	11.5–20.9	6.1–17.5	NIPR MN 11(1)
A-880685	H5	42.37	B/C	17.8	15.7	NIPR MN 11(1)
A-880686	H5	22.50	B	17.9	15.5	NIPR MN 11(1)
A-880688	L6	19.55	A/B	24.6	20.4	NIPR MN 11(1)
A-880691	CK4	28.77	A/B	30.1	25.9	NIPR MN 11(1)
A-880693	H5	36.63	B	18.8	16.5	NIPR MN 11(1)
A-880694	H4	10.36	B	18.3	15.9	NIPR MN 11(1)
A-880695	H3	138.69	B	15.8–20.5	16.3	NIPR MN 11(1)
A-880698	H3	12.96	A/B	17.7–23.3	6.8–20.7	NIPR MN 11(1)
A-880700	H4	327.50	A/B	18.3	16.0	NIPR MN 11(1)
A-880701	H4	44.30	A/B	18.1	15.9	NIPR MN 11(1)
A-880702	Euc	10.51	A	–	–	NIPR MN 11(1)
A-880703	H5	11.87	B	18.4	16.0	NIPR MN 11(1)
A-880704	H5	51.64	B/C	18.6	16.4	NIPR MN 11(1)
A-880708	L3	33.20	A	22.5–24.3	13.2–24.8	NIPR MN 11(1)
A-880709	H3	15.22	A	16.6–20.2	4.2–23.2	NIPR MN 11(1)
A-880710	H3	14.66	A/B	17.1–22.7	2.0–21.0	NIPR MN 11(1)
A-880711	H4	59.58	A/B	19.0	15.6	NIPR MN 11(1)
A-880712	L6	111.85	A/B	24.4	20.3	NIPR MN 11(1)
A-880713	H3	16.24	B	16.6–17.7	9.0–19.7	NIPR MN 11(1)
A-880715	H5	1909.25	A/B	18.4	16.0	NIPR MN 11(1)
A-880717	H6	41.41	B/C	18.6	16.2	NIPR MN 11(1)

Appendix 2. Recently described meteorites from Japanese NIPR expeditions. *Continued.*

Name	Class	Mass (g)	Weath	Fa	Fs	Ref
A-880718	CK5	30.18	A/B	29.6	–	NIPR MN 11(1)
A-880720	H5	44.29	B/C	18.5	16.1	NIPR MN 11(1)
A-880721	H5	113.20	B/C	18.7	15.9	NIPR MN 11(1)
A-880723	H5	16.57	B/C	18.6	16.2	NIPR MN 11(1)
A-880724	H3	78.24	A/B	1.9–22.9	7.3–18.1	NIPR MN 11(1)
A-880725	H6	48.72	A/B	18.6	15.3	NIPR MN 11(1)
A-880727	L6	11.05	A/B	24.1	20.4	NIPR MN 11(1)
A-880728	H4	13.01	A	18.2	15.7	NIPR MN 11(1)
A-880729	H3	239.61	A/B	17.6–23.2	12.4–18.6	NIPR MN 11(1)
A-880730	H4	24.09	B/C	17.7	15.7	NIPR MN 11(1)
A-880731	H6	10.06	A	18.5	16.1	NIPR MN 11(1)
A-880732	L6	13.89	A/B	24.1	20.0	NIPR MN 11(1)
A-880733	H4	16.72	B/C	18.7	16.5	NIPR MN 11(1)
A-880734	H4	44.19	B/C	18.5	15.8	NIPR MN 11(1)
A-880735	H4	442.46	B/C	18.3	15.6	NIPR MN 11(1)
A-880736	LL6	16.85	A	30.1	23.8	NIPR MN 11(1)
A-880737	H4	47.14	B/C	17.9	15.6	NIPR MN 11(1)
A-880738	L6	40.75	A/B	24.4	20.3	NIPR MN 11(1)
A-880740	H4	22.10	A/B	18.3	16.0	NIPR MN 11(1)
A-880741	H5	29.83	C	18.0	15.8	NIPR MN 11(1)
A-880742	H4	37.14	B/C	18.2	15.9	NIPR MN 11(1)
A-880743	H5	37.26	B/C	18.7	16.5	NIPR MN 11(1)
A-880744	H4	154.38	B/C	–	–	NIPR MN 11(1)
A-880745	H3	74.10	A	9.9–22.9	2.5–19.7	NIPR MN 11(1)
A-880746	H3	239.71	A/B	16.3–20.0	9.5–24.3	NIPR MN 11(1)
A-880747	LL6	246.41	A/B	29.5	24.0	NIPR MN 11(1)
A-880748	H6	23.49	A/B	19.0	16.4	NIPR MN 11(1)
A-880749	H6	16.65	A/B	19.0	16.8	NIPR MN 11(1)
A-880752	H6	72.01	B/C	18.6	16.2	NIPR MN 11(1)
A-880753	L4	36.29	A/B	25.7	21.3	NIPR MN 11(1)
A-880754	H5	10.35	A/B	18.0	15.9	NIPR MN 11(1)
A-880755	H4	11.90	B	17.1	15.1	NIPR MN 11(1)
A-880756	H5	62.37	B/C	18.2	15.9	NIPR MN 11(1)
A-880757	H4	90.28	A/B	18.0	15.8	NIPR MN 11(1)
A-880758	H5	80.85	B	18.9	16.0	NIPR MN 11(1)
A-880759	H5	69.42	B	18.5	16.2	NIPR MN 11(1)
A-880760	H5	68.42	B/C	18.4	16.2	NIPR MN 11(1)
A-880761	Euc	65.44	A	–	–	NIPR MN 11(1)

Appendix 2. Recently described meteorites from Japanese NIPR expeditions. *Continued.*

Name	Class	Mass (g)	Weath	Fa	Fs	Ref
A-880762	H4	155.30	B/C	17.7	15.6	NIPR MN 11(1)
A-880763	H5	54.73	B/C	18.5	15.6	NIPR MN 11(1)
A-880764	H4	38.36	B	17.8	15.8	NIPR MN 11(1)
A-880765	H4	60.09	B/C	17.9	15.7	NIPR MN 11(1)
A-880766	H4	25.24	B/C	17.2	15.1	NIPR MN 11(1)
A-880767	H4	44.01	A	17.8	15.5	NIPR MN 11(1)
A-880768	H5	44.62	B/C	20.1	16.6	NIPR MN 11(1)
A-880769	L6	47.68	A/B	24.4	20.4	NIPR MN 11(1)
A-880770	H6	1166.03	B	19.0	16.4	NIPR MN 11(1)
A-880771	H6	35.31	C	18.7	16.2	NIPR MN 11(1)
A-880772	L6	69.57	A	24.1	20.2	NIPR MN 11(1)
A-880773	H5	55.16	A/B	18.6	16.2	NIPR MN 11(1)
A-880774	L3	12.21	A	22.6–25.9	7.8–22.4	NIPR MN 11(1)
A-880775	LL6	30.76	A/B	31.2	25.6	NIPR MN 11(1)
A-880776	H5	153.78	B/C	17.5	15.5	NIPR MN 11(1)
A-880777	H5	105.15	B/C	18.4	15.9	NIPR MN 11(1)
A-880778	H5	53.40	B	18.5	16.0	NIPR MN 11(1)
A-880779	H5	92.48	B	18.6	16.8	NIPR MN 11(1)
A-880780	LL5	85.55	A	29.2	23.9	NIPR MN 11(1)
A-880781	H4	81.85	C	17.8	15.5	NIPR MN 11(1)
A-880782	H4	58.28	B	18.4	16.0	NIPR MN 11(1)
A-880784	Ure	44.22	A	–	–	NIPR MN 11(1)
A-880785	Dio	82.72	A	–	23.4–.3	NIPR MN 11(1)
A-880786	H4	47.05	B	18.2	15.8	NIPR MN 11(1)
A-880788	H5	220.13	A/B	17.8	16.5	NIPR MN 11(1)
A-880789	H4	61.55	B	18.5	16.0	NIPR MN 11(1)
A-880790	H4	40.60	B	18.4	16.1	NIPR MN 11(1)
A-880791	H4	27.02	B/C	18.3	16.1	NIPR MN 11(1)
A-880792	H6	28.75	A/B	18.7	16.5	NIPR MN 11(1)
A-880793	H3	67.01	B	15.2–.7	8.8–22.2	NIPR MN 11(1)
A-880794	H4	27.97	B	18.5	16.2	NIPR MN 11(1)
A-880795	LL4	27.91	A	28.7	22.7	NIPR MN 11(1)
A-880796	H5	43.14	B/C	17.8	15.6	NIPR MN 11(1)
A-880797	H5	43.29	B	18.1	16.2	NIPR MN 11(1)
A-880798	H4	25.59	B	17.9	15.7	NIPR MN 11(1)
A-880799	H4	21.85	B/C	18.3	15.8	NIPR MN 11(1)
A-880800	H4	51.52	B	18.6	15.9	NIPR MN 11(1)
Y-980459	SNC	82.46	A	15.8–25.9	16.8–26.7	NIPR MN 11(1)