Abundance and form of the most abundant elements in Earth's continental crust.

1 Oxygen 46.3 60.2 94.2 O²- in minerals and H₂O; small amount as elemental O₂ in atmosphere 2 Silicon 28.2 20.8 0.8 Almost all as Si⁴+ in silicate minerals; some as H₄SiO₄ in seawater 3 Aluminum 8.1 6.2 0.4 Almost all as Al³+ in minerals 4 Hydrogen 0.1 2.9 - Almost all as H⁺ in H₂O, OH in minerals, and HCO₃⁻ 5 Sodium 2.4 2.2 1.1 All as Na⁺, largely in minerals but also in seawater 6 Calcium 4.1 2.1 1.2 All as Ca²+, largely in minerals but also in seawater 7 Iron 5.4 2.0 0.4 Mostly as Fe²+ and Fe³+ in minerals 8 Magnesium 2.3 2.0 0.3 All as Mg²+, largely in minerals but also in seawater 9 Potassium 2.1 1.1 1.5 All as K⁺, largely in minerals but also in seawater 10 Titanium 0.5 0.2 0.04 Almost all as Ti⁴+ in minerals 11 Phosphorous 0.1 0.1 0.002 Mostly as P⁵+ in phosphate (PO₄³) 12 Fluorine 0.06 0.07 0.1 All as F₁ largely in minerals but also in seawater 13 Carbon 0.02 0.04 0.0003 Range of valence states from 4- to 4+ 14 Manganese 0.1 0.04 0.007 Mostly as Mn²+, Mn³+, and Mn⁴+ in minerals 15 Sulfur 0.03 0.02 0.004 Almost all as S⁶+ in sulfate (SO₄²-) or S²- in sulfides	Order of abundance		Weight % in crust	Molar % in crust	Volume % in crust	Typical natural form at Earth surface
$ some as H_4SiO_4 in seawater \\ 3 Aluminum \qquad 8.1 \qquad 6.2 \qquad 0.4 \qquad Almost all as Al^{3+} in minerals \\ 4 Hydrogen \qquad 0.1 \qquad 2.9 \qquad - \qquad Almost all as H^+ in H_2O, OH^- in minerals, and HCO_3 \\ 5 Sodium \qquad 2.4 \qquad 2.2 \qquad 1.1 \qquad All as Na^+, largely in minerals but also in seawater \\ 6 Calcium \qquad 4.1 \qquad 2.1 \qquad 1.2 \qquad All as Ca^{2+}, largely in minerals but also in seawater \\ 7 Iron \qquad 5.4 \qquad 2.0 \qquad 0.4 \qquad Mostly as Fe^{2+} and Fe^{3+} in minerals but also in seawater \\ 8 Magnesium \qquad 2.3 \qquad 2.0 \qquad 0.3 \qquad All as Mg^{2+}, largely in minerals but also in seawater \\ 9 Potassium \qquad 2.1 \qquad 1.1 \qquad 1.5 \qquad All as K^+, largely in minerals but also in seawater \\ 10 Titanium \qquad 0.5 \qquad 0.2 \qquad 0.04 \qquad Almost all as Ti^{4+} in minerals \\ 11 Phosphorous \qquad 0.1 \qquad 0.1 \qquad 0.002 \qquad Mostly as P^{5+} in phosphate (PO_4^{3-}) \\ 12 Fluorine \qquad 0.06 \qquad 0.07 \qquad 0.1 \qquad All as F^-, largely in minerals but also in seawater \\ 13 Carbon \qquad 0.02 \qquad 0.04 \qquad 0.0003 \qquad Range of valence states from 4- to 4+ \\ 14 Manganese \qquad 0.1 \qquad 0.04 \qquad 0.007 \qquad Mostly as Mn^{2+}, Mn^{3+}, and Mn^{4+} in minerals \\ 15 Sulfur \qquad 0.03 \qquad 0.02 \qquad 0.004 \qquad Almost all as S^{6+} in sulfides \\ \cdots$	1	Oxygen	46.3	60.2	94.2	- /
4 Hydrogen 0.1 2.9 - Almost all as H ⁺ in H₂O, OH ⁻ in minerals, and HCO₃ ⁻ 5 Sodium 2.4 2.2 1.1 All as Na ⁺ , largely in minerals but also in seawater 6 Calcium 4.1 2.1 1.2 All as Ca ²⁺ , largely in minerals but also in seawater 7 Iron 5.4 2.0 0.4 Mostly as Fe ²⁺ and Fe ³⁺ in minerals 8 Magnesium 2.3 2.0 0.3 All as Mg ²⁺ , largely in minerals but also in seawater 9 Potassium 2.1 1.1 1.5 All as K ⁺ , largely in minerals but also in seawater 10 Titanium 0.5 0.2 0.04 Almost all as Ti ⁴⁺ in minerals 11 Phosphorous 0.1 0.1 0.002 Mostly as P ⁵⁺ in phosphate (PO₄³⁻) 12 Fluorine 0.06 0.07 0.1 All as F⁻, largely in minerals but also in seawater 13 Carbon 0.02 0.04 0.0003 Range of valence states from 4- to 4+ 14 Manganese 0.1 0.04 0.007 Mostly as Mn²+, Mn³+, and Mn⁴+ in minerals 15 Sulfur 0.03 0.02 0.004 Almost all as S ⁶⁺ in sulfate (SO₄²⁻) or S²⁻ in sulfides	2	Silicon	28.2	20.8	0.8	
in minerals, and HCO $_3$ ⁻ Sodium 2.4 2.2 1.1 All as Na $_1$, largely in minerals but also in seawater Calcium 4.1 2.1 1.2 All as Ca $_2$ ⁻ , largely in minerals but also in seawater Iron 5.4 2.0 0.4 Mostly as Fe $_1$ ⁻ and Fe $_2$ ⁻ in minerals Magnesium 2.3 2.0 0.3 All as Mg $_2$ ⁻ , largely in minerals but also in seawater Potassium 2.1 1.1 1.5 All as K $_1$, largely in minerals but also in seawater In Titanium 0.5 0.2 0.04 Almost all as Ti $_2$ ⁻ in minerals but also in seawater In Phosphorous 0.1 0.1 0.002 Mostly as P $_2$ ⁻ in phosphate (PO $_3$ ⁻) Fluorine 0.06 0.07 0.1 All as F $_1$, largely in minerals but also in seawater Carbon 0.02 0.04 0.0003 Range of valence states from 4- to 4+ Manganese 0.1 0.04 0.007 Mostly as Mn $_2$ ⁻ , Mn $_2$ ⁻ , and Mn $_2$ ⁻ in sulfides Sulfur 0.03 0.02 0.004 Almost all as S $_1$ ⁻ in sulfides	3	Aluminum	8.1	6.2	0.4	Almost all as Al ³⁺ in minerals
but also in seawater 6 Calcium 4.1 2.1 1.2 All as Ca^{2+} , largely in minerals but also in seawater 7 Iron 5.4 2.0 0.4 Mostly as Fe^{2+} and Fe^{3+} in minerals 8 Magnesium 2.3 2.0 0.3 All as Mg^{2+} , largely in minerals but also in seawater 9 Potassium 2.1 1.1 1.5 All as K^+ , largely in minerals but also in seawater 10 Titanium 0.5 0.2 0.04 Almost all as Ti^{4+} in minerals 11 Phosphorous 0.1 0.1 0.002 Mostly as P^{5+} in phosphate (PO_4^{3-}) 12 Fluorine 0.06 0.07 0.1 All as F^- , largely in minerals but also in seawater 13 Carbon 0.02 0.04 0.0003 Range of valence states from 4- to 4+ 14 Manganese 0.1 0.04 0.007 Mostly as Mn^{2+} , Mn^{3+} , and Mn^{4+} in minerals 15 Sulfur 0.03 0.02 0.004 Almost all as S^{6+} in sulfate (SO_4^{2-}) or S^{2-} in sulfides	4	Hydrogen	0.1	2.9	-	
but also in seawater 7 Iron 5.4 2.0 0.4 Mostly as Fe^{2+} and Fe^{3+} in minerals 8 Magnesium 2.3 2.0 0.3 All as Mg^{2+} , largely in minerals but also in seawater 9 Potassium 2.1 1.1 1.5 All as K^+ , largely in minerals but also in seawater 10 Titanium 0.5 0.2 0.04 Almost all as Ti^{4+} in minerals 11 Phosphorous 0.1 0.1 0.002 Mostly as P^{5+} in phosphate (PO_4^{3-}) 12 Fluorine 0.06 0.07 0.1 All as F^- , largely in minerals but also in seawater 13 Carbon 0.02 0.04 0.0003 Range of valence states from 4- to 4+ 14 Manganese 0.1 0.04 0.007 Mostly as Mn^{2+} , Mn^{3+} , and Mn^{4+} in minerals 15 Sulfur 0.03 0.02 0.04 Almost all as S^{6+} in sulfate (SO_4^{2-}) or S^{2-} in sulfides	5	Sodium	2.4	2.2	1.1	
8 Magnesium 2.3 2.0 0.3 All as Mg^{2+} , largely in minerals but also in seawater 9 Potassium 2.1 1.1 1.5 All as K^+ , largely in minerals but also in seawater 10 Titanium 0.5 0.2 0.04 Almost all as Ti^{4+} in minerals 11 Phosphorous 0.1 0.1 0.002 Mostly as P^{5+} in phosphate (PO_4^{3-}) 12 Fluorine 0.06 0.07 0.1 All as F^- , largely in minerals but also in seawater 13 Carbon 0.02 0.04 0.003 Range of valence states from 4- to 4+ 14 Manganese 0.1 0.04 0.007 Mostly as Mn^{2+} , Mn^{3+} , and Mn^{4+} in minerals 15 Sulfur 0.03 0.02 0.004 Almost all as S^{6+} in sulfate (SO_4^{2-}) or S^{2-} in sulfides	6	Calcium	4.1	2.1	1.2	
but also in seawater 9 Potassium 2.1 1.1 1.5 All as K^+ , largely in minerals but also in seawater 10 Titanium 0.5 0.2 0.04 Almost all as Ti^{4+} in minerals 11 Phosphorous 0.1 0.1 0.002 Mostly as P^{5+} in phosphate (PO_4^{3-}) 12 Fluorine 0.06 0.07 0.1 All as F^- , largely in minerals but also in seawater 13 Carbon 0.02 0.04 0.0003 Range of valence states from 4- to 4+ 14 Manganese 0.1 0.04 0.007 Mostly as Mn^{2+} , Mn^{3+} , and Mn^{4+} in minerals 15 Sulfur 0.03 0.02 0.004 Almost all as S^{6+} in sulfate (SO_4^{2-}) or S^{2-} in sulfides	7	Iron	5.4	2.0	0.4	Mostly as Fe ²⁺ and Fe ³⁺ in minerals
but also in seawater 10 Titanium 0.5 0.2 0.04 Almost all as Ti^{4+} in minerals 11 Phosphorous 0.1 0.1 0.002 Mostly as P^{5+} in phosphate (PO_4^{3-}) 12 Fluorine 0.06 0.07 0.1 All as F^- , largely in minerals but also in seawater 13 Carbon 0.02 0.04 0.0003 Range of valence states from 4- to 4+ 14 Manganese 0.1 0.04 0.007 Mostly as Mn^{2+} , Mn^{3+} , and Mn^{4+} in minerals 15 Sulfur 0.03 0.02 0.004 Almost all as S^{6+} in sulfate (SO_4^{2-}) or S^{2-} in sulfides	8	Magnesium	2.3	2.0	0.3	<u> </u>
11 Phosphorous 0.1 0.1 0.002 Mostly as P^{5+} in phosphate (PO_4^{3-}) 12 Fluorine 0.06 0.07 0.1 All as F^- , largely in minerals but also in seawater 13 Carbon 0.02 0.04 0.0003 Range of valence states from 4- to 4+ 14 Manganese 0.1 0.04 0.007 Mostly as Mn^{2+} , Mn^{3+} , and Mn^{4+} in minerals 15 Sulfur 0.03 0.02 0.004 Almost all as S^{6+} in sulfate (SO_4^{2-}) or S^{2-} in sulfides	9	Potassium	2.1	1.1	1.5	· •
Fluorine 0.06 0.07 0.1 All as F ⁻ , largely in minerals but also in seawater 13 Carbon 0.02 0.04 0.0003 Range of valence states from 4- to 4+ 14 Manganese 0.1 0.04 0.007 Mostly as Mn ²⁺ , Mn ³⁺ , and Mn ⁴⁺ in minerals 15 Sulfur 0.03 0.02 0.004 Almost all as S ⁶⁺ in sulfate (SO ₄ ²⁻) or S ²⁻ in sulfides	10	Titanium	0.5	0.2	0.04	Almost all as Ti ⁴⁺ in minerals
but also in seawater 13 Carbon 0.02 0.04 0.0003 Range of valence states from 4- to 4+ 14 Manganese 0.1 0.04 0.007 Mostly as Mn^{2+} , Mn^{3+} , and Mn^{4+} in minerals 15 Sulfur 0.03 0.02 0.004 Almost all as S^{6+} in sulfate (SO_4^{2-}) or S^{2-} in sulfides	11	Phosphorous	0.1	0.1	0.002	Mostly as P ⁵⁺ in phosphate (PO ₄ ³⁻)
14 Manganese 0.1 0.04 0.007 Mostly as Mn^{2+} , Mn^{3+} , and Mn^{4+} in minerals 15 Sulfur 0.03 0.02 0.004 Almost all as S^{6+} in sulfate (SO_4^{2-}) or S^{2-} in sulfides	12	Fluorine	0.06	0.07	0.1	
15 Sulfur 0.03 0.02 0.004 Almost all as S^{6+} in sulfate (SO_4^{2-}) or S^{2-} in sulfides	13	Carbon	0.02	0.04	0.0003	Range of valence states from 4- to 4+
(SO_4^{2-}) or S^{2-} in sulfides	14	Manganese	0.1	0.04	0.007	Mostly as Mn ²⁺ , Mn ³⁺ , and Mn ⁴⁺ in minerals
	15	Sulfur	0.03	0.02	0.004	
>/3 Gold 0.0000003 0.00000003 - As Au' and Au'	 ≥73	Gold	0.0000003	0.00000003	_	As Au^0 and Au^+

Percentages are calculated from data for average continental crust in Appendix III of Krauskopf (1979). For a more recent but less complete compilation, see Taylor and McLennan (1985) The abundances of the first fifteen elements listed add up to 99.77 molar % of average crust. Gold is included solely to allow comparison of these 15 most abundant elements to a very scarce element. Volume percent for oxygen in boldface illustrates the paraphrase by Mason (1958) of the words of Viktor Goldschmidt that "the lithosphere may well be called the oxysphere".