Brief biography of Prof. Saburo Nagakura

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One of the most important purposes of the 7th International Symposium on Magnetic Field and Spin Effects in Chemistry and Related Phenomena (SCM2001) is to celebrate the 80th birthday of Prof. Saburo Nagakura, who is one of the pioneers of Spin Chemistry. This article shows his brief biography.

A brief biography of Prof. Saburo Nagakura is summarized in Table 1. He was born in Shizuoka, Japan, on October 3rd, 1920. In 1941 he was enrolled in the Department of Chemistry of the Faculty of Science of Tokyo Imperial University, where he studied physical chemistry with Prof. San-ichiro Mizushima. Because World War II began during his college period, the college curriculum for his class was shortened and he graduated from his university in 1943. He then became a technical officer in the navy and carried out research on the dielectric properties of materials. By the end of the war in 1945, he joined the Radiation Chemistry Research Institute of the University of Tokyo established by Prof. Mizushima. At that time Prof. Mizushima was the most active leader of structural chemistry research in Japan, but the facilities and space for research were severely limited. For example, the young Nagakura gathered snow to cool his samples. Amid the ruins of the war, he had a strong desire to rebuild fundamental research in chemistry in Japan.

In 1949 he was promoted to Associate Professor and he received a D.Sc from the University in 1953. His interests centered on the electronic structure of molecules and he formed a discussion group with a few colleagues which grew into the largest meetings in physical chemistry in Japan. During 1955–1957, he went abroad and worked with Prof. R. S. Muliken in Chicago and Prof. C. A. Coulson in Oxford. In 1959 Prof. Nagakura became a full professor at the Institute for Solid Sate Physics (ISSP) of The University of Tokyo, which was newly built for research on condensed materials. He directed the Molecular Science Section at ISSP. He was also the chief adjunct scientist in the Physical Organic Chemistry Laboratory of the Institute of Physical and Chemical Research (RIKEN) during 1961–1981.

In these laboratories, he welcomed numerous young people who loved science, trained them with a great enthusiasm to be real scientists, and succeeded in bringing them up to be active independent researchers. After his retirement from these positions in 1981, he became President of the Institute for Molecular Science in Okazaki. In 1985, he became President of the Okazaki National Research Institutes. He then established the Graduate University for Advanced Studies, of which he was President from1988 to 1995. Since 1995, he has been the Chairman of the Kanagawa Academy of Science and Technology. Prof. Nagakura has received many honors and prizes, including the followings: He was awarded the Chemical Society of Japan Prize in 1966, the Asahi Prize in 1971, and the Japan Academy Prize in 1987. He was President of the International Union of Pure and Applied Chemistry from 1981 to 1983 and President of the Chemical Society of Japan from 1984 to 1985. He became a Person of Cultural Merit in 1985 and received an Order of Cultural Merit in 1990. He was decorated with the Grand Cordon of the Order of the Sacred Treasure in 1995.

Prof. Nagakura's research interests were in the field of the electronic structures of molecules and molecular complexes before 1970, but he changed his major emphasis in the early

Table 1. Brief biography of Prof. Saburo Nagakura.

October 3, 1920	Born in Shizuoka, Japan
1941	Enrolled in the Department of Chemistry, Faculty of Science, Tokyo Imperial University
1943	Graduated from Tokyo Imperial University
1943	Technical Officer in the Navy
1945	Radiation Chemistry Research Institute, The University of Tokyo
1949	Associate Professor, Radiation Chemistry Research Institute
1953	D.Sc from The University of Tokyo
1955–57	Worked with Prof. R. S. Muliken in Chicago and Prof. C. A. Coulson in Oxford
1959–81	Professor, Institute for Solid Sate Physics (ISSP), The University of Tokyo
1961–81	Chief Scientist, Physical Organic Chemistry Laboratory, Institute of Physical and Chemical Research (RIKEN)
1981–85	President, Institute for Molecular Science (IMS)
1985–88	President, Okazaki National Research Institutes
1988–95	President, Graduate University for Advanced Studies
1995–	Chairman, Kanagawa Academy of Science and Technology

Table 2. Brief history of dynamic spin chemistry.

1963	CIDEP: Fessenden & Schuler
1965	S-T Mixing of Radical Pair: Hayashi, Itoh, & Nagakura
1967	CIDNP: Bargon *et al.* and Ward & Lawler
1969	RPM of CIDNP: Kaptein and Closs
1973	MFE, Thermal Reactions: Sagdeev *et al.*
1974	MFE, Pulse Radiolysis: Brocklehurst *et al.*
1974	MQ, Gaseous Fluorescence: Matsuzaki & Nagakura
1976	MFE, Photochemical Reactions: Tanimoto, Hayashi, Nagakura, Sakuragi, & Tokumaru, Hata, Weller *et al.*, and Michel-Beyerle *et al.*
1976	MIF, Photochemical Reactions: Buchachenko *et al.* and Molin *et al.*

Abbreviations: CIDEP (Chemically Induced Dynamic Electron Polarization), S-T Mixing (Singlet-Triplet Mixing), CIDNP (Chemically Induced Dynamic Nuclear Polarization), RPM (Radical Pair Mechanism), MFE (Magnetic Field Effect), MQ (Magnetic Quenching), MIE (Magnetic Isotope Effect).

1970's. At that time, he was in ISSP where there were many solid state physicists and many large magnets. From discussion with the physicists, he realized that studies of magnetic field effects (MFEs) on such dynamic behavior of molecules as energy transfer and chemical reactions would give birth to a promising new research area. In 1969, he published a general theory on the singlet-triplet (S-T) mixing of radical pairs. In 1974, he published a paper on the magnetic quenching of gaseous fluorescence. In 1976, he published a paper on MFEs on a photochemical reaction in solution. As you know well, they are pioneer works in Dynamic Spin Chemistry. A brief history of Dynamic Spin Chemistry is summarized in Table 2.

You will be sorry to hear that Prof. Nagakura was uncharacteristically ill in March of this year but you will rejoice with me, I am sure, at his complete recovery. We look forward as a community to celebrating his 85th birthday.