

Foreword

Biographical sketch of Professor Oleg Matveevich Nefedov



Professor Oleg M. Nefedov was born in Dmitrov (Moscow region) on November 25, 1931. He graduated from the D.I. Mendeleev Institute of Chemical Technology (Moscow) in 1954. He received his candidate of sciences (Ph.D.) degree in 1957 at the same institute. In 1957 Oleg Nefedov joined the N.D. Zelinsky Institute of Organic Chemistry, Russian (former USSR) Academy of Sciences. In 1959–1960 Oleg Nefedov worked with Professor Georg Wittig at Heidelberg University. In 1967 he received his Doctor of Sciences degree (organic chemistry) at the N.D. Zelinsky Institute of Organic Chemistry. From 1968 up to the present day, he has been Professor of Chemistry and the head of the Laboratory of Carbenes and Small Ring Chemistry at the N.D. Zelinsky Institute of Organic Chemistry, Russian (former USSR) Academy of Sciences. In 1979 Professor Nefedov was elected as a Corresponding Member of the USSR Academy of Sciences and in

1987—as a full member (Academician) of the USSR Academy of Sciences—Russian Academy of Sciences. Since 1988, up to the present day—he has been the Vice President of the Russian (former USSR) Academy of Sciences. Professor Nefedov is a member of the IUPAC Bureau (since 2000).

Oleg Nefedov is a well-known scientist in the field of organic, physical organic and organometallic chemistry. He is one of the founders of the modern chemistry of carbenes and their Group 14 element analogs—silylenes, germlyenes, stannylenes—the important class of reactive intermediates. His review published in *Angewandte Chemie* in 1966 actually initiated the development of this new field of organometallic chemistry. In tight cooperation with colleges in Russia and abroad, he has developed new methods for the generation of these species, studied their structure and reactivity using different physical–chemical methods and quantum–

chemical calculations. In particular, the first data on the structure of short-lived carbene analogs (dihalosilylenes and dihalogermynes) as well as allyl radicals in gas phase were obtained by electron diffraction; low temperature matrix isolation was successfully used to spectroscopic observation and investigation of carbenes, carbene analogs, complexes of carbene analogs with n - and π -donor agents, free radicals. In 1976 Oleg Nefedov and his co-workers succeeded in the isolation in low temperature matrices and the direct IR spectroscopic detection of the first molecules with silicon-carbon double bonds. Using the same technique, the related derivatives of double-bonded silicon (siladienes, silanones) and germanium (germenes, germadienes, germanones, germathiones) were matrix isolated and studied in 80–90th.

Strained silicon- and germanium-containing heterocycles are the subject of particular interest in Professor Nefedov's laboratory. In 1985 the first germacyclopentene was isolated in an individual form and its structure was determined by X-ray analysis. Recently the mechanisms of photochemical generation of silylenes and germynes from the derivatives of strained 7-sila- and 7-germanorbornadienes were studied in detail using spin chemistry methods.

Another area of Professor Nefedov's research activity is related to the chemistry of diazocompounds, cyclopropanes and cyclopropenes. He and his co-workers investigated the catalytic cyclopropanation of mono- and polyunsaturated compounds by aliphatic diazocompounds. Regio- and stereoselectivity of these reactions in the presence of transition metal complexes have been studied and preparative methods for the synthesis of cyclopropane and cyclopropene derivatives including some pyrethroids and polycyclic hydrocarbons were found. A new perspective synthetic method of the direct cyclopropanation of monosubstituted and strained carbon-carbon double bonds by diazomethane generated in situ has been elaborated.

Principally, a new approach to the introduction of fluorine into aromatic rings was developed in Professor Nefedov's laboratory. The method is based on gas-phase generation and cycloaddition of fluorohalocarbenes and polyfluoroolefines to the unsaturated hydrocarbons followed the thermal isomerization of fluoro-containing cyclopropanes and cyclobutanes. Using these methods the key syntheses of high effective fluoro-containing biologically active compounds and drugs were obtained.

Professor Oleg Nefedov has authored five books and numerous papers, a significant proportion of which have been published in the *Journal of Organometallic Chemistry*.

Professor Nefedov has been a Visiting Professor at Pennsylvania State University (USA), Kyoto University (Japan), University of Paris, Orsay (France), and Hamburg University (Germany). He has been recognized with numerous awards and honorary degrees. He is a Fellow of the Collegium Ramazzini, Bologna, Italy (1990), Honorary Fellow of the Royal Society of Chemistry, London, UK (1991), Member of the Academia Europaea, London, UK (1991), Member of the Academia Scientiarum et Artium Europaea, Salzburg, Austria (1991), Foreign Member of the Georgia Academy of Sciences (1996), Member of the Asia-Pacific Academy of Materials (APAM), Bangalore, India (1997), Foreign Member of the National Academy of Sciences of Ukraine (2000), Honorary Professor of Harbin Polytechnic Institute, China (2000). Professor Oleg Nefedov was awarded with USSR State Prize (twice, in 1983 and 1990), N.D. Zelinsky Prize (Moscow, USSR, 1987), Prize of the USSR and Hungarian Academies of Sciences, (Moscow, USSR, 1988), N.N. Semenov Prize (Moscow, Russia, 1991), A.P. Karpinsky Prize, (Hamburg, Germany, 1993), D.I. Mendeleev Gold Medal (Moscow, Russia, 1998).

Oleg Nefedov is the founder of the Journal '*Mendeleev Communications*', published jointly by the Russian Academy of Sciences and the Royal Society of Chemistry (UK), Editor-in-Chief of the *Russian Chemical Bulletin* (Izvestiya Akademii Nauk, Seriya Khimicheskaya) and *Russian Chemical Reviews* (Uspekhi Khimii). He serves on the Advisory Boards of *Organometallics*, *Structural Chemistry*, *Bulletin of the Chemical Society of Japan*, and *Organic Preparations and Procedures International*.

Professor Nefedov has found time to contribute extensively to the development of new approaches to the education of chemistry in Russia. He is one of the organizers and the Chairman of the Higher Chemical College of the Russian Academy of Sciences. Professor Nefedov's numerous students are working in research centers in Russia and other former USSR countries, and in the USA, Canada, Israel, etc.

Oleg Nefedov's contribution to the field of organometallic chemistry has inspired his former students, co-workers and colleagues all around the world to dedicate this Special Issue of the Journal to his 70th birthday. We wish you, Professor Nefedov, good health and many more fruitful years in organometallic chemistry.

Mikhail Egorov
N.D. Zelinsky Institute of Organic Chemistry,
Russian Academy of Sciences,
Moscow, Russia