

In Memoriam of Aleksandr Yakovlevich Rozovskii

DOI: 10.1134/S0023158408030221

Aleksandr Yakovlevich Rozovskii, an outstanding scientist in the field of chemical kinetics and catalysis, Professor, Doctor of Chemistry, Chief Researcher (Head of the Laboratory of Kinetics until 2005) of the Topchiev Institute of Petrochemical Synthesis (Russian Academy of Sciences), and member of the editorial board of *Kinetics and Catalysis*, passed away on March 10, 2008.

Rozovskii was born on February 8, 1929, in Moscow. After graduating from Moscow State University in 1951, he worked at a chemical plant. From 1955 on, all his scientific activity was connected with the Topchiev Institute of Petrochemical Synthesis, where he headed the Laboratory of Kinetics beginning in 1975.

He started his scientific career while a student under the supervision of Prof. A.V. Frost, to whom he was grateful throughout his lifetime.

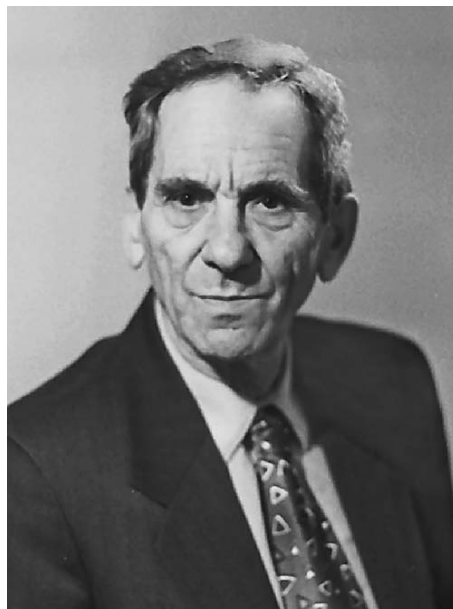
Rozovskii was a researcher successfully combining a keen intellect, original experimental approaches, and the capability to take a fresh view of the scientific problems he was addressing.

Rozovskii and his team carried out systematic studies in solid surface chemistry and surface compounds. Experimental methods for investigation of surface kinetics were developed. A number of redox reactions of surface compounds were studied using model systems and real catalysts. These studies qualitatively changed the conventional notion of the possible pathways of heterogeneous catalytic reactions. It was discovered that tight (“irreversible”) chemisorption is not a dead end of catalysis, contrary to what was thought before. Conversely, in many catalytic reactions, the formation and conversion of stable surface compounds and tightly chemisorbed products are within the main reaction pathway.

The most important result of Rozovskii’s studies in solid state chemistry is his kinetic and macrokinetic theory of heterogeneous reactions, primarily reactions involving a solid (gas–solid and liquid–solid reactions).

Based on his kinetic and mechanistic studies of catalytic reactions, Rozovskii put forward a new understanding of the role of the medium in catalytic reactions and discovered the self-regulation effect in catalytic systems.

In his series of studies on methanol synthesis, Rozovskii discovered a radically new macroscopic synthesis mechanism: he established that methanol results from the hydrogenation of CO₂, not CO. This series of stud-



ies was awarded a prize from the Council for Catalysis and Its Industrial Applications as the best work in the field of catalysis. In the studies that followed, he elucidated the detailed mechanism of the reactions involved in methanol synthesis and laid the modern physicochemical foundations of this process. Nearly all of the basic results of these studies anticipated the related results of other Russian and foreign researchers and were later confirmed by data obtained in other laboratories.

Rozovskii summarized his achievements in the following monographs: *Kinetics of Topochemical Reactions* (1974), *Heterogeneous Chemical Reactions: Kinetics and Macrokinetics* (1980), *Catalyst and Reaction Medium* (1988), and *Theoretical Foundations of Methanol Synthesis* (1990, coauthored with G.I. Lin). These monographs are widely known both in Russia and abroad.

In recent years, Rozovskii and his team carried out kinetic and mechanistic studies of methanol dehydrogenation into methyl formate, methanol steam reforming, methanol decomposition into CO and H₂, dimethyl ether synthesis, selective CO oxidation in the presence of hydrogen, etc.

In 2004, Rozovskii and Lin’s series of works entitled *Studies in the Kinetics and Mechanisms of Catalytic Reactions of One-Carbon Molecules* was awarded

a Balandin prize from the Presidium of the Russian Academy of Sciences. Based on these studies, Rozovskii and his colleagues developed a high-efficiency process for single-step synthesis of dimethyl ether from synthesis gas and suggested an efficient way of converting synthesis gas into motor fuels and valuable chemical products. The fundamental part of these studies was reported in a series of publications under the general title *New Concepts in the Kinetics of Catalytic Reactions and Their Use in Natural Gas Conversion into Motor Fuels and Valuable Chemical Products*. This series was awarded the Grand Prix from MAIK Nauka/Interperiodica in 1999.

Rozovskii was an organizer and an active participant of All-Union, All-Russia, and international conferences and symposia and was a member of scientific councils for catalysis and petroleum chemistry of the Russian Academy of Sciences. He was a member of the editorial boards of *Kinetika i Kataliz* (Kinetics and Catalysis), *Zhurnal Fizicheskoi Khimii* (Russian Journal of Physical Chemistry), and *Kataliz v Promyshlennosti* (Catalysis in Industry) and a member of the international editorial council of the journal *Protsessy Neftekhimii i Neftepererabotki* (Petrochemical and

Petroleum Refining Processes) of the National Academy of Sciences of Azerbaijan.

Rozovskii is the author of over 400 publications. His pupils include over 20 doctors and candidates of sciences. He was Meritorious Scientist of the Russian Federation and was decorated with the Order of Friendship, the Medal for Valiant Labor, and the Jubilee Medal "850 Years of Moscow."

Rozovskii was a real Russian intellectual realizing the responsibility of science to society and his own responsibility for developing the area of science in which he worked. He put great effort into education of young scientists and willingly accepted invitations to deliver a lecture or to be an opponent or an adviser. In scientific discussions, he was always exact and correct. He stood for the priority of facts and logic, but he never forgot to note the contribution made by earlier researchers and his colleagues. He had well-deserved authority among Russian and foreign scientists and industries.

Those who were lucky to know Aleksandr Yakovlevich Rozovskii of blessed memory, to communicate with him, or to be his colleagues will remember him forever.