Kinetics and Catalysis, Vol. 42, No. 3, 2001, pp. 432–433. Translated from Kinetika i Kataliz, Vol. 42, No. 3, 2001, pp. 479–480.

CHRONICLE

Vladimir Borisovich Kazanskii

(On the Occasion of His 70th Birthday)

On June 28, 2001, Editor-in-Chief of *Kinetics and Catalysis*, member of the Russian Academy of Sciences, Head of the Laboratory of Radiospectroscopic and Optical Methods of Mechanistic Studies of Heterogeneous Catalysis at the Zelinskii Institute of Organic Chemistry, Vladimir Borisovich Kazanskii celebrates his 70th birthday.

Vladimir Borisovich Kazanskii is an eminent scientist whose works in the field of catalysis, spectroscopy, quantum chemistry, chemistry and physics of surfaces are well known in our country and abroad. His scientific interests include the development of fundamentals of catalysis, that is, the elucidation of relationships between the structures of active sites on heterogeneous catalysts, intermediates formed on their surfaces, and catalytic reaction mechanisms.

Kazanskii was the first to introduce several methods and techniques into the practice of catalysis research. He usually combines spectroscopic studies and quantum chemical calculations for which he developed and justified the cluster principle for describing active and adsorption sites on heterogeneous catalysts.

A series of Kazanskii's mechanistic studies devoted to complete and selective oxidation on supported oxide catalysts led him to the discovery of adsorbed O^- and O^{2-} radicals, which were proven by the EPR method. He showed that these radicals determine the reactions of complete oxidation on dilute supported catalysts.

When he studied the structure and properties of low-coordination cations of noble and transition metals on the surfaces of oxide catalyst by spectroscopy, Kazanskii was the first to show that they are active sites in the reactions of olefin conversions. These studies formed the basis of a new field—the coordination chemistry of surface compounds.

Kazanskii contributed greatly to radiocatalysis and photocatalysis. He determined the mechanism for the transfer of light energy absorbed by oxides and the energy of ionizing radiation via adsorbed molecules, studied the structure and reactivity of the hole sites O^-, and found the phenomenon of low-temperature selective photoreduction of the surface of supported oxide catalysts, which is an efficient way for their activation.

Many studies by Kazanskii in the field of acid–base catalysis are of priority. Thus, he showed that Lewis sites on the surfaces of oxides are nothing but acid–base pairs in which both low-coordination cations and the nearest basic oxygen atoms are important. Kazanskii found that synchronous mechanisms are very common in catalytic conversions of hydrocarbons and that adsorbed aliphatic carbocations are not stable intermediate species but rather excited transition states.

Kazanskii was the first to show experimentally that, in nonaqueous solutions, the simplest stable solvates of proton are formed due to a strong quasi-symmetric H-bond. He conjectured and proved that the strong quasi-symmetric H-bond is formed in heterogeneous processes. These advances became possible thanks to his use of vibrational spectroscopy, specifically diffuse-reflectance IR spectroscopy, for the identification of intermediate complexes in heterogeneous reactions. Several Kazanskii's studies are of fundamental importance for understanding the mechanisms of homogenous acid–base catalysis. Thus, he was the first to pay attention to the fact that the energetics of proton hydration in water is limited to six molecules. He proposed an idea that an increased catalytic activity of superacids is due to relatively low energy of proton solvation and

0023-1584/01/4203-0432$25.00

to the dominating role of anion solvation during superacid dissociation.

Kazanskii was the first to propose and theoretically justify using present-state quantum chemical methods the possibility for generating carbenium ions from alkyl sulfates and alkyl fluorides in strong solutions of sulfuric and hydrofluoric acids.

The latter work is important both theoretically and practically since it sheds light on the mechanism of large-scale commercial process of alkylbenzene synthesis. Although Kazanskii carries out mostly basic research, he also gives a lot of attention to the issues of applied science. He introduced into the practice of catalytic studies diffuse-reflectance IR spectroscopy, EPR spectroscopy, and programs for cluster quantum chemical calculations, which are widely used in many laboratories. Collaborative studies by Kazanskii with researchers from academic and applied-research institutes made it possible to improve several important catalysts.

Kazanskii is the author of more than 500 research papers, monographs, reviews, and patents. He developed a scientific school: more than 40 of his students are now doctors and candidates of sciences, who successfully work in many leading Russian and foreign research centers. In recent years, Kazanskii became the Head of the Department of Physical Chemistry at the Higher Chemical College of the Russian Academy of Sciences, and teaches in this College. He developed a course on catalysis, which is unique and has no analogs in Russia.

Kazanskii works hard on the organization of science. For many years he has been a member of the Scientific Council on Catalysis of the Russian Academy of Sciences. He is a member of editorial boards of several Russian academic journals and international journals *Journal of Catalysis*, *Catalysis Letters*, *Advances in Catalysis*.

The editorial board of *Kinetics and Catalysis* expresses cordial congratulations to Vladimir Borisovich Kazanskii and wishes him good health and further professional success.