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Preface

Anniversaries whose number does not end in zero are not usually celebrated so fully as jubilees. This is the reason why the 45th anniversary of the Boreskov Institute of Catalysis (hereafter, the Institute), which was officially founded in May 1958, was not widely advertised. Nevertheless, prompted by the editorial board of *Kinetics and Catalysis*, we have prepared a journal issue devoted to current research at the Institute, particularly to studies in fundamental areas of catalysis science.

The Institute was established in 1958 in order to tackle problems of the USSR chemical process industries. In the same year, the government decided to build a large number of refineries, which later became widely known, and to establish 17 specialized and three academic chemical institutes.

The Institute was set up within the newly formed Siberian Division of the USSR Academy of Sciences with the aim of combining fundamental and applied research in catalysis, which is among the most important fields of chemistry. The main fundamental problems posed for the Institute were to develop a theory capable of predicting catalytic effects and to construct mathematical models for catalytic processes in order to strengthen the impact of fundamental research on industrial catalysis.

Analysis of the years that have elapsed since the foundation of the Institute shows that, on the whole, the above problems have been solved. Fundamental science made the greatest contribution to domestic industry in the late 1980s, when the Institute became the leading institution of MNTK Katalizator, a prominent Soviet research corporation. MNTK Katalizator has had a strongly favorable impact on domestic industry, taking advantage of administrative methods of management and centralized planning.

Along with solving applied problems, the Institute conducts fundamental studies, which were long managed and guided by Academician G.K. Boreskov. The Institute's theoretical research in the 1960s and 1970s was focused on substantiation of the chemical theory of catalysis, which is now commonly accepted. A marked progress in fundamental research was made in the late 1970s, when K.I. Zamaraev arrived at the Institute. Later, he was promoted to Academician. He promoted a wide variety of new physical methods for studying catalysis on the atomic and molecular levels.

Investigation of catalytic processes and catalysts on the atomic and molecular levels is still the main concern of the Institute. The emphasis is now on *in situ* studies of catalytic processes and states of catalysts. Taking full advantage of modern physical methods is still typical of the Institute's studies. This is possible owing to the fact that the Institute steadily improves its own instrumentation—it did this even in the 1990s, when Russian science went through some hard times—and works in close contact with foreign researchers and institutions, as is evident from the names of the authors of publications in *Kinetics and Catalysis*, especially in this issue.

At present, the specific features of the Institute are that it widely applies modern physical methods to investigation of heterogeneous catalysts (including model systems), invokes thermodynamic theory much more frequently than before, and makes efficient use of modern quantum chemical methods. The priority area of investigation is still partial oxidation and polymerization of olefins. Much attention is given to novel catalytic processes, including photocatalysis and selective oxidation with unconventional oxidizers such as nitrous oxide. As before, much thought is given to the technological advancement of catalytic processes. In recent years, many noteworthy results have been obtained with structured catalysts and/or very short contact times. The achievements of the Institute in this area are demonstrated in this issue.

A single specialized journal issue cannot cover all lines of investigation or provide a complete idea of this large institution which employs some 400 researchers and includes more than 50 scientific divisions. However, we hope that this issue will familiarize the reader with the Institute's current priorities in fundamental research.

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