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Metal complex catalysis

Metal complex catalysis belongs to those few fields of modern chemistry the active interest in which by specialists has not diminished in three decades. This can be explained by the evident prospect of being able to use transition metal complexes in fine and large scale organic synthesis and the theoretical importance of the problem of metal–ligand interactions for natural science.

Here it is appropriate to mention the prediction by M Taube made as early as 1972: "At one time it was customary to say that the prosperity of the country is reflected in the scale of the manufacture of sulphuric acid. However, this was the time of coal and steam, battleships, and TNT. It may be that in the future the prosperity of the country will be defined by figures illustrating the use of organometallic catalysts".

Clearly the monograph literature and even review articles concerning a vigorously developing branch of science are doomed to become rapidly obsolete. This is the reason why the Editorial Board of the journal *Uspekhi Khimii* decided to devote a topical issue of the journal to the latest advances in catalysis by metal complexes. All the authors in this issue are leading specialists actively working in this field of chemistry.

The limited size of the issue prevented the authors from covering the entire spectrum of different aspects of studies on metal complex catalysis or even its greater part. Thus questions concerning heterogeneous metal complex catalysis, which now constitutes a fairly broad field requiring special consideration, have not been touched upon.

In the present issue, we concentrated on key problems such as the activation of the C–C bond (review by M E Vol'pin and I S Akhrem), the C–H bonds of hydrocarbons†, catalysis of the polymerisation of ethylene (B A Krentsel' and L A Nekhaeva), catalysis of oxidation reactions (I I Moiseev and M N Vargaftik), applications of metal complexes in organic synthesis (I P Beletskaya and M A Bumagin) and organo-element synthesis (G A Tolstikov, U M Dzhemilev, and O S Vostrikova), macrocycles in catalysis (K B Yatsimirskii), and prospects for the practical application of metal complex catalysts in the processing of solid organic raw material (B N Kuznetsov).

At the same time, in order to enable the readers to become at least briefly acquainted with the most striking results obtained in a wider field than that covered by the reviews presented, a list of such advances during the last 3–5 years is given at the end of the issue.

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†The review by A E Shilov and G B Shul'pin on the activation of C–H bonds was prepared somewhat earlier than the others and was printed in issue No. 9 in 1990.