

INFORMATION

DEVELOPING HIGH-CAPACITY REACTORS FOR IMPORTANT CHEMICAL PROCESSES

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In the Catalysis Institute of the Siberian Division of the Academy of Sciences of the USSR (Novosibirsk) from June 11-16, 1966 there was held a session of the Scientific Council to discuss the problem of "Catalysis and Its Industrial Applications," devoted to the problem of developing high-capacity reactors by means of mathematical simulation. The session was opened by the President of the Scientific Council on Catalysis, Academician G. K. Boreskov, who spoke at the plenary session on June 11 and presented a report in which he discussed the main problems facing the Scientific Council on Catalysis in the year 1966. Associate Member of the Siberian Division of the Academy of Sciences of the USSR M. G. Slin'ko formulated the principal assumptions which must be made in developing and planning high-capacity reactors. Chief Engineer of the VNIINP, A. V. Agafonov described the results of work at the Institute to improve present industrial cat-cracking plant with mobile layers of coarse-grained catalyst, and the results of development work on high-capacity reactor units for a number of other processes, including cat-cracking with a general fluidized bed, cat-cracking in staged-counterflow apparatus, thermal-contact cracking of heavy petroleum residues in a fluidized bed, and hydrocracking in stationary catalysts.

The Czech scientists J. Beranek and D. Sokol described some aspects of the theory of the fluidized bed. A report by V. M. Dobkin (NIOPiK) analyzed the choice of economic optimization criteria in development of reactors.

In the section on simulation of contact processes, the following reports were presented:

K. K. Kirdin (Ministry of Chemical Production of the USSR) and M. G. Slin'ko: Sequence of stages in development of chemical reactors.

I. A. Burovyi (Moscow Institute of Steel and Alloys) and V. M. Dobkin: forced stabilization of stationary unstable states of exothermic processes.

N. N. Ovchinnikov and colleagues (GIPKh): development of industrial technology for catalytic reduction of aromatic nitro-compounds in the liquid phase under pressure, and construction of high-capacity reactors for these processes.

In the section on catalytic organic synthesis, V. Ya. Polotnyuk (NIOPiK) presented the results of work on intensification of oxidation of naphthalene to phthalic anhydride in a fluidized-bed catalyst, and the prospects for building high-capacity apparatus. From NIFKhI im. L. Ya. Karpov and Giprogaztopprom, G. D. Lyubarskii, Yu. S. Snagovskii, and I. R. Chernii presented a mathematical model of a benzene-hydrogenation reactor; while V. S. Beskov and his colleagues (Institute of Catalysis of the Siberian Branch of the Academy of Sciences of the USSR) and G. S. Yablonskii and his colleagues presented the results of developing apparatus for obtaining formaldehyde with oxide catalysts and for hydrochloridization of acetylene in a stationary catalyst bed.

At the sections on catalytic processes of inorganic and organic synthesis, reports were heard from workers at the Ministry of Chemical Production of the USSR, and also from several other institutes (NIISS, GIAP, NIOPiK, etc.). The influence of efficient diffusion and heat conduction on the operation of a radial catalyst bed in high-capacity ammonia-synthesis plant was assessed in a report by A. Ya. Raskin and his co-authors (NIISS, GIAP). A report by M. B. Aizenbud, Z. I. Vorotilina and Yu. A. Sokolinskii (GIAP) was devoted to aspects of the theory of optimization of the high-capacity ammonia-synthesis column; a report by R. P. Rumyantsev, V. M. Dobkin and V. N. Geiman (Ministry of Chemical Production of the USSR, NIOPiK) discussed problems in intensification of the oxidation of o-xylene to phthalic anhydride in a reactor with a stationary catalyst bed.

Workers from TsNIIK and VNIINP (A. D. Serebryanskii, V. V. Manshilin, A. A. Popov, and others) presented the section on catalytic conversion of hydrocarbons with a report on optimization of industrial cat-cracking with a general fluidized bed.

Technological and equipment problems associated with processes occurring above dust-type catalysts and heat-carriers were dealt with in reports by workers from VNIINP, I. M. Razumov E. Ya. Barsukov et al. V. A. Basov (VNIINP) presented a report on the technological efficiency of the fluidized bed and methods of solving the problems of scale conversion in technological processes in a fluidized bed.

In the section on catalytic dehydrogenation, S. S. Rozenoer and M. N. Shchedrik (Giprokauchuk) read reports on the results of work on industrial reactors for catalytic dehydrogenization of alkanes and alkenes and simulation of catalytic processes and reactors for dehydrogenation of n-butane. The design of a high-capacity reactor for obtaining styrene and α -methylstyrene was dealt with in a report by R. N. Volkov (Voronezh Branch of VNIISK). I. Ya. Tyuryaev (GIPKh) reported on improving the mathematical representation of an industrial hydrocarbon-dehydrogenation reactor.

The concluding plenary session of the Scientific Council discussed the work of the section and adopted some resolutions.