

CHRONICLES

THE TERMIYA-75 ALL-UNION CONFERENCE

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The Termiya-75 All-Union Conference was held November 25-27, 1975, in Leningrad; numerous topics in chemistry, heavy petrochemicals, and adjacent branches of industry were considered at plenary sessions and at meetings of sections, which were as follows: technology of electrothermal and plasmochemical processes, research on electrophysical processes in ore-treatment ovens, equipment for high-temperature and electrothermal processes, theoretical problems and methods, experimental researches on high-temperature heterophase processes, and high-temperature processes in fluidized beds and thermochemical ovens. Particular attention was given to the electrothermy of phosphorus (review papers by V. N. Belov, V. A. Ershov, N. S. Shumakov, and others), and also to the closely related topic of research into the improvement of ore-treatment ovens (papers by Ya. V. Dantsis, A. S. Mikulinskii, G. M. Zhilov, M. Z. Fainitskii, and others). The full papers and the summaries of communications (the sequence was first a review and then a discussion) indicated that the 72 MVA high-productivity ore-treatment oven has now been widely adopted in the USSR, which has provided a large phosphorus output. Some methods have been developed for approximate theoretical analysis of the physical and physicochemical processes in the oven (melting of phosphorites, interaction between the melt and coke, heat release on passage of a current, formation of incrustations, and so on), and studies have been made on industrial ovens (by probing), in conjunction with laboratory physical simulation. Another major trend is research on fluidization, especially as regards practical applications. In particular, this has occurred because six years have passed since the previous All-Union Conference on Fluidized Beds (Ivanovo, 1969) and it was necessary to discuss the numerous results obtained since then.

The review by A. P. Baskakov dealt in detail with the difficulties of objective application of the theory of two-phase fluidization; N. A. Shakhova indicated that there was scope for considering at least one of the mechanisms responsible for producing bubbles, which may be based on the jet theory. Much attention was also given to measurement methods for heterogeneous systems (O. M. Todes, M. M. Mandel'shtam, O. A. Myadrikov, M. B. Grinbaum, etc.). Particular importance attaches to methods of determining grain-size characteristics directly on equipment. Various forms of capacitance, magnetic, optical, ultrasonic, piezometric, and other devices have been proposed for the purpose. A. G. Sutugin described a simple method of estimating the grain-size distribution for a powder obtained by condensation, while S. P. Nalimov and S. I. Radin considered the stability in processes involving a variable dispersed phase.

These topics are directly related to the general approximate mathematical description of high-temperature processes in heterophase systems; the relationships are nonlinear, and the process itself is generally complex, so the result is that sometimes self-excited oscillations occur. On occasion, particularly in large-scale plants, such oscillations may hazard the equipment or the normal course of the process. This makes it necessary to supplement empirical engineering design methods by means of analyzing the scope for oscillation. E. A. Kazakova dealt with some practical topics related to these industrial problems.

Certain papers were concerned particularly with fluidization techniques, e.g., those by D. T. Mitev, N. B. Rashkovskaya, P. G. Romankov, N. S. Rassudov, I. P. Mukhlenov, A. T. Bartov, and others; considerable emphasis was placed on developing means of burning gaseous, liquid, and solid fuels in fluidized beds, which in some cases can very considerably reduce the escape of pollutants to the atmosphere. Here particular attention is attracted by ovens and steam generators containing fluidized beds, in which the bed contains additional heat-transfer surfaces, as well as multistage fluidized-bed systems (M. A. Veidemar, Yu. P. Nekhlebaev, and others). More attention to design aspects is required for the gas-distribution grids in fluidized-bed systems, particularly as regards fluidization of polydisperse systems, the effects of nonuniformity in fluidization, and the consequent loss of bed material (Yu. Ya. Kaganovich, Yu. Kh. Lokshin, V. M. Suroshnikov, etc.).

Translated from *Inzhenerno-Fizicheskii Zhurnal*, Vol. 31, No. 1, pp. 169-170, July, 1976.

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M. É. Aérov dealt with heat transfer in stationary and fluidized systems, and related topics were considered by N. I. Gel'perin, G. A. Nosov, V. G. Ainshtein, N. I. Syromyatnikov, and others. Considerable importance attaches also to the development of essentially novel high-temperature processes in chemical technology e.g., based on optical methods, plasma chemistry, high-frequency heating, and so on (L. S. Polak, V. D. Parkhomenko, S. A. Krapivin, and others).

The papers and discussions showed that there is a need to develop and introduce methods of automating routine measurements and computations in many research laboratories. In addition, the conference considered some aspects of energy technology (Z. F. Chukhanov, E. Kh. Rozenberg, L. N. Sidel'kovskii, and others), as well as environmental protection for industrial high-temperature and electrothermal processes (V. A. Povergo, V. D. Dement'ev, and others).

The participants felt the need to improve the coordination of research and design work in high-temperature and electrothermal processes, including the need to publish appropriate reference literature, organize special training courses for technologists, engineers, laboratory workers, and so on. In some instances it would be necessary to organize the training of engineers in certain new specialities.