

CHRONICLES

CONFERENCE OF THE SECTION ON "HEAT AND MASS TRANSFER IN THE HARDENING OF MATERIALS BASED ON BINDERS" OF THE COUNCIL ON PROBLEMS OF HEAT AND MASS TRANSFER IN TECHNOLOGICAL PROCESSES OF THE STATE COMMITTEE OF THE USSR ON SCIENCE AND TECHNOLOGY

A conference of the section on "Heat and Mass Transfer in the Hardening of Materials Based on Binders" devoted to an investigation of heat and mass transfer when obtaining high-strength building materials was held on Apr. 10-13, 1978, in Minsk at the A. V. Lykov Institute of Heat and Mass Transfer of the Academy of Sciences of the BSSR.

Seventy-nine delegates took part in the section representing 16 scientific research and academic institutes, universities and establishments from 12 cities of the Soviet Union.

Papers and contributions were published by the Institute of Heat and Mass Transfer under the title "Heat and Mass Transfer when Obtaining Very Strong Building Materials."

I. M. Akhvedov (BPI) and A. F. Polak (NIIPromstroï) reviewed the present state and future experimental and theoretical investigations of the process of hardening of very strong concrete and the theoretical principles of the technology of the hardening of binders.

General results of the work of the Kalinin Polytechnic Institute in investigations of heat and mass transfer processes in the hardening of concrete using different methods of heat dissipation and under different conditions of humidity of the surrounding medium were described by N. I. Gamayunov (KPI).

The paper by O. P. Mchedlova-Petrosyan (KhISI), devoted to problems of heat and mass transfer in the initial stages of the hydration of cement, and the contribution by I. M. Lyashkevich (ITMO) on problems of heat and mass transfer and the technology of obtaining very strong building materials based on gypsum and cement were of considerable interest.

Papers devoted to theoretical problems of the strengthening of gypsum obtained from high-strength artificial gypsum dihydrate, investigations of the thermal characteristics of concrete during thermal processing, investigations of the mass-transfer characteristics and porous structure of special concrete, the vapor formation of concrete during thermal processing when using a radiant method of heat dissipation, and the determination of the distribution laws of the granular composition of the components of a concrete mixture for high-strength concretes, were discussed.

It was pointed out that obtaining high-strength materials and, primarily, concretes, is one of the most pressing problems in the structural materials industry. According to the prospects for the development of concrete and reinforced concrete in the USSR, until the year 2000 the mass production of grade 700 concretes is proposed, and in individual cases of grades 800-1000.

Work on obtaining high-strength building materials based on gypsum and cement has been carried out at a number of scientific-research institutes and universities such as the ITMO of the Academy of Sciences of BSSR, the MIIZhBe, the BPI, the NIIPromstroe MIN-Promstroya of the USSR, the Minsk NIISM, the KhISI, etc.

The problem of obtaining high-strength building materials cannot be successfully solved without developing a single quantitative physicochemical theory of hydration, and the structure of binders, and also without controlling the heat and mass transfer processes in binders due to physicochemical interaction of the components and external actions.

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Work in this direction is being carried out at the present time without much coordination, not sufficiently actively, and without including fundamental and allied applied areas of science.

For the successful solution of this problem, for the further development of the theory of hardening of binders, and the scientific basis for controlling processes of structure formation, the section considered it necessary to endorse the trends and results of scientific research on obtaining high-strength building materials based on gypsum and cement carried out at the Laboratory of Electrothermal Processes of the Academy of Sciences of the BSSR, at the Laboratory of Heavy and Other Concretes, and at other establishments, and recommended that a series of investigations be carried on the development of the theoretical basis for the hydration process and structure formation in gypsum rock with the aim of obtaining high-strength materials and components.

The section also adopted a number of organizational measures to coordinate investigations in the area of the control of the processes of structure formation in concrete and the hardening of binders.

E. A. Raskina

TENTH ALL-UNION SYMPOSIUM ON RHEOLOGY

The Tenth All-Union Symposium on Rheology organized by the Division of Physics of Polymers of the Ural Scientific Center of the Academy of Sciences of the USSR and the Institute of Petrochemical Synthesis of the Academy of Sciences of the USSR under the direction of the corresponding divisions of the Academy of Sciences of the USSR, and also of the D. I. Mendeleev All-Union Chemical Society, took place on June 20-24, 1978 in Perm.

It was noted that scientists and engineers had actively participated in the programme of communist construction put forward by the Twenty-Fifth Congress of the Communist Party of the USSR with regard to increasing the efficiency of production, accelerating scientific-technical progress, and introducing scientific results into the national economy. Their efforts were directed to completing the Tenth Five-Year Plan ahead of schedule. Rheology is undergoing extensive development at the moment and should make a considerable contribution to the solution of pressing practical problems.

More than 230 specialists representing the main scientific centers of the country participated in the symposium. These included 25 doctors of science and 106 candidates, who are the leading specialists in various branches of science and technology.

Thirteen lectures and papers and 148 communications were presented.

The following rheological problems were considered: the mechanics of solutions and melts of polymers and composition materials based on them, the hydrodynamics of petroleum and petroleum products and the rheological behavior of drilling solutions and other materials. The symposium also brought out the trend in the rheology of filled and unfilled polymers which combine problems of flow with problems of fracture. New experimental and theoretical investigations enabling these materials to be widely used in industry were presented.

New results have been obtained regarding the connection between molecular characteristics and the rheological behavior of different polymers.

Particular attention was given to work in the area of the extraction and transport of petroleum and also the properties of petroleum products as they apply to problems of petroleum and gas techniques, providing a scientific basis for transportation processes.

A number of new problems in the hydrodynamics of anomalous-viscous liquids as they apply to processing, mixing and heat-transfer processes, have been solved.

During the last 2 years several monographs on rheology have been published which have increased the general level of rheological research in the USSR.

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