

CHRONICLES

SEVENTH ALL-UNION CONFERENCE ON LOW-TEMPERATURE PLASMA GENERATORS

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The Seventh All-Union Conference on Low-Temperature Plasma Generators, convened by the Siberian Branch of the Academy of Sciences of the USSR, the Ministry of Higher and Secondary Special Education (MVSSO) of the Kazakh SSR, the Academy of Sciences of the Kazakh SSR, and the Alma-Ata Power Institute, took place from August 30 to September 2, 1977, at Alma-Ata.

The work of the conference was carried out in the following seven principal fields:

1. schematic diagrams and power characteristics of plasmotrons;
2. theoretical studies of electric arcs;
3. experimental studies of electric arcs;
4. processes near electrodes;
5. arc plasma diagnostics;
6. hF and sHF plasma generators;
7. plasmotron power sources.

At 24 sessions 205 reports, which were published in three volumes before the start of the conference, were heard and discussed.

Participating in the work of the conference were 338 Soviet scientists, and eight foreign specialists [German Democratic Republic (GDR), Polish People's Republic (PPR), USA, Federal Republic of Germany (FRG), and Canada].

N. N. Rykalin and L. S. Polak addressed the conference with reports of a problem-solving character, reflecting the current state and the prospects for the development of plasma chemistry and metallurgy. The achievements and the prospects in obtaining cast refractory materials required in the metallurgical and glass industries were illuminated in the report "The use of low-temperature plasma in the technology of refractory materials" (A. V. Bolotov et al.).

Reports devoted to the structural properties of electric-arc heaters and their operating life, especially those operating on water and steam, to linear plasmotrons with porous channels, and to a coaxial plasmotron with two sequential arc zones (A. V. Nikolaev, I. V. Popov, B. I. Mikhailov, E. M. Rudyak, and others) were heard with great interest.

Significant results have been achieved in the field of the creation of hF and sHF plasma generators; hf generators with a power of 1000 kW have been created and those with a power of 3 MW are being developed.

A number of reports were devoted to the technological applications of a low-temperature plasma, where the demands on plasmotrons, a large share of which can already be satisfied today, were defined.

Work on the theoretical and experimental study of electric arcs and to processes near electrodes, which are closely connected with practical problems arising in the development of plasmotrons and power sources, was widely represented (M. F. Zhukov, B. A. Uryukov, O. I. Yas'ko, I. G. Panevin, O. Ya. Novikov, and others).

The work of the section on "Processes near Electrodes" showed that practical interest in problems of the physics and technology of electrodes has also grown and that the processes taking place in the electrode plasma layer, the metal, and at cathode surfaces are being studied more deeply.

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The current state of work on electrode erosion and on processes at electrodes in a vacuum and at atmospheric pressure, in the presence of a magnetic field and without it, was illuminated in the review report of K. Kimblin (USA).

B. Bolanovski (PPR) dwelt on an impulse model of the cathode zone of an electric zone.

The reports to the section on "Arc plasma diagnostics" were divided into three main groups: questions of nonequilibrium and diagnostics of a nonequilibrium plasma; the improvement of diagnostic methods and new procedures; diagnostic apparatus.

Reports of W. Rother, W. Neumann (GDR), C. R. James (Canada), and J. Uhlenbusch (FRG) devoted to methods of plasma diagnostics, probe-type and optical, and their results were heard in the section.

A section on power sources operated for the first time at the Conference on Low-Temperature Plasma Generators. Direct-current power sources and new developments were discussed here: control of the parameters and processes in a plasma medium, separate power-source constructions, and auxiliary devices (M. E. Zarudi, P. I. Tamkivi, A. S. Markus, V. M. Egorov, and others).

In the conference resolution adopted at the concluding plenary session notice was taken of the principle directions in the creation of low-temperature plasma generators and emphasis was placed on the necessity of expanding work on processes near electrodes, electric arcs under complicated conditions, plasma diagnostics, the stability of the electric-discharge-power-source system, and coordination of the research on low-temperature plasma generators. The next conference on this problem was planned to be held in 1980.

RESOLUTION OF THE SECOND ALL-UNION CONFERENCE ON THE MECHANICS OF ANOMALOUS SYSTEMS

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The Second All-Union Conference on the Mechanics of Anomalous Systems, convened by the Academies of Sciences of the USSR and the Azerbaidzhan SSR, the Ministry of Higher and Secondary Special Education (MVSSO) of the USSR, the MVSSO of the Azerbaidzhan SSR, and the M. Azizbekov Azerbaidzhan Institute of Petrochemistry, met at Baku on September 26-28, 1977.

A total of 203 people took part in the work of the conference. The program of the conference included 99 reports in two sections: "The rheology and fluid dynamics of anomalous systems" and "Transfer processes. The motion of anomalous fluids in porous media. Application."

Principal attention was paid to the theoretical fluid dynamics of anomalous systems; the rheology of viscoelastic liquids; filtration theory for anomalous systems; the control of hydrodynamic characteristics using physical fields and admixtures; transfer processes in anomalous systems.

It was noted that over the period which has passed since the First Conference on the Mechanics of Anomalous Systems (Baku, 1969) the range of the research has expanded considerably and interest has grown in the fluid dynamics of viscoelastic systems and in new hydrodynamic methods of studying such systems; transfer processes and methods of controlling the flow and rheology of a fluid using physical fields are being studied intensively; efficient methods have been developed for calculating filtration flows of anomalous fluids. Non-equilibrium processes during filtration are being widely studied and their foundation within the framework of the theory of relaxing media is being developed. Numerical methods are being developed for the fluid dynamics of anomalous systems. A number of studies are directly connected with practical applications.

At the same time, it was noted at the conference that, as before, the required coordination between theoretical and experimental research is absent. Composite reports in which the theoretical research is conducted on a unified program with experimental research are rarely encountered. The coordination of the work carried out at different institutions of the country is inadequate. A number of experimentally observed phenomena

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