# PHYSICOTECHNICAL PROBLEMS OF INVESTIGATION OF MONODISPERSED SYSTEMS

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As is well known, in the last few years interest in breaking up a substance into monodispersed particles in order to obtain macroparticles with uniform parameters (sizes, charge, velocity, etc.) has increased substantially. The study of such monodispersed systems is revealing a number of new physical effects and is leading to the development of some new technologies. It can be stated that the investigation and application of monodispersed systems is a new fundamental and applied direction in science in which several well-known fields — hydrodynamics, thermal physics, electrophysics, and a number of others — are combined together.

This issue of Inzhenerno-fizicheskii Zhurnal is devoted to monodispersed systems. The articles present, first of all, the results of investigations on the production of monodispersed macroparticles by different methods (electrodispersion, forced capillary breakup, pulsed arc, etc.) from a wide collection of substances (cryogenic liquids, liquid metals, water and other solutions, etc.). The scientific principles of the formation of capillary jets in different devices that produce macroparticles are described and the questions of the effect of a number of factors on the parameters of monodispersed macroparticles are examined (heat exchange with the surrounding medium, electrification in a corona discharge, and effect of oxidation for liquid-metal jets).

Investigations concerning the thermophysical aspects are of great interest (behavior of drops and granules in different media, freezing of drops on cooled substrates, new methods of contact-free temperature diagnostics of drops, study of radiative heat exchange between macroparticles taking into account size effects, etc.).

There are a significant number of articles on electric charging and control of macroparticles and flows of macroparticles as well as articles on the electrophysical characteristics of macroparticles. They include a study of the maximum charge carried off by drops in the case of corona charging, a model of the flight of drops in electrodrop-jet devices, investigation of the mechanism of corona discharge of drops, questions of photoemission charging of drops, the study of induction charging of a flow of drops, and a number of other suggestions.

The results presented in the papers have wide applications in different cryodispersed, electrodrop-jet, heat-exchange, cryochemical, etc. devices and technologies. These technologies are already employed in power production and electronics, for obtaining new materials, and in medicine and biology. It should be expected that in the near future the spectrum of investigations and applications of monodispersed systems will increase and it is hoped that publication of this issue will contribute to this process.

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Translated from Inzhenerno-fizicheskii Zhurnal, Vol. 60, No. 4, p. 533, April, 1991.

0022-0841/91/6004-0399$12.50  