

**Proceedings of the Second All-Soviet Union Conference on Heat and Mass Transfer (1967).** C. GAZLEY, JR., J. P. HARTNETT and E. R. G. ECKERT (Editors)

IMPRESSIVE evidence of the active interest in heat and mass transfer is demonstrated in the Proceedings of the Second All-Soviet Union Conference on Heat and Mass Transfer that was held in Minsk, B.S.S.R., U.S.S.R. Approximately 450 papers, totalling 3500 pages, are presented in the seven volumes that comprise the proceedings which were published in 1967. Readers must note, however, that the papers were presented almost six years ago (in 1964) and recognise that progress has been made in the intervening years. It should also be noted that a third conference has been held in 1968. In spite of these factors, many of the papers consider problems, both basic and applied, which are of current interest.

The introduction to Vol. 1 entitled "Convective Heat Transfer in a Homogeneous Medium" by B. S. Petukhov provides a critique as well as a useful summary of both the papers and the general state of knowledge in this field. The following topics are covered in Vol. 1:

- I. Heat Transfer and Frictional Resistance in a Liquid or Gas the Physical Properties of which vary Appreciably with Temperature and Pressure.
- II. Heat Transfer and Frictional Resistance in Pipes and Channels of Different Shapes.
- III. Heat Transfer and Resistance Studies in Entry Sections of Pipes and Channels.
- IV. Studies on Increasing the Rate of Convective Heat Transfer.
- V. Unsteady-State Convective Heat Transfer.

P. Ginzburg, in his introduction to Vol. 2, entitled "Heat and Mass Transfer during Interaction of Solids with Liquid and Gas Flows (A Review)", first presents the basic conservation equations on a continuum basis and then proceeds to give the highlights and, frequently, many details of almost every paper printed in the volume. Since none of the papers have abstracts, the considerable effort expended by Ginzburg is all the more valuable and greatly enhances the value of the volume. The following topics are covered in Vol. 2:

- I. Studies of the Influence of Various Physical Factors on Heat and Mass Transfer in Laminar Boundary-Layer Gas Flow.
- II. Some Problems of Hydrodynamics and Heat Transfer in Gas Flow Around Solids.
- III. Theoretical Solution of Boundary-Layer Problems in the Presence of Physicochemical Transformations on a Surface with Consideration of Non-Steady-State Flow.
- IV. Theoretical and Experimental Solution of the Problems of Heat and Mass Transfer in Turbulent Flow.
- V. Turbulent-Jet Gas Flows.

Volume 3 contains articles on diffusion at the critical point, heat and mass transfer with a phase change and, in particular, heat and mass transfer during boiling under

critical heat flux conditions. The first paper in this volume, "Turbulent Heat and Mass Transfer in Physicochemical Transformations" by S. S. Kutateladze, covers a wide range of problems and should be of interest to the general reader as well as to the specialist.

Volume 4 contains articles on problems encountered in chemical technology as well as basic studies of heat and mass transfer in the presence of chemical and phase changes; for example, distillation and rectification, extraction, absorption and desorption, combustion and gasification.

The contents of Vol. 5 are divided into two sections:

- I. Heat and Mass Transfer in Dispersed Systems (Fluidized Beds and Two-Phase Flows).
- II. Drying Processes.

S. S. Zabrodsky has written a review and critique of the papers on disperse systems. A. S. Ginsburg provides a general discussion of drying processes which includes the papers printed and also presents a summary of drying methods, including drying materials in fluidized beds and in the suspended state, sublimation, infra-red radiation atomization and convective drying.

Theoretical studies in heat and mass transfer are presented in Vol. 6. The problems and techniques considered are quite diverse and the material is classified in the following manner:

- I. Analytical Methods of Solving Heat and Mass Transfer.
- II. Numerical Methods of Solution of Problems of Heat and Mass Transfer.
- III. Computational Methods and Simulation of Heat- and Mass-Transfer Processes.

"Thermophysical Properties of Various Heat Transfer Media and Methods of Their Determination" is the subject of Vol. 7. The article "Present State of the Problem of Estimating and Analyzing the Thermophysical Properties of Materials" by G. N. Dul'nev and A. F. Chudnovskiy is of general interest. This field (among others) has, however, undergone rapid advances; for example, in the determinations of the condensation coefficient of water, the use of ultrasonic methods and thin film resistance thermometers to obtain transport properties of gases, etc.

The translations are very good with only minor errors present; controversial for controversial, Meyerott for Meyerott, Rouse for Rose, and perhaps some differences in nomenclature; inequilibrium (nonequilibrium). As previously noted, it would have been helpful if the papers were provided with abstracts.

The volumes have a soft cover and the printing is very good in the usual xerographic format of University Microfilms. The price for the complete set of seven volumes is high, some £70. However, the volumes may be purchased individually, the cost ranging with the size of the volume. Although the specialist will, of course, be concerned with his particular area of interest the various critiques are also recommended for the general reader.

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