# *Preface*

If one attempts to rank the scientific accomplishments of the twentieth century and their impact on modern technology, the discovery of chain-branching reactions by Nikolai Nikolaevich Semenov would be among the top of the list. The results of Semenov's discovery — the combustion and explosion theory, the theory of elementary chain reactions, the theory of nuclear chain reactions, and the theory of thermal breakdown of dielectrics, just listing a few — influenced the progress in science and technology considerably. The amazing thing that bright individuals, like Semenov, do advance our knowledge by quantum jumps giving birth to novel technologies and extending the horizons of human imagination.

The International Symposium on Combustion and Atmospheric Pollution, dedicated to the memory of N. N. Semenov, has received an impressive response from the scientific community. The Symposium is aimed at providing a forum of international experts in combustion and atmospheric physics and chemistry to address the issues of combustion-generated pollutants and technogenous aerosols and their environmental effects in view of the growing public concern and antropogenous challenges ahead. The scope of the Symposium includes fundamentals of combustion in propulsion devices, ground transportation engines, and stationary power plants with the emphasis on emission problems, pollutant formation chemistry, in particular formation of soot, chemiions, sulfur and nitrogen-containing species, and polycyclic aromatics, physics and chemistry of exhaust-related clusters and aerosols including liquid aerosols, ice particulates, and charged particles, and assessment of accompanying environmental effects.

This book contains about 130 revised, edited and formatted condensed versions of the papers submitted by scientists from 17 nations. The book provides a quick overview of the state-of-the-art in the intrinsically interrelated disciplines: combustion science and technology

and physical chemistry of atmospheric pollution. Limited references are added but further information can be obtained from the authors, and an author index is provided at the end of the book. The volume is prepared as a reference for practicing engineers, research scientists working in the field of combustion, propulsion, and atmospheric chemistry, as well as for experts in environmental protection and safety.

The Symposium and this volume are the outcome of hard work of many people and we appreciate their contribution. In particular, we acknowledge the assistance given by Ms. Olga Frolova and Ms. Olga Rein. We thank the staff of Torus Press, Ltd. for their excellent service in organizing the Symposium and producing the volume.

We would like to thank Ms. L. G. Shcherbakova-Semenova for her enthusiastic assistance in the preparation of the Symposium.

Special thanks are due to Academician Zh. I. Alferov, Academician M. V. Alfimov, Academician A. A. Berlin, Academician A. L. Buchachenko, Academician O. N. Favorskii, Academician V. E. Fortov, Academician V. A. Kabanov, Academician A. G. Merzhanov, and Academician A. E. Shilov for their valuable contribution to organization of the Symposium.

We are grateful to the members of the International Advisory Committee of the Symposium for their time in elaborating the technical program of the meeting, and to the plenary speakers for their invited lectures on the challenging issues of the modern science.

We appreciate the time and effort the authors provided in preparing their contributions and participation in the Symposium. We acknowledge the sponsoring agencies: Russian Foundation for Basic Research, U.S. Office of Naval Research, and German Science Foundation, for their support to make this endeavor possible.

We dedicate this book to the fond memory of Nikolai Nikolaevich Semenov — a distinguished scientist, founder of the chain-branching reaction theory and the theory of combustion and explosion, and a Nobel prizewinner. We do hope this volume will serve as a useful addition to the literature on combustion and atmospheric pollution.

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