PREFACE

This book contains selected papers addressing the fundamental and applied issues of explosion dynamics and hazards written by world-known experts. The papers have been presented at the 7th International Symposium on Hazard, Prevention, and Mitigation of Industrial Explosions (7th ISHPMIE) held in St. Petersburg, Russia, July 7–11, 2008.

The objective of the 7th ISHPMIE was to disseminate to the scientific and production community the advancements recently made in experimental and computational, fundamental and applied studies relevant to fire and explosion hazards, prevention and mitigation, and to determine the avenues of research, development, and regulations that are needed to ensure process and labor safety in a wide range of industries.

The 7th ISHPMIE has brought together researchers, engineers, and practitioners dealing with a variety of potential hazards that can lead to explosions of gases, vapors, dusts, liquids, solid explosives, and hybrid mixtures. The presentations covered a range of prevention and mitigation strategies from several perspectives — relevant fundamental studies including experimental and modeling efforts, practical applications, and investigations of actual accidents. The Symposium was organized with the following parallel Technical Sessions: (1) Mixing, (2) Ignition, (3) Combustion, (4) Gas Explosions, (5) Vapor Cloud Explosions, (6) Dust Explosions, (7) Hybrid Explosions, (8) Detonations, (9) Fires, (10) Prevention, (11) Mitigation, (12) Risk Assessment, (13) Case Studies, (14) Hydrogen Safety, (15) Special ISTC Session, and (16) Panel Discussion.

There were 9 plenary lectures and 98 contributed presentations. The plenary lectures were the reviews of recent worldwide accomplishments in research and development in the respective fields delivered by international experts. The contributed presentations were dedicated to current ongoing basic and applied experimental and computational research. The open Panel Discussion identified the issues to be addressed, the aspects of R&D needed, and the international cooperation that can be fostered to solve the issues more effectively and expeditiously. The Panel consisted of international professionals, program managers, and industry experts.

The list of Symposium participants included 126 scientists and engineers from 19 countries (Austria, Belarus, Belgium, Canada, France, Germany, Israel, Italy, Japan, Korea, Norway, Poland, Romania, Russia, Taiwan, The Netherlands, Ukraine, United Kingdom, and USA).

The papers selected by the editors for this book have been reviewed, revised, and thoroughly edited. The book provides an overview of the state-of-the-art in fundamental and applied sciences addressing various aspects of explosion dynamics and hazards. Extended up-to-date references as well as authors' affiliations are added so that further information can be readily obtained. To make reading more convenient, 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 explosion dynamics and risk assessment, and graduate students studying the corresponding disciplines.

This volume is the result of hard work of several persons, and we appreciate their valuable contributions. We acknowledge the assistance given by Ms. Olga Frolova and Ms. Tatiana Mikhailova for their excellent services in organizing the conference. We thank the staff of TORUS PRESS Publishers for producing this impressive volume.

Special thanks are due to Academician A. A. Berlin, Academician A. G. Merzhanov, and Prof. S. A. Tsyganov for their valuable contribution to the organization of the Symposium. We thank the authors for their time and effort in preparing full manuscripts of their papers and the sponsoring agencies — Russian Foundation for Basic Research and International Science and Technology Center — for their financial support.

We hope that this volume will serve as a useful up-to-date addition to the literature on explosion dynamics and hazards.

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