

PREFACE

In the context of the International Francqui Chair of Rodney O. Fox, Professor at Iowa State University, two volumes of *Advances in Chemical Engineering* are dedicated to “Bridging Scales in Modelling and Simulation of Reacting Flows.” As Professor Rodney Fox, the contributors to this issue have made numerous ground-breaking contributions to the field of multiphase and reactive flow modelling. The impact of the advances made extends far beyond chemical engineering and touches every technological area dealing with turbulent flow and chemical reactions (e.g., combustion, atmospheric science, nuclear fuel processing).

All contributions to this collection recognize that future scientific and technological developments will greatly benefit from detailed simulations and that a fundamental approach combining numerical simulations, experiments, and rigorous validation needs to be developed. Scale-bridging approaches are essential for simulations at industrial scale as they allow using the information gathered at the microscale for more accurate calculations at the macroscale. This is not a trivial task, and implies a thorough understanding of the physical processes involved and their interactions, as well as the possible degree of simplification of the problem, in view of the multi-disciplinary application.

Whereas Volume 52 addresses the coupling between flow and species composition fields, Volume 53 focuses on fluidized bed reactors and the advances made in developing scale-bridging approaches. The methods presented in the different chapters are illustrated with industrially relevant applications.

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