



Preface

This special issue of Solid State Ionics contains papers presented at the E-MRS Symposium on Solid State Ionics: Mass and Charge Transport across and along Interfaces of Functional Materials, held in Strasbourg/France, May 14–17, 2012.

Special emphasis of this symposium was laid on transport processes across/along grain and interphase boundaries as well as defect chemistry and thermodynamics of interfacial regions in nanocrystalline materials, nanocomposites, and heterostructures.

Highlights comprised presentations on nanoionics as well as surface reaction, diffusion, and ionic conduction in thin films. Especially, the role played by interfaces and strain with regard to enhanced or impeded transport of oxide ions in nanocrystalline materials has been discussed in detail during the symposium. New aspects of ab-initio modelling of the electronic and atomic structure of interfaces were introduced. A variety of characterization techniques of surfaces and interfacial regions, including in-situ methods, were presented in order to gain insight into the relationship between microstructure and transport properties of novel materials. Moreover, a number of presentations were devoted to applications, such as electrochemical devices for energy conversion and storage, emphasizing solid oxide fuel cells and Li-batteries, as well as electroceramic components.

The symposium consisted of 13 invited talks, 47 contributed talks, and more than 60 posters. The four days of the symposium attracted more than 120 participants from 30 countries. We are grateful to all colleagues for their interesting, high-quality presentations at the symposium and contributions to this proceedings volume. We likewise thank the chairpersons for leading the stimulating discussions of 14 sessions. A selection of the presentations from the symposium

is published in this special issue which is divided into sections on Surface Reaction, Thin Films, Theory, Oxide Ion Conductors, Glasses, and Rechargeable Batteries.

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