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Diffusion and Degradation Phenomena in Solid Oxide Materials

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Message from the Guest Editors

Solid oxide fuel cells (SOFCs) and solid oxide electrolyzer cells (SOECs) are key elements for a future emission-free energy system as they allow for storing energy from intermittent renewable sources via electrochemical energy conversion.

To optimize the material performance, a deeper understanding of the fundamental diffusion processes in mixed ionic–electronic conductors under gradients of the chemical and electrical potential is needed. Therefore, the relation between crystallographic structure and ionic conductivity is one of the pivotal research questions. As interfaces and inner surfaces such as grain boundaries and dislocations can also play an important role in the electrochemical performance of an oxide but may simultaneously act as a seed for irreversible phase transformations, the analysis and comparison of the properties of single crystals and ceramics can assist in building heuristic models for mass transport in solid oxides.

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Message from the Editor-in-Chief

Welcome to *Crystals*, the journal dedicated to the fascinating world of crystallographic research! Crystals are more than mere decorative elements; they hold the key to understanding the fundamental structure of matter. Our mission is to explore the crucial significance of this research across various fields. From medicine to technology, chemistry to geology, crystals play a vital role. Their structure provides insights into new advanced materials, innovative drugs, and groundbreaking technologies. Through *Crystals*, we delve into the microscopic world to discover solutions that will shape the future. Join us on a journey through the *Crystals*, where science merges with beauty and innovation.

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