

Volume 8 (2008)

Special Issue "Diffusion and Reactions in Advanced Materials",
Bunsen Colloquium, September, 27th – 28th, 2007, Clausthal, Germany

Preface

This special issue of the Online Journal *Diffusion Fundamentals* contains a number of contributions presented at the 100th *Bunsen Colloquium*, held in Clausthal-Zellerfeld, Germany from 27 to 28 September 2007. It was the 100th issue of a series of colloquia supported by the German Bunsen Society for Physical Chemistry with a long standing tradition starting in 1980. The conference was organized on the occasion of the 65th birthday of Prof. Dr.-Ing. Günter Borchardt, who has been - and still is - a very successful scientist and a prominent person fruitfully impacting for several decades on the research area under consideration here.

The topic of the international conference was “*Diffusion and Reactions in Advanced Materials*”. Advanced materials for high-technology applications (e. g. as sensors, solid state electrolytes, ion conductors, semiconductors, photonic materials, but also as efficient structure materials) are increasingly chemically and structurally complex. Due to this high complexity kinetic processes play a central role for synthesis, specific tailoring (e. g. via doping, heat treatment etc.), and stability of these materials. Diffusion and reaction processes take place independently only in rare cases; they have to be described and atomistically and phenomenologically modelled in a holistic approach. In this context, the development of new materials often leads to the occurrence of unknown transport mechanisms or new interrelations between kinetic and structural properties. Especially, in terms of nanostructuring of solids and their stability, kinetics is important on all scales.

The conference was very successful in its aim to bring together experimentally and theoretically working scientists from solid state chemistry, physics, and materials science in order to enable an exchange of experience and to discuss current and arising topical problems in an interdisciplinary context.

We would like to thank all the delegates, speakers and sponsors for presenting and sharing their perspectives on topics related to diffusion and reactions in advanced materials.

The Organizers

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Klaus Dieter Becker (Braunschweig University of Technology, Germany)
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