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Editorial

The Bunsen Colloquium 2014 „*Lithium in Solids: Structure and Dynamics*" is the third in a series of colloquia under the auspices of the Deutsche Bunsengesellschaft für Physikalische Chemie which were held in Hannover in 2011 and 2009 with the titles "*Diffusion in Solids — Methods, Models, and Materials*" and „*Spectroscopic Methods in Solid State Diffusion and Reactions*", respectively.

The topic of the present two-days symposium has been inspired by and is obviously related to the work of the DFG Research Unit FOR 1277 "*Mobility of Lithium Ions in Solids (molife)*" with the Leibniz Universität Hannover as Speaker University. This *Forschergruppe* is devoted to the fundamentals of Li ion mobility — both fast and slow — in solid state model systems and is tackling questions like:

- Which diffusion pathways do the elementary Li+ jumps in solids follow?
- How the diffusion parameters are influenced when the dimensionality of the host matrix is changed?
- Which influence does structural disorder of solid materials have on the Li+ transport process?
- Can non-classical isotope effects (like in the case of H^+) be (precisely) detected?
- How can the insertion kinetics of Li in the host material be registered quantitatively?

Interestingly, basic questions like these as well as the "model systems" studied up to now in the seven projects of FOR 1277 have quite often turned out to be directly relevant also for application-oriented research, of course, mainly in the field of Li ion batteries.

Therefore, instead of a symposium confined to *molife* themes, the scope of the present Colloquium has been broadened to include besides fundamental studies also application-oriented investigations on ion dynamics and structure of Li containing materials, and eventually battery research contributions. The latter include, *e.g.*, questions about the cyclability, electrochemical performance of electrodes and electrolytes, and even the status of post-Li ion batteries. The intention is to foster cross-fertilization of the seemingly antagonistic approaches.

As a consequence, in the program of the Bunsen Colloquium the more fundamental and the more applied research contributions, whose abstracts are collected in this booklet, are blended within the oral (invited talk) and the poster sessions, respectively.

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Oral presentations about Li ion battery research will be taken up again on the first day of the Summer School "*Energy Materials*" of the Centre for Solid State Chemistry and New Materials (ZFM) which directly follows the Bunsen Colloquium. The lecture program of this "*Li Ion Battery Day*" is reprinted in this booklet for convenience.

Of course, the Colloquium would not be possible without the constant help of an enthusiastic team handling countless tasks. I like to cordially thank the members of my group involved in the local organization, in particular Elena Witt, Andre Düvel, Kai Volgmann, Katharina Bösebeck, Vinod Chandran Nair, Ngoc Anh-Thu Duong, Jan-Hendrik Borter, Vanessa Werth and Sebastian Busch. Moreover, Christian Schröder deserves special thanks for his indispensable help in coordinating the Bunsen Colloquium with the subsequent ZFM Summer School at the same venue.

Paul Heitjans
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