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INM-KOLLOQUIUM

"PROCESSING OF FUNCTIONAL THIN FILMS AND BATTERY ELECTRODES"

Prof. Dr.-Ing. Wilhelm Schabel
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Dienstag, 14.11.2017, 11.00 Uhr

INM, Leibniz-Saal, Campus D2 5
Gastgeber: Prof. Dr. Tobias Kraus

Functional Films and composite coatings are of great interest in coatings, printed electronics, batteries, biosensors. Our goal is to describe the processing of functional films such as heat and mass transfer, sorption thermodynamics. To predict absorption and diffusion of multi-component mixtures with a suitable model by predicting the model parameters in polymer mixtures from measurements of pure component data. From experiments with multicomponent solvent mixtures a method to determine diffusion coefficients of solvent in polymers with a few transient measurements from concentration profiles in films by means of Inverse Micro Raman Spectroscopy are shown. The properties of polymer solutions are strongly dependent on the solvent concentration and transport coefficients vary by orders of magnitude from the range of liquids to solids.

In a second part of the talk recent results in battery processing technology will be presented. Coating speed and film quality for industrial applications are limited by several factor that can be expressed in coating windows. Particularly for intermitted coatings the requirements on start and stop edges are the current limitations. In this presentation current state of the art and results beyond will be presented. The coated slurry consists of active material, solvents or water together with additives and binders. During solidification of the coating, a complex internal structure and network has to be formed with a porous network for Li Ions for penetration and a conductive network for electrons to the current collectors and conduction substrates. Conducting additives and binders have to increase mechanical and electrical properties of the electrodes and the distribution is highly affected by the drying process conditions. An understanding of the correlation between processing conditions and electrode properties is of great interest regarding to increase production speed and reduce costs by improving electrode performance. In this study significant influence of drying conditions and current limitations in industry on electrode properties could be shown.

Wir laden 15 Minuten vor Beginn zu einem Get-together mit dem Referenten ein.

KONTAKT

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