Priority Programme

“Material Synthesis near Room Temperature”

Project Description – Project Proposal

Multifunctional Soft Materials from and with Borate Ionic Liquids and Lanthanides

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Summary of proposal

This project is intended to explore the IL-based electrochemical synthesis of In and Ga nanostructures and of nanoparticle films as well as the generation of nitride and oxide structures for low temperature production of group-III semiconductor nanostructures. In this project a template-assisted electrodeposition technique will be applied to produce gallium and indium nanostructures, namely nanowires and macroporous nanostructures, electrochemically in various ionic liquids. The reaction mechanisms will be studied based on surface analysis of the IL-salt mixture as well as the resulting deposits. Possible post-synthesis surface modification routines for removal of residual IL fractures and the modification of the surface composition to form gallium/indium oxide and nitride will be characterized. Furthermore, first attempts will be done to deposit GaN and InN electrochemically in ionic liquids containing ammonia salt.