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# #ICMolTalks

## Prof. Dr. Claudia Backes

***Physical Chemistry of Nanomaterials, University of Kassel (Germany)***

April 11th - 09:30h

Assemby Hall - ICMol

## Abstract

### *Making nanomaterial inks from insoluble rocks*

Liquid exfoliation of layered materials has become an important production technique to give access to large quantities of two-dimensional nanosheets in colloidal dispersion. Importantly, this is a highly versatile technique that can be applied to numerous layered materials beyond graphene. While this was clear already 10 years ago, some major obstacles on the fundamental level of exfoliation, size selection and characterisation had to be overcome. In this poster, I will summarise the most important steps that allowed us to arrive at a point, where it is possible to produce samples suitable for (device) applications. This includes aspects of deposition as individual nanosheets or in tiled networks, microscopic and spectroscopic characterisation and is illustrated through material comparisons with regard to exfoliation efficiency based on AFM statistics, centrifugation-based size selection, identification of size-dependent optical properties and the quantitative assessment of degradation in the presence of water and oxygen across a range of layered materials and their nanosheets.

## Biography

Claudia is Chair Professor of Physical Chemistry of Nanomaterials at Kassel. She is a chemist by training and has received her Ph.D with honors in 2011 from the University of Erlangen, Germany working under the supervision of Andreas Hirsch. After some time as deputy executive director in the Erlangen Cluster of Excellence “Engineering of Advanced Materials” Claudia received a fellowship grant from the German Research Foundation (DFG) in 2012 and moved to Jonathan Coleman’s group at Trinity College Dublin, Ireland. In 2015, she returned to Germany and started her independent research at the Chair of Applied Physical Chemistry at Heidelberg University funded through the prestigious Emmy Noether programme from the German Research Foundation from 2016. In 10/2021, she was appointed to her current position and in 03/2025 elected as spokesperson of the Kassel’s Center for Interdisciplinary Nanostructure Science and Technology (CINSaT). Claudia’s research interests are low dimensional nanomaterials, in particular in liquid exfoliation, nanosheet size control and size-dependent properties, chemical modification and production of composites and hybrid structures.