

## SIZE CONTROLLED PREPARATION OF NANOPARTICLES AND SAFE-TO-HANDLE NANOPARTICLE DISPERSIONS BY THE USE OF IONIC LIQUIDS

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### **Abstract**

Ionic liquids (IL) – by definition organic salts with melting points below 100°C – have widely been used as alternative solvents in the synthesis of a wide range of organic and inorganic products since the early 1990s and became popular as alternative “green” or “designer solvents”.

Major reasons for this development are the unique properties of ionic liquids that include high thermal stability over a wide temperature range, often a good solubility of many inorganic precursor salts as a consequence of the tunable polarity of ILs and their tenside like character, which allows the stabilization of e.g. metal, metal oxide [4,5] or carbon-based nanoparticles. In addition, these ILs have a negligible vapor pressure and are non-inflammable. This unique combination of properties makes ILs the media of choice for dispersing nanoparticles.

The use of ionic liquids as green solvents for the synthesis of nanoparticles and their impact on the size control of the produced nanoparticles will be highlighted in this contribution as well as their influence on the stabilization of metal-, metal oxide- and carbon-based nanoparticle dispersions will be discussed. Finally, results of the performed stability test via Photon Cross-correlation Spectroscopy (PCCS, Nanophox®) will be presented.

**Keywords:** Nanomaterials, synthesis, ionic liquids, dispersions

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