



## Ionic Liquids for the Dispersion of Nano-scaled Materials

With the general rise of nanotechnology over the past years, ionic liquids were recognized to be interesting reaction media for the synthesis of inorganic nano-sized materials, since size, size-distribution and also shape can be controlled by the use of different ionic liquids.<sup>[1-3]</sup> The quasi reversed principle can be used to stabilize nanoparticles by electrostatic or steric effects, avoiding their agglomeration.

At our own labs we were able to apply this principle to a number of nano-sized materials, e.g. like SiC, Carbon-Nanotubes, and many more materials.

### IL for nano-scaled material dispersions:

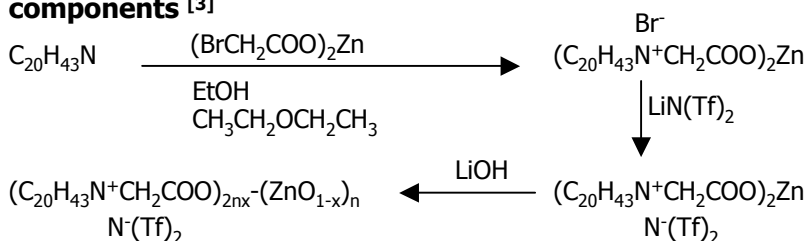
#### • Dispersion of metal carbide nanopowders (TiC, SiC) <sup>[4]</sup>

Ionic liquids can be used as surfactants to stabilize aqueous dispersions of metal carbide nanopowders. Dispersions are treated with ultrasound to break agglomerates.

Please contact us if you interested to find the right ionic liquid to disperse your nanopowder – we'll find a solution!



#### • Stabilization of ZnO nanocrystals by ionic liquids components <sup>[3]</sup>



#### • Magnetorheological fluids based on ionic liquids <sup>[5]</sup>

Fe<sub>3</sub>O<sub>4</sub> nano-powders can be dispersed and stabilized in ionic liquids to obtain magnetic dispersions that are colloidally stable and show an improved stability against sedimentation.

IOLITEC offers a selection of ionic liquids suitable as innovative surfactants or carrier fluids for dispersions of nanomaterials.

| Product Code | Compound   | Quantities   |
|--------------|--|--------------|
| IL-0115-HP   | 1-Hexadecyl-3-methylimidazolium chloride, >98 %                    | 25 g to bulk |
| IL-0012-HP   | 1-Butyl-3-methylimidazolium tetrafluoroborate, 99%                 | 25 g to bulk |
| IL-0029-HP   | 1-Butyl-3-methylimidazolium bis(trifluoromethylsulfonyl)imide, 99% | 25 g to bulk |
| IL-0054-HP   | 1-Hexyl-3-methylimidazolium chloride, 99%                          | 25 g to bulk |
| IL-0118-HP   | Methyltrioctylammonium triflate, 99%                               | 25 g to bulk |
| IL-0046-SG   | 1,3-Didecyl-2-methylimidazolium chloride, >97%                     | 25 g to bulk |
| IL-0011-HP   | 1-Butyl-3-methylimidazolium hexafluorophosphate, 99%               | 25 g to bulk |

### References:

- [1] M. Antonietti, D. Kuang, B. Smarsly, Y. Zhou, *Angew.Chem.* **2004**, *116*, 5096.
- [2] Y. Zhou, *Current Nanoscience* **2005**, *1*, 35.
- [3] D-P. Liu, G-D. Li, Y. Su, J-S. Chen, *Angew. Chem.* **2006**, *118*, 7530.
- [4] IOLITEC 2007, results obtained at our own labs.
- [5] C. Guerrero-Sanchez, T. Lara-Ceniceros, E. Jimenez-Regalado, M. Rasa, U.S. Schubert, *Adv. Mater.* **2007**, *19*, 1740.

