CONTINUOUS FLOW SYNTHESIS AT THE “CENTER FOR APPLIED NANOTECHNOLOGY”

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Abstract

The Center for Applied Nanotechnology (CAN) was found in November 2005 as a spin-off from the University of Hamburg. We are working in the following business segments: nanoparticle production, nanoanalytics, energy (especially solar and fuel cells) and biomedical applications. Our core expertise is the synthesis of high-quality nanoparticles with well defined properties, high solubility and size distributions smaller than 10%.

Here we report about our latest progress in the fields of nanoparticle production and analytics. We will give an overview about our continuous flow approach for the production of high quality nanoparticles which we use for core/shell/shell quantum dots, lead sulfide and iron oxide particles. All these particle systems benefit from the excellent reproducibility and up-scaling capacity of this approach. In addition we will introduce our brand new rod shaped quantum dots with quantum yields above 70% combined with increased absorption cross sections in the UV-VIS.

Because water soluble particles are needed for any biomedical application, we have established a continuous flow phase-transfer approach to produce homogeneously dispersed particles in water. This procedure can be performed using any of the above described particles. These water soluble particles can be used for unspecific labeling or they can be bound to antibodies etc. to allow specific labeling of targets. Some of these reactions and cell toxicity tests are performed at CAN, too.

Keywords: CAN, quantum dots, lead sulfide, rods, iron oxide, continuous flow

ACKNOWLEDGEMENTS:

All this work is done in close collaboration with the University of Hamburg, especially with the group of Prof. Horst Weller.

Author did not supply full text of the paper/poster