

Transfer Offer 21-02

Superstructures with nanoparticles of defined shape and size

Description

The research group of Prof. Joachim Koetz is dealing with the synthesis of nanoparticles of different shape and size and their application as sensor materials and for the surfaceenhanced Raman spectroscopy for the detection of molecules and reaction mechanisms. The important thing here is the separation and isolation of anisotropic nanoparticles (nanotriangles and nanostars) and their surface modification. In addition to the selforganization of gold and magnetite nanoparticles, the research is focused on the insertion of these particles into Janus emulsions. This makes it possible to adjust the droplet size of stimuli-sensitive Janus emulsions, and respectively the pore sizes of the resulting aerogels. The ultralight magnetic aerogels can be used for purifying liquids (dye and oil layer separation).



Details

- Template phases
 - Polyelectrolyte-modified microemulsions
 - o Janus emulsions
 - Metal nanoparticles and quantum dots
 - $\circ \quad \text{Different shape and size} \\$
 - o Modification of particles
 - o Use for surface-enhanced Raman spectroscopy

Methods

- High-resolution transmission electron microscopy (HRTEM)
- Cryo-Scanning electron microscopy (Cryo-SEM)
- Asymmetric field flow fractionation (AFFF)
- Rheology, electrophoretic light scattering, interfacial tension measurements

Scientific literature

- Koetz J., The effect of surface modification of gold nanotriangles for surface-enhanced Raman scattering performance, Nanomaterials, 2020, 10, 2187
- Martin et al., Template-mediated self-assembly of magnetite-gold nanoparticle superstructures at the water-oil interface of AOT reverse microemulsions, J. Colloid Interface Sci., 2021, 581, 44-55
- Raju et al., Ultralight Magnetic Aerogels from Janus Emulsions, RSC Advances, 2020, 10, 7492-7499

Applications

- Pharmaceutics
- Medical therapy
- Medical diagnostic
- Sensor development
 Detection and analysis of chemical reactions in real-
- time
 Detection of chemical compounds and biomolecules
- Stabilization of emulsions

Keywords

- Polyelectrolytes
- Template phases
- Emulsions
- Nanoparticles
- Stabilization
- Monolayer
- Surface coating
- Biosensors
- Optical sensors

Interest in cooperation

- Research cooperation
- Contact research

Contact

Transfer Service Tel: +49 (0)331 / 977 61 71 Fax: +49 (0)331 / 977 38 70 tech@potsdam-transfer.de

Potsdam Transfer

Center for start-ups, innovation & transfer of knowledge and technology Karl-Liebknecht-Straße 24–25, Haus 29 14476 Potsdam www.potsdam-transfer.de

Date 25.01.2021