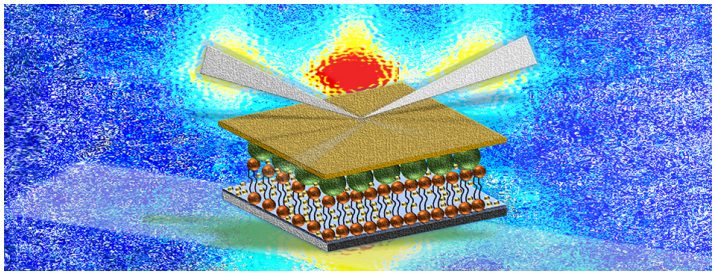

Beitrag ID: **37** Typ: **Poster**

Morphology-Controlled Synthesis and Characterization of Cobalt Ferrite Nanoparticles: Insights from SAXS and TEM

Mittwoch, 9. Oktober 2024 17:20 (7 Minuten)

Cobalt ferrite (CoFe2O4) nanoparticles have garnered significant attention due to their unique magnetic properties and potential applications in fields ranging from biomedicine to data storage. This study presents a systematic investigation of shape- and size-controlled synthesis of CoFe2O4 nanoparticles, focusing on spherical and cubic morphologies. We employed thermal decomposition method to synthesize nanoparticles with varying sizes.

The synthesized nanoparticles were characterized using a complementary approach combining Small Angle X-ray Scattering (SAXS) and Transmission Electron Microscopy (TEM). SAXS provided ensemble-averaged information on particle size distribution, shape, and interparticle interactions in solution, while TEM offered direct visualization of individual nanoparticles, confirming their morphology and size.

Our results demonstrate excellent control over nanoparticle shape and size, with SAXS data revealing distinct scattering patterns for spherical and cubic morphologies. Size distributions obtained from SAXS showed good agreement with TEM measurements, validating the complementary nature of these techniques.

This study highlights the effectiveness of combining SAXS and TEM for comprehensive nanoparticle characterization and underscores the importance of morphology control in tailoring the properties of CoFe2O4 nanoparticles for specific applications.

Hauptautor: MAHHOUTI, Zakaria (JCNS-Forschungszentrum Jülich)

Co-Autoren: WU, Baohu (JCNS-4); APPAVOU, Marie-Sousai (JCNS-4); FRIELINGHAUS, Henrich (Jülich Centre for Neutron Science at MLZ, Forschungszentrum Jülich GmbH, Garching, Germany)

Vortragende(r): MAHHOUTI, Zakaria (JCNS-Forschungszentrum Jülich)

Sitzung Einordnung: Poster

Track Klassifizierung: Nanoparticles