CY-522 NANOCHEMISTRY

Chemistry of nanomaterials: Different types of nanomaterials (metal nanoparticles, emiconductor nanoparticles, nanowires, nanorods, nanotubes, quantum dots, fullerenes, clusters)

Theoretical foundations for the properties of nanomaterials: Thermodynamics, structure, magnetic and electronic properties, principle of self-assembly, methods of self-assembly, templated structures.

Synthesis and characterization of nanomaterials

Novel methods for synthesis of advanced nanomaterials and detailed growth mechanisms, advanced characterization techniques for nanomaterials: Synchrotron radiation techniques (XAFS and XRD), HRTEM, TEM, AFM, XPS, Raman, FTIR, FESEM, BET surface analyzer, VSM, Zeta Potential, etc

Nano-toxicology Mapping: Environmental fate of nanomaterials: key behavior on transport, transformation, bio-distribution, exposure, safety, and toxicity to humans and other species.

Nano products: Commercial products based on different nanomaterials, advanced biomedical and commercial applications of different nanomaterials: metal oxides, ferrites, silicon, gold, and silver, cadmium sulfide.

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