



KN-B-1337

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Room: Reda 2

MAGNETIC NANOPARTICLES : SYNTHESIS, SHAPE CONTROL, ORGANIZATION AND TRANSPORT PROPERTIES

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Organometallic nanoparticles can be prepared by decomposition in mild conditions of organometallic precursors in solution, in general under dihydrogen. Addition of various ligands may orientate the reactions towards the formation of particles of defined sizes and shapes, as well as to extended super-lattices of monodisperse nano-objects. The ligands coordinate at the surface of the particles and modify both the physical and the chemical properties of the particles. The lecture will in particular address the synthesis of iron and cobalt nanoparticles with a special emphasis on the role of the organic matrix created by the ligands to control the growth of spheres, cubes, stars and hollow cubes in the case of iron and spheres, rods, wires and stars in the case of cobalt. The growth of bimetallic systems displaying various types of chemical order (homogeneous, core-shell, complex objects resulting from heterogeneous nucleation) will also be presented. The magnetic properties of all these systems will be reported. Finally, a special emphasis will concern the organization of these nanoparticles for applications in micro- and nano-electronics.