SYNTHESIS AND STUDIES OF COORDINATION POLYMER NANOPARTICLES.

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Cyano-bridged soluble coordination polymer nanoparticles were synthesized considering different approaches :

- Stable colloid solutions containing nanoparticles of cyano-bridged molecule-based magnets $M_3[Fe(CN)_6]_2$/[RMIM][BF_4] (M^{2+} = Ni, Cu, Co) and $Fe_4[Fe(CN)_6]_3$/[RMIM][BF_4] (R = 1-butyl, BMIM and 1-decyl, DMIM) were prepared in the corresponding 1-R-3-methylimidazolium salts [RMIM]X (where X =BF_4, Cl,…) which acts as both a stabilizing agent and a solvent. By varying the length of the N-alkyl chain on the imidazolium cation of $[RMIM]^+$ and the temperature, the growing process can be controlled to produce nanoparticles of different size.[1]

- The use of silica matrixes with different pore sizes allow to afford nanocomposites incorporating nanoparticles with variable and controlled sizes.[2]

- Water-soluble coordination polymer nanoparticles core/chitosan shell were synthesized by using chitosan beads as matrixes.[3]

- The organic-phase soluble coordination polymer nanoparticles were obtained by using different stabilizing ligands such as oleic acid, oleyl amine, etc.[4]

Depending on the surrounding media, these coordination polymer nanoparticles exhibits diverse magnetic regime from superparamagnetic behaviour to spin-glass like dynamic that can be caused by a spin frustration on the surface of the nanoparticles and/or by interparticle magnetostatic interactions of variable strength.

References:

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