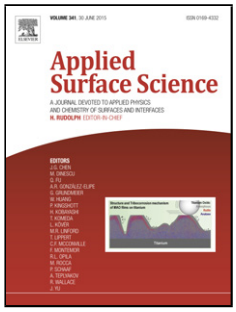

Title: A facile route for the synthesis of Co, Ni and Cu metallic nanoparticles with potential antimicrobial activity using novel metallosurfactants

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<AT>A facile route for the synthesis of Co, Ni and Cu metallic nanoparticles with potential antimicrobial activity using novel metallosurfactants

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<ABS-Head><ABS-HEAD>Graphical abstract

<ABS-P>► In this work diamine dicholoro metal surfactants have been synthesized for cobalt, nickel and copper. The prepared complexes have been characterized by FTIR, NMR and TGA and were used as templates in form of vesicular aggregates to fabricate respective nanoparticles using redox two phase ► <ST>methods</ST> The size of core of bilayer is playing a crucial role in controlling the size of metallic nanoparticle.
<ABS-HEAD>Highlights► Diamine-dichloro complexes of Co, Ni and Cu have been synthesized using ligand insertion method. ► Characterization of the prepared complexes was done by FTIR, NMR, MASS, CHN and TGA. ► Self aggregation properties of prepared complexes were analysed in different alcohols ► Solutions of the metallic aggregates of complexes were used as templates to synthesize metallic nanoparticles. ► BSA binding studies were performed with all metallic nano-structures to ascertain their surface activity and biological application. ► Antimicrobial studies of prepared complexes and metallic nanoparticles were evaluated against bacterial and fungal strains.
<ABS-HEAD>Abstract
<ABS-P>The work deals with optimizing a methodology for fabrication of monodisperse metallic nanoparticles (active against microbes) using micellar core of amine based metallosurfactant. Novel double chained amine metallosurfactants of the type $[M(C_{12}H_{25}NH_2)_2]$ (where M is copper, nickel and cobalt) have been synthesized and characterized with elemental analysis, Fourier Transform Infrared spectroscopy (FTIR), Nuclear Magnetic Resonance (NMR) and thermogravimetric analysis (TGA). Further, study of their aggregated structures (i.e. bilayer) of these lipophilic metallosurfactants in various alcohols has been carried out. Thermodynamics parameters of reverse micellization have also been estimated. The process is spontaneous and entropy driven. Prepared metallosurfactants have been utilized as precursors for the fabrication of metallic nanoparticles (NPs) of Co, Ni and Cu. The method is validated for all the three studied transition metals for the preparation of metallic nanoparticles. This approach offers better results in terms of size, shape, morphology, distribution and stability of NPs. Characterization of NPs is done by UV-visible, X-Ray Diffraction (XRD), Transmission Emission Microscopy