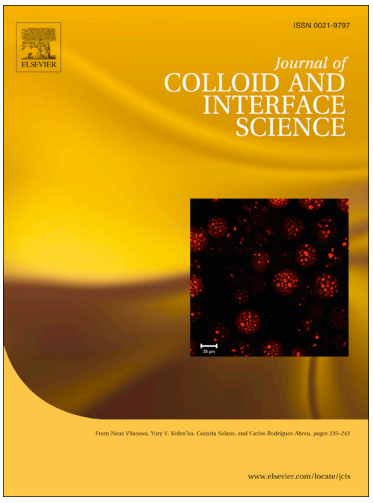

Regular Article

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Surface oxidation of Single Wall Carbon Nanohorns for the production of surfactant free water-based colloids

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Abstract

In this work, powders of Single Wall Carbon Nanohorns (SWCNHs), a typical hydrophobic material, were oxidized with concentrated HNO_3 with the aim of surface carboxylation and consequent improved hydrophilicity and dispersibility in polar solvents. Dynamic Light Scattering and ζ-potential measurements demonstrated that very stable colloidal suspensions of SWCNH in water were obtained in total absence of stabilizers. By properly optimizing the reaction parameters, the suspensions achieved stability even higher than colloids with similar composition but prepared with the use of surfactants. Surface damage and oxidation degree of SWCNHs were evaluated by SEM microscopy, Thermogravimetric Analysis, Residual Gas Analysis, XPS and UV-visible spectroscopy.

Keywords: single wall carbon nanohorn, oxidation, colloid, stability, water

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