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PREDOMINANT INTERACTIONS BETWEEN DISPERSED CARBON NANOTUBES AND HYDROPHOBIC ALLY FUNCTIONALIZED POLYSACCHARIDE IN WATER

Skender A[1], Hadj Ziane A[2] and **Flahaut E[3]**
[1]University Yahia Fares Medea, Algeria
[2]University Saad Dahlab Blida, Algeria
[3]CIRIMAT, France

Achieving stable suspensions of carbon nanotubes (CNTs) is still a challenge; pristine CNTs have limited solubility in either organic solvents or water due to their hydrophobicity and strong inter tube van der Waals forces. Thus, a lot of efforts have been devoted over the years to prepare stable dispersion. Therefore, a non-covalent approach has the advantage of no disruption of the structure and the properties of the native tubes, which is realized by adding surfactants as it allows keeping intact the intrinsic properties of the CNTs. However, for different applications, the potential toxicity of the surfactant is an important issue. Polysaccharides are among the best candidates and chemical modification can improve their intrinsic features. Therefore, bioengineering technology has likewise become increasingly sophisticated with the result using numerous chemical derivatives of commercial polysaccharides and many of the untreated polymers themselves, showing remarkable and sometimes unique properties as thickening, stabilizing, gelling, and emulsifying agents. Hence, among the family of water-soluble polysaccharide the xanthan gum, the physical properties of this polysaccharide are correspondingly subject to less than normal variations and certain bacterial polysaccharides, chemical modification can change the character of the polysaccharide yielding therefore, to a new properties. The dispersion and the stability against sedimentation of double walled carbon nanotubes (DWCNTs) have been investigated (rheological properties, Zeta potential) as a function of pH and Xan concentration. Our results show that stable suspension of DWCNTs with functionalized xanthan gum could be obtained.

skender_ab@yahoo.com