PROPIEDADES ESTRUCTURALES, VIBRACIONALES Y MAGNÉTICAS DE CNT'S MODIFICADOS CON GRUPOS AMINO

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One of the most emerging trends for water decontamination is the application of nanomaterials because they demonstrate increased reactivity for adsorption, oxidation, reduction and catalysis of several contaminants. Some of the most common nanomaterials used for heavy metals treatment are carbon nanotubes (CNTs), due to their larger specific area, faster kinetics and higher reactivity than common adsorbents and can be easily regenerated and reused. In this work we present the synthesis and characterization of aminofunctionalized CNTs that will be used for water remediation.

CNTs functionalized with triethylenetetramine showed consistent evidence of the amino group incorporation. FTIR spectrum of CNT-Ox showed typical C=O and O–H bands, meanwhile after amination, signals associated with C–N and N–H emerged, confirming the reaction between –COOH and amines. XRD data indicates that the (002) Bragg peak remains at the same position after aminofunctionalization, with slight broadening likely due to the increase of surface disorder. Raman spectra showed that after the animation, the ID/IG ratio increases, indicating the generation of defects, which must be useful as active adsorption sites for the application. Moreover, magnetic measurements revealed evidences of superparamagnetic behavior and a decrease in saturation magnetization after the functionalization, due to the incorporation of nonmagnetic material. Mossbauer spectroscopy spectra confirm the presence of Fe and Fe-C phases, before and after the amination, which is agreement with the magnetic results.

The amination was successful, introducing active groups without altering the tubular structure. Results confirmed the increase of defects and preservation of crystallinity. These modified CNTs exhibit a high capacity to interact with heavy metals, showing potential for efficient water remediation.

5. REFERENCES

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