One-step synthesis of amino-functionalized carbon nanoparticles and their incorporation in graphite oxide

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Abstract

Amine-rich carbon nanoparticles (NH_2-CNPs) are synthesized by one-step hydrothermal reaction [1] using the polyethylenimine (PEI) polymer as the only component. The synthesized NH_2-CNPs, with a size ranging between 10 and 20 nm, are composed of a continual external shell and a denser carbon-based core, and they exhibit a strong photoluminescence under UV light at 365 nm. The amine-rich CNPs are easily homogeneously incorporated in graphite oxide (GO) sheets [2-4] creating a novel hybrid carbon superstructure. The structure of the final nanocomposite and the physicochemical properties are studied using a number of analytical techniques (FT-IR, PL, XRD, Raman, XPS, TEM). The developed material is a promising candidate for solid state lightning, light detection, as well as for pharmaceutical and environmental applications.

References

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Figures

Figure 1: Photoluminescence of NH_2-CNPs under UV light (365 nm)

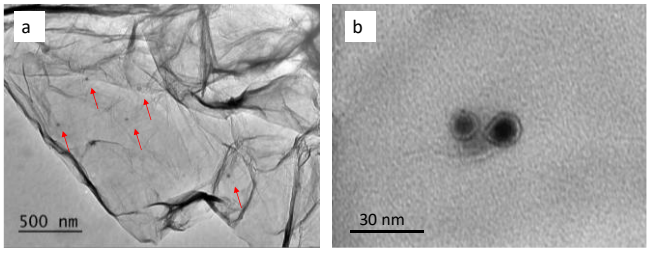

Figure 2: TEM images of the NH_2-CNPs-GO material