

# **Title: “Carbon based Nanomaterials”**

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## **Abstract**

New layered carbon-based materials were prepared and exhaustively characterized exploiting different characterization techniques, such as thermogravimetry (TGA), differential thermal calorimetry (DSC), Fourier transform infrared (FTIR) and wide angle X-ray diffraction (WAXD).

Pristine graphite (G) with high surface area and carbon black (CB) samples with different surface areas were selected as starting materials to prepare the corresponding oxidized samples, *i.e.* graphite oxide (GO) and carbon black oxide (oCB), with the Hummers' method.

Thanks to the strong hydrophilicity and to the lamellar structure of oxidized carbon-based materials, a rich intercalation chemistry is permitted.

In fact, after treatments of GO and oCB by strong basis, ordered intercalation compounds have been obtained, not only if the starting material is crystalline like graphite oxide, but also if it is completely amorphous like oxidized carbon black.

Starting basified GO, free-standing papers can be obtained by vacuum filtration, as well as by casting procedure, of colloidal dispersions of graphene oxide sheets.

The use of basified GO leads to more flexible, solvent resistant and thermally stable GO papers. Spectroscopic analyses of the obtained papers have been conducted aiming to a possible rationalization of the observed behavior.