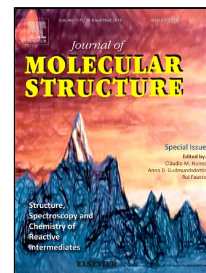


Accepted Manuscript

Single-wall carbon nanotube modified with copper-oxamate flat complex probed by synchrotron x-ray photoelectron and x-ray absorption spectroscopies



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PII: S0022-2860(18)31109-8
DOI: 10.1016/j.molstruc.2018.09.026
Reference: MOLSTR 25660
To appear in: *Journal of Molecular Structure*
Received Date: 26 May 2018
Accepted Date: 11 September 2018

Please cite this article as: Gustavo m. Do nascimento, walace d. Do pim, morinobu endo, go bong choi, yoong ahm Kim, Noriberto A. Pradie, Humberto O. Stumpf, Single-wall carbon nanotube modified with copper-oxamate flat complex probed by synchrotron x-ray photoelectron and x-ray absorption spectroscopies, *Journal of Molecular Structure* (2018), doi: 10.1016/j.molstruc.2018.09.026

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**SINGLE-WALL CARBON NANOTUBE MODIFIED WITH COPPER-
OXAMATE FLAT COMPLEX PROBED BY SYNCHROTRON X-RAY
PHOTOELECTRON AND X-RAY ABSORPTION SPECTROSCOPIES**

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ABSTRACT

Nanocomposites formed from the precursor of molecule-based magnets [Cu(opba)]²⁻ [opba = *o*-phenylenebis(oxamate)] and single-wall carbon nanotubes (SWCNTs) were characterized by X-ray absorption near edge structure (XANES) and X-ray photoelectron spectroscopy (XPS) at Carbon and Nitrogen *K* edges and Cu *L*_{2,3} edges. The N *K* XANES, XPS and micro-ATR-FTIR data strongly suggested that [Cu(opba)]²⁻ molecules be flatly bonded onto the surface of the SWCNTs. Therefore, higher charge delocalization and electronic modifications were observed. The presence of a new band at 286.1 eV in the Carbon peak of XPS spectra of nanocomposites was assigned to the Carbon surface of the SWCNTs modified by interaction with the metal complex. The micro-ATR-FTIR data supported by DFT calculations show many changes in the bands related to νC=C and νC=O groups of the metal complex in the nanocomposites. Such changes confirmed that the vibrational properties of the complex also changed due to interaction with the carbon nanotubes.

Keywords: Copper(II) complex, Oxamate, SWCNTs, XANES, XPS

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