**Obtention of TiO2 coating in multiwalled carbon nanotubes by the sol-gel technique.**

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In recent years, efforts in developing high strength-low density materials are increasing significantly. Transportation industry, mainly automotive, aeronautical and space are the responsible for pushing research activities on this subject. One of the promising materials to attend this demand is the carbon nanotube (CNT), mainly as a reinforcing phase in lightweight metal matrix composites (MMC). However, a proper dispersion of CNT in metals is challenging.

In the present work, the sol-gel technique has been employed to obtain $TiO_2$ coating on commercial multiwall carbon nanotubes (MWCNT). The aim of such coating is to improve MWCNT reinforced MMC processing. It helps in dispersing the nanotubes by reducing Van der Waals attraction between them, besides it can protect them from oxidation and/or reaction with metallic matrix during processing that is commonly carried out in high temperatures. Furthermore, $TiO_2$ coating can improve the matrix to nanotubes adhesion, which is a key issue in terms of load transfer to the reinforcing phase.

$TiO_2$ coating was obtained over MWCNT surface using titanium isopropoxide as a precursor, and after calcination in inert atmosphere in order to crystallize a stable coating phase. The hybrid CNT/$TiO_2$ was characterized by XRD, Raman spectroscopy, DSC, TGA, and FEG-SEM. The coating structure was observed to change from anatase to rutile, as the calcination temperature increased. Results from thermogravimetric analysis showed that calcining the samples at 1000 ºC seemed to be more efficient protecting MWCNT from oxidation at high temperatures.

Key-words: Carbon nanotubes, TiO2, sol-gel, Aluminum alloy, metal matrix composite