

Influence of concentration of carbon nanotubes multiwall on the properties of copper

A. Zahaf¹, Y. Debbah², M. sahli³, S. Revo⁴, A. Boubertakh¹, S. Hamamda¹

¹ *Transfer TTSM Laboratory, University of Frères Mentouri, Constantine, Algeria.
E-mail: shamamda@yahoo.com*

² *Mechanics Laboratory, University of Frères Mentouri, Constantine, Algeria.*

³ *Physics Energy Laboratory, University of Frères Mentouri, Constantine, Algeria.*

⁴ *R&D Laboratory of Metal and Ceramics Physics, Taras Shevchenko National University of Kyiv, 64/13, Volodymyrska Street, 01601 Kyiv, Ukraine.*

In this note, we propose to investigate the concentration effect of multiwall carbon nanotubes (NTCM) in copper matrix. Differences techniques were used for carrying out this work as Dynamic Scanning Calorimeters (DSC), Thermogravimetry (TG), Raman and Infrared spectroscopy for analyzing three nanocomposites Cu + 1%NTCM, Cu + 1.5%NTCM and Cu + 2%NTCM. Where, obtained results are as next.

The behavior of Dynamic Scanning Calorimeters (DSC) of differences samples are changed hardly according the concentration. The DSC of Cu + 1%NTCM is very intense when comparing with other samples. The nanomaterial Cu + 2% NCTM have in mid curve DSC containing fewer anomalies. The DSC of Cu + 1.5% NCTM is the lowest. From 400 ° C, it varies monotonically and tends to a constant.

On the other hand, Thermogravimetry behavior differs from one sample to another. For 1.5% Cu + NTCM decreasing of weight is substantially linear comparing with two other samples. Its rate variations of TG become lower than the other two Above 320°C.

Infrared spectrums contain practically the same numbers of anomalies. Their intensity is depending of concentration on NTCM. With the increase of amount NTCM introduced in copper matrix, the intensities of various anomalies are reduced and the bands tend to peaks.

The Raman spectroscopy showed that the peak shape changes depending on the concentration. They become less extensive and intensity increases as the concentration increases.