

# Author's Accepted Manuscript

A novel two-step mechanical milling approach and in-situ reactive synthesis to fabricate TiC/Graphene layer/Cu nanocomposites and investigation of their mechanical properties

N. Sadeghi, M.R. Akbarpour, H. Aghajani



PII: S0921-5093(18)31035-9  
DOI: <https://doi.org/10.1016/j.msea.2018.07.101>  
Reference: MSA36765

To appear in: *Materials Science & Engineering A*

Received date: 10 July 2018  
Revised date: 22 July 2018  
Accepted date: 27 July 2018

Cite this article as: N. Sadeghi, M.R. Akbarpour and H. Aghajani, A novel two-step mechanical milling approach and in-situ reactive synthesis to fabricate TiC/Graphene layer/Cu nanocomposites and investigation of their mechanical properties, *Materials Science & Engineering A*, <https://doi.org/10.1016/j.msea.2018.07.101>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

**A novel two-step mechanical milling approach and in-situ reactive synthesis to fabricate TiC/Graphene layer/Cu nanocomposites and investigation of their mechanical properties**

N. Sadeghi<sup>1</sup>, M.R.Akbarpour<sup>1\*</sup>, H.Aghajani<sup>2</sup>

<sup>1</sup>Department of Materials Engineering, University of Maragheh, Maragheh, P.O. Box 55136-553, Iran

<sup>2</sup>Department of Materials Engineering, Faculty of Mechanical Engineering, University of Tabriz, Tabriz 51666-16471, Iran

mreza.akbarpour@gmail.com

Akbarpour@maragheh.ac.ir

\*Corresponding author: M.R.Akbarpour. Tel: +98 4137273068, Fax: +98 4137276060

**Abstracts**

TiC-Graphene/Cu hybrid nanocomposites were fabricated from a mixture of Cu, Ti and Graphite (C) powders in three different TiC percentages (20, 40, 60 vol. %) by two-step ball milling for (8+8) h and in-situ reactive sintering. The microstructure of the synthesized composites was characterized using x-ray diffraction (XRD), scanning/ transmission electron microscopy (SEM/TEM), and mechanical properties were evaluated by microhardness and wear tests. Microstructural studies revealed that the fabricated composites were composed of a copper matrix together with the homogeneous distribution of the TiC nanoparticles and graphene layers (as un-reacted carbon) with minimal porosities. The TiC addition led to a reduction in the density of sintered composites. With the increasing of reinforcement's volume fraction, microhardness of the nanocomposites increased. Cu-40 vol. % TiC nanocomposite exhibited the

Download English Version:

<https://daneshyari.com/en/article/7971556>

Download Persian Version:

<https://daneshyari.com/article/7971556>

[Daneshyari.com](https://daneshyari.com)