

Accepted Manuscript

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PII: S0925-8388(18)30472-9

DOI: [10.1016/j.jallcom.2018.02.051](https://doi.org/10.1016/j.jallcom.2018.02.051)

Reference: JALCOM 44927

To appear in: *Journal of Alloys and Compounds*

Received Date: 13 December 2017

Revised Date: 4 February 2018

Accepted Date: 5 February 2018

Please cite this article as: X. Jiang, H.C. Fang, P. Xiao, T. Liu, J.M. Zhu, Y.C. Wang, P.F. Liu, Y. Li, Influence of carbon coating with phenolic resin in natural graphite on the microstructures and properties of graphite/copper composites, *Journal of Alloys and Compounds* (2018), doi: 10.1016/j.jallcom.2018.02.051.

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**Influence of carbon coating with phenolic resin in natural graphite on the microstructures
and properties of graphite/copper composites**

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Abstract

Carbon-coated graphite/copper composites were fabricated by using electrolytic copper powder and phenolic resin-coated graphite as raw materials via powder metallurgy method. The effect of natural graphite with phenolic resin coating on the microstructures and properties of graphite/copper composites was investigated. The results indicated that the surface of natural graphite was modified by phenolic resin. Smooth amorphous carbon shell with the thickness of 40 nm to 1 μm was formed on the surface of natural graphite after carbonizing at 900 °C for 2h under hydrogen atmosphere. The sintering of Cu particles was accelerated by phenolic resin coating, and a continuous network-shaped Cu matrix with isolated graphite phase was formed in carbon-coated graphite/copper composites. The electrical conductivity, flexural strength, and tribological properties of graphite/copper composites were improved.

Keywords: carbon coating; metal matrix composites; powder metallurgy; microstructure

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