

Accepted Manuscript

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PII: S0167-577X(17)31662-2

DOI: <https://doi.org/10.1016/j.matlet.2017.11.038>

Reference: MLBLUE 23404

To appear in: *Materials Letters*

Received Date: 25 September 2017

Revised Date: 9 November 2017

Accepted Date: 9 November 2017



Please cite this article as: M. Liu, J. Chen, H. Cui, X. Sun, S. Liu, M. Xie, Ag/Ti₃AlC₂ Composites with High Hardness, High Strength and High Conductivity, *Materials Letters* (2017), doi: <https://doi.org/10.1016/j.matlet.2017.11.038>

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Abstract

Ag/graphite composites, as the most well-known sliding contact material, have short lifetime resulting from its lower hardness and strength. Ti₃AlC₂ has high conductivity, high hardness and layered structure similar to graphite, which makes it an ideal substitute for graphite. Here, Ag/Ti₃AlC₂ composites were successfully fabricated *via* hot pressing technique. In comparison with commercial Ag/graphite composites, the obtained Ag/5 vol.% Ti₃AlC₂ composite exhibited superior mechanical and electrical properties, that is, high hardness of 94.5±0.3 Hv, high tensile strength of 220.0 MPa, and high conductivity of 59.5 % IACS (the international annealed copper standard). The formation of Ag (Al) solid solution in interfacial zone, arising from the partial decomposition of Ti₃AlC₂, greatly enhanced the mechanical properties of Ag/Ti₃AlC₂ composites.

Keywords: Electronic materials; Metallic composites; Contacts; MAX phase; Particle reinforcement.

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