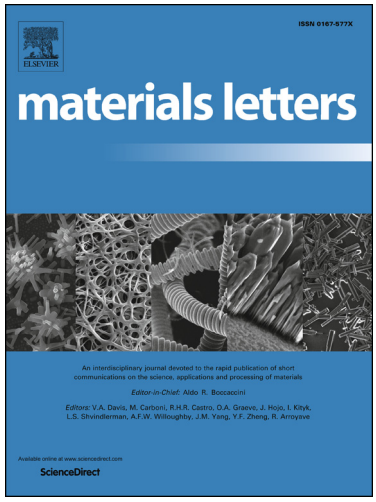

Chemical interaction and activation phenomena in cold-sprayed Cu particles on Sn substrate

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PII: S0167-577X(17)31850-5
DOI: https://doi.org/10.1016/j.matlet.2017.12.092
Reference: MLBLUE 23590

To appear in: *Materials Letters*

Received Date: 26 October 2017
Revised Date: 11 December 2017
Accepted Date: 19 December 2017

Please cite this article as: K.H. Ko, H. Lee, S-H. Jung, B. Ahn, Chemical interaction and activation phenomena in cold-sprayed Cu particles on Sn substrate, *Materials Letters* (2017), doi: https://doi.org/10.1016/j.matlet.2017.12.092

Chemical interaction and activation phenomena in cold-sprayed Cu particles on Sn substrate

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Abstract

For the interactions at the interfaces of cold sprayed particles/substrates, the formation of intermetallic compounds (IMCs) of cold-sprayed Cu particles on a Sn substrate was investigated. Under room-temperature spray conditions, intermetallic layers (Cu_6Sn_5) were formed at the interfaces because of the high velocity collisions of the Cu particles. For the chemical interaction and activation phenomena, including intermixing at the interfaces, the bonding mechanism of the cold-sprayed coatings involved interlocking of the sprayed particles on the blasted substrates, as well as interactions between the particles and the substrate due to the high-velocity collisions (intermixing → particles' interaction).

Keywords: Cold spray, Cu, Intermixing, Interfaces, Intermetallic compounds