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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 \rightarrow particles' interaction).

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

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