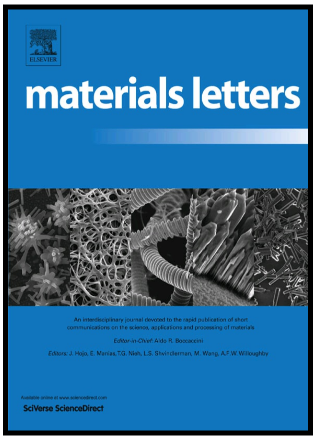

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Surface effect induced Cu-Cu bonding by Cu nanosolder paste

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Abstract:

Based on surface effect of nanoparticles, excellent Cu-Cu bonding was achieved by sintering of Cu nanosolder paste. The surface melting behavior of nanoparticles and the bonding process was investigated at the temperature of 250 ºC to 400 ºC under the protection of Argon/Hydrogen gas mixtures. The antioxidative Cu nanoparticles were synthesized with high yield by an efficient method for the preparation of solder paste. The bonding achieved by thermo-compression shows great tolerance to experimental environment and the roughness of bonding substrates. The largest shear strength in this study could exceed 35 MPa, which is suitable for high-density packaging of three-dimensional integrated circuits.