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【247】 Aluminum and Copper Thin Contacts Augmented with Gallium for Flexible Electronics Applications

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Successful implementation of cutting-edge flexible devices in various branches of modern life requires the synthesis of efficient materials with advanced properties. We address this challenge by mixing Al, Cu, and Ga via vacuum co-deposition applying the combinatorial libraries approach. Systematic screening of maximum current density and voltage, film thickness, and composition reveals the prominent potential of Al-Ga and Cu-Ga alloys of certain concentrations for replacing conventional interconnects materials in flexible electronic devices due to their more than 100% improved ability to withstand electromigration and enhanced adhesion to a PEN-based substrate. In-detail TEM characterization of the contacts with superior performance highlights the self-healing effect of polycrystalline film grain-boundaries wetted by Ga.

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