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## Sn-Pb共晶钎料在铜基板及金属间化合物基板上的 润湿动力学

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**摘 要:** 对锡-铅共晶钎料63Sn-37Pb在Cu基板及Cu-Sn金属间化合物表面层基板上的反应润湿动力学特性进行研究。结果表明: 63Sn-37Pb钎料在Cu基板上的铺展特性随界面反应过程中液态钎料中Sn组元的消耗而变化; 钎料熔化后的初始铺展符合简单流体规律, 随后在Sn组元充足的条件下钎料以稳定速率铺展; 随着Sn组元的不断消耗, 润湿机制呈现界面活性元素扩散控制的反应铺展特征; 63Sn-37Pb在Cu-Sn IMC表面层基板上呈现出非常好的铺展能力, 远优于其在Cu基板上的铺展。

**关键字:** 63Sn-37Pb钎料; 界面反应; 反应润湿; 扩散; 固-液界面能

## Wetting kinetics of Sn-Pb eutectic solder on Cu and Cu-Sn intermetallics substrates

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**Abstract:** The wetting kinetics of the eutectic 63Sn-37Pb solder on Cu and Cu-Sn intermetallic compound (IMC) substrates were investigated. The results show that the spreading feature of 63Sn-37Pb solder on the Cu substrate changes with the exhaustion of element Sn as the Cu-Sn interfacial reaction goes on. In the initial stage, the spreading fits the simple liquid flow rule well, while with decreasing Sn, it comes into the typical reactive spreading character stage. The first sub-stage follows a model involving a local chemical reaction controlled wetting with the stable triple line moving rate under the condition of sufficient Sn supply. The second sub-stage shows a wetting behavior that follows a model of diffusion-controlled reactive spreading with the lacking supply of Sn. The spread of eutectic 63Sn-37Pb solder on Cu-Sn intermetallic compound substrates is very well, much better than its spread on Cu substrate.

**Key words:** 63Sn-37Pb solder; interfacial reaction; reactive wetting; diffusion; solid-liquid interfacial energy

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