

Preparation of Poly(vinyl pyridine) Copolymers for Organic Solderability Preservatives

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Solder ball in microelectronic package is used for the interconnecting material between silicon chip and main board. The interconnecting surface is usually treated by Ni/Au in order to preserve surface and increase adhesive force. However, there are several reports of defects including non-wetting, peeling and pitting of organic layer during package process. To overcome this problem, novel method of surface treatment is a prerequisite. In this study, Poly(4-vinyl pyridine)(PVP) and its copolymers such as poly(4-vinyl pyridine-co-acrylamide) and poly(4-vinyl pyridine-co-allylamine) were synthesized and evaluated for the application of organic solderability preservatives (OSP). All the polymers showed good adhesion properties on Cu pad when they were spin-coated. We can confirm good adhesion properties through measured contact angle [original Cu-pad(90°C), coated Cu-pad(<50°C)]. Especially, copolymers containing allylamine showed good adhesion and solubility. Also, they exhibited better thermal stability than that of PVP and thermal properties strongly depends on the chemical composition and their molecular weight. Copolymers containing allylamine can be considered as a promising OSP material that has excellent thermal and adhesive properties.