

에폭시 아크릴레이트 올리고머와 전도성 카본블랙을 이용한 감광성 저항 페이스트 조성 연구

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Study on the Compositions of Photosensitive Resistor Paste Using Epoxy Acrylate Oligomers and Conductive Carbonblack

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Abstract: Generally, the polymer thick-film resistors for embedded organic or hybrid substrate are patterned by screen printing so that the accuracy of resistor pattern is not good and the tolerance of resistance is too high($\pm 20\sim 30\%$). To reform these demerits, a method using Fodel[®] technology, which is the patterning method using a photosensitive resin to be developable by aqueous alkali-solution as a base polymer for thick-film pastes, was recently incorporated for the patterning of thermosetting thick-film resistor paste. Alkali-solution developable photosensitive resin system has a merit that the precise patterns can be obtained by UV exposure and aqueous development, so the essential point is to get the composition similar to PSR(photo solder resist) used for PCB process. In present research, we made the photopatternable resistor pastes using 8 kinds of epoxy acrylates and a conductive carbonblack (CDX-7055 Ultra), evaluated their developing performance, and then measured the resistance after final curing. To become developable by alkali-solution, epoxy acrylate oligomers with carboxyl group were prepared. Test coupons were fabricated by patterning copper foil on FR-4 CCL board, plating Ni/Au on the patterned copper electrode, applying the resistor paste on the board, exposing the applied paste to UV through Cr mask with resistor patterns, developing the exposed paste with aqueous alkali-solution (1wt% Na₂CO₃), drying the patterned paste at 80°C oven, and then curing it at 200°C during 1 hour. As a result, some test compositions couldn't be developed according to the kind of oligomer and, in the developed compositions, the measured resistance showed different results depending on the paste compositions though they had the same amount of carbonblack.

Key Words : Photosensitive, Resistor, Paste, Epoxy acrylate, Carbonblack

감사의 글

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