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Improvement of Heat Dissipation Ability of Polyimide Composite Film

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Abstract : Polyimide is widely used in electronic industries, and heat dissipation of polyimide film is important for its application in electric devices for high-temperature resistance heat dissipation film. In this study, we demonstrated a new way to increase heat dissipating rate by adding carbon black as filler. This type of polyimide composite film was produced by pyromellitic dianhydride (PMDA) and 4,4'-oxydianiline (ODA). Carbon black (CB) is added in different loading, shows increasing heat dissipation rate for increase of Carbon black. The polyimide-carbon black composite film is synthesized with high dissipation rate to ~8W•m−1K−1. Its high thermal decomposition temperature and glass transition temperature were maintained with carbon filler verified by thermogravimetric analysis (TGA) and differential scanning calorimetric (DSC), the polyimidization reaction of polyi(amide-mide) was confirmed by Fourier transform infrared spectroscopy (FT-IR). The polyimide composite film with carbon black with high heat dissipating rate could be used in various applications such as computers, mobile phone industries, integrated circuits, coating materials, semiconductor etc.

Keywords : polyimide, heat dissipation, electric device, filler
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