「エレクトロニクス実装学会誌」9〔6〕485～489 (2006)

難燃剤の化学構造と誘電正接の検討

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Study of Chemical Structure and Dielectric Loss Tangent of Flame Retardants

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Abstract

The relationship between the chemical structure and dielectric loss tangent (tan δ) of various organophosphate flame retardants was studied. It was presumed that the low tan δ of organophosphate results from its structure, which retards the rotation of substituents inside the molecules. Resorcinol bis(dixylenylphosphate) (D) and 10-(2,5-dihydroxyphenyl)-10H-9-oxa-10-phosphaphenanthrene=10-oxido (F) have chemical structures with a bulky xylene or a rigid cyclic bond, and these organophosphate compounds have a low tan δ. Organophosphate (D) and (F) also work as effective flame retardants without influencing the tan δ of a resin. The tan δ of cured 1,2-bis(vinylphenyl)ethane/poly(phenylene oxide) (BVPE/PPO) resin containing 30 phr of organophosphate (D) or (F) was 0.0019–0.0022, while the average burning time was 0–1 sec.

Key Words: *Dielectric Low Loss Materials, Thermosetting Resin, Copper Clad Laminated Sheets*