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P(MMA-St)/MWNTs复合材料导电性能研究

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Electrical conductivity properties of P(MMA-St)/MWNTs composites

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摘要 采用原位乳液聚合方法制备了甲基丙烯酸甲酯-苯乙烯共聚物 (P(MMA-St)) 包覆多壁碳纳米管 (MWNTs) 复合材料. 研究了 MWNTs 含量和共聚物单体配比对复合材料导电性能的影响; 用 SEM、FTIR、Raman 和 XPS 等手段, 探究了复合材料结构、相互作用与性能之间的关系. 结果表明, MWNTs 的加入提高了复合材料的热稳定性和电导率: 当 MWNTs 含量一定, 提高 PMMA 链段含量时, 共聚物与 MWNTs 的作用增强, 共聚物更易均匀地包覆在 MWNTs 表面, 呈现出优异的热、电性能.

关键词: 甲基丙烯酸甲酯-苯乙烯共聚物 多壁碳纳米管 原位乳液聚合 成键 掺杂

Abstract: Methyl methacrylate-styrene copolymer-encapsulated multiwalled carbon nanotubes (MWNTs) composites were prepared via situ emulsion polymerization. The influence of the MWNTs content and the monomer ratio of the copolymer on the properties of composites were studied. The relationship between the structure, interaction and properties of the composites were initiated by SEM, FTIR, Raman and XPS. The results indicated that the thermal stability and electrical conductivity of the composites are enhanced with addition of MWNTs. When the content of MWNTs unchanged, the interaction between copolymers and MWNTs enhanced with increasing the content of PMMA chains segment. Copolymers are encapsulated on the surface of MWNTs evenly and the thermal stability and electrical conductivity of composites became higher.

Key words: P(MMA-St) MWNTs in situ emulsion polymerization bonding doping

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