高分子学报 2006 (3): 455-460 ISSN: 1000-3304 CN: 11-1857/O6

论文

多官能单体TMPTA在LDPE表面光接枝聚合研究

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收稿日期 2004-12-31 修回日期 2005-3-9 网络版发布日期 接受日期

摘要 以二苯甲酮(BP)为光引发剂、丙酮和水的混合物为溶剂, 研究了室温下多官能单体三羟甲基丙烷三丙烯酸酯(TMPTA)在低密度聚乙烯(LDPE)表面的光接枝聚合(λ>300nm). 研究表明, 多官能单体的接枝速率较快, 接枝聚合易产生交联结构, 聚合后仍残留双键; 延长聚合反应时间、增加单体用量有利于单体接枝转化率的提高; 随引发剂用量增加, 单体接枝转化率出现一峰值; 在研究范围内, 混合溶剂中水含量增加可使单体接枝转化率明显提高. 扫描电镜观察到接枝膜表面形成了许多小球, 表面粗糙度增加, 疏水性提高.

关键词 光接枝 多官能单体 三羟甲基丙烷三丙烯酸酯（TMPTA）

分类号

STUDIES ON PHOTOGRAFTING OF TRIMETHYLOL PROPANE TRIACRYLATE ONTO THE SURFACE OF LDPE FILMS

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Abstract Photografting(λ>300 nm)of trimethylol propane triacrylate(TMPTA)onto the surface of low-density polyethylene(LDPE)films was investigated at room temperature in a mixed solvent composed of acetone and water,using benzophenone(BP)as all initiator. It seems that the polyfunctional monomer could be grafted easily onto the surface,forming a cross—linked structure,and as confirmed by IR spectroscopy there were still some double bonds un—reacted. Influences on the photografting of TMPTA were examined and the experimental results indicated that longer irradiation time and higher monomer concentration were useful for the increase of grafted pelymer conversion At a certain concentration of BP,a maximum grafted polymer conversion was obtained,and the decrease of grafted conversion at higher BP concentrations was probably due to the absorption effect of initiator. The increase of grafted polymer conversion Was observed with increasing the water contents. SEM images showed that a lot of small particles appeared on the surface of grafted films,and water contact angle measurements noted that the surface hydrophobicity was improved.

Key words Photografting Polyfunctional monomer TMPTA

DOI:

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