

电火花引发 HEMA 接枝 LDPE 薄膜及其血液相容性

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摘要 采用接枝量、ATR-IR、SEM、与水接触角、溶血试验和再钙化时间等测试手段研究了电火花引发甲基丙烯酸 β -羟乙酯(HEMA)表面接枝低密度聚乙烯(LDPE)薄膜的接枝聚合反应影响因素、表面结构和血液相容性。结果表明,电火花能有效引发 HEMA 在 LDPE 薄膜表面接枝聚合反应, 随接枝聚合反应时间延长、单体浓度的增大。接枝量增大。随反应温度升高, 接枝量增大到一最大值后, 进一步升高反应温度, 接枝量下降, 最佳接枝聚合温度为 60℃ 当在 60℃ 单体 $\phi=5\%$ 水溶液是反应 2h 时, 经空气气氛和 1.5kV 电火花预处理 72s 和 LDPE 薄膜表面接枝量可达 169 $\mu\text{g}/\text{cm}^2$ 。接枝改性后 LDPE 薄膜与水的接触下降, 亲水性增加, 溶血程度减小, 再钙化时间延长, 血液相容性得到改善。

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Surface structure and blood-compatibility of LDPE film grafted with 2-hydroxyethyl methacrylate using coronadischarge

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Abstract Corona discharge was explored as a means of forming chemically active sites on the surface of low density polyethylene (LDPE) film. The active species thus prepared at atmospheric pressure in air was used to induce subsequent graft copolymerization of 2-hydroxyethyl methacrylate (HEMA) on LDPE film in aqueous solution. The surface structure and blood-compatibility of the grafted LDPE film were studied through ATR-IR, SEM, contact angle with water, hemolysis and recalcification time measurements. The results show that with reaction time and HEMA concentration in the reaction solution, the grafting degree of HEMA onto LDPE film increases. As reaction temperature increases, the grafting degree first to a maximum, then decreases. As the grafting degree increases, the contact angle of HEMA-grafted LDPE film with water decreases. Compared with ungrafted LDPE film, the hemolysis degree of HEMA-grafted LDPE film decreases and the recalcification time increases. The blood compatibility of HEMA-grafted LDPE film is improved.

Key words [METHYLPROPENOIC ACID ESTER](#) [POLYETHYLENE](#) [THIN FILMS](#) [CORONA DISCHARGE](#) [INFRARED SPECTROPHOTOMETRY](#) [SCANNING ELECTRON MICROSCOPES](#) [GRAFT POLYMERIZATION](#)

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