

材料科学与工程

纤维素的乳液接枝共聚(I)引发剂对纤维素的氧化降解作用

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摘要 研究了乳液接枝共聚,单体未加入体系前羟丙基甲基纤维素(HPMC)与引发剂过硫酸钾(KPS)的相互作用。通过HPMC水溶液特性黏度的测定、FT-IR及UV表征,证明了这种相互作用的存在,HPMC的特性黏数随着相互作用时间的延长而减小,说明HPMC与KPS的相互作用最终导致大分子链的氧化降解,而纤维素大分子自由基的形成是氧化降解的中间步骤。另一方面,在HPMC存在下,KPS的分解反应与在纯水中一样,仍符合一级动力学规律,但在60℃下,HPMC的存在使得KPS的分解速率常数比在纯水中提高了近7倍,在宏观上表现为分解半衰期缩短,分解速率提高。

关键词 [羟丙基甲基纤维素](#); [过硫酸钾](#); [相互作用](#); [分解动力学](#)

分类号

Emulsion graft copolymerization of cellulose (I) Interaction between cellulose and initiator

Abstract

The interactions between hydroxypropyl methylcellulose (HPMC) and potassium persulfate (KPS) during the emulsion graft copolymerization process in aqueous system were investigated. Their interactions were proved by specific viscosity measurements, FT-IR and UV methods. The results showed that the specific viscosity of HPMC solution decreased significantly with increasing time of the interaction time, and KPS could lead to the oxidation degradation of the main chain of HPMC macromolecules. The cellulose macroradicals could be formed in the middle step of oxidization degradation reaction. On the other hand, the decomposition rate of KPS followed first-order kinetics with respect to the concentration of KPS in the presence of HPMC, which was just the same as in pure water. However, the decomposition rate constant of KPS in the presence of HPMC was 7 times higher than that in water at 60℃, resulting in lowering of the half-life and higher decomposition rate of KPS.

Key words [hydroxypropyl methylcellulose](#) [potassium persulfate](#) [interaction](#) [decomposition kinetics](#)

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