عنوان مقاله:

Mechanism and Kinetic Modeling of Photodegradation of Polymer-based Composites in Aqueous Solution

محل انتشار:

دومین کنفرانس بین المللی کامپوزیت (سال: 1389)

تعداد صفحات اصل مقاله: 6

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خلاصه مقاله:

The process of ultraviolet radiation and hydrogen peroxide is investigated to establish the kinetics for the photooxidative degradation of the water-soluble polymers as the main component of watersoluble composite films in aqueous solution. Rate expressions are based on free radical mechanisms. Random chain scission is assumed to be the mechanism of chain scission. Continuous-distribution kinetics is applied to model the kinetics of photooxidative degradation of polymers in aqueous solution based on population-balance equations (PBEs). The PBEs are solved by the moment operation which transforms the integro-differential equations into ordinary differential equations that can be readily solved to give the rate coefficients of polymer degradation. The model predictions were in excellent agreement with the experimental data for the photodegradation of poly(ethylenglycol). The kinetic parameters were found using a sequential quadratic programming (SQP) that minimize the error between the model and the .experimental data

کلمات کلیدی:

Water-soluble composites; advanced oxidation technologies (AOTs); radicaldepolymerization; continuous – distribution kinetics; moment method