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光引发的甘油三乙酯反应的振荡

贺占博,祁刚,张凤才

田径大学理学院化学系

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摘要 在(30±0.1)℃条件下，以1对5W节能灯(电子荧光灯)为光源，设计出以甘油三乙酯为底物，环已烷水混合体系的Beluosov-Zhabotinskii振荡反应，并研究了改变光源、有机溶剂、各组分浓度以及加入各类表面活性剂形成O/W型乳液后，各种因素对此类光引发振荡反应的影响。实验表明，能够引发反应产生振荡的光源范围是较大的，通过光谱实验，分解实验和元素分析说明了环已烷在此反应中基本是惰性，并通过机理模型的计算，初步讨论了光照使原单调反应产生振荡的原因。

关键词 甘油三乙酯 化学振荡 环己烷 表面活性剂 光化学反应

分类号 0644

Oscillation induced by light in reactions of glycerol triacetate

He Zhanbo,Qi Gang,Zhang Fengcai

Abstract A new beluosov-Zhabotinskii oscillating reaction induced by light with glycerol triacetate as substrate in cyclohexane-water at (30±0. 1)℃ has been designed. The main light resource was a pair of 5W electronic fluorescent lamp. The oscillatory curves were monitored by the general method using Pt electrode and Br^- electrode, as well as a pair of Pt electrode. Effects of various factors on the oscillating reaction were studied, including the change of concentrations, substitution of light and organic solvent, as well as the addition of various surfactants. The experiments show that the light range which can induce the oscillation is very large. It was demonstrated that cyclohexane was inactive according to the separation and analysis of the organic solvent. An oscillatory mechanism is also put forward on the basis of the experimental results. Mathematical simulation proves that the mechanism is also put forward on the basis of the experimental results. Mathematical simulation proves that the mechanism is correct. A new way to design chemical oscillator for inducing ocillation in a variety of reactions is thus developed.

Key words CHEMICAL OSCILLATIONS CYCLOHEXANE SURFACTANTS PHOTOCHEMICAL REACTION

DOI:

通讯作者