

Pinnaree Bongprom 2013: Degradation of Reactive Black 5 dye in Synthetic Wastewater by Persulfate Oxidation. Master of Science (Environmental Technology and Management), Major Field: Environmental Technology and Management, Department of Environmental Technology and Management. Thesis Advisor: Associate Professor Tunlawit Satapanajaru, Ph.D. 137 pages.

This research objective was to study the effectiveness of degradation of Reactive Black 5 dye (RB5) by using persulfate oxidation. The results had showed that the degradation reaction rate constants of RB5 increased when persulfate and Ferrous ion dosage were increased. The best condition was molar ratio of persulfate to ferric ion at 400 : 4 at pH 5.0. The rate of degradation was  $2.5472 \text{ h}^{-1}$  at 12 hours with 90% degradation efficiency. At five different catalysts, catalyst including ferrous ion ferric ion zero valent iron silver nano and silver ion, we found that the best catalyst was zero valent iron with 99% degradation efficiency in 12 hours ( $2.8609 \text{ h}^{-1}$ ). The degradation efficiencies were 97-98% at 4 h when RB5 containing 1,000-4,000 mg/L chloride ion were treated by persulfate with a catalyst, zero valent iron. The optimal conditions of treating 100 mg/L RB5 by RSM with 3 factors, concentration of persulfate pH and two different catalysts, ferrous iron and zero valent iron, were studied the results found that the optimal condition of treat RB5 by using ferrous ion as catalyst was molar ration of concentration of persulfate and ferrous ion and pH were 395 mM and 6.35 mM at pH 4.5 within 4 h. The optimal condition of treat RB5 by using zero valent iron as catalyst was molar ration of concentration of persulfate and zero valent iron were 540 mM and 6.9 mM at pH 5.75 within an hour.

---

Student's signature

---

Thesis Advisor's signature