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Intermediate Products of Unsymmetrical Dimethylhydrazine Catalytic Degradation by UV-Vis Spectroscopy

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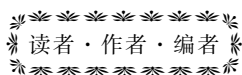
Abstract: The two oxidative systems of $\text{Cu}^{2+}/\text{H}_2\text{O}_2$ and $\text{Fe}^{2+}/\text{H}_2\text{O}_2$ were adopted to degrade unsymmetrical dimethylhydrazine (UDMH) wastewater to study degradation efficiency and mechanism, and the impacts of the four factors: pH value, temperature, time and oxidant dosage on the degradation rate of UDMH wastewater were studied. UV-vis method was applied to analyze the oxidative degradation products of UDMH. The mechanism of oxidative degradation of UDMH was discussed, and the degradation products of two systems at pH 3, 5, 7, 9 were comprehensive comparative analyzed. Results show that the two factors temperature and oxidant dosage have little effect on the degradation rate of UDMH, but pH has great influences on the degradation rate of UDMH and pH is the main factor controlling the type of degradation products of UDMH. The systems of $\text{Cu}^{2+}/\text{H}_2\text{O}_2$ and $\text{Fe}^{2+}/\text{H}_2\text{O}_2$ have the similar degradation products, which are less produced under acidic condition than alkali and neutral conditions. The system of $\text{Cu}^{2+}/\text{H}_2\text{O}_2$ has a relatively high degradation rate on UDMH but many in-process products under alkali condition, and the system of $\text{Fe}^{2+}/\text{H}_2\text{O}_2$ has high degradation efficiency and few in-process products under acidic condition.

Key words: unsymmetrical dimethylhydrazine (UDMH); oxidation; ultraviolet spectroscopy; degradation products

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