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Treatment of Partially Hydrolyzed Polyacrylamide Wastewater by Combined Fenton Oxidation and Anaerobic Biological Processes

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ABSTRACT

With the promotion of the polymer oil-displacing technology in China, polyacrylamide (PAM) are widely used in the exploitation of oil. Biodegradation of partially hydrolyzed polyacrylamide (HPAM) may be an efficient way to treat oilfield sewage, because part of the amidogen and carbon of the HPAM could be utilized as the source of nitrogen and carbon nutrition for the growth of microorganism in anaerobic environment. The HPAM wastewater was treated by combined Fenton oxidation and anaerobic biological processes in this paper. The optimum dosages of Fenton pretreatment were determined to be $5.3 \text{ mmol}\cdot\text{L}^{-1} \text{ H}_2\text{O}_2$, $1.44 \text{ mmol}\cdot\text{L}^{-1} \text{ Fe}^{2+}$, pH 3.0 and $30 \text{ }^\circ\text{C}$. The influence of parameters on COD_{Cr} and HPAM removals followed a decreasing order of $[\text{H}_2\text{O}_2] > [\text{Fe}^{2+}] > \text{pH} > \text{temperature}$. The pretreated wastewater was further treated by an anaerobic reactor (ABR). Through the combined processes, the

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