

Preparation and Application of Polymer Silicate Phosphate Ferric Sulfate Used in High-Viscosity Oil Refining Wastewater Treatment

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ABSTRACT

A new kind of flocculants, named Polymer Silicate Phosphate Ferric Sulfate (PSPFS), was synthesized by ferrous sulfate used as the main material and activated silicic acid as additive. In this paper, High-Viscosity Oil Refining wastewater from Liaohe Petrochemical Corporation was the treatment object. Overall, the influencing factors and synthesis technology conditions of PSPFS were determined by experiments. First of all, the conditions of influencing factors were showed as follows: the mass percent concentration of ferrous sulfate 55%, concentration of sodium silicate 15%, the molar ratio of ferrous sulfate and hydrogen peroxide 1.2: 1, oxidation temperature 40 degree Celsius, oxidation time 4 hours, polymerization temperature 60 de-gree Celsius and polymerization time 2 hours. Secondly, the optimal ratios of components were determined by uniform design method. The molar ratio of Fe/Si is 5.0: 1, Fe/H₂SO₄ is 3.2: 1, and Fe/P is 18.0: 1. At last, the optimal experimental condition was determined as follows: the dosing quantity 200mg/L, pH value 5.5~9, temperature 25~45°C, stirring time 2 min, and standing time 3 min, according to the result of flocculation experiments with PSPFS. Besides, the result of the comparative experiments showed that the efficiency of PSPFS was much better than the reference flocculants.

KEYWORDS

Polymer Silicate Phosphate Ferric Sulfate, Flocculant, Preparation, High-Viscosity Oil Refining Wastewater

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