

凹凸棒石—聚合硫酸铁复合混凝剂在废水处理中的应用研究

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The Study of Wastewater Treatment Using the Composite Coagulant of Attapulgite-PFS

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Flocculation; polymeric ferric sulfate; attapulgite; composite-flocculant;orthogonal experiment

随着我国经济的高速发展和城市人口的不断增加,城市生活污水处理受到了大家广泛关注。目前,用于污水处理的方法有很多,而絮凝处理是污水处理方法中最常用、最省钱的工艺之一。与其它的絮凝剂相比较,聚合硫酸铁不但具有较强的吸附、架桥、絮凝沉淀性能,而且在水处理过程中有生成絮体速度快、絮体不易破碎、重聚性能好、腐蚀性小等特点,因此广泛用于工业废水、城市污水、工业用水以及生活饮用水等的净化处理。凹凸棒是一种含水镁铝硅酸盐粘土矿物,对废水的净化具有吸附效率高、成本低、无腐蚀性、操作简便、且二次污染少等特点,因而在印染废水、油脂等有机物废水的净化处理方面具有较大的应用潜力,并且凹凸棒矿石在我国储量丰富,因此将其用于废水处理中可以有效的降低废水处理成本。本文合成了数种聚合硫酸铁系絮凝剂并对其废水COD去除率进行了比较;在聚合硫酸铁投加量一定的条件下,利用正交实验法,考察了凹凸棒石投加量、凹凸棒石改性温度以及凹凸棒石与聚合硫酸铁反应温度、反应时间对复合絮凝剂絮凝性能的影响。通过对其在生活废水中的COD去除率进行比较,得到了复合絮凝剂的最优制备工艺条件:凹凸棒石热处理温度为420℃、聚合硫酸铁5.0ml、反应温度50℃、凹凸棒石投加量2.0g、搅拌反应4h。本文最后在前人的基础上对铁系絮凝剂的作用机理进行了探讨。

With the rapid development of economy and the increasement of urban population, urban sewage treatment has gotten more and more attention in our country. At present, there are lots of methods used in sewage treatment, the flocculation is one of the most common and economic techniques. Compared with other flocculants, the polymeric ferric sulfate(PFS) has much better performance and characteristics, such as better adsorption, bridge erection, flocculation, flocculation fast, not easy to breaking, better repolymerization and weak corrosion. So it was widely used in the wastewater purification and treatment which contains industrial wastewater, urban sewage, water for industrial use and potable water etc. Because attapulgite(ATP) which is a kind of clay mineral containing water and zeopan, has several traits, such as higher adsorption efficiency, lower cost, non-corrodibility, simple operation and fewness secondary pollution problem, it has a great potential in the purify treatment of dyeing wastewater and organic compounds wastewater. The attapulgite clay mineral is abundant in our country, so it can be used in wastewater treatment to reduce the cost. In this article, several ferric series polymer flocculants are synthesised, and their characteristic are compared in the COD removal rate of the wastewater. Under the fixed condition of input dosage, we investigated the effect of some factors which contain ATP's adding quantity, modification temperature and reaction temperature, reaction time on composite-flocculant's flocculation performance by the orthogonal experiment. Through the comparison in the COD removal rate of the wastewater, the optimized preparation process conditions of the composite-coagulant: attapulgite (roasted in 420° C in the oven before the reaction) 2.0g, polymeric ferric sulfate 5.0ml, stirring reaction 4 hour at 50°C. At last, this article discusses the dispersion mechanism of the poly ferric serious flocculants based on the previous works.

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