

Surface Water Treatment with Natural Starches as Coagulant via Coagulation Process

Abstract

In this study, natural polymers in the forms of starch from sago and tapioca were used as coagulant. The removal of turbidity and chemical oxygen demand (COD) using coagulation process from river water was examined. The treatment on the river water sample was evaluated via a series of Jar Test experimental works with rapid mixing speed of 120 rpm for 1 minute, slow mixing speed of 30 rpm for 20 minutes and settling time of 60 minutes. The tapioca starch removed 93.7% of turbidity at dosage of 1000 mg/L. While, sago starch successfully removed 96.4% of turbidity under optimum dosage of 2000 mg/L. pH 12 was optimum pH for turbidity removal by using sago and tapioca starch whereas the highest percentage of COD removal occurred at pH 4 using sago and tapioca starch. At pH 4, tapioca and sago starch removed 22.5% and 25% of COD respectively. Overall tapioca starch showed better removal percentage of turbidity compared to sago starch throughout the experiment study. Generally, the usage of natural polymers as coagulants is good for turbidity removal; however, it did not work well on COD removal.