

Colour removal from biologically treated landfill leachate with tannin-based coagulant

ABSTRACT

High humic substances remaining after biological treatment led to high colour values in landfill leachate which require treatment to make it dischargeable into the water stream. To date, limited studies were performed in using tannin-based coagulant as post-treatment for decolourisation of landfill leachate. In this work, the effectiveness of removing the colour from biologically treated landfill leachate (BTLL) via coagulation-flocculation process was studied. A tannin-based coagulant was used as coagulant with the aid of anionic and cationic polyacrylamide (PAM) as flocculant. Initially, jar test experiments were conducted with a varying dosage of coagulant and initial leachate pH. Next, tests were carried out with different values of PAM dosage, flocculation time as well as sedimentation time to find out the optimum condition for colour removal. The supernatant layer of treated leachate from each test was analysed for colour, zeta potential, pH and conductivity. At optimum leachate pH of 5, experiments with 3 min flocculation time and sedimentation time of 10 min resulted in the highest colour removal (81.8%) at coagulant dosage of 100 mg/L, with 1 mg/L anionic PAM (APAM) being added. Coagulation flocculation system of OF as tannin-based coagulant with APAM as flocculant showed the promising result in decolourisation of BTLL.