

Removal of highly concentrated industrial grade leather dye: Study on several flocculation and sand filtration parameters

Abstract

Highly concentrated leather dye, i.e., Durapel Black NT removal, was studied using coagulation/flocculation-sand filtration. Eight polymers (6 from polyacrylamide family, polydiallyl dimethyl ammonium chloride (polyDADMAC) and epichlorohydrin-dimethylamine (EpiDMA)); were tested as flocculant aids. Based on the highest dye removal and lowest cost, polydiallyl dimethyl ammonium chloride (polyDADMAC) was found to give the best results. In this study, the difference of Durapel Black NT (DBNT) dye supplies cause the difference in initial absorbance, and a reassessment of several flocculation parameters were carried out again in order to find the optimum parameters. At one hour settling time, the maximum dye removals were about 30–70%. Sufficient times for rapid mixing and polymer injection were found to be important parameters during flocculation. Separation of the flocs was enhanced by the sand filtration. Coagulation/flocculation-sedimentation (4 hours) followed by sand filtration removed about 85% of the dye and a sand size of 0.3–0.6 mm was suitable.