

ABSTRACT

The effluents from the slime ponds or thickener of iron ore mines when discharged to down stream cause environmental pollution at the same time the waste of valuable metal in form of slimes. The effluents contain iron ore slimes. The usage of polymeric flocculants in a thickener enhances settling of fine particles which can be retained leaving the less turbid water to be discharged to water bodies thus averting environmental pollution as well as saving of valuable metals in the flocculated slimes. In our laboratory, a large number of highly shear stable and efficient polymeric effluents have been developed by grafting polyacrylamides branches on various polysaccharides.

The effluent from iron ore mine has been treated with these grafted polysaccharides and commercial polymeric flocculants. It has been found that the performance of amylopectin –g-polyacrylamide (Ap-g-PAM) and starch-g-polyacrylamide (St-g-PAM) is better or at par with commercial flocculants at higher flocculant dose in relation to settling and filtration of the slime suspension. This has been explained in the terms of greater approachability of dangling polyacrylamide branches on rigid polysaccharides backbone towards the solid particles.

The experiments show that sedimentation rate increases with increasing flocculant dose up to a certain limiting value. The settling rate decreases with increasing the pulp density. The volume of filtrate increases with increasing flocculant dose. The filtration efficiency of synthesized polymer is comparable with commercial one i.e. Magnafloc (1011) at natural pH. The pH value of the suspension has considerable effect on the settling and filtration kinetics. The settling and filtration rates decreases with increasing pH. The effect of divided flocculants addition in relation to minimizing the flocculant dose has been explained by the fact that the greater compactness of the floc is achieved which results in improvement of flocculant efficiency.