



Flocculation process and Increasing sedimentation of total suspended solids in clarifier

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ABSTRACT

Sedimentation is the process of allowing particles in suspension in water to settle out of the suspension under the effect of gravity. The particles that settle out from the suspension become sediment, and in water treatment is known as sludge. Several factors can affect the sedimentation process including physical and environmental conditions. Increased pretreatment may be necessary when adverse conditions are present. Factors that affect the sedimentation process include the shape and size of particles, the density of particles, water temperature, Alkalinity of water, particle charge, dissolved substances in the water, environmental effects, and characteristics of the basin. Flocculation is the slow mixing process that causes smaller particles to merge into larger particles that settle more easily. Polymer flocculants are used to promote solid-liquid separation processes in potable water and wastewater treatment by controlling the rate of impacts between particles as they gain size. In this paper, the effect of increasing substance A23 to B90 polymer flocculant on the deposition of suspended solids is investigated. The results showed that by adding A23, the amount of particle sedimentation increases and water turbidity decreases, in addition by adding substance A23 to the polymeric flocculant, less amount of B90 flocculant polymer is required to increase the sedimentation efficiency.

1. Introduction

In wastewater treatment plants as well as in a variety of industrial processes, sedimentation tanks are used to separate suspended solids from water [1]. Sedimentation by gravity is the most common and extensively applied treatment process for the removal of solids from water and wastewater. Generically, such solids-liquid separation processes are sometimes referred to as clarification processes [2]. Several factors can affect the sedimentation process including physical and environmental conditions. Factors that affect the sedimentation process include the kind of flocculant shape and size of particles, the density of particles, water temperature, water PH, particle charge, and dissolved substances in the water, environmental effects, and

characteristics of the basin [3,4]. Smaller particles do not settle out easily and their size must be increased with coagulation and flocculation [5]. Smoother particles with less jagged edges settle out quicker and easier. Temperature decreases will cause the settling rate to decrease. The settling rate or velocity decreases when the water temperature is colder. Chemical dosage rates need to be adjusted during colder periods of the year or lower flows are necessary for the flocculation basins. kind of effective flocculant depends on particle charge and chemical activities of a particle in different PH Based on the functional group we have eleven groups of flocculants. Table.1 [6]

The function of anionic flocculant is based on latex polyacrylamide emulsion with high molecular weight.

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