INVESTIGATION ON THE USE OF A PRECIPITATION METHOD TO REDUCE CHEMICAL OXYGEN DEMAND (COD) IN AN INDUSTRIAL EFFLUENT

BY

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ABSTRACT

Water is the most precious resource on earth; it is necessary to life on earth. Plants & animals require water that is moderately pure, & they cannot survive if their water is loaded with toxic chemicals or harmful microorganisms.

Industries need a large quantity of water & they also release a large quantity of liquid waste, which in most cases is ultimately released into inland water bodies. These wastes contain polluting substances, which affect the ecological balance of the ecosystem & cause the environmental pollution.

Therefore it is essential to detect the degree of pollution & to take appropriate action to prevent the damage. Chemical Oxygen Demand (COD) is a parameter, which is utilized, assesses the extent of pollution by organic matter. It gives an indication of the efficiency of the treatment process. The efficiency of the treatment process is expressed as COD removal, measured as a percentage of the organic matter removed during the cycle. The existing conventional treatment facility at the Agro chemical factory of Lankem Ceylon Ltd failed to achieve the required tolerance level of COD. Experimental studies reveals that the major contributor for the high COD value is dissolved organics mainly surfactants.

The lime treatment is used to remove phosphate type pesticides, heavy metals & some dissolved organics. The surfactants undergo hydrolysis only during the lime treatment, since it does not ionize in a solution to form any insoluble salts with calcium.

A powerful oxidizing agent (potassium permanganate) oxidizes substances remaining, which are ultimately precipitated as calcium salts.

This study involves on use of a powerful oxidizing agent such as permanganate to oxidize surfactants to oxidize species such that they would be precipitated as calcium salts.

Therefore the tolerance level of COD was achieved effectively by oxidation followed by hydrolysis & subsequent precipitation.