

Treatment of Detergent Industries Wastewater

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Abstract Surfactants are the most important gradients in detergent products. Environmental pollution can be caused due to the use of alkyl benzene sulfonate, if the wastewater is not treated. For this reason, chemical and physical methods of treatment should be employed. In this work wastewater treatment of one of the detergent industries in Iran containing surfactants are considered and treatment with use of chemical, physical and biological methods has been compared. In the chemical method, the best coagulant were, lime with alum which caused a 90% reduction of COD. Dissolved Air Flotation (DAF) as a physical procedure was employed and which 8.26% reduction of COD occurred. Biological method was based on the use of Sequencing Batch Reactor (SBR) which led to an 86% reduction of COD. Effluent water after treatment can be used for agricultural, landscape irrigation and garden watering.

Keywords: Industrial, Pollution, Surfactants, Treatment

Introduction

Surfactants are in widespread use throughout the world. The use of surfactant is gradually increased day by day. A wide range of these products are actually synthesized and used in several domains such as textiles, fibbers, food, paints, polymers, cosmetics, detergents, etc. Anionic surfactants are the major class of surfactants used in detergents formulations and are among the most widely disseminated xenobiotics that may enter waste streams and the aquatic environment (Eichhorn, *et al.*, 2001, 2002), they are harmful to human beings, fishes and vegetation and cause foam in rivers and effluent treatment plants and reduce the quality of water. They cause short term as well as long –term changes in ecosystem. Due to these reasons, many environmental and public health regulatory authorities have fixed limits for use of detergents. Surfactants removal operations involve processes such as chemical and electrochemical oxidation (Lissens, *et al.*, 2003; Mozia, *et al.*, 2005), membrane technology (Sirieix-Plénet, *et al.*, 2003; Kowalska, *et al.*, 2004; Fernández, *et al.*, 2005), chemical precipitation (Talens-Alesson, *et al.*, 2002), photo catalytic degradation (Zhang, *et al.*, 2003), adsorption (Lin, *et al.*, 2002; Adak, *et al.*, 2005) and various biological methods (Dhouib, *et al.*, 2003; Chen, *et al.*, 2005).