

Application of coagulants in pretreatment of fish wastewater using factorial design

A.G.M. Silva*, M.O. Hornes, M.L. Mitterer, M.I. Queiroz

Laboratório de Biotecnologia, Universidade Federal do Rio Grande, Rua Eng. Alfredo Huch 475, 96201-900 Rio Grande, RS, Brasil
Tel. +53 3 233-8636; email: biotecnofurg@yahoo.com.br

Received 20 November 2007; Accepted 4 August 2008

ABSTRACT

The effect of aluminum sulfate and ferric chloride on the coagulation of the effluent from the fish industry was investigated. Jar test experiments were used to evaluate the effect of parameters such as pH, type of coagulation and coagulant dose. A complete $3^2 \times 2$ factorial design was used where the independent variables were: type of coagulant (aluminum sulfate and ferric chloride), coagulant concentration (50 mg L^{-1} ; 300 mg L^{-1} ; 550 mg L^{-1}) and pH of the effluent (6.0, 7.0, 8.0). The responses were the removal of volatile solids, suspended solids, turbidity and chemical oxygen demand (COD). The studied variables were statistically significant ($p \leq 0.05$) for all responses. The exception was volatile solids considering coagulant concentration. A significant and negative effect for the variable type of coagulant was observed when it was considered COD and turbidity removal. The best condition was using ferric chloride in the concentration of 550 mg L^{-1} at pH 8.0, whose results indicated maximum efficiency removals of 86, 96, 89 and 60% for COD, turbidity, suspended solids and volatile solids, respectively.

Keywords: Coagulants; Aluminum sulfate; Ferric chloride; Fish effluent

* Corresponding author.