Poster

Wastewater purification with activated carbon

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ABSTRACT

Activated carbon filtration is a frequently used technology based on the adsorption of particles of contaminants onto the surface of a filter. This process is effective in removing some organic pollutants as anionic surfactant from wastewater among others contaminants [1,2]. The objective of this study is to eliminate anionic surfactants and chemical organic demand in a wastewater coming from a detergent industry as these contaminants are majority in industries specialized in manufacturing cleaning chemical products [3]. Seven assays were proposed in order to determine the optimal concentration of activated carbon which allow a correct elimination of initial contaminants in the wastewater from a detergent industry (12800 mg/L of COD and 4,6 mg/L of anionic surfactants). For this proposal, 1, 5, 10, 25, 50 and 100 g/L of activated carbon were added to several vessels containing 250 ml of wastewater and, after stirring (700 rpm) during 1 h. Treated waters were filtered through a 5 µm of diameter filter and COD and anionic surfactants quantifications were carried out by spectrophotometry using the kits LCK 514 and LCK 332 for COD and anionic surfactants measurements, respectively. Results showed than only 5 g/L of activated carbon were enough to remove 90% of anionic surfactant reaching a reduction of 99% of pollutant concentration with 100 g/L of activated carbon. In contrast, COD removal was less noticeable, decreasing only 10% with 5 g/L of adsorbent. A reduction of 73% in COD concentration was achieved when the higher concentration of active carbon was used. Therefore, COD is a critical parameter for the design of the decontamination technique as elevated concentrations of adsorbent do not guarantee a correct wastewater treatment. In consequence, activated carbon could be used as pre-treatment and an adequate combination with other technology (as ozonation) is desirable in order to decrease operation cost.

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