



Impact of soluble COD on grey water treatment by electrocoagulation technique

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ABSTRACT

Grey water (GW) is a valuable source for water reclamation in many useful applications. In order to be safe for reuse, grey water should undergo sufficient treatment. In the last few years, electrocoagulation (EC) technique has proved to be an attractive method for GW treatment. However, an important consideration when dealing with grey water is the duration time prior to treatment which, if extended, might lead to a significant increase in the fraction of soluble chemical oxygen demand (SCOD), which could affect the EC treatment performance. This parameter presents a potential for explaining further patterns in selecting EC technique for GW treatment. In this study, three categories of GW samples comprising different percentages of SCOD, specifically 10%, 54% and 85% were obtained after storing the samples for 1, 7 and 30 d, respectively. A bench-scale EC unit was used to demonstrate the impact of the SCOD fraction on the total COD removal. Both Al and Fe electrodes were used at different applied current densities ranged from 5.85 to 11.70 mA/cm². An applied current density of 9.36 mA/cm² was found to be sufficient to remove 96% of the total COD at 10% of SCOD during 15 min of EC time with either Al or Fe electrodes. However, a significant impact of SCOD on the total COD removal was observed; the removal efficiency of COD decreases dramatically with increasing the SCOD fractions. Statistical analysis confirmed the superiority of aluminum anodes over iron anodes with regards to energy consumption and COD removal.

Keywords: Grey water; Electrocoagulation; Soluble COD; Wastewater treatment

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