Data Article

Electrocoagulation process to Chemical and Biological Oxygen Demand treatment from carwash grey water in Ahvaz megacity, Iran

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A B S T R A C T

In this work, we present the result of an electric coagulation process with iron and aluminum electrodes for removal of chemical and biological oxygen demand (COD and BOD) from grey water in different car washes of Ahvaz, Iran. Nowadays, one of the important dangerous that can contaminate water resources for drinking, agriculture and industrial is Car wash effluent [1,2]. In this study, initial COD and BOD concentration, pH of the solution, voltage power and reaction time was investigated. The concentration level...
of remaining COD and BOD in samples was measured, using DR/5000 UV–vis HACH spectrophotometer [3,4]. The effects of contact time, initial pH, electrical potential and voltage data on removal of COD and BOD were presented. Statistical analysis of the data was carried out using Special Package for Social Sciences (SPSS 16).

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### Specifications Table

| Subject area       | Environment                          |
|--------------------|--------------------------------------|
| More specific subject area | Chemical and biological oxygen demand |
| Type of data | Table, figure |
| How data was acquired | DR/5000 UV–vis HACH spectrophotometer |
| Data format | Raw, analyzed |
| Experimental factors | - For samples collection from different grey water of Alhaz, a glass tank was used with a volume of 2–4 l, containing 3 electrode-plate iron and aluminum (Al-Al, Al-Fe, Fe-Fe) was used for Electrocoagulation removal.  
  - After collection of wastewater along the car washes, added Sulfuric acid (H₂SO₄), potassium dichromate (K₂Cr₂O₇), mercury sulfate (HgSO₄), silver sulfate (Ag₂SO₄), potassium hydrogen phthalate (C₈H₅KO₄) and 3-methyl-2-benzothiazoline, then it was stored in a dark place at 4 °C temperature until the metals analysis  
  - The effects of contact times, initial pH, electrical potential and voltage were examined. |
| Experimental features | Electrocoagulation between many treatment processes having to be cost-effective for wastewater treatment with pollutant wide range. |
| Data source location | Ahvaz, Iran |
| Data accessibility | Data is with this article. |

### Value of the data

- These data describe changes in COD and BOD removal from grey water by electrocoagulation process.
- Data show that electrocoagulation can be used as cost-effective for removal of other pollutant from wastewater.
- Data of this study can be used to design the electrocoagulation experiments for removal of wide range of pollutant in wastewater.
- Data are important for discharge environment especially resource water, aqueous and agriculture.

### 1. Data

In this article the data in Table 1 present the measured parameters and characteristics of the raw grey water that used for description of experiments. Calculated values of K (1/min) and kWh/m³ in the grey water effluent are reported in Table 2. Figs. 1 and 2 show data of different arrangements under optimal conditions applied in this study. The maximum removal efficiency (90.18%) of COD and
BOD was obtained at optimum pH = 7, level of 30 voltage, and contact time of 90 min. The effects of optimum parameters on removal efficiency of COD and BOD are shown in Fig. 3.

2. Experimental design, materials and methods

2.1. Sample collection and analytical procedures

Our data set was obtained from All Car washes. The raw grey water was obtained along the Ahvaz in Iran. The initial concentration of samples has been tested for determination of COD and BOD. To
Fig. 1. (a) Aluminum electrode, (b) Aluminum – Iron electrode, and (c) Iron electrode applied in the different Voltage on COD removal efficiency.

Fig. 2. (a) Aluminum electrode, (b) Aluminum – Iron electrode, and (c) Iron electrode applied in the different Voltage on BOD removal efficiency.
adjust the primary pH of the solution, the sulfuric acid and one-tenth normal sodium hydroxide were used. A lab-scale reactor with diameters of 15 cm × 15 cm × 15 cm was used for performing experiments. Sulfuric acid (H$_2$SO$_4$), potassium dichromate (K$_2$Cr$_2$O$_7$), mercury sulfate (HgSO$_4$), silver sulfate (Ag$_2$SO$_4$), potassium hydrogen phthalate (C$_8$H$_5$KO$_4$), 3-methyl-2-benzothiazoline hydrazine were used for preparing COD and BOD solutions in grey water. Steering time of 30, 60 and 90 min, voltage values of 10, 20 and 30 V were used in this study. At each experiment, removal efficiency of COD and BOD in grey water with special Al–Al, Al–Fe, Fe–Fe electrode was investigated. Spectrophotometer (DR/5000 UV–vis HACH) was used to investigate the remaining concentration level of COD and BOD in the grey water effluent [5]. Following equation was applied to calculate the electrocoagulation electrical energy consumption during experiments [4,5].

$$EE = \frac{V \times I \times t}{V_r}$$

where: $U$ is voltage used in the process ($V$), $I$ is intensity of the applied current ($A$), $t$ is reaction time (min) and $V_r$ is reactor volume (Lit).

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Transparency document. Supporting information

Transparency data associated with this article can be found in the online version at http://dx.doi.org/10.1016/j.dib.2017.03.006.

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