COD ... Reactive Blue 19

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COD ... Reactive Blue 19 ...

reactive Blue 19 ... Fe^{2+} ... COD ...

COD ... mg/L ... min ... mg/L ... mg/L ... pH ... COD

COD ... Reactive Blue19

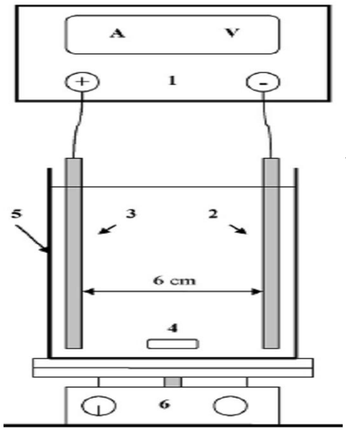
Reactive Blue19

$$O_2H_2 \rightarrow O_2 + 4H^+ + 4e^-$$

$$O_2 + 2H^+ + 2e^- \rightarrow O_2H_2$$

$$Fe^{3+} + e^- \rightarrow 2+ Fe^{+2}$$

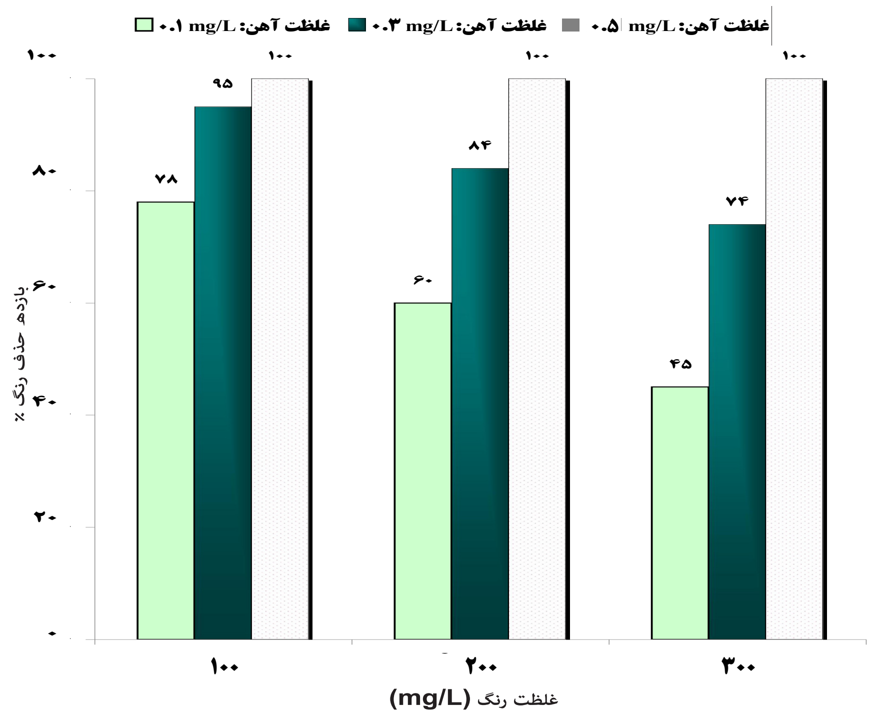
$$Fe^{+2} + O_2H_2 \rightarrow Fe^{3+} + OH^0 + OH^-$$



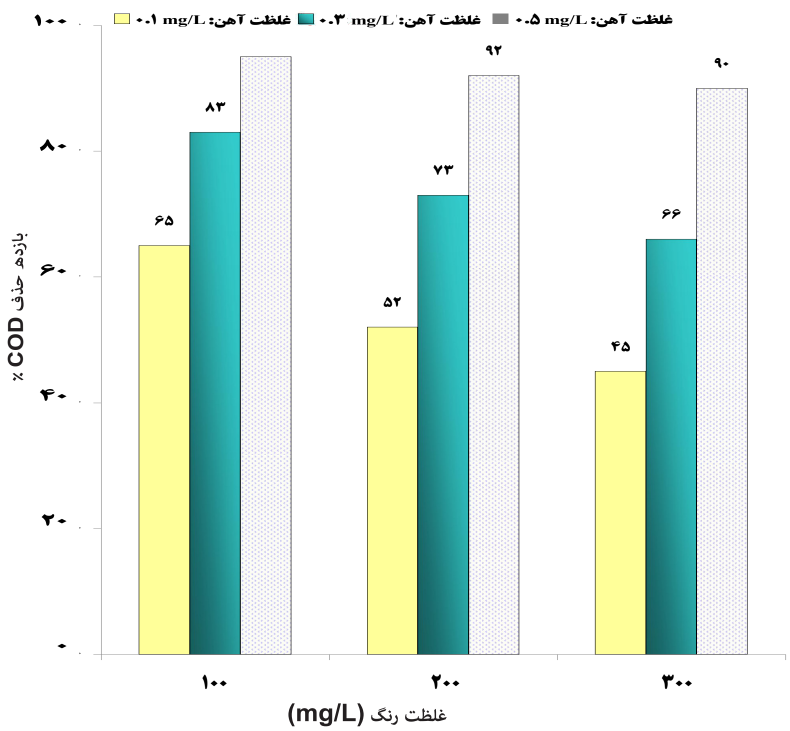
[illegible]

[illegible] (RB19) [illegible] mg/L [illegible] pH [illegible]

[illegible] mg/L [illegible] min [illegible] mg/L [illegible] pH [illegible]



[illegible]
([illegible] min [illegible] pH=[illegible] mg/L [illegible])


غلظت آهن: ۰.۱ mg/L
غلظت آهن: ۰.۳ mg/L
غلظت آهن: ۰.۵ mg/L
٪ COD بازده حذف
۰
۲۰
۴۰
۶۰
۸۰
۱۰۰
۶۵
۸۳
۵۲
۷۳
۹۲
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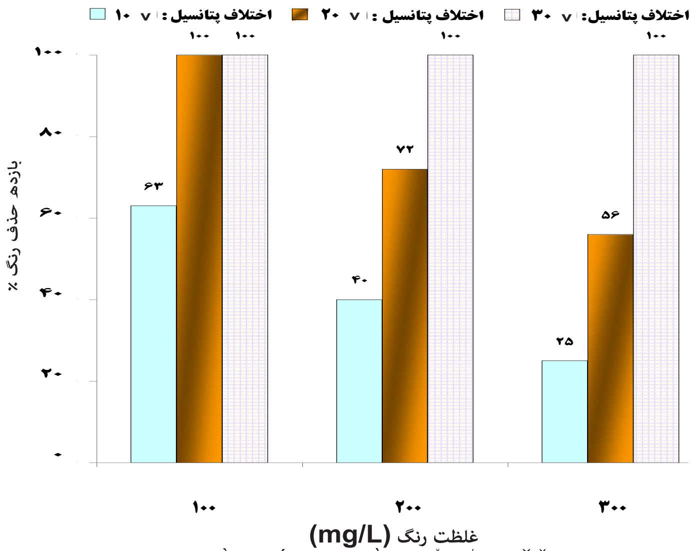
۹۰
۱۰۰
۲۰۰
۳۰۰
غلظت رنگ (mg/L)


اختلاف پتانسیل: ۱۰ v
اختلاف پتانسیل: ۲۰ v
اختلاف پتانسیل: ۳۰ v
بازده حذف رنگ ٪
۱۰۰
۸۰
۶۰
۴۰
۲۰
۰
۶۳
۱۰۰
۱۰۰
۴۰
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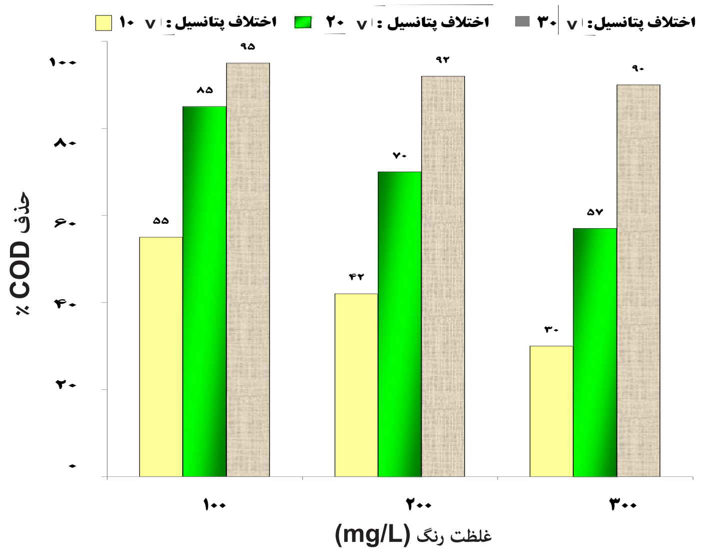
غلظت رنگ (mg/L)


اختلاف پتانسیل: ۱۰ v
اختلاف پتانسیل: ۲۰ v
اختلاف پتانسیل: ۳۰ v
٪ COD حذف
۱۰۰
۸۰
۶۰
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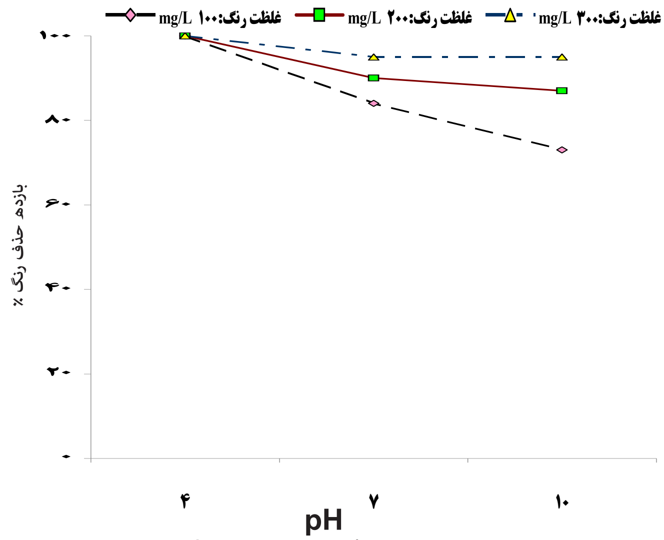
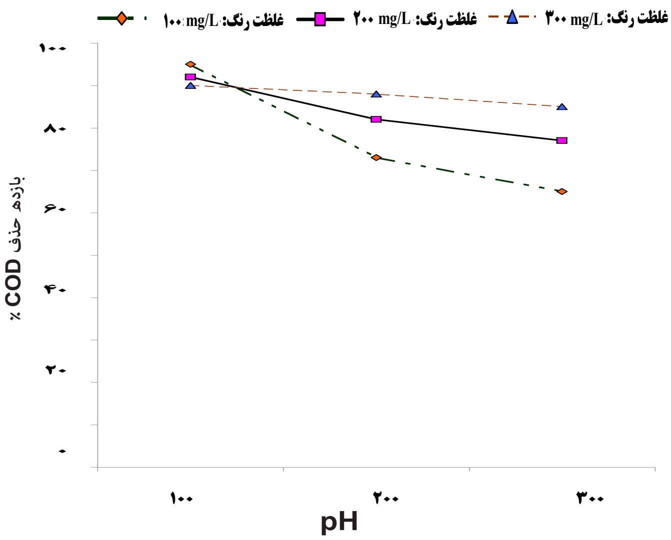
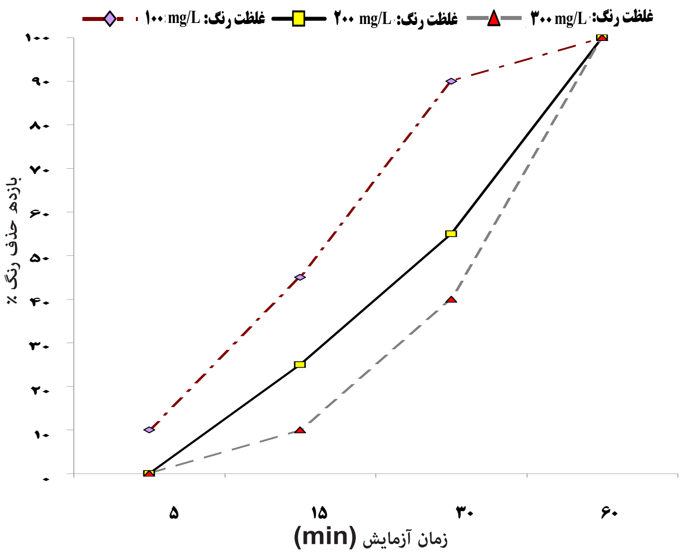
۳۰۰
غلظت رنگ (mg/L)


غلظت رنگ: ۱۰۰ mg/L
غلظت رنگ: ۲۰۰ mg/L
غلظت رنگ: ۳۰۰ mg/L
% بازده حذف رنگ
۱۰۰
۸۰
۶۰
۴۰
۲۰
۰
۴
۷
۱۰
pH


غلظت رنگ: ۱۰۰ mg/L
غلظت رنگ: ۲۰۰ mg/L
غلظت رنگ: ۳۰۰ mg/L
% COD بازده حذف
۱۰۰
۸۰
۶۰
۴۰
۲۰
۰
۱۰۰
۲۰۰
۳۰۰
pH



Ūǃ3 Ùzf Æǂ3Ǩg ƸǶ lǃgǂp ǯǨǭƸ ƸǿƥǨơ :ī ǨĞǁ

(Ħġġ p ĥġġ ǗĦġġ mg/LŪǃ3 ǻǨġƠǒǭǗ p ġ/Ī mg/L ǰġǻ ǻǨġǯǸǂ ƠǒǭǗ ¡Ħġ vǨǿsǃǨǰ ǗÊǃǮǂ ¡pH=ħ : l ǂǨǭƸǻ njǂƸǁ)

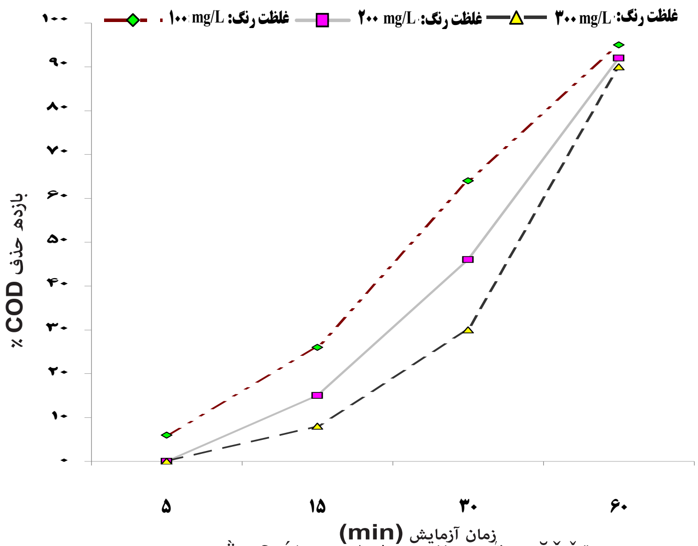
ǯǨǭyǃ3 ě Īġ Ǩơ ǗŪǃ3 ù ǃǗǭ ǻǨġƠǒǭǗ 3Y p Ħġ min ǯǨǭƸ njǂƸǁ 3Y p īġ min ǯǨǭƸ ǯǨǂǨǰ 3Y p yǂǻÆǭ Ơ5Y Ǵǂ Ùzf .yǂǻÆǭ Ơ5Y ǴǂCOD p Ūǃ3 Ùzf Ƹǂǂyf Ǘyǂǂ Ƹǂ ǴǂǗǂǂ 3Y ǯǨsŪǂ Ùzf ǂYƸǨǂ Ǵǂ ǯyǿ53 ǻǂƸǂ Ǵǂ yǁ ǂyǧǨǂǂǭ ǰǿǃšǬġ .yǂǂÆǭ lǂǃ3ǂ ƸǨǿǂ Y3ǸǭǯǨǭƸ ǗŪǃ3 ù ǃǗǭ ǻǨġƠǒǭǗ

l ǃǂǂp ǯǨǭƸ ƸǿƥǨơ

COD p Ūǃ3 Ùzf Æǂ3Ǩǂ Ƹǂ l ǃǂǂp ǯǨǭƸ ƸǿƥǨơ ī p Ī ǨŪǁ ǰġǻ ǻǨġǯǸǂ ƠǒǭǗ ǗĦġ V ǨǿsǃǨǰ ǗÊǃǮǂ ǗpH=ħ 3Y ǃ3 Ħġġ p ĥġġ ¡ Ħġġ mg/LŪǃ3 ǻǨġƠǒǭǗ p ġ/Ī mg/L Æǂ3Ǩǂ Ǘ l ǃǂǂp ǯǨǭƸ lǂǃ3ǂ Ǩǂ Ǘ 2 Ǩ5ǂ ǰǂ Ƹǂ .yǧYÆǭ ǯǨǂǁ 3Y ǗYǸǁÆǭ ǂyǧǨǂǂǭ Ǵǂ 3ǸǍ ǯǨǯġ .yǂǂÆǭ lǂǃ3ǂ yǂǂƸǂ ǰǿǂǨǰ 3Ǩǿsǂ Ūǃ3 Ùzf ǯǂ3ǿǭ ĤĪ min Ƹǂ Ƹǃǯǂ ǻǨġǯǨǭƸ ǻǨġǧǨŪǂY3 Ƹǃǂǿǂ yǿǂǸǂ Ǵǂǃ ǿǃǃ 3Y p ǯǨǭƸ Ơǁzū ǂǨ ǨǭǂƠ5ǂ l ǂǂ3ǂ ǻƸǿūǬǂš 3ǸǍ Ǵǂ Ūǃ3 Ùzf ǯǂ3ǿǭ ǗǨǿsǂp3yǿġ Ơǁzū Ƹǂ yǿǂ lǂǨǭƸǻ Ɵěǂf Ƹǃǂǿǂ 3Y Ǵǂ ǻ3ǸǍ Ǵǂ ǗyǂǂÆǭ

PŢǂ

RB19 Ūǃ3 ǻpǨf ǩÊljǨǂ ÆǂǨǿǯǿǁpƸǃŪǂ ǯǸǿ5ǂyǿsǂ Ǵǂ lǂǨǭƸǻ ù ǃǗǭ njǂƸǁ ƠŢơ ǯǸǃǂpƸǃŪǂ yǂǂƸǂ Ǵǿ5p Ǵǂ



COD Ùzf Æǂ3Ǩǂ Ƹǂ l ǃǂǂp ǯǨǭƸ ƸǿƥǨơ :ĬǨĞǁ

(Ħġġ p ĥġġ ¡ mg/L Ħġġ Ūǃ3 ǻǨġƠǒǭǗ p ġ/mg/L Ī ǰġǻ ǻǨġǯǸǂ ƠǒǭǗ ¡Ħġ vǨǿsǃǨǰ ǗÊǃǮǂ ¡pH=: ħ l ǂǨǭƸǻ njǂƸǁ)

[illegible]

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Evaluation of Electro-Fenton Process Performance for COD and Reactive Blue 19 Removal from Aqueous Solution

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ABSTRACT

Background and Objectives: Synthetic dyes represent one of the largest groups of pollutants in wastewater of dying industries. Discharging these wastewaters into receiving streams not only affects the aesthetic but also reduces photosynthetic activity. Electrochemical advanced oxidation processes such as Electro-Fenton process are low operational and have high mineralization degree of pollutants. In this study, we investigated affective factors in this process to determine the optimum conditions for dye and COD removal from aqueous solutions containing Reactive Blue 19 dye.

Materials and Methods: Synthetic samples containing Reactive Blue 19 dye were prepared by dissolving dye powder in double distilled water. and the the solution prepared was transferred into pilot electrochemical cell having two anode and cathode electrode made of iron and carbon. Electro-Fenton process was began by adding of Fe^{2+} ions and establishing electrical potential difference. After testing and at specified time intervals, each sample was collected from the pilot cell, and process performance was evaluated through measuring dye concentration and COD.

Results: Based on the results obtained, optimum conditions of Electro-Fenton process for dye and COD removal was determined. Accordingly, potential difference of 20 volt for dye concentration up to 100 mg/L and potential difference of 30 volt for dye concentration of more than 200 mg/L, reaction time 60 minutes, 0.5 mg/L of Fe^{2+} concentration and suitable pH for the maximum dye removal efficiency equaled 4 respectively. Under such conditions, the dye and COD removal was 100 and 95% respectively.

Conclusion: Based on the results obtained, it was revealed that Electro-Fenton process has significant ability in not only dye removal but also in COD removal. Accordingly, it was found that the effective parameters in Electro-Fenton process for removal Reactive Blue19 dye are electric potential difference, concentration of iron ions and electrolysis time.

Keywords: Electro-Fenton process, Avanced oxidation, Reactive Blue19 dye, Electrical Potential difference

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