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چکیده

Fe^{2+} /H_2O_2 ... pH ... Excel ...

(Fe^{2+} = ... mmol/L) Fe^{2+}/ H_2O_2 = ... pH= ... mmol/L ... mmol/L ... mmol/L ...

واژگان کلیدی:

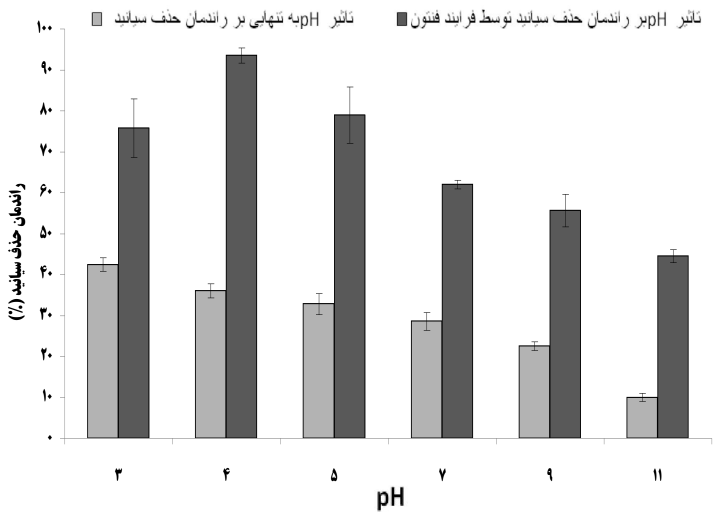
[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



[illegible] **pH** [illegible] (**Fe**$^{2+}$ = [illegible] **mmol/L**) **Fe**$^{2+}$/ **H**$_2$**O**$_2$ = [illegible] **min** [illegible] **mmol** [illegible]

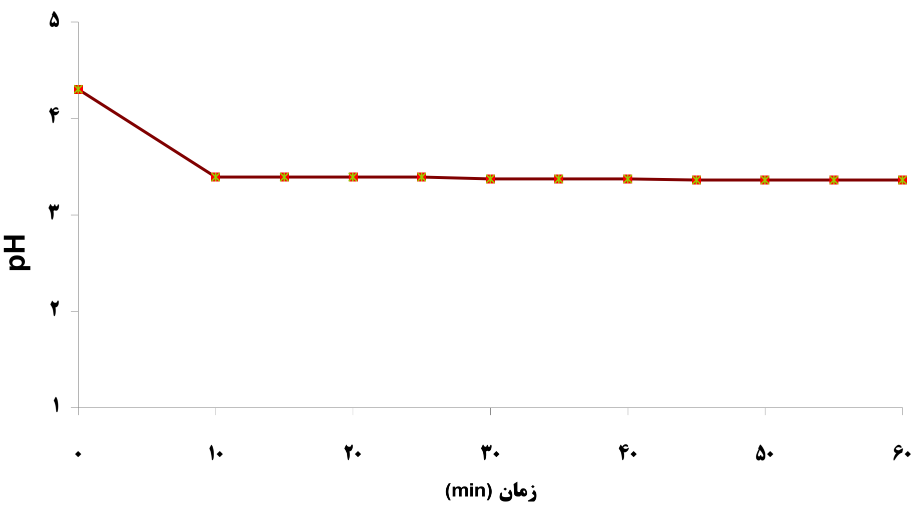
[illegible] pH [illegible]

[illegible] pH [illegible] min [illegible] pH [illegible]

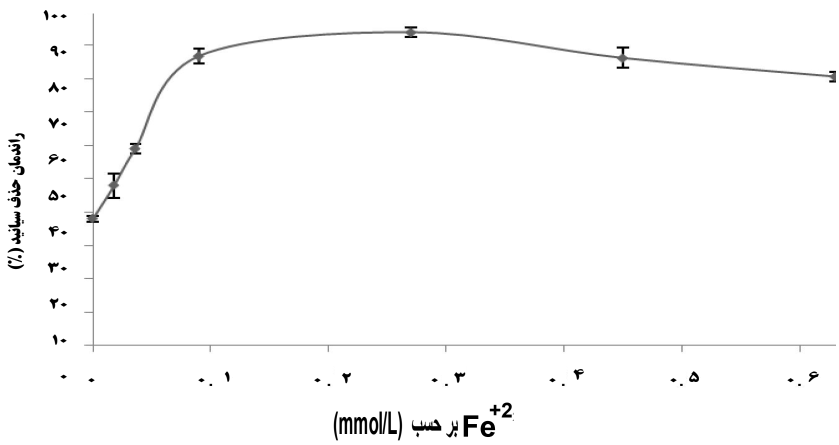
[illegible] **Fe**$^{2+}$ [illegible] **H**$_2$**O**$_2$ [illegible]

[illegible] Fe^{2+} [illegible] H$_2$O$_2$ [illegible] mmol/L [illegible]

[illegible] (pH = [illegible] H$_2$O$_2$ = [illegible] mmol/L [illegible] (Fe^{2+}/H$_2$O$_2$ = [illegible]) Fe^{2+} = [illegible] mM/L [illegible]) Fe^{2+} = [illegible] mmol/L [illegible] (Fe^{2+}/H$_2$O$_2$ [illegible] pH = [illegible] Fe^{2+} = [illegible] mmol/L [illegible] mmol/L [illegible] mmol/L [illegible] H$_2$O$_2$ = [illegible] mmol/L [illegible] /H$_2$O$_2$ = [illegible]



[illegible] **pH** [illegible]



(ĕ) ƿƸə ǯǸĠ ù ǪǕǭ ƸĠYƘǩǭ ƷY ƴĠǨĠƺ Ǜƶƒ ǯƘǭƴǨƷ :Ħ ǨŨ
(H_2O_2 = Ĩ/Ĭ **mmol/L** ¡pH =ħ ¡ĩġ**min** ǀ ǝŧƿ ǯƘǭƸ ¡ġ/ħ **mmol**Ƙ ƸǂƸ ƴǨƘǿƺ ƓǿǨƿ ƠǒǪǕ)

ÆǨǸǭ ƠǦƽǦ) H_2O_2 =Ĩ/Ĭmmol/L ƷY ĕĬġ ƸŁ ƸǪǂǿƘ Ɠƛ (Fe^{2+} ǕƷŁƴǨǭ ǰǩ ǀ ǩƺǩ Ƙ ǰǿƽǬġ .ƴƽƷÆǭ (Fe^{2+}/H_2O_2 =ġ/ġħĩ .ƴǨǩÆǯǀ ǻŁǾŏƒÊǭ ǨƘǨ ǀ ġŧ ƴǿǨǿƺ Ǜƶƒ ÆǩŁƷǨŧ

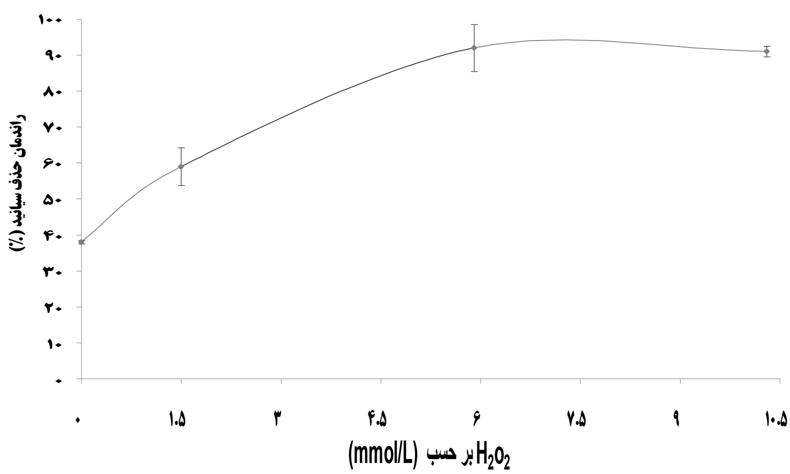
ƴǿǨǿƺ Ǜƶƒ ǯƘǭƴǨƷ ƸƘ ƴǿǨǿƺ ƓǿǨƿ ƠǒǪǕ ƿ ǯƘǭƸ ƸǿǨƘǭ .Ħ ǯǸǪǩə ƴǨǩƸə ǌƽǸǭ

ǯƘǭƴǨƷ ƸƘ ǯƴǨǩèǭ ƓǿǨƿ ƠǒǪǕ ƿ ǯƘǭƸ ƸǿǨƘǭ ǕĩƿĨ ǻǨġǨŨ ƸŁ ǨDžƘƒ ƓǿǿƘ ǌǩŁƸǀ ƷY ǯǸǪǩə ƴǨǩƸə ǌƽǸǭ ƴǿǨǿƺ Ǜƶƒ ƓǿǨƿ ƠǒǪǕ ƿ ĩġmin ǯƘǭƸ ƷY .ƴġYÆǭ ǯƘǂǀ ƷŁ ǨǨā ǨƒŁƸǭ ğYǨǖǭ Ǜƶƒ ǯƘǭƴǨƷ ǰǩƸǪǂƘ Ǖġ/ħ mmol/L Ƙ ƸǂƸ ƴǿǨǿƺ .ƴǨ ǩƴğǨǂǭ ĕĬĥ

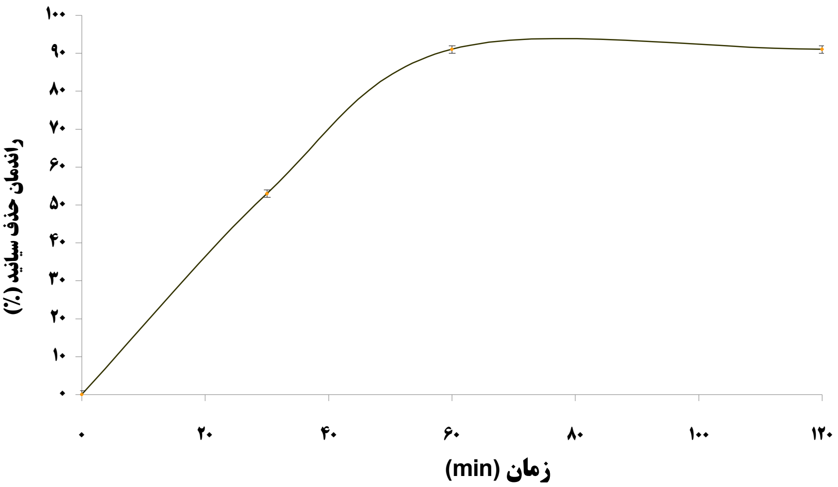
ƤƮ

ǕǰġǨ ƠǒǪǕ ǕpH ǯǸŢǯġ ǻYǨǩƸ ǨǭŁǸǕ Ɠƛ ǯǸǪǩə ƴǨǩƸə ǕǸǨ (ǰġǨ ƷYǸř ǕŦǩƸə Ǩǩ ƿƸə ǻǨġŦǯǀ) ǰġǨ ǕǸǨ ƠǒǪǕ ǯƘǭƸ ƿ ǰġǨ ǯǸǩ Ɠƛ ǯţƿƷƴǿġƴǿƽŧŁƸř ƠǦƽǦ ǕǯţƿƷƴǿġƴǿƽŧŁƸř ƓǿǿǨƛ ǌǩŁƸǀ ǕƠƽǩƷƿƸǈ ǰǩǂƸǨǨƛ .(ĥĬ) YƷŁY ÆǕǪƽƛ ǀ ǝŧƿ .ƴǩǰ ƠƽY Ɠƛ ƟǨǂǩǭƸǰ ǪǨǔǨ ǍǩƸǍ ƸŁ ƴǨǩƸə ǰǩ

Ɠŧ YŁY ǯǨǂǀ ƴǿǨǿƺ Ǜƶƒ Ƹƛ ÆǩǨƛǿǰ Ɠƛ pH ƸǿǨƘ ƟǨǂǩǭƸǰ ƷY ĕĤġ ƿ ħĥ Yƿƴƒ ǂ ǿǭƸǿ Ɠƛ ƴǿǨǿƺ Ǜƶƒ ǰǩƸǪǯŧ ƿ ǰǩƸǪǂǿƛ ǻƴǿƺŁ ǻǨġǌǿŢǭ ƷY ǬǿƽǨǿǭ ƴǿǨǿƺ .YǸǨ ĤĤ ƿ Ħ Ƙ ƸǂƸǨ ǻǨġ pH ǨǩƴǨǫ ƴǿǨǿƺ ǯǸǩ ƿ ǯţƿƷƴǿġ ƴǿǨǿƺ ǭƸə Ɠƛ ǂ ǿƸǿ Ɠƛ ÆǩǨǿǭā ƿ



(ĕ) ǯţƿƷƴĠġƴĠƽŧŁƸř ù ǪǕǭ ƸĠYƘǩǭ ƷY ƴĠǨĠƺ Ǜƶƒ ǯƘǭƴǨƷ :ħ ǨŨ
(Fe^{2+} = ġ/ĥĨ mM/L ¡pH =ħ ¡ĩġ**min** ǀ ǝŧƿ ǯƘǭƸ ¡ġ/ħ **mmol** Ƙ ƸǂƸ ƴǿǨǿƺ ƓǿǨƿ ƠǒǪǕ)



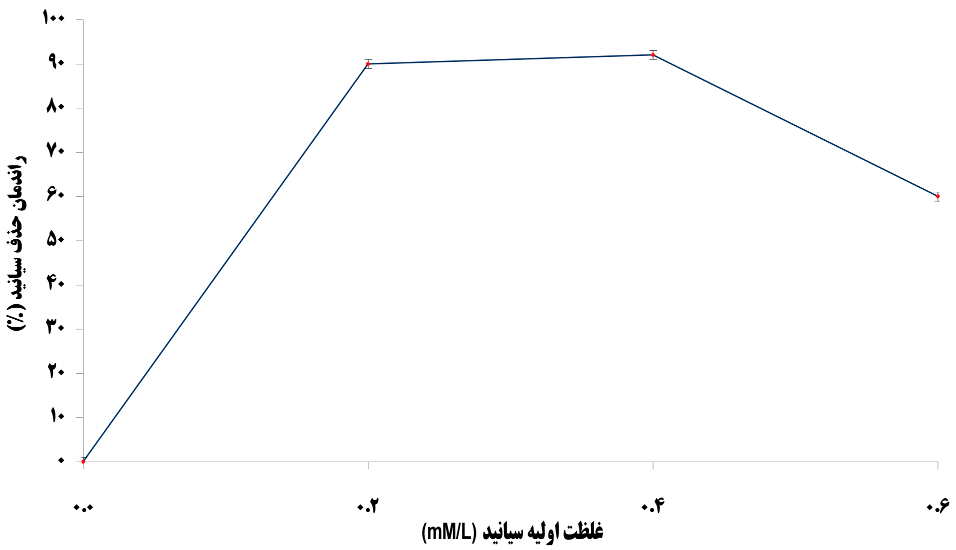
[illegible]

((Fe^{2+} = [illegible] mmol/L) Fe^{2+}/H_2O_2 = [illegible] pH = [illegible] mmol [illegible])

[illegible] (Strong Acid dissociable) [illegible] pH [illegible]

[illegible] pH [illegible] pH [illegible]

[illegible] pH [illegible] min [illegible] (H^+ [illegible]) [illegible] pH [illegible] pH [illegible]



[illegible] (**mmol**)

(Fe^{2+} = [illegible] mmol/L) Fe^{2+}/H_2O_2 = [illegible] min [illegible] pH = [illegible])

$$Fe^{2+} + H_2O_2 \rightarrow Fe^{3+} + OH^0 + OH^-$$

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

$$2H_2O_2 \rightarrow 2H_2O + O_2$$

$$H_2O_2 + OH^0 \rightarrow H_2O + HO_2^0$$

[illegible] H_2O_2 :CN [illegible] H_2O_2 [illegible]

[illegible]

[illegible]

[illegible]

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The Study of Fenton Performance in Removal of Cyanide from Aqueous Solution

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ABSTRACT

Background and Objectives: Cyanide is a toxic pollutant existing in the various industrial effluents such as iron and steel, coal mining, non-ferrous metals manufacturing and metal plating. Its presence in water resources and wastewater, as serious hazardous substances leads to undesirable effects on both the environment and human. Thus, its concentration control is essential for human health. The main goal of this study was to evaluate Fenton process efficiency in cyanide removal from aqueous solution.

Materials and Methods: This is an experimental study Conducted at Lab scale in a batch system. We investigated effect of different variables including; pH, mole ratio of Fe^{2+}/ H_2O_2, contact time, and initial concentration of cyanide. Data were analyzed using Excel software.

Results: We found that cyanide with initial concentrations of 0.4 mM/L was reduced by 92 %. This removal result was related to oxidizing agent of hydroxyl radicals under optimum conditions including; pH = 4, molar ratio Fe^{2+}/ H_2O_2= 0.046 (Fe^{2+}=0.27 mM/L) after 6o min reaction time. An increase in reaction time was not improved cyanide removal efficiency. Moreover, the Fenton process efficiency in cyanide removal decreased from 92 to 60 %, by increasing the initial cyanide concentration from 0.4 to 0.6 mM/L.

Conclusion: It can be concluded that Fenton oxidation Process can be considered as a suitable alternative for cyanide removal to achieve environmental standards.

Keywords: Advanced oxidation, Hydrogen peroxide, Fenton, Wastewater treatment, Cyanide

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