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(II)

(Chemical Oxygen Demand)

(OH

.(Glaze et al.1987)

(AOPs)

Advanced Oxidation Processes

OH

COD

2,4-DCP

Oxidation – Reduction Potential (ORP)

$E^{\circ} = + 3.06 \text{ V}$

Fe^{2+} H_2O_2

2,4-DCP

OH

)

(

:(Freeman 1998)

() AOPs

DCP

H_2O_2 /

UV /

H_2O_2 / UV /

COD BOD₅

UV/ H_2O_2

BOD₅/COD

Fe^{2+} / H_2O_2

H.J.H Fenton

()

(Fenton Reaction)

(Fenton Reagent)

.(Nesheiwat et al. 2000)

OH

H_2O_2

2,4-)

(DCP

.(Bigda 1995)

2,4-DCP

()

H₂O₂

H₂O₂

(Chamarro et al. 2001)

pH

pH

pH

pH

(Adams et al. 1994)

(Chlorophenols)

H₂O₂

(Fares 2003)

2,4-DCP

(2,4-D)

(2,4-DP)

DCP

(Chen et al. 1997)

$\frac{Fe^{2+}}{Fe^{3+}}$

(high-production volume chemicals)

(H₂O₂/substrate)

H₂O₂

(US EPA)

/

(BUA 1988)

(Adams et al. 1994)

Fe=15 mg/L

2,4-DCP=100 mg/L

pH

mg/L

2,4-DCP

pH=3

Fe=15 mg/L

(II)

() H₂O₂

H₂O₂

Fe=15 mg/L

pH

)

2,4-DCP=50 mg/L

pH (

2,4-DCP=100 mg/L

pH

H₂O₂

H₂O₂

H₂O₂ (II)

H₂O₂

COD

(Chamaro et al. 2001)

H₂O₂ =50 mg/L

BOD₅ COD

H₂O₂

COD

(APHA 1998)

(II)

H₂O₂=50 mg/L

COD %

Fe(II) =5 mg/L H₂O₂=50 mg/L

COD %

COD

% COD

COD

Fe(II) =5 mg/L

2,4-DCP=100 mg/L

BOD₅

H₂O₂=50, 75, 100 mg/L

| mg/L | COD | | COD | H ₂ O ₂ | H ₂ O ₂ |
|-----------------------|---|---|-----------------------|--|--|
| BOD ₅ | / | / | / | / | mg/L |
| / | / | / | mg/L | | |
| | | | () | COD | |
| | COD | | | % | % |
| | COD | % | | | |
| BOD ₅ /COD | | | COD | (II) | H ₂ O ₂ |
| | / | | | | |
| COD | | | | | |
| | | | (II) | | H ₂ O ₂ = 100 mg/L |
| | Fe=15 mg/L | H ₂ O ₂ =100 mg/L | COD | | |
| | | BOD ₅ /COD | | | % |
| | () | / | | | 5 mg/L |
| | | | % | | COD |
| | | BOD ₅ /COD | | | |
| | | | | H ₂ O ₂ = 100 mg/L | |
| | | | | 10 min | Fe(II) = 5 mg/L |
| | | | | % | COD |
| BOD ₅ /COD | Fe=10 mg/L | H ₂ O ₂ =50 mg/L | COD | | |
| / | 2,4-DCP=50 mg/L | | | | |
| | | | | | () |
| | H ₂ O ₂ =100 mg/L | Fe=15 mg/L | | | |
| | / | | BOD ₅ /COD | | H ₂ O ₂ |
| | | | () | | COD % |
| | | | BOD ₅ /COD | | % |
| | | | COD | (II) | |
| | Fe=15 mg/L | | | | |
| | | | | | |
| Fe=15 mg/L | | | | H ₂ O ₂ =75 mg/L | |
| | BOD ₅ /COD | | | | Fe(II) = 10 mg/L |
| | | | COD | | 2,4-DCP=100 mg/L |
| | | | | | |
| | | BOD ₅ /COD | | | |

H₂O₂

pH (II) 2,4-DCP=100 mg/L

/ / / /

.() pH 2,4-DCP=100 mg/L BOD₅/COD

pH 2,4-DCP=100 mg/L H₂O₂=100 mg/L /

Fe=10 mg/L H₂O₂=75 mg/L Fe=15 mg/L

COD H₂O₂ (BOD₅/COD)

Fe H₂O₂

pH Fe²⁺ H₂O₂

pH / .() /

BOD₅/COD (II)

%

%

.(Ma et al. 2000) H₂O₂

H₂O₂

pH

.(Bum et al. 1999) BOD₅/COD

pH=3-4 pH

pH

.(Chamarro et al. 2001) NaOH pH

pH

pH 2,4-DCP=50 mg/L

/...

%

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COD

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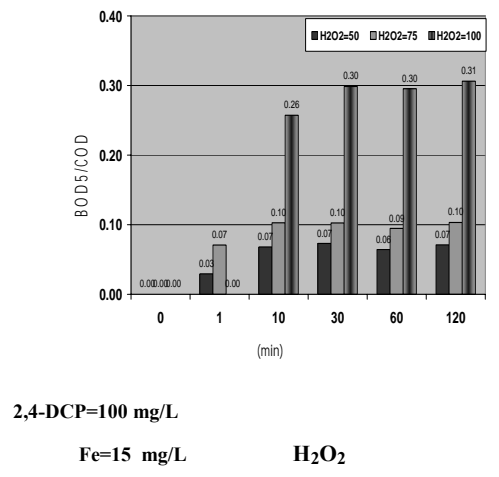
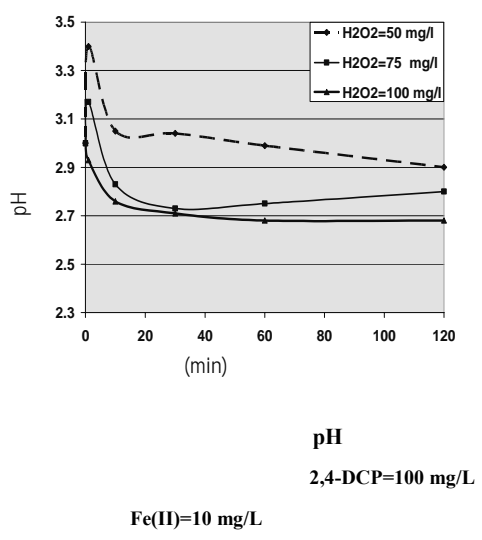
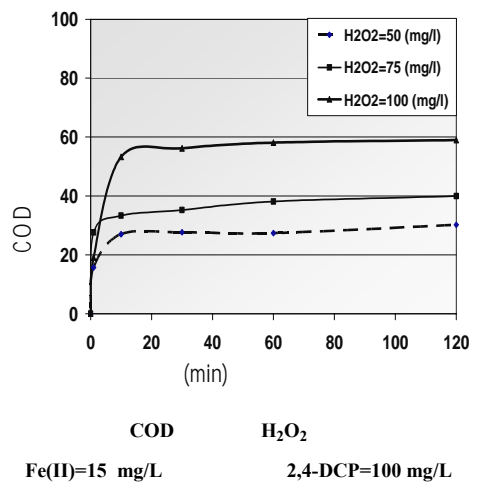
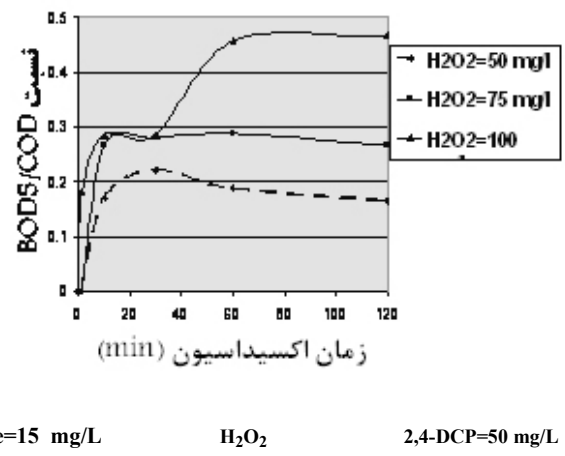
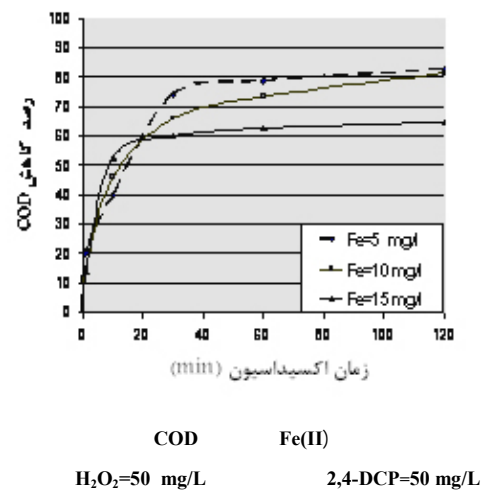
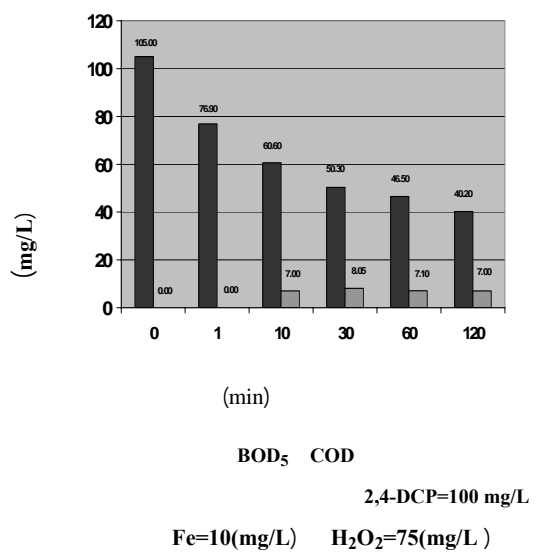
| Fe(II)=10 mg/L | H ₂ O ₂ | | 2,4-DCP=50 mg/L | | | | $\frac{BOD_5}{COD}$ | | BOD ₅ · COD | | | |
|---------------------|---|-----|-----------------|--|--------------------------|-----|--|---------------------|--------------------------|-----|-------------|-----|
| | Fe=10 mg/L | | | | | | | | | | | |
| | H ₂ O ₂ =100 mg/L | | | H ₂ O ₂ =75 mg/L | | | H ₂ O ₂ =50 mg/L | | | | | |
| $\frac{BoD_5}{COD}$ | BOD ₅ mg/L | COD | COD mg/L | $\frac{BoD_5}{COD}$ | BOD ₅ mg/L | COD | COD mg/L | $\frac{BoD_5}{COD}$ | BOD ₅ mg/L | COD | COD mg/L | min |
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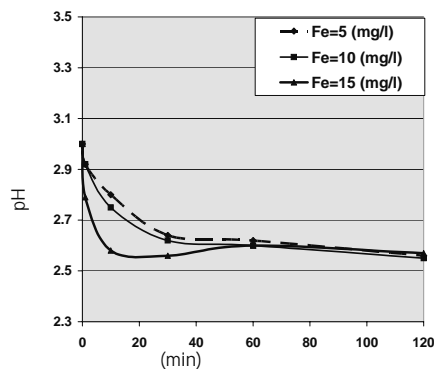
| Fe(II)=15 mg/L | H ₂ O ₂ | | 2,4-DCP=50 mg/L | | | | $\frac{BOD_5}{COD}$ | | BOD ₅ · COD | | | |
|---------------------|---|-----|-----------------|--|--------------------------|-----|--|---------------------|--------------------------|-----|-------------|-----|
| | Fe=15 mg/L | | | | | | | | | | | |
| | H ₂ O ₂ =100 mg/L | | | H ₂ O ₂ =75 mg/L | | | H ₂ O ₂ =50 mg/L | | | | | |
| $\frac{BoD_5}{COD}$ | BOD ₅ mg/L | COD | COD mg/L | $\frac{BoD_5}{COD}$ | BOD ₅ mg/L | COD | COD mg/L | $\frac{BoD_5}{COD}$ | BOD ₅ mg/L | COD | COD mg/L | min |
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| Fe(II)=10 mg/L | H ₂ O ₂ | | 2,4-DCP=100 mg/L | | | | $\frac{BOD_5}{COD}$ | | BOD ₅ · COD | | | |
|---------------------|---|-----|------------------|--|--------------------------|-----|--|---------------------|--------------------------|-----|-------------|-----|
| | Fe=10 mg/L | | | | | | | | | | | |
| | H ₂ O ₂ =100 mg/L | | | H ₂ O ₂ =75 mg/L | | | H ₂ O ₂ =50 mg/L | | | | | |
| $\frac{BoD_5}{COD}$ | BOD ₅ mg/L | COD | COD mg/L | $\frac{BoD_5}{COD}$ | BOD ₅ mg/L | COD | COD mg/L | $\frac{BoD_5}{COD}$ | BOD ₅ mg/L | COD | COD mg/L | min |
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| Fe(II)=15 mg/L | H ₂ O ₂ | | 2,4-DCP=100 mg/L | | | | $\frac{BOD_5}{COD}$ | | BOD ₅ · COD | | | |
|---------------------|---|-----|------------------|--|--------------------------|-----|--|---------------------|--------------------------|-----|-------------|-----|
| | Fe=15 mg/L | | | | | | | | | | | |
| | H ₂ O ₂ =100 mg/L | | | H ₂ O ₂ =75 mg/L | | | H ₂ O ₂ =50 mg/L | | | | | |
| $\frac{BoD_5}{COD}$ | BOD ₅ mg/L | COD | COD mg/L | $\frac{BoD_5}{COD}$ | BOD ₅ mg/L | COD | COD mg/L | $\frac{BoD_5}{COD}$ | BOD ₅ mg/L | COD | COD mg/L | min |
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pH :
2,4-DCP=100 mg/L

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