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(II)

(Chemical Oxygen Demand)

(OH

)

(AOPs)

.(Glaze et al.1987)

Advanced Oxidation Processes

OH

COD • Oxidation – Reduction Potential (ORP)

2,4-DCP

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

$\text{Fe}^{2+} \text{ H}_2\text{O}_2$

2,4-DCP

OH

)

:(Freeman 1998)

(

() AOPs

DCP

COD BOD₅

BOD₅/COD

H₂O₂ /

UV /

H₂O₂/ UV /

UV/H₂O₂

Fe²⁺/ H₂O₂

H.J.H Fenton

()

(Fenton Reaction)

(Fenton Reagent)

.(Nesheiwat et al. 2000)

OH

H₂O₂

2,4-)

(DCP

.(Bigda 1995)

2,4-DCP

()

H₂O₂

H₂O₂

(Chamarro et al. 2001)

pH pH pH

pH

pH

(Adams et al. 1994)
(Chlorophenols)

H₂O₂

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

(Fares 2003)

2,4-DCP

(2,4-D)

(2,4-DP)

DCP

(Chen et al. 1997)

(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

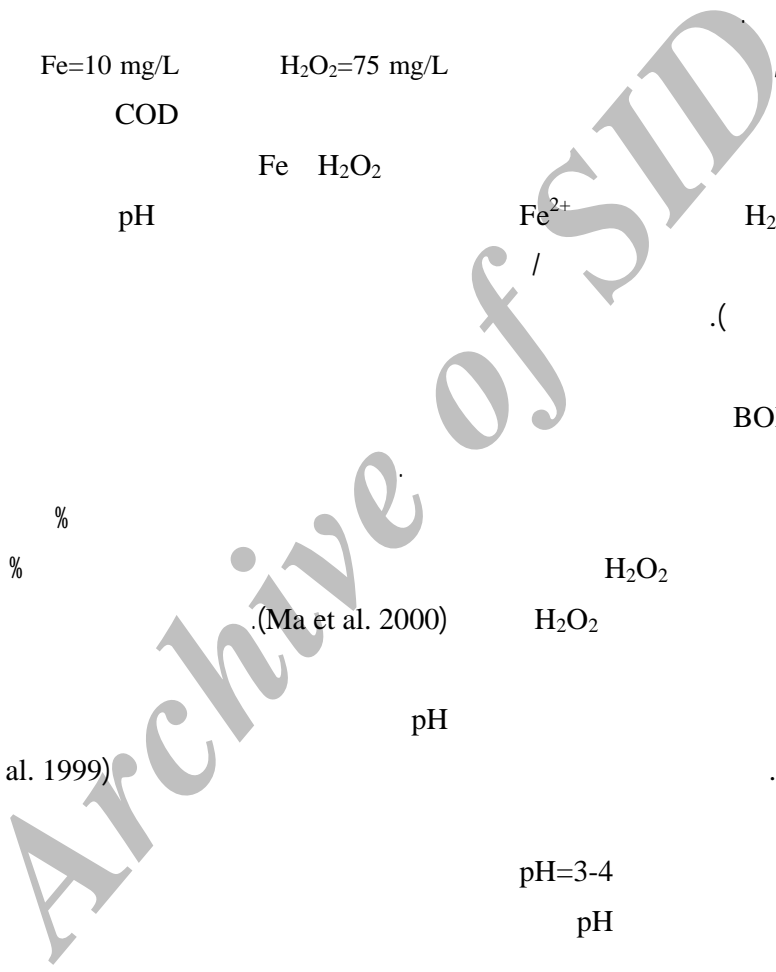
pH=3-4 pH

pH

.(Chamarro et al. 2001) NaOH pH

pH

pH 2,4-DCP=50 mg/L



%

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COD

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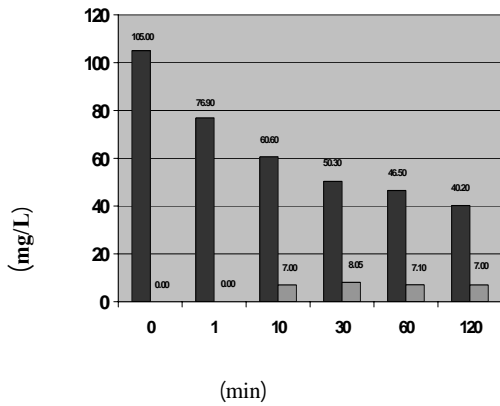
Fe(II)=10 mg/L	H ₂ O ₂		2,4-DCP=50 mg/L				$\frac{BOD_5}{COD}$		BOD ₅ , COD			
	Fe=10 mg/L											
	H ₂ O ₂ =100 mg/L		H ₂ O ₂ =75 mg/L		H ₂ O ₂ =50 mg/L							
$\frac{BoD_5}{COD}$	BOD ₅ mg/L	COD	COD mg/L	$\frac{BoD_5}{COD}$	BOD ₅ mg/L	COD	COD mg/L	$\frac{BoD_5}{COD}$	BOD ₅ mg/L	COD	COD mg/L	min
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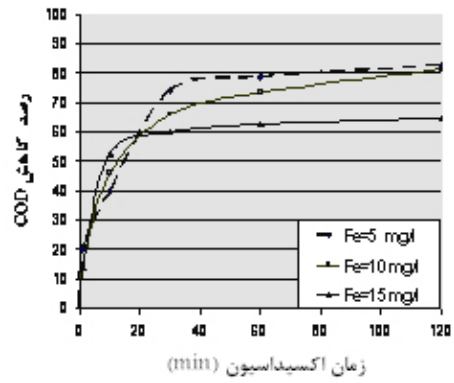
/ ...

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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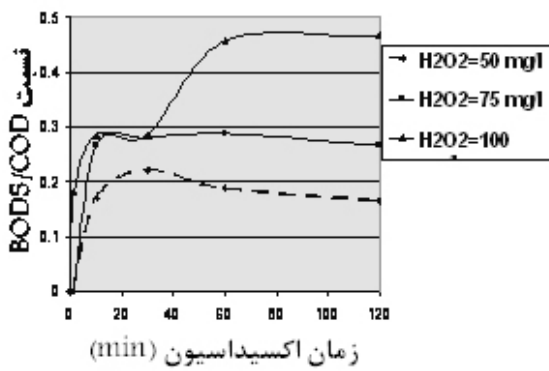
Fe(II)=15 mg/L		H ₂ O ₂		2,4-DCP=100 mg/L				$\frac{BOD_5}{COD}$		BOD ₅ , COD		
Fe=15 mg/L												
H ₂ O ₂ =100 mg/L			H ₂ O ₂ =75 mg/L				H ₂ O ₂ =50 mg/L					
$\frac{BoD_5}{COD}$	BOD ₅ mg/L	COD	COD mg/L	$\frac{BoD_5}{COD}$	BOD ₅ mg/L	COD	COD mg/L	$\frac{BoD_5}{COD}$	BOD ₅ mg/L	COD	COD mg/L	min
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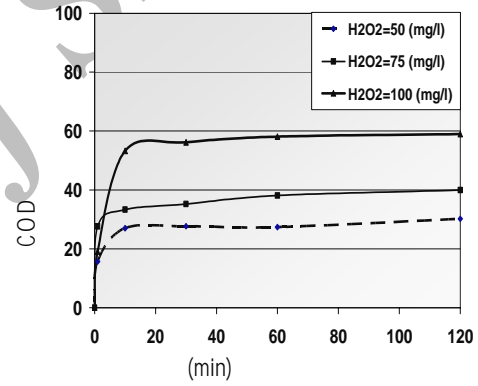
BOD₅ COD
 2,4-DCP=100 mg/L
 Fe=10(mg/L) H₂O₂=75(mg/L)



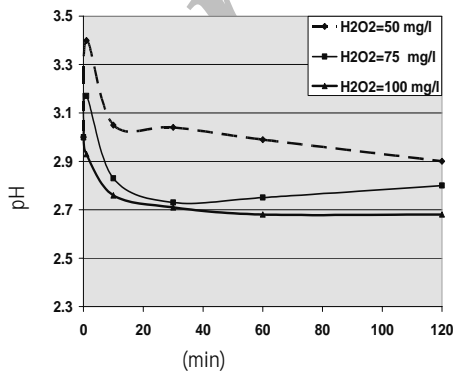
COD Fe(II)
 H₂O₂=50 mg/L 2,4-DCP=50 mg/L



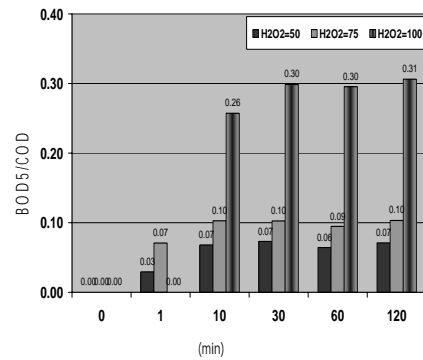
BOD₅/COD
 Fe=15 mg/L H₂O₂ 2,4-DCP=50 mg/L



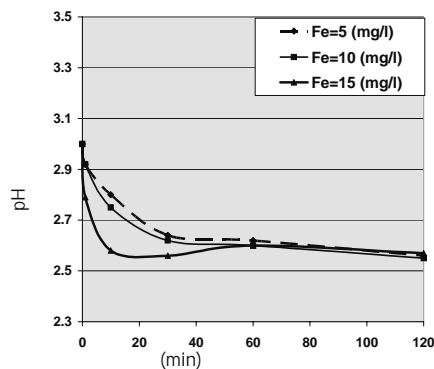
COD H₂O₂
 Fe(II)=15 mg/L 2,4-DCP=100 mg/L



pH
 2,4-DCP=100 mg/L
 Fe(II)=10 mg/L



BOD₅/COD
 2,4-DCP=100 mg/L
 Fe=15 mg/L H₂O₂



pH :
2,4-DCP=100 mg/L

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