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(II)

(Chemical Oxygen Demand)

(OH

.(Glaze et al.1987)

OH

(AOPs)

Advanced Oxidation Processes

COD

2,4-DCP

• Oxidation – Reduction Potential (ORP)

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

Fe²⁺ H₂O₂

2,4-DCP

• OH

)

(

• (Freeman 1998)

() AOPs

DCP

• H₂O₂ /

• UV /

• H₂O₂/ UV /

COD BOD₅

• UV/H₂O₂

BOD₅/COD

• 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)

() H₂O₂H₂O₂

Fe=15 mg/L

pH

)

2,4-DCP=50 mg/L

pH (

2,4-DCP=100 mg/L

pH

H₂O₂H₂O₂H₂O₂ (II)H₂O₂

COD

.(Chamaro et al. 2001)

H₂O₂ =50 mg/LBOD₅ CODH₂O₂

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

BOD₅H₂O₂=50, 75, 100 mg/L

mg/L		COD		COD	
BOD ₅	/ /	/ /	mg/L	H ₂ O ₂	H ₂ O ₂
/ / /	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				

	H ₂ O ₂			
pH	(II)		2,4-DCP=100 mg/L	
/	/	/	/	
.	()	pH	2,4-DCP=100 mg/L	BOD ₅ /COD
pH	pH	2,4-DCP=100 mg/L	H ₂ O ₂ =100 mg/L	/
				Fe=15 mg/L
	Fe=10 mg/L	H ₂ O ₂ =75 mg/L		, H ₂ O ₂
	COD			(BOD ₅ /COD)
	Fe	H ₂ O ₂		
pH	pH	Fe ²⁺	H ₂ O ₂	
		/		
			()	/
			BOD ₅ /COD	
			(II)	
	%			
	%		H ₂ O ₂	
		(Ma et al. 2000)	H ₂ O ₂	
		pH		
(Bum et al. 1999)				BOD ₅ /COD
		pH=3-4		pH
		pH		
	(Chamarro et al. 2001)	NaOH	pH	
				pH
			pH	2,4-DCP=50 mg/L

/...

%

)

COD

()

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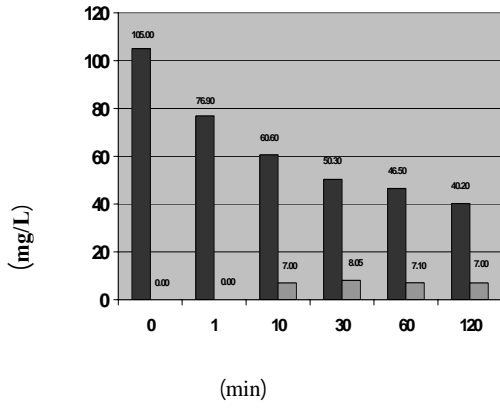
Fe(II)=10 mg/L	H ₂ O ₂		2,4-DCP=50 mg/L				$\frac{BOD_5}{COD}$		BOD ₅ , COD			
	Fe=10 mg/L											
	H ₂ O ₂ =100 mg/L		H ₂ O ₂ =75 mg/L		H ₂ O ₂ =50 mg/L							
$\frac{BoD_5}{COD}$	BOD ₅ mg/L	COD	COD mg/L	$\frac{BoD_5}{COD}$	BOD ₅ mg/L	COD	COD mg/L	$\frac{BoD_5}{COD}$	BOD ₅ mg/L	COD	COD mg/L	min
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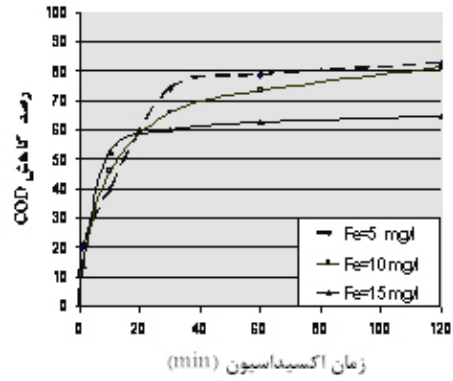
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Fe(II)=10 mg/L	H ₂ O ₂		2,4-DCP=100 mg/L				$\frac{BOD_5}{COD}$		BOD ₅ · COD			
	Fe=10 mg/L											
	H ₂ O ₂ =100 mg/L			H ₂ O ₂ =75 mg/L				H ₂ O ₂ =50 mg/L				
$\frac{BoD_5}{COD}$	BOD ₅ mg/L	COD	COD mg/L	$\frac{BoD_5}{COD}$	BOD ₅ mg/L	COD	COD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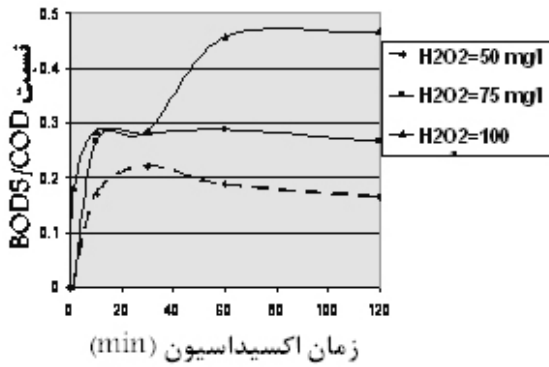
Fe(II)=15 mg/L	H ₂ O ₂		2,4-DCP=100 mg/L				$\frac{BOD_5}{COD}$		BOD ₅ · COD			
	Fe=15 mg/L											
	H ₂ O ₂ =100 mg/L			H ₂ O ₂ =75 mg/L				H ₂ O ₂ =50 mg/L				
$\frac{BoD_5}{COD}$	BOD ₅ mg/L	COD	COD mg/L	$\frac{BoD_5}{COD}$	BOD ₅ mg/L	COD	COD mg/L	$\frac{BoD_5}{COD}$	BOD ₅ mg/L	COD	COD mg/L	min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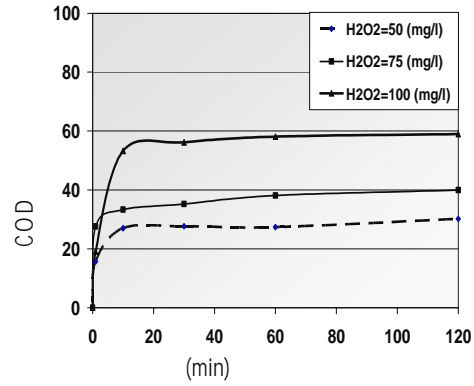
BOD₅ COD
 2,4-DCP=100 mg/L
 Fe=10(mg/L) H₂O₂=75(mg/L)



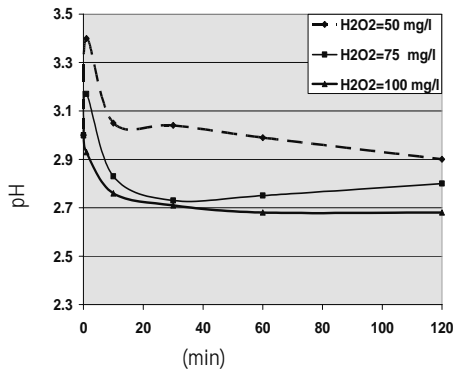
COD Fe(II)
 H₂O₂=50 mg/L 2,4-DCP=50 mg/L



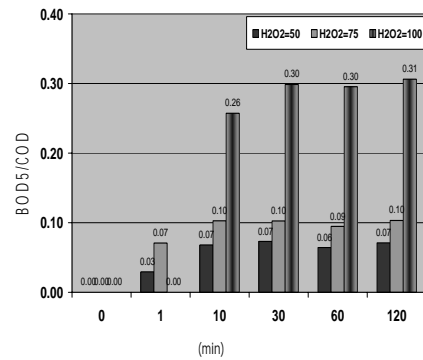
BOD₅/COD
 Fe=15 mg/L H₂O₂ 2,4-DCP=50 mg/L



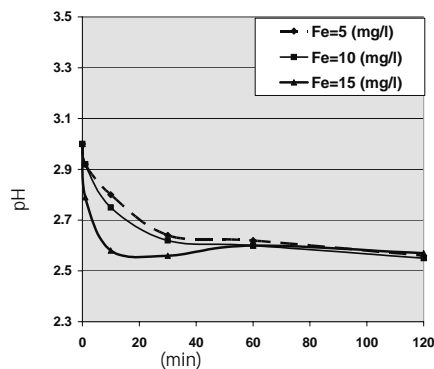
COD H₂O₂
 Fe(II)=15 mg/L 2,4-DCP=100 mg/L



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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