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(Chemical Oxygen Demand)

(AOPs)

Advanced Oxidation Processes

(OH

).( Glaze et al.1987)

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 •  $\text{H}_2\text{O}_2 /$

DCP • UV /

COD BOD<sub>5</sub> •  $\text{H}_2\text{O}_2 / \text{UV} /$

BOD<sub>5</sub>/COD • UV/H<sub>2</sub>O<sub>2</sub>

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

H.J.H Fenton

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(Fenton Reaction)

( Fenton Reagent)

.(Nesheiwat et al. 2000)

OH

$\text{H}_2\text{O}_2$

2,4-) (DCP

.( Bigda 1995)

•

2,4-DCP

( )

			H <sub>2</sub> O <sub>2</sub>
			H <sub>2</sub> O <sub>2</sub>
		(Chamarro et al. 2001)	
	pH	pH	: pH
		pH	
		pH	
		H <sub>2</sub> O <sub>2</sub>	
	(Adams et al. 1994)		
	(Chlorophenols)		
		$\frac{Fe^{2+}}{Fe^{3+}}$	
	(Fares 2003)		
	2,4-DCP		
	(2,4-D)		(Chen et al. 1997)
	(2,4-DP )		
	DCP		
		(H <sub>2</sub> O <sub>2</sub> /substrate)	
	( high-production volume chemicals)		
		H <sub>2</sub> O <sub>2</sub>	
	(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)

( ) H<sub>2</sub>O<sub>2</sub>

H<sub>2</sub>O<sub>2</sub>

Fe=15 mg/L

pH

)

2,4-DCP=50 mg/L

pH (

2,4-DCP=100 mg/L

pH

H<sub>2</sub>O<sub>2</sub>

H<sub>2</sub>O<sub>2</sub>

H<sub>2</sub>O<sub>2</sub> (II)

H<sub>2</sub>O<sub>2</sub>

COD

(Chamaro et al. 2001)

H<sub>2</sub>O<sub>2</sub> =50 mg/L

BOD<sub>5</sub> COD

H<sub>2</sub>O<sub>2</sub>

COD

(APHA 1998)

(II)

H<sub>2</sub>O<sub>2</sub>=50 mg/L

COD %

Fe(II) =5 mg/L H<sub>2</sub>O<sub>2</sub>=50 mg/L

COD %

COD

% COD

COD

Fe(II) =5 mg/L

2,4-DCP=100 mg/L

BOD<sub>5</sub>

H<sub>2</sub>O<sub>2</sub>=50, 75, 100 mg/L

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

	H <sub>2</sub> O <sub>2</sub>			
pH	(II)		2,4-DCP=100 mg/L	
/	/	/	/	
.	( )	pH	2,4-DCP=100 mg/L	BOD <sub>5</sub> /COD
pH	pH	2,4-DCP=100 mg/L	H <sub>2</sub> O <sub>2</sub> =100 mg/L	/
				Fe=15 mg/L
	Fe=10 mg/L	H <sub>2</sub> O <sub>2</sub> =75 mg/L		, H <sub>2</sub> O <sub>2</sub>
	COD			( BOD <sub>5</sub> /COD )
	Fe	H <sub>2</sub> O <sub>2</sub>		
pH	pH	Fe <sup>2+</sup>	H <sub>2</sub> O <sub>2</sub>	
		/		
			( )	/
			BOD <sub>5</sub> /COD	
			(II)	
	%			
	%		H <sub>2</sub> O <sub>2</sub>	
		(Ma et al. 2000)	H <sub>2</sub> O <sub>2</sub>	
		pH		
(Bum et al. 1999)				BOD <sub>5</sub> /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

( )

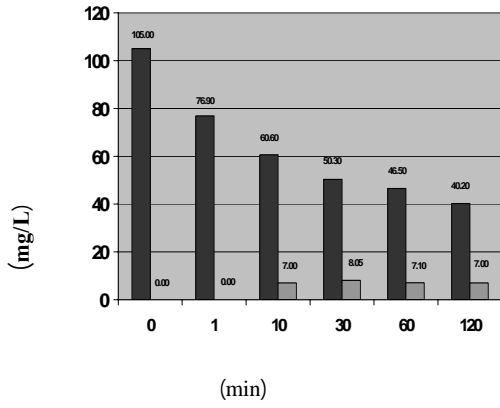
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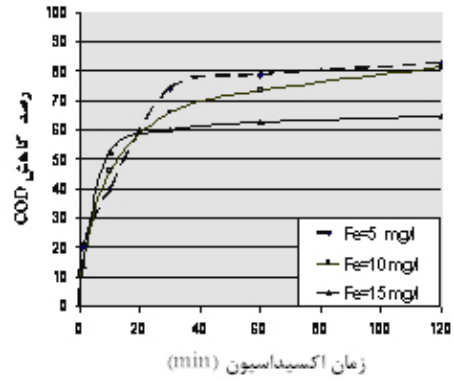




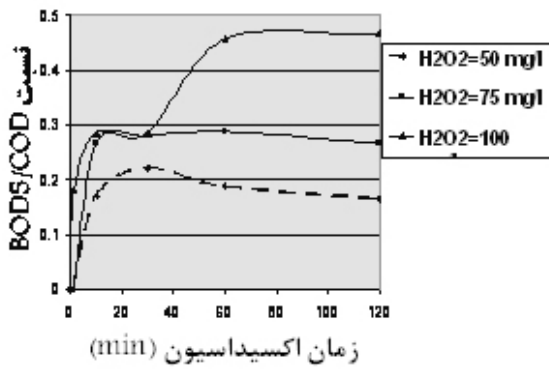




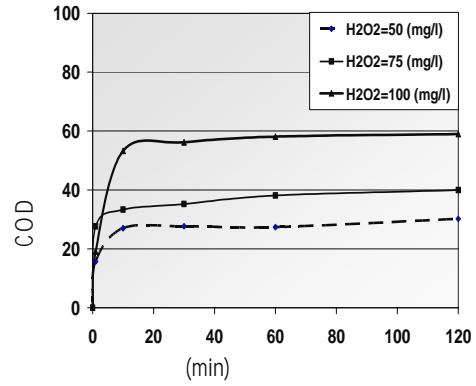
**BOD<sub>5</sub> COD**  
 2,4-DCP=100 mg/L  
 Fe=10(mg/L) H<sub>2</sub>O<sub>2</sub>=75(mg/L)



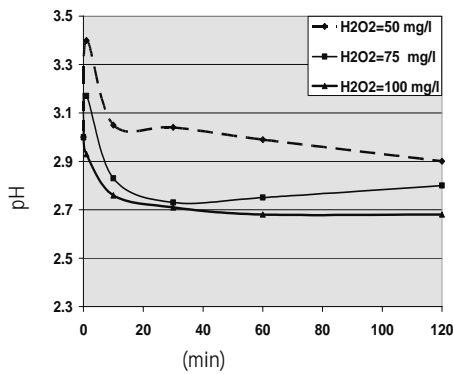
**COD Fe(II)**  
 H<sub>2</sub>O<sub>2</sub>=50 mg/L 2,4-DCP=50 mg/L



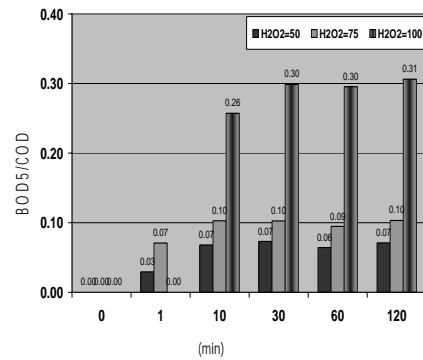
**BOD<sub>5</sub>/COD**  
 Fe=15 mg/L H<sub>2</sub>O<sub>2</sub> 2,4-DCP=50 mg/L



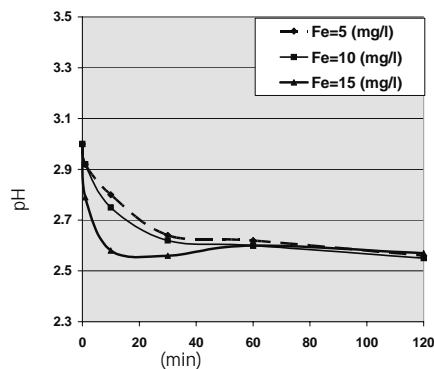
**COD H<sub>2</sub>O<sub>2</sub>**  
 Fe(II)=15 mg/L 2,4-DCP=100 mg/L



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



**BOD<sub>5</sub>/COD**  
 2,4-DCP=100 mg/L  
 Fe=15 mg/L H<sub>2</sub>O<sub>2</sub>



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

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