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pH

(Ellis, 1997)

1999)

(Pettersson,

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< < < < < ( )  
( ) < < <

.(Pitt, et al., 1999)

.(Akan, 2003)

.(Liu, et al., 2005a)

2005 )

.(Sansalone et al.,

/ pH

( )

pH

.(Remmler, 1997 )

(Remmler, 1997)

(Pitt, et al, 1999 )

.(Yousef, et al., 1999)

pH

pH

.(Harper et al., 1988)

.....

( )

pH

Batch

( )

%

(B)

(A)

(C)

( )

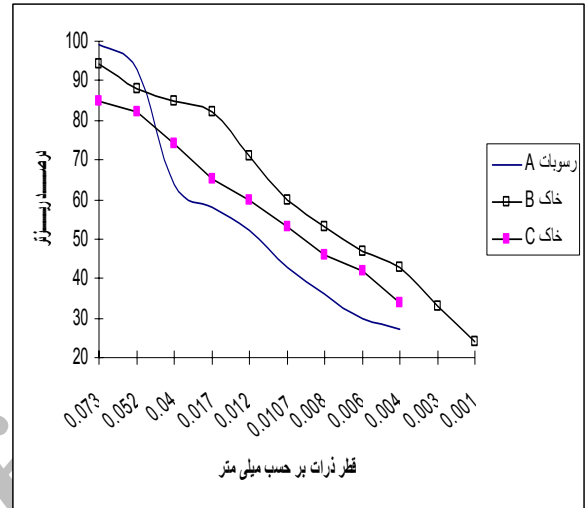
( )



:( )

C B  
C

Desorption



V S

Co

Shaker

Ce  
( )

$$q = \frac{(C_0 - C_e) * V}{S} \quad ( ) \quad ( )$$

(mg/Kg ; ) :q ( )

(mg/L) :Co ( )

(mg/L) :Ce ( )

(L ; ) :V ( )

(Kg ; ) :S ( )

	PI	PL	LL	Gs	
/				/	A
/				/	B
/				/	C

pH .  
pH

pH

pH

pH

pH

( )

.....

/ pH

(Liu et al., 2005b)

( )

( )

pH, : ( )

Temp C°	pH	TDS mg/l	mg/l TSS	TS mg/l		
/ /	/ /					
/ /	/ /					
/	/ /					

: ( )

Mn mg/l	Zn mg/l	Cu mg/l	Fe mg/l		
/ /	/ /	/ /	/ /		
/ /	/ /	/ <	/ /		
/ /	/ /	/ /	/ /		

: ( )

Cu (mg/kg)	Fe (mg/kg)	Zn (mg/kg)	(Cm)	
/		/		A
/		/		C

( )

( )

Desorption Batch : ( )

Volume/Water	Temp	PH 4day	Cu (mg/kg)	Fe (mg/kg)	Zn (mg/kg)	
/		/	< /	< /	/	A
/		/	< /	< /	/	C

Batch : ( )

q mg/kg	V CC	pH 4day	pH 24h	Ce mg/l	C0 mg/l	S gr	
		/	/	/		/	A
			/	/		/	
		/	/	/		/	
		/	/	/			mg/l
		/	/	/		/	C
		/	/	/		/	
		/	/	/		/	
		/	/	/			mg/l
		/	/	7			
		/	/	/			
		/	/	/			
		/	/	/			mg/l
		/	/	< /			
		/	/	< /			
		/	/	< /			
		/	/	/		/	mg/l
		/	/	/			
		/	/	/			
		/	/	/			
		/	/	/			mg/l
		/	/	/			
		/	/	/			
		/	/	/			
		/	/	/			mg/l

.....

( )

pH

pH

mg/kg

mg/kg

(Göbel, et al., 2007)

pH

pH

( )

/

( )

(A)

( )

Desorption

( ) Desorption Batch : ( )

V CC	PH Desorption	Fe mg/l	Zn mg/l	
	/	-	/	A
	/	-	/	C
	/	-	/	
	/	/	/	
	/	/	-	
	/	/	/	
	/		/	
	/	-	/	
	/	-	/	
	/			

(TDS) Batch : ( )

% Removal	TDS (mg/l)	(g/l)	PH	TDS (mg/l)	( )	
-	-	-	/			Low
			/			Low
			/			Med
			/			Med
			/			Med
			/			High
			/			High

Batch : ( )

% Removal	TIME	V CC	mg/l	mg/l	S gr	
	h					
	DAY					

mg/kg

pH

mg/kg

pH



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