

*

// : // :

pH pH

pH pH

/ (q_{max} /) / (K_d (/))

...) /

WHO, 1996; Eckenfelder, 2000; Lester, 1987; Lee and)

.(Lin, 1999; Canningham, 1997

.(

(Forster,1997 Danahy,)

(1996

(Norton et al.,2004)

()

/ /

(WHO,1996)

Gupta et al.,2000; Volesky, 1990;)

(Volesky, 2001; Volesky, 1987; Gadd,1978

Norton)

Gadd and Griffiths,1978; Volesky, 1987; Volesky,)

(et al.,2004; Volesky, 2001

(1990

)

(

(Tung, 1988)

(Volesky, 1990)

(Volesky, 1990)

(... pH)

(Volesky, 1990; Wase and Forster,1997)

/

)

/ Wase and)

(...

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pH /

/ / /

pH

(+)

(Eaton, et al. 1998)

/ /

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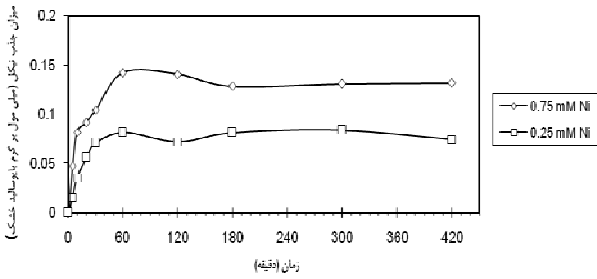
pH

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pH (/)

UNICAM)

(919



/ /

pH

/ / : ()

AI

pH

/ / ()

/ /

pH

pH

/ / /

/

()

Norton .

/ / /
/ /

pH

pH

/ /

Antunes .

(/)

(K_{2ads})
(2003)

q=0)

(t=t t=0)

() (q=q_e)
()

Yan and .

(2003) Viraraghavan

$$\frac{dq}{dt} = k_{1ads}(q_e - q)$$

$$\log(q_e - q) = \log q_e \frac{k_{1ads}}{2.303} t$$

()

:q_e

pH

()

pH

:q

pH

pH

:K_{1ads}

pH

(t)

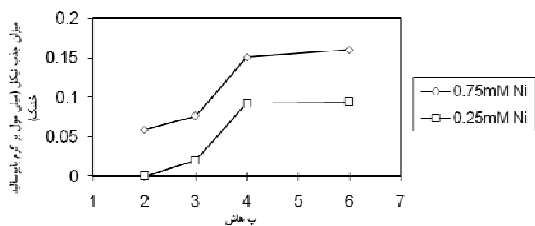
(log(q_e-q))

pH

pH

(Antunes, et al, 2003)

pH



pH

: ()

/ /

(2004)

Norton

/

pH

pH

(K_{2ads})

(q_e)

(g/mg.min)

(t)

(t/q)

(Antunes et al, 2003)

/

pH

pH

$$\frac{dq}{dt} = k_{2ads}(q_e - q)^2 \quad ()$$

$$\frac{t}{q} = \frac{1}{k_{2ads} q_e^2} + \frac{1}{q_e} t \quad ()$$

K_{2ads}

(1999)

Mameri

pH

(2000) Kaewsarn .

/ pH

pH

pH . pH

(2004)

Norton

(1999)

Mameri .

(2002) Weng .

pH

()

pH

pH

()

(Yan and Viraraghavan, 2003)

(Mameri et al, 1999)

(COOH)

()

(Norton et al., 2004)

(McCabe, et al., 1982)

()

()

/

/

()

$$\frac{C_{eq}}{q_{eq}} = \frac{K_d}{q_m} + \frac{1}{q_m} C_{eq} \quad ()$$

(K_d) .

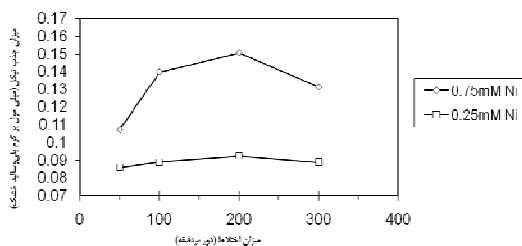
(AWWA, 1990;Liu et al., 2004)

(q_{eq})

()

(C_{eq})

$$q_{eq} = K_F (C_{eq})^{1/n} \quad ()$$



()

/ /

pH

pH

pH

/

•

/

(q_{max})

(q_{max})

/

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(

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(

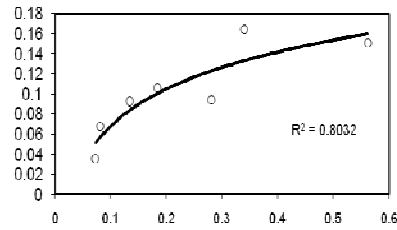
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(K_d)

میزان جذب نیکل (میلی مول در کیلوگرم باغیچه خشک)



غلظت تعادلی فلز باقیمانده (میلی مول بر لیتر)

ایزوترم جذب نیکل

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pH

(2003)

Padmavathy

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(2002)

Arican

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(2000)

Wong

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(2000) Özer .

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ENV

pH

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pH

pH

An tunes W. M., et al.2003. An evaluation of copper biosorption by a brown seaweed under optimized Conditions. *Electronic Journal of Biotechnology* ISSN: 0717-3458 Vol.6 No.3.

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