

() , ()

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(// : - // :)

/

(*EF*)

(*RMSE*)

(χ^2)

(Ratti & Mujumdar, 1997)

(Anon., 2006)

Sacilik &)

Kingsly & Singh,) (Elicin, 2006; Wang et al, 2007

(Togrul & Pehlivan, 2002, 2003) (2007

Dandamrongrak et) (Hamdy & El-Ghetany, 2006)

Kashaninejad et al., 2007; Midilli &) (al., 2002

Goyal et) (Akpınar, 2003) (Kucuk, 2003

(al., 2007; Menges & Ertekin, 2006

(Yaldız & Ertekin, 2001)

Doymaz, 2006, Doymaz, 2007a, Doymaz,)

Doymaz, 2007; Erenturk & Erenturk,) (2007b

(2007

E-mail: m.sharifi@ut.ac.ir :

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()

() TESTO 405-V1

/ m/s
()

Cihan et al., 2007; Doymaz, 2007; Erenturk &)
Erenturk, 2007; Giri & Prasad, 2007; Goyal et al., 2007;
Kashaninejad et al., 2007; Kingsly & Singh, 2007;
(Sacilik & Elicin, 2006; Wang et al., 2007

)

(× cm²

()

°C

()

(LM35)

/ m/s

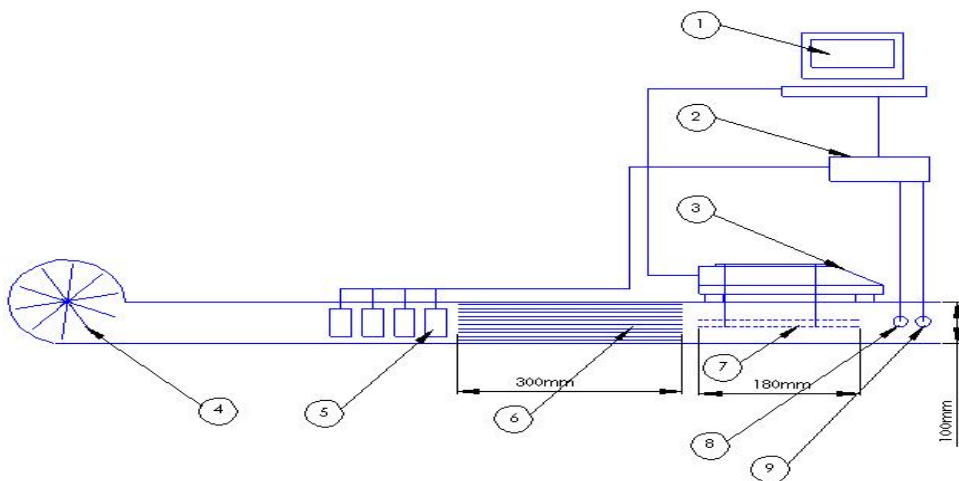
)

(/ /

Zhang &)

°C

(Litchfield, 1991



$$\chi^2 = \frac{\sum_{i=1}^n (MR_{exp,i} - MR_{pre,i})^2}{N - n} \quad (\text{v})$$

$$RMSE = \left[\frac{1}{N} \sum_{i=1}^n (MR_{pre,i} - MR_{exp,i})^2 \right]^{1/2} \quad (\text{z})$$

$$EF = \frac{\sum_{i=1}^N (MR_{i,exp} - MR_{i,exp_{mean}})^2 - \sum_{i=1}^N (MR_{i,pre} - MR_{i,exp})^2}{\sum_{i=1}^N (MR_{i,exp} - MR_{i,exp_{mean}})^2} \quad (\text{e})$$

()

() ()

$$MR = \frac{M - M_e}{M_0 - M_e} \quad (1)$$

$$MR = \frac{M}{M_0} \quad (2)$$

i $M_{exp,i}$

$M_{pre,i}$

M

MR

M_0

M_e

n ()

N

i

Akpınar et al., 2003;)

Cihan et al., 2007; Midili & Kucuk, 2003; Togrul &

(Pehlivan, 2002; Togrul & Pehlivan, 2003

(Doymaz, 2007a; Goyal et al., 2007)

()

(MR)

(Guarte, 1996)

Linear Y = a+bX (v)

Logarithmic Y = a+bln(X) (v)

Power Y = aX^b (v)

Exponential Y = aexp(bX) (v)

Arrhenius Y = aexp(b/X) (v)

SPSS 14

#

Westerman et al., 1973 MR = exp(-kt)

Guarte, 1996 MR = exp(-ktⁿ)

Yaldiz et al., 2001 MR = exp[-(kt)ⁿ]

Zhang & Litchfield, 1991 MR = a exp(-kt)

Yaldiz & Ertekin, 2001 MR = a exp(-kt) + c

Rahman et al., 1998 MR = a exp(-k₀t) + bexp(-k₁t)

Verma et al., 1985 MR = aexp(kt) + bexp(gt) + cexp(ht)

Ertekin & Yaldiz, 2004 MR = exp(-kt)

()

/ °C

/ / /

/ /

°C

/

/ °C

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/

/ °C

k g h c b a (min) t (d.b.) :MR #

m

(χ^2)

(EF)

(RMSE)

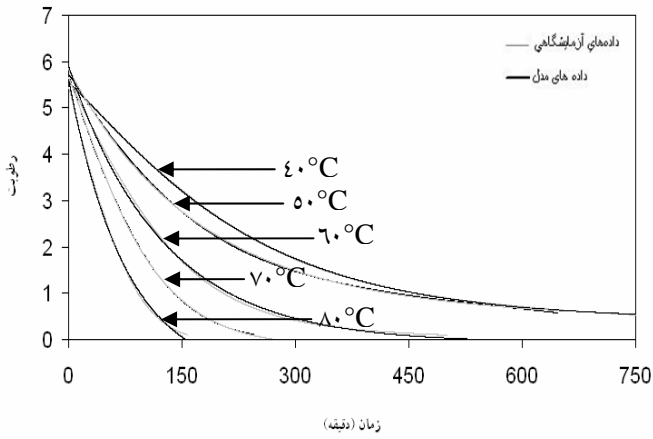
χ^2 EF

()

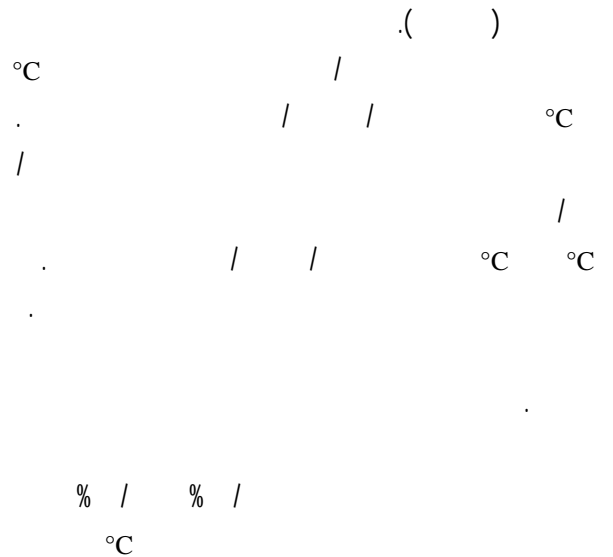
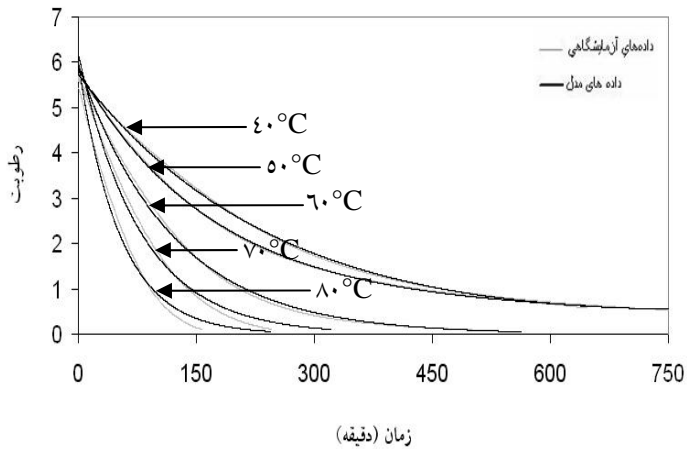
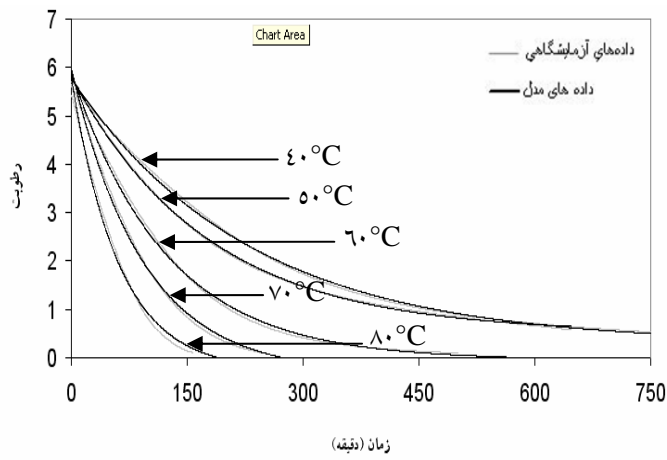
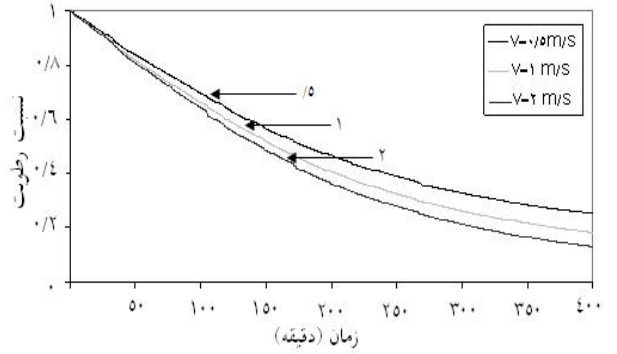
RMSE

()

/ :



(Guarte, 1996; Yaldız & Ertekin, 2001)



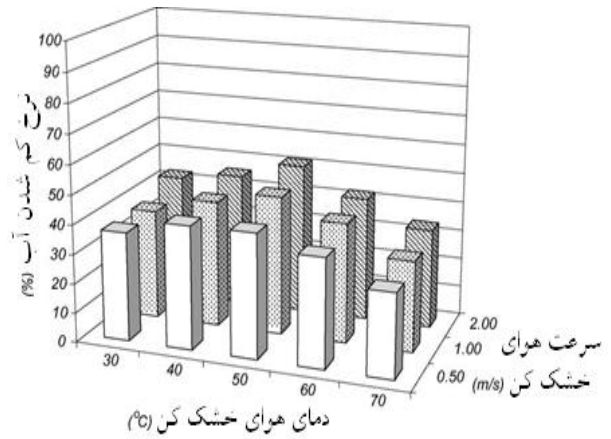
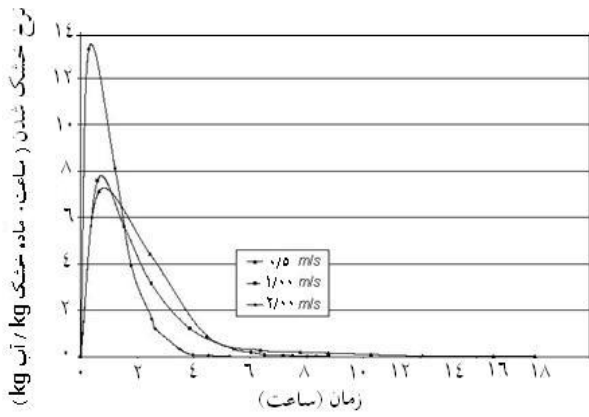
RMSE χ^2 EF

()

°C

(Yaldiz et al., 2001)

()



°C

()

χ^2	EF	RMSE	b (h ⁻¹)	n	k (h ⁻¹)	a	(m/s)	(°C)
/	/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/	/
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/	/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/	/

$$\frac{M}{M_0} = a \exp(-kt^n) + bt$$

b

			χ^2	RMSE	
b	.	/	/	/	/
		/	/		

()

()

EF χ^2 RMSE

()

χ^2 / /

/ /

()

$$MR = (c + dT) \exp[(e + fT)t^{(g+hT)}] + (i + jT + lT^2 + mV)t$$

		()					
χ^2	RMSE	EF	χ^2	EF	RMSE	(m/s)	(°C)
/	°C		/	/	/	/	
		m/s	/	/	/	/	
			/	/	/	/	
			/	/	/	/	
			/	/	/	/	
			/	/	/	/	
			/	/	/	/	
			/	/	/	/	
		a, b, n, k	/	/	/	/	
		EF	/	/	/	/	
		M	/	/	/	/	
d.b.		M_0	g= /	f= /	e= /	d= /	c= /
kg water/kg dry matter		M_e	l= /	j= /	i= /	h= /	
kg water/kg dry matter		MR				m= /	
		$MR_{exp;i}$					
		$MR_{exp;mean}$					
	i	$MR_{pre;i}$					
		N					
		n					
		RMSE					
°C		T	°C		()		
s		t					
		χ - square					

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