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SEM

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(Drake, 1997)

(Doosthoseini, 2007)

(Withers & Loutfy, 2004)

(Chun et al., 2008 and Easter et al., 2001)

(Tabarsa, 1988 and Kargarfard *et al.*, 2003)

(Moghadassi et al., 2010)

CuO

(Layeghi et al., 2010)

, 2008 and Noorbakhsh & )

Ramtin .Kargarfard, 2006 and Kashanizaeh, 1988

(et al

Meng, 2009 and Xia .

%

(Chopkar et al., 2008)

(Sun & et al., 2005)

Ag<sub>2</sub>Al Al<sub>2</sub>Cu

/

%

( )

%

)

(

Pallmann pz8

%

/

ppm

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(nm)	W/(m·K)	(°C)	(g/cm <sup>3</sup> )			
		/	/		Ag	

DIN68763

DIN25363

SEM

) BS500

Black&Decker

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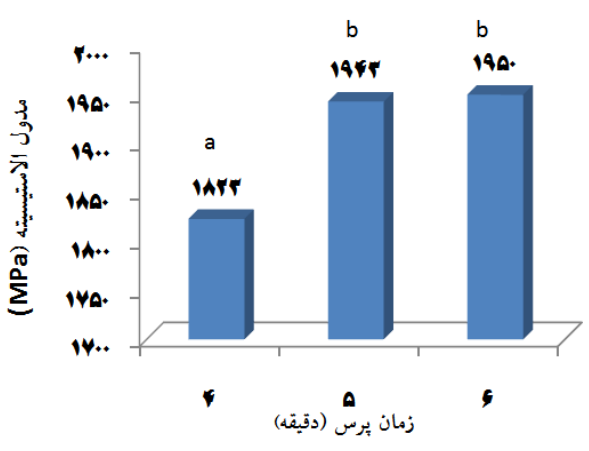
-

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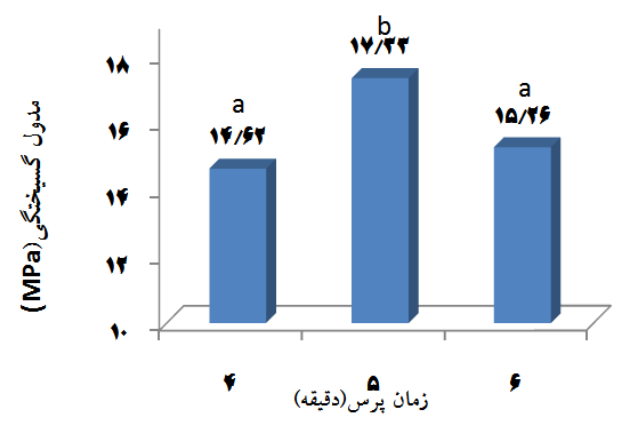
Burkle.LA160

...

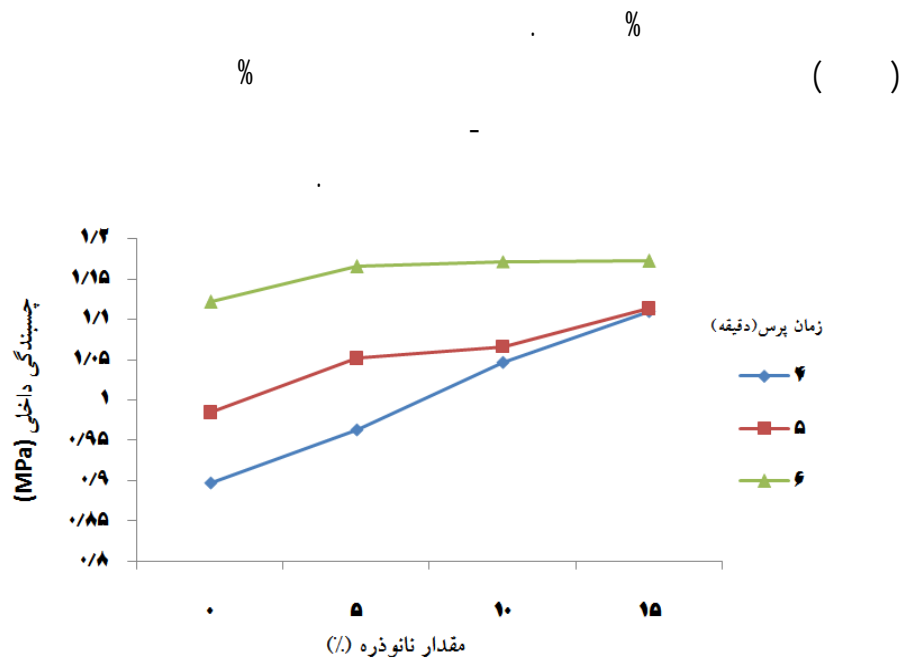
**	ns	**	ns	**	ns	ns	A
ns	**	**	*	**	*	**	B
ns	ns	*	ns	**	ns	ns	AB
/	/	/	/	/	/	/	%CV
				ns	*	**	



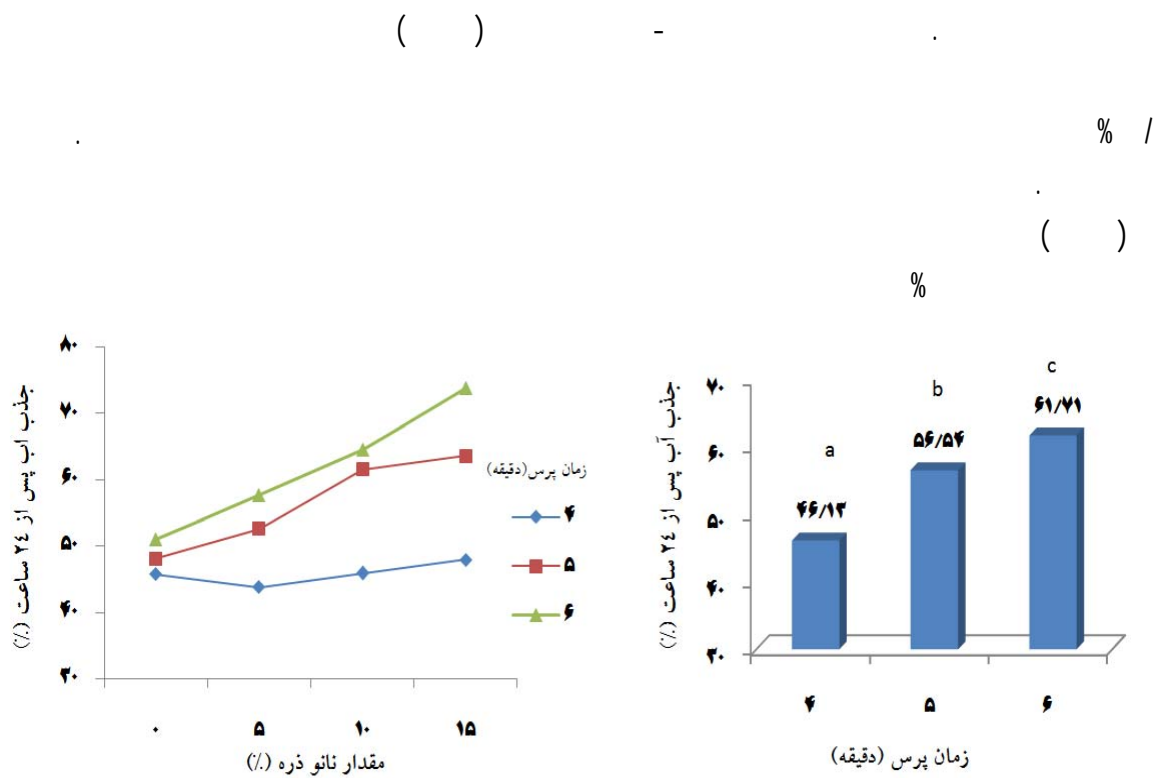
شکل ۲- اثر مستقل زمان پرس بر مدول الاستیسیته



شکل ۱- اثر مستقل زمان پرس بر مدول گسیختگی

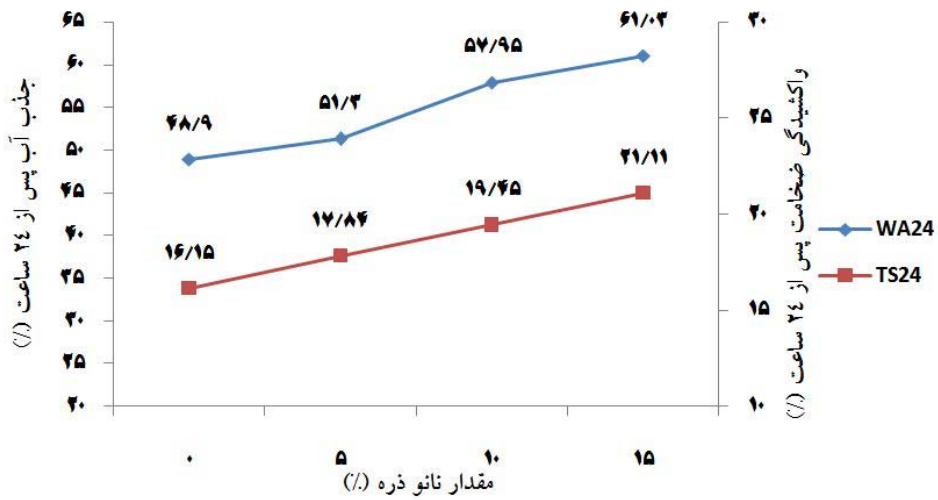


شکل ۳- اثر متقابل مقدار نانوذره و زمان پرس بر چسبندگی داخلی



شکل ۵- اثر متقابل مقدار نانوذره و زمان پرس بر جذب آب پس از ۲۴ ساعت

شکل ۴- اثر مستقل زمان پرس بر جذب آب پس از ۲۴ ساعت



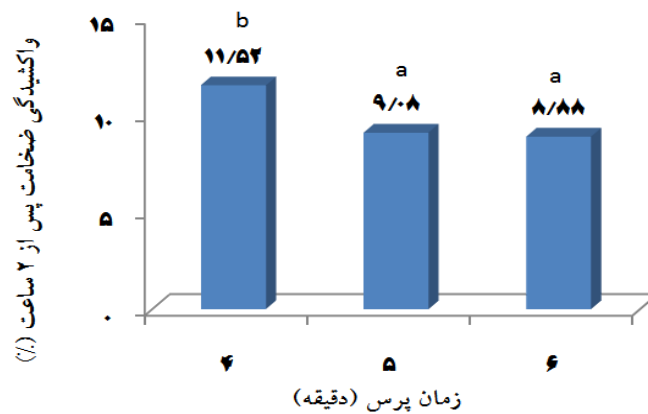
شکل ۶- اثر مستقل مقدار نانو ذرات نقره بر جذب آب و واکسیدگی ضخامت پس از ۲۴ ساعت

%

%

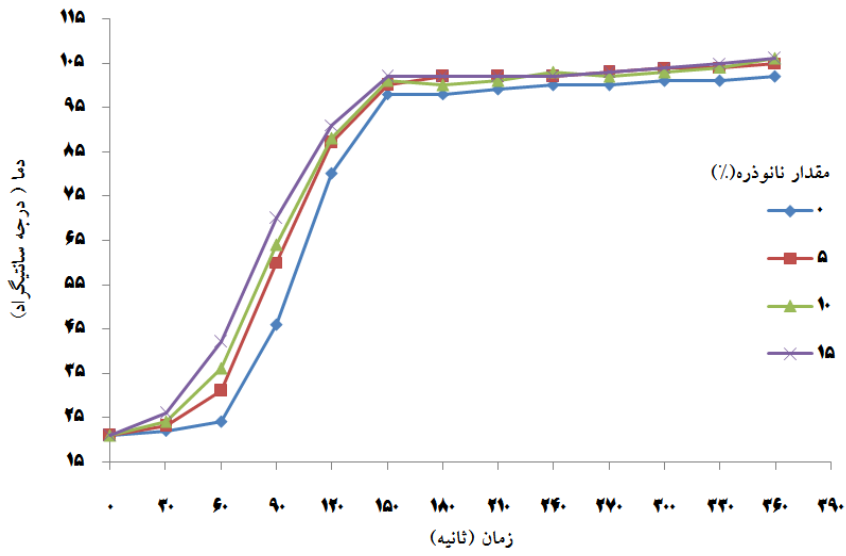
%

%



شکل ۷- اثر مستقل زمان پرس بر جذب آب پس از ۲ ساعت

( )



(B)

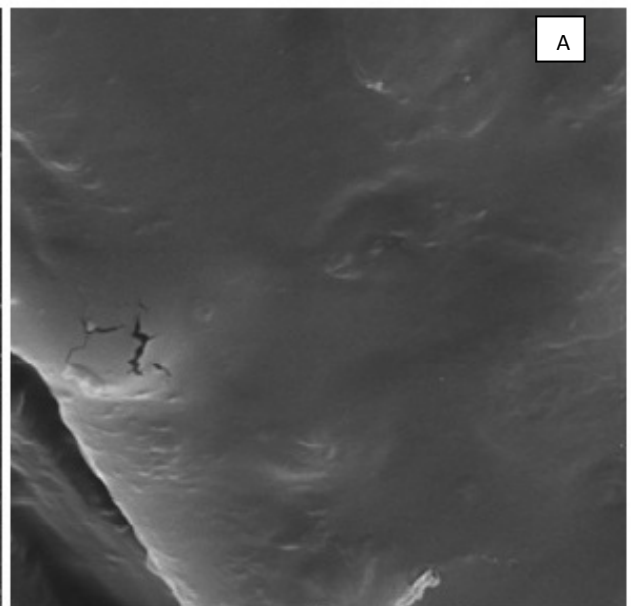
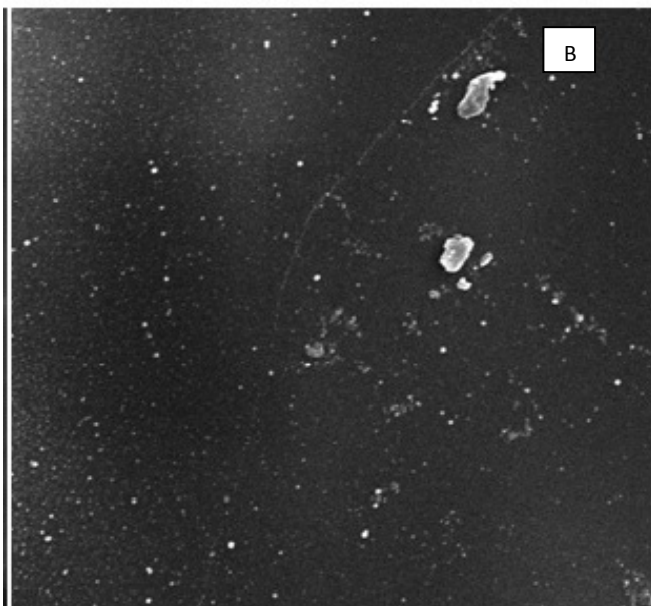
SEM

EDX

SEM

EDX

(A)



SEM HV: 20.00 kV WD: 12.9680 mm VEGA\\ TESCAN  
SEM MAG: 10.00 kx Det: SE  
Date(m/d/y): 08/18/10 guest  
Performance in nanospace  
Micro 1  
IPPI

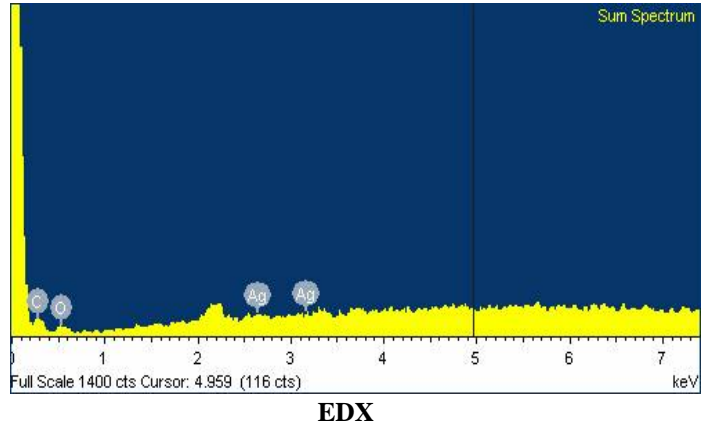
SEM HV: 20.00 kV WD: 13.8270 mm VEGA\\ TESCAN  
SEM MAG: 10.00 kx Det: SE  
Date(m/d/y): 08/18/10 guest  
Performance in nanospace  
Micro 1  
IPPI

%

:B

:A

SEM



Tabarsa, )

.(1988

( )

.(Noorbakhsh & Kargarfard, 2006)

.(Chopkar et al., 2008)

.(Kashanizadeh, 1988)

Tabarsa, )

.(1988

Meng, 2009 )



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SEM

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## Ag nanoparticles effects on heat transfer in press cycle and physical and mechanical properties of particleboard

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(Received: 22 December 2010, Accepted: 06 June 2011)

### Abstract

In this paper, effect of Ag nanoparticles different contents on heat transfer during press cycle and physical and mechanical properties of particleboard was investigated. Mechanical strength including Internal Bonding (IB) and Bending Strength and physical properties including Water Absorption (WA) and Thickness Swelling (TS) after 2 and 24 hours soaking was determined. Heat transfer process from hot press plates to core layer of the mat during press time was recorded by thermocouples. Energy Dispersive X-Ray Spectroscopy (EDX) and Scanning Electron Microscopy (SEM) result prove presence and dispersion of nanoparticles in glue line well. Results indicate that Ag nanoparticles increase heat transfer to the core layer and cause IB improvement. But nanoparticles had negative effects on physical properties and increased WA and TS after 24 hour soaking. Heat transfer acceleration during hot press cycle is a way to reduce press time that results in efficiency increase by preserving essential strengths.

**Keywords:** Particleboard, Ag nanoparticles, Heat transfer, Press cycle, Physical and Mechanical Properties