



*

(// : // :)

ISO ASTM

Archive of SID

...

()

()

pH

pH

()

)

(

Archive of SID

()

Olivers () Roffael

() Sellers ()

OSL

%

() Lantzy Lewis

() Vazquez

)

(

Nada () Ozmen Cetin

() Alonso ()

(B)		(A)	
B1		A1	
B2		A2	
B3		A3	
B4		A4	

Archive of SID

×

pH= / %

Kg/Cm²

ISO

ASTM

(MPa)	(MPa)		(MPa)		(%)		(%)		(%)
/	/	/	/	/	/	/	/	/	
/	/	/	/	/	/	/	/	/	
/	/	/	/	/	/	/	/	/	
/	/	/	/	/	/	/	/	/	
**	ns	ns	ns	ns	ns	ns	ns	ns	

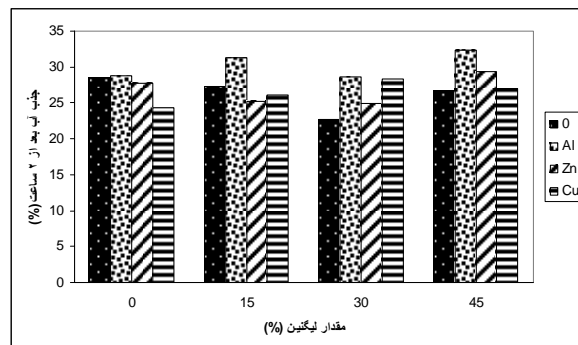
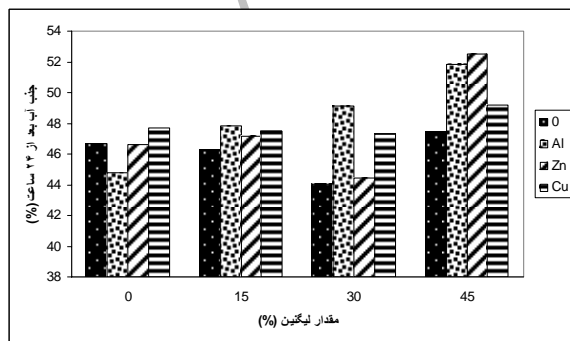
ns

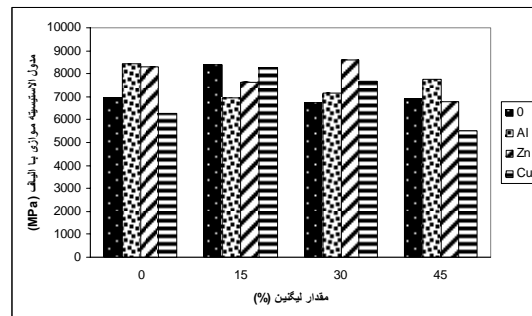
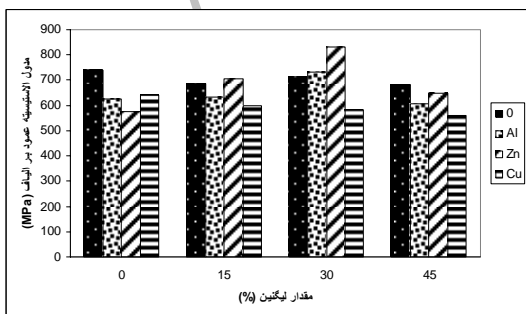
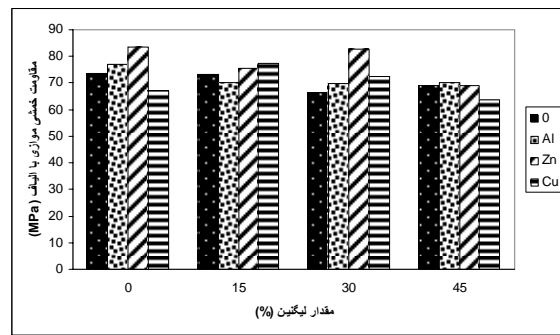
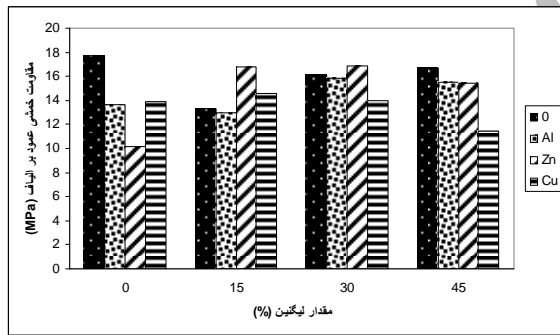
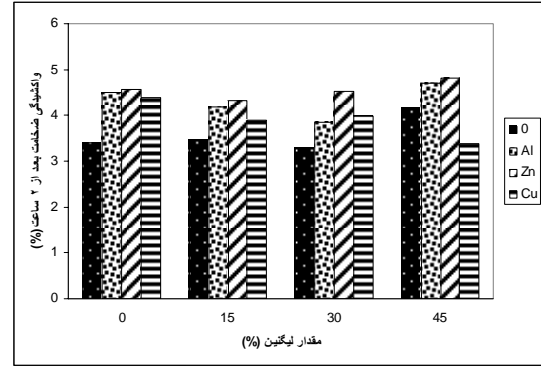
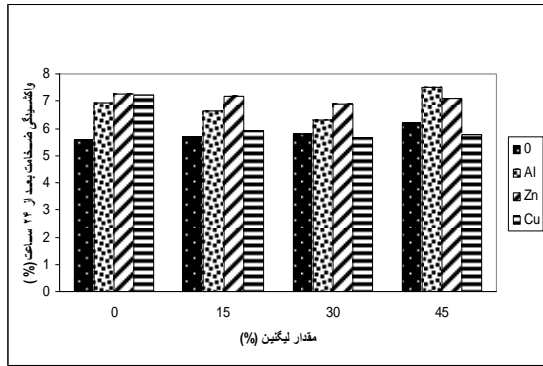
**

(MPa)	(MPa)		(MPa)		(%)		(%)		(%)
/	/	/	/	/	/	/	/	/	
/	/	/	/	/	/	/	/	/	
/	/	/	/	/	/	/	/	/	
/	/	/	/	/	/	/	/	/	
ns	ns	ns	ns	ns	**	**	ns	ns	

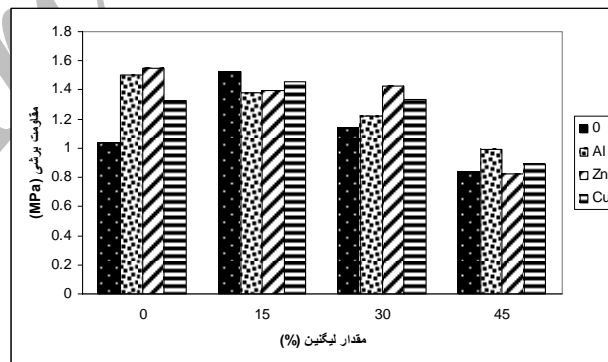
ns

**





() Kopitovic Klasnja



()

- 4- Annual Book of ASTM standards, 2002. West Conshohocken, PA. Vol 04.10.
- 5- Coppens, H.A. & M.A.E santane, 1979. Tannin Formaldehyde Adhesives for exterior grade plywood and particleboard manufacture. Forest product J , vol.30(4):38-42.
- 6- Forss, K. & A. Fuhrmann, 1976. Karatex- a lignin based adhesive for Plywood, particleboard and fiberboard. pap.puu, 58:817-824.
- 7- Fredheim, G.E., S.M. Braaten, & B.E. Christensen, 2003. Comparison of Molecular Weight and Molecular Weight Distributions of Softwood and Hardwood Lignosulfonates. Journal of wood chemistry and Technology. Vol 23, No.2:197-215.
- 8- Klasnja, B. & S. Kopitovic, 1992. Lignin-Phenol-Formaldehyde Resins as Adhesives in the Production of plywood. Holz als Roh-und werkstoff, 50:282-285.
- 9- Lin, Stephen Y. & Carlton W. Dence, 1992. Methods in lignin chemistry. Spring- Verlag Berlin Heidelberg: Germany.
- 10- Nada, M.A., Hussein Abou-Yossef & Sound.E.M.El-Gohary, 2003. Phenol Formaldehyde Resin Modification with Lignin. Polymer-Plastics Technology and Engineering.Vol.42, no.4: 689- 699.
- 11- Neus, M., J. Reguant, R. Garcia –Valls & J. Salvado, 2003. Characteristics of Lignin Obtained From Steam-exploded Softwood with Soda/antraquinone Pulping. Wood Science Technology. Vol.37:309-320.
- 12- Oliver, M., J.A. Guzman, A. Natho, & A. Saavedra, 1988. Kraft Lignin Utilization in Adhesives. Wood Science and Technology. Vol. 22, no. 2: 157- 165.
- 13- Sarkanen, K.V. & C.H. Ludwig, 1971. Lignins. Wiley- Interscience: New York.
- 14- Sjöström, E. & R. Alen, 1998. Analytical Methods in wood chemistry, pulping and papermaking. Spring verlag.
- 15- Walker,J.C.F. & Co-authors, 1993. Primary wood processing; Principles and practice,Chapman & Hall, pp.595.
- 16- Yanhua, J., Q. weihong, L. Zongshi, & C. Lubai, 2004. A study on the modified lignosulfonate from lignin. Energy sources, 26:409-414.

Utilization of Kraft Lignin with Metal ions Catalyst as Filler-Extender in Urea Formaldehyde Resin for Plywood Manufacture

L. Jamalirad^{*1}, K. Doosthoseini² and A. Mirshokraie³

¹ Ph.D. Student of Wood and Paper Science and Technology, Faculty of Natural Resources, University of Tehran, I. R. Iran

² Professor, Faculty of Natural Resources, University of Tehran, I. R. Iran

³ Professor, Chemistry Department, Payame Noor University, I. R. Iran

(Received 2005 Oct 17, Accepted 2006 Oct 30)

Abstract

Nutritional and economic value of wheat flour necessitates the utilization other potential material such as by-products of pulp and paper industry, especially Kraft lignin, as possible filler-extender in urea formaldehyde resin, in the presence of metal ion catalysts. The variables were the amount of Kraft lignin powder and the type of catalyst. Water absorption and thickness swelling of samples after being submerged in water for 2 and 24 hours, modulus of elasticity and bending strength in parallel and perpendicular to grain and shear strength were evaluated according to AFNOR, ASTM and ISO standards and the results were analyzed. The results of this study show that the water absorption and dimensional stability of the boards examined improve with using 30 percent of lignin Kraft powder in the absence of catalyst and, furthermore, mechanical properties of the boards will improve if 30 percent of lignin Kraft powder is used together with zinc acetate catalyst.

Keywords: Plywood, Kraft Lignin, Urea formaldehyde resin, Metal ions catalyst, Filler, Extender

* Corresponding author: Tel: 0261-2249311 , Fax: 0261-2249311 E-mail: Loyajamalirad@yahoo.com