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(Qiojia et al., 2006)

(Lie et al., 2008)

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(Wen et al., 2006)

(Wen et

.al., 2006)

PVF

He-sheng et al., (2004)

Qiaojia et al., (2006)

SiO₂

MDF

(Qiojia et al., 2006)

% / SiO₂

SiO₂

Lei et al., (2008)

NaMMT

UF

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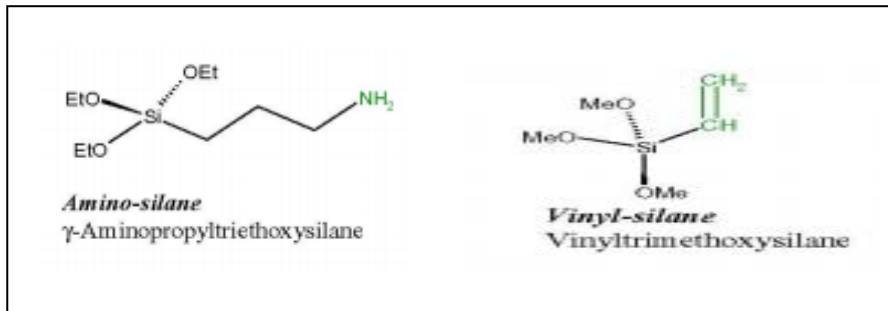
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(Mortezaei et al., 2008)

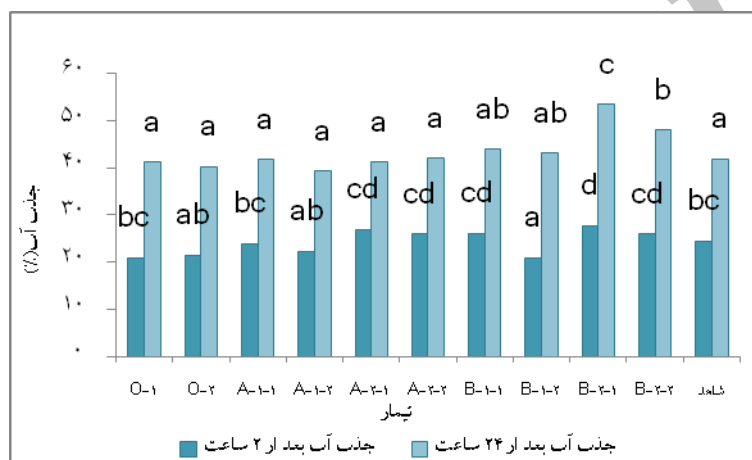


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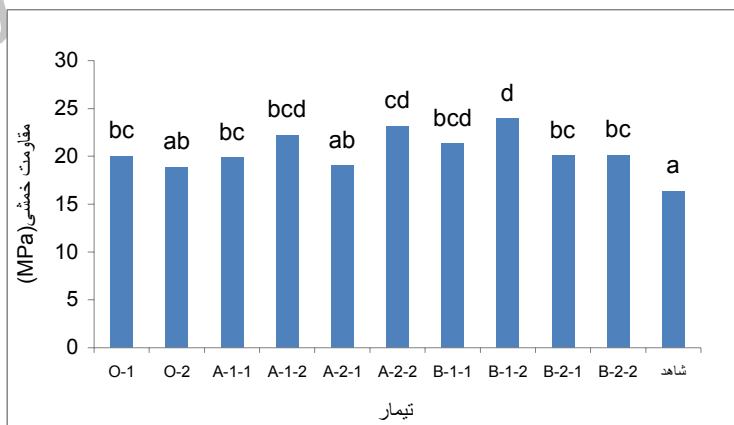
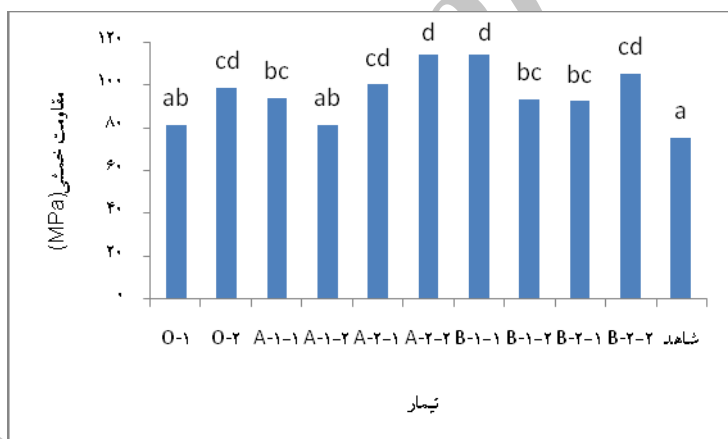
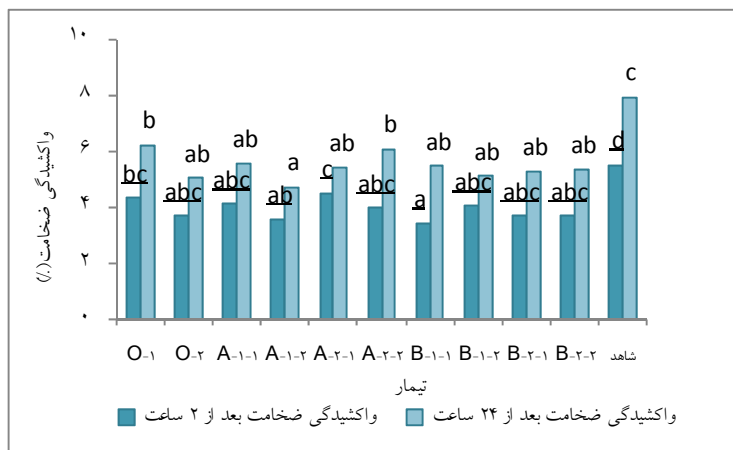
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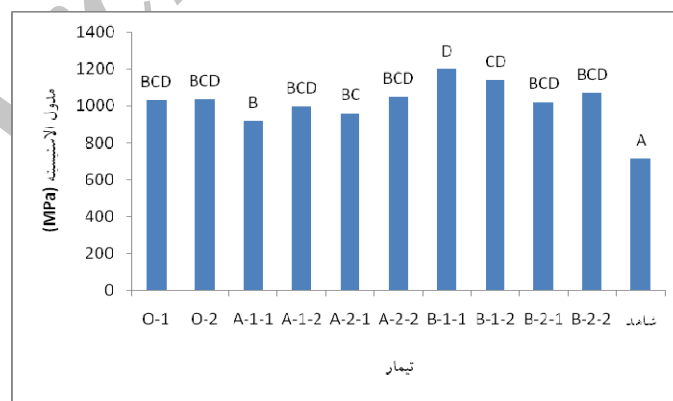
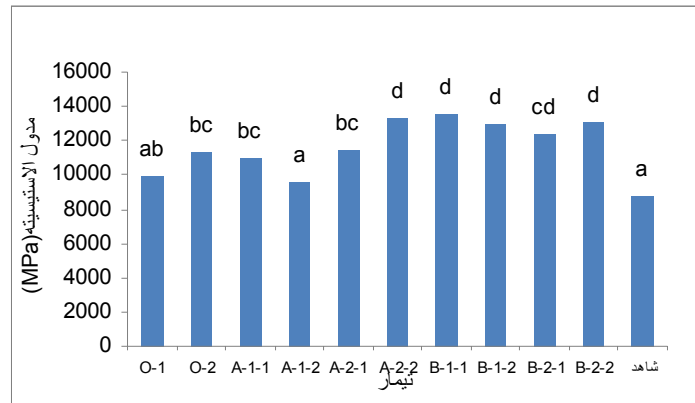
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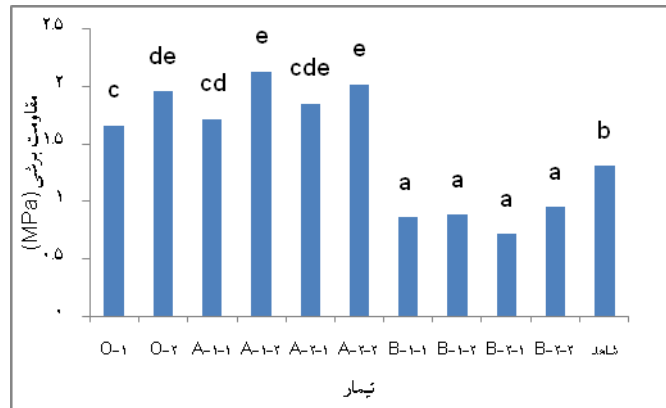


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He-sheng et al., (2004)

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Wen et al., (2006)

He-sheng et al., (2004)

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Zou et al., (2006) .

Wang et al., (2008)

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Utilization of nano silica as filler in plywood manufacturing

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Abstract

The effect of nano SiO₂ and silane coupling agents on practical properties of plywood was investigated. After plywood production with layers of hornbeam wood (*Carpinus betulus*), physical and mechanical properties were analyzed. Variables were the type of silane coupling agent (vinyl tri methoxy silane and γ -amino propyl tri ethoxy silane), the amount of nano SiO₂ (1% and 2%) and the amount of silane coupling agent (1% and 2%). The lowest water absorption and thickness swelling were observed in the case of boards produced with 1% treated nano SiO₂ by 2% vinyl tri methoxy silane, and those with 1% treated nano SiO₂ by 2% γ -amino propyl tri ethoxy silane had the highest bending strength and modulus of elasticity. The highest shear strength was found for the boards produced with 2% nano SiO₂ treated by 1% vinyl tri methoxy silane. The results of this study revealed that utilization of nano SiO₂ treated by silane coupling agent as filler for urea formaldehyde resin is effective in improving the physical and mechanical properties of plywood.

Keywords: Plywood, Hornbeam Wood, Vinyl tri methoxy silane, γ -amino propyl tri ethoxy silane, Urea- formaldehyde, Filler