Chemical wood pretreatment for OHT process - analysis of the selected application properties

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The aim of research was to improve the biological durability of low-quality wood species against wood destroying fungi and reduce its water absorption and hygroscopicity.
Methodology

Spices of wood: pine, poplar, black alder

Chemicals for pretreated process:
A - 10% sodium silicate
B – 10% emulsion based on 2-9034 (Dow Corning),
C - 10% emulsion based on 2-9034 (Dow Corning) + 5% Aerodisp W 1714 (Evonik).

Chemical pretreated
Vacuum 0.85 bar/30 minute
Pressure 10 bar/150 minutes

OHT process
Preheated T = 100ºC; Heated T = 200ºC, t= 18 h
Heating medium – palm oil

Analysis:
Mycological examination; Poria placenta acc. to EN 113
Aging test acc. to EN 84
Hygroscopicity
Water absorption
The **benefit** of the pretreatment was mostly discovered in case of wood treated with **sodium silicate**

The mass loss of wood treated with sodium silicate [EN 113]

<table>
<thead>
<tr>
<th>Species of wood</th>
<th>Pretreated with sodium silicate [%]</th>
<th>After leaching [%]</th>
<th>Preactreated with sodium silicate and OHT [%]</th>
<th>After leaching [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scots pine</td>
<td>0</td>
<td>29,9</td>
<td>2,1</td>
<td>2,3</td>
</tr>
<tr>
<td>Poplar</td>
<td>2,5</td>
<td>32,0</td>
<td>1,9</td>
<td>0,8</td>
</tr>
<tr>
<td>Black alder</td>
<td>1,1</td>
<td>26,2</td>
<td>1,1</td>
<td>2,7</td>
</tr>
</tbody>
</table>
Conclusion

- OHT wood pretreated with sodium silicate reveal resistance to *Poria placenta*, regardless to the species of wood.
- OHT process limited leaching effect of used chemicals.
- The sodium silicate increased the hygroscopicity of scots pine and black alder by about 30% and of poplar by about 70%.
- Organosilicon compounds did not show any significant improvement of the tested wood properties.
Thank you for your attention