عنوان فارسی مقاله:

متوسط حالت اکسیداسیون کربن چوب اصلاح شده حرارتی به عنوان شاخصی برای مقاومت در برابر پوسیدگی با بازیدیومیست‌ها

عنوان انگلیسی مقاله:

The average carbon oxidation state of thermally modified wood as a marker for its decay resistance against Basidiomycetes
5. Conclusions

The quantitative theory in this work related the average carbon oxidation state to an inherent stability against oxidation and subsequently to the fungal resistance thermally modified wood. This theory does not intend to explain the complex fungal degradation mechanisms, but rather poses an semi-empirical thermodynamic limit on the relative degradation rates by fast degrading *Poria placenta* brown rot on heat-treated wood in comparison to untreated wood. The parameter-free theory was verified and found in reasonable agreement with published experimental fungal resistance results on a series of heat treated woods with known elemental composition.

The elemental composition of several thermally modified wood species shows a universal correlation between the molar elemental ratios O/C and H/C. This correlation is partly understood on the basis of elimination reactions of small molecules, e.g. water and carbon dioxide. The elimination of volatiles, notably carbon dioxide, has a chemically reducing effect on wood, quantified by the average carbon oxidation state \( Z = 2(O/C) - H/C \). Further research, assuring the relation between the composition of the volatile yield during heat-treatment of wood and its carbon oxidation state, is important for its potential to in-line process monitoring of the wood modification degree.