

The role of hydroxyl groups in determining the sorption properties of modified wood

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Renuables



Samples

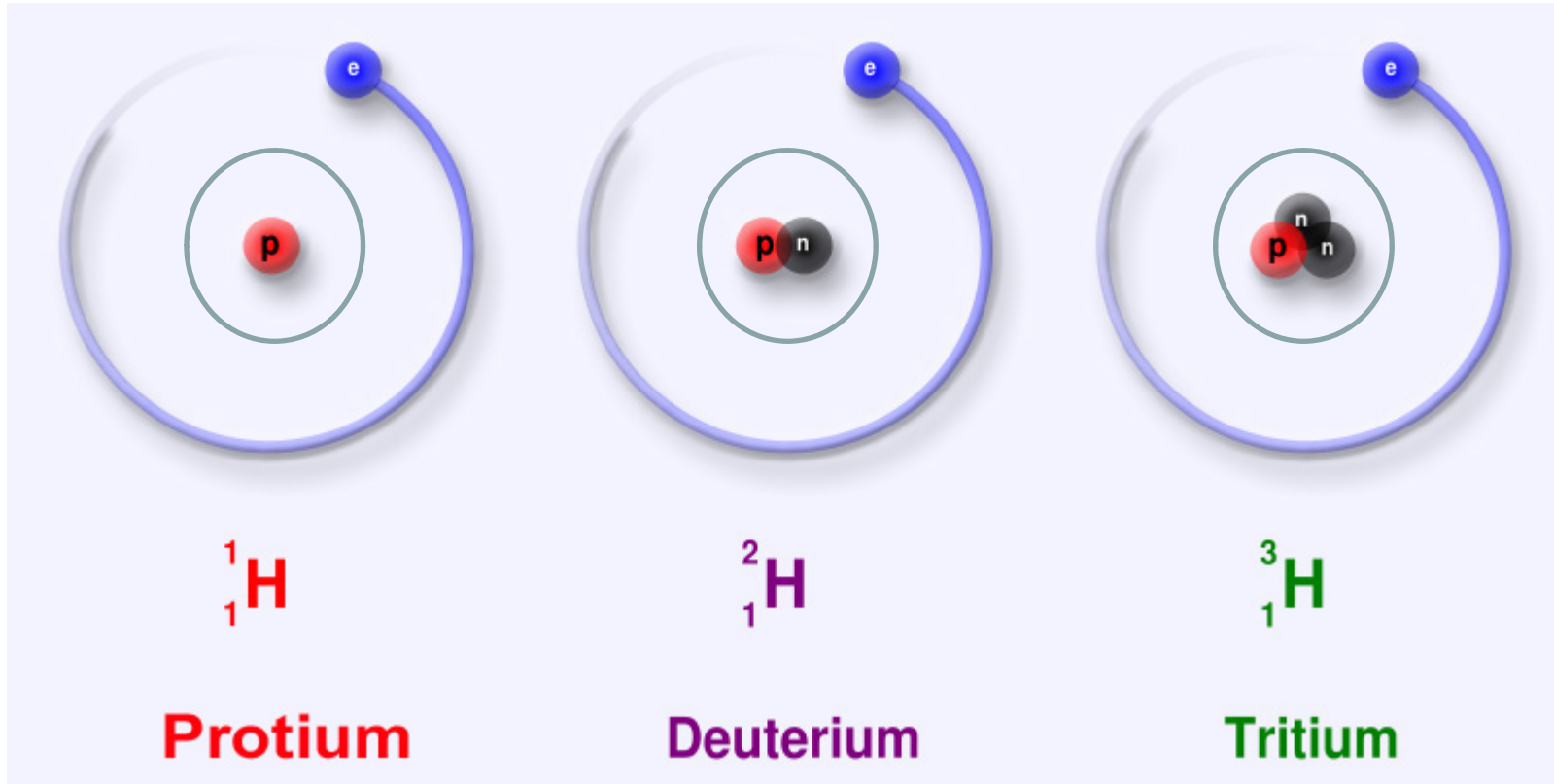
- Thermal treated samples - acacia (*Acacia mangium*) and sesendok (*Endospermum malaccense*)
- Acetylated samples – birch (*Betula pendula* L)

Methods

- Dynamic water vapour sorption
- Deuterium exchange

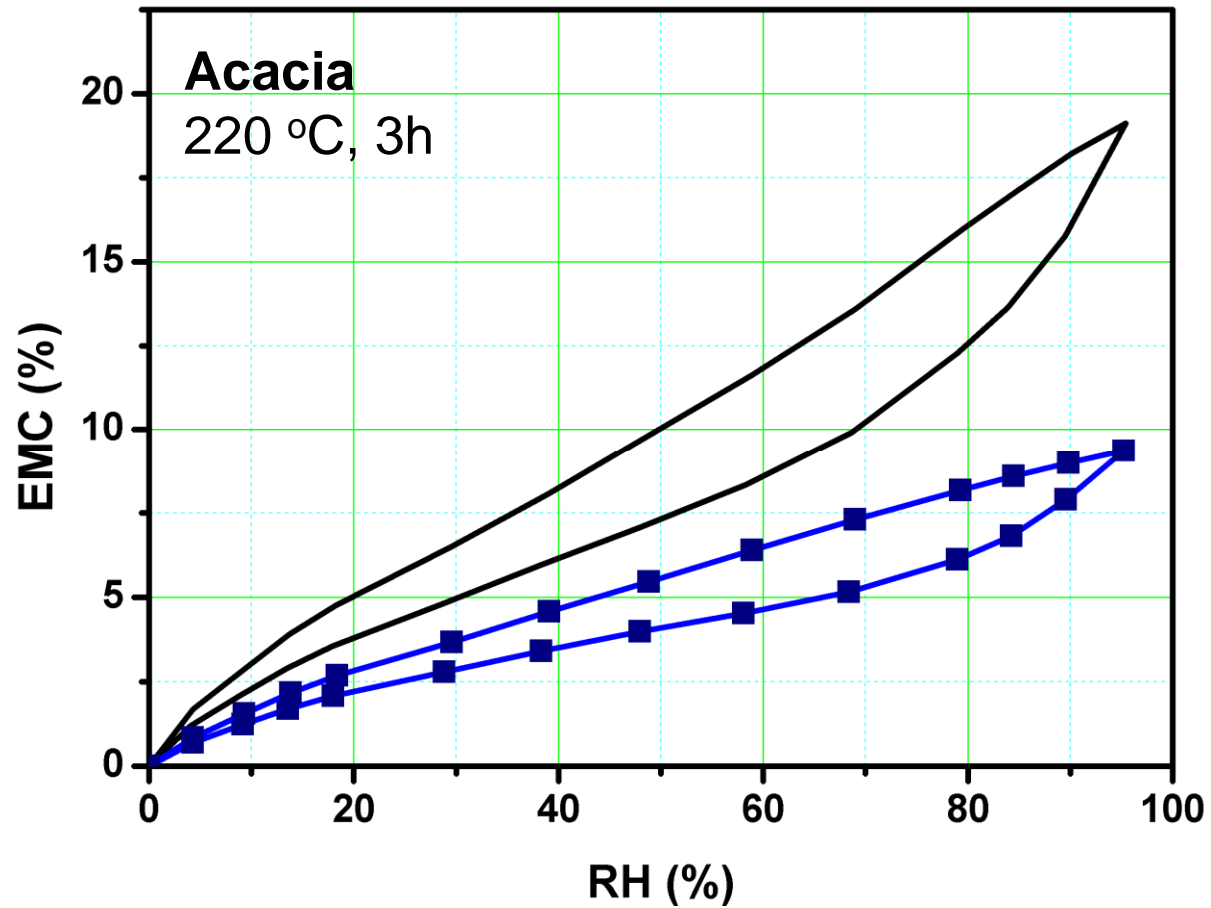


Deuterium

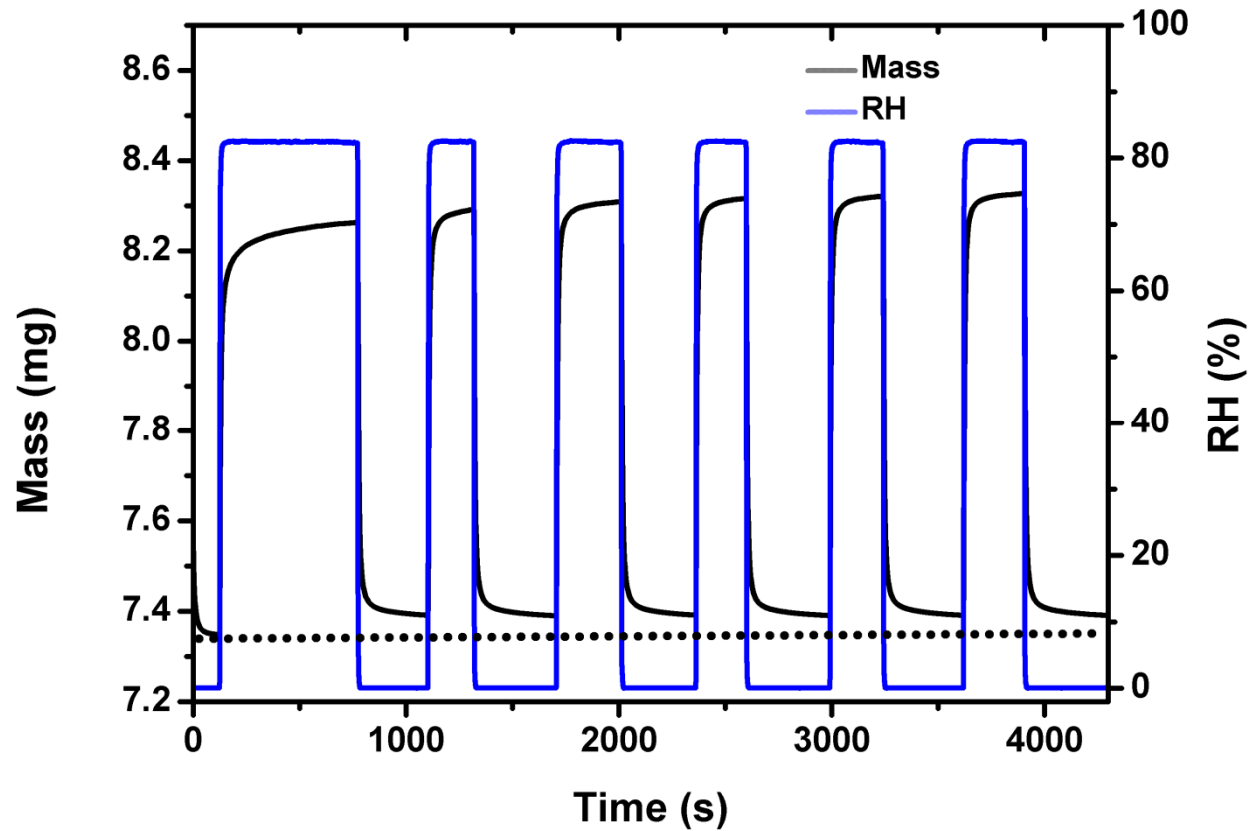


${}^4\text{H}$ to ${}^7\text{H}$ – highly unstable nuclei have been synthesized in the laboratory but not observed in nature

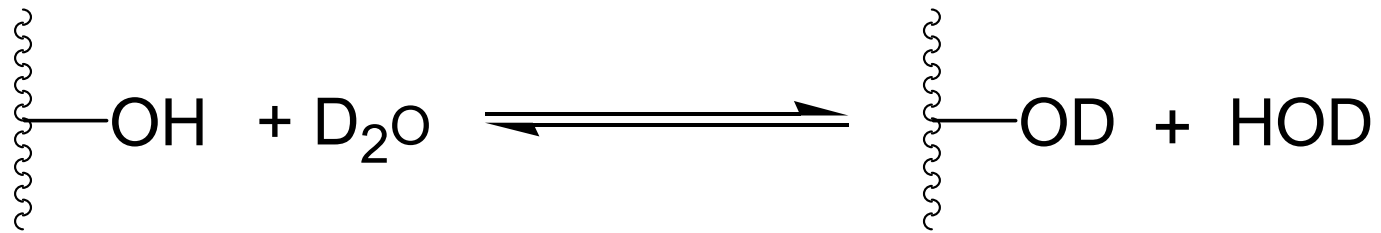
Thermally modified wood



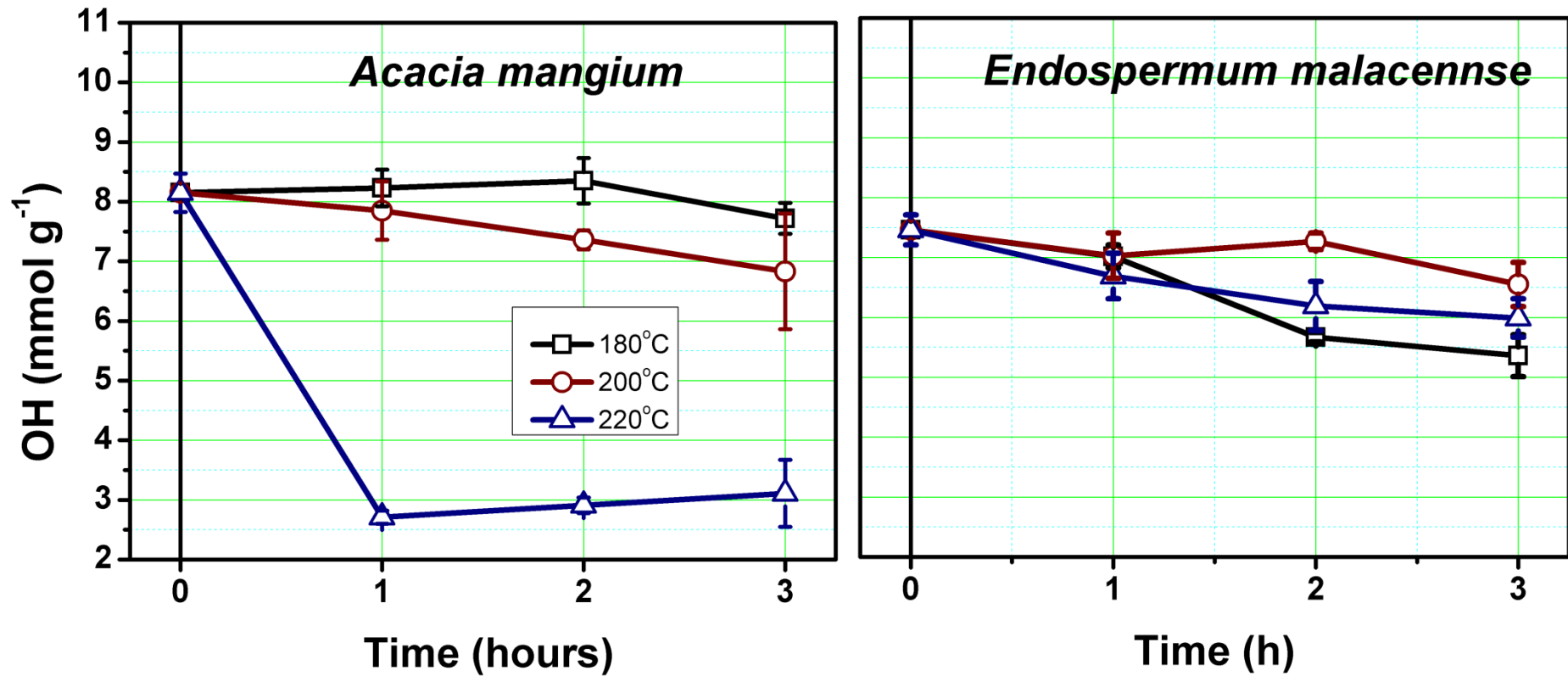
Deuterium exchange



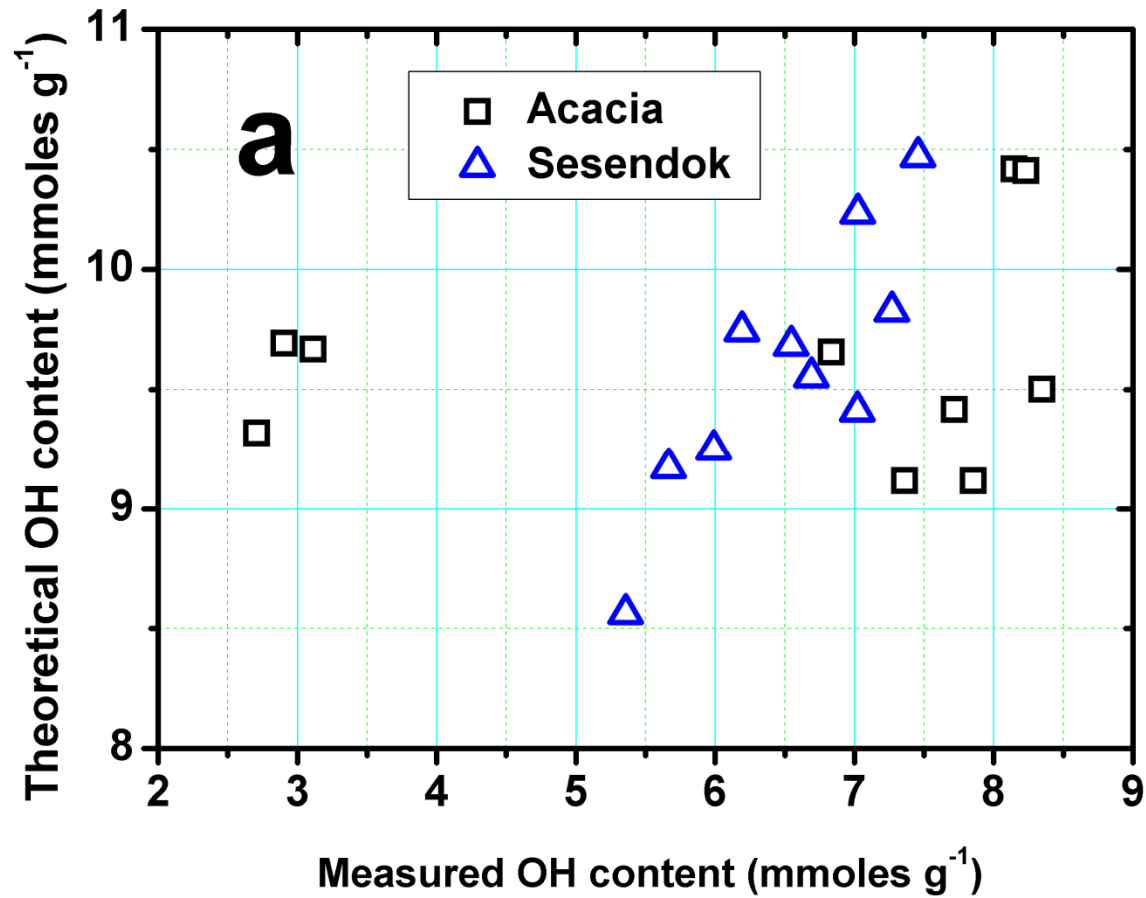
Deuterium exchange



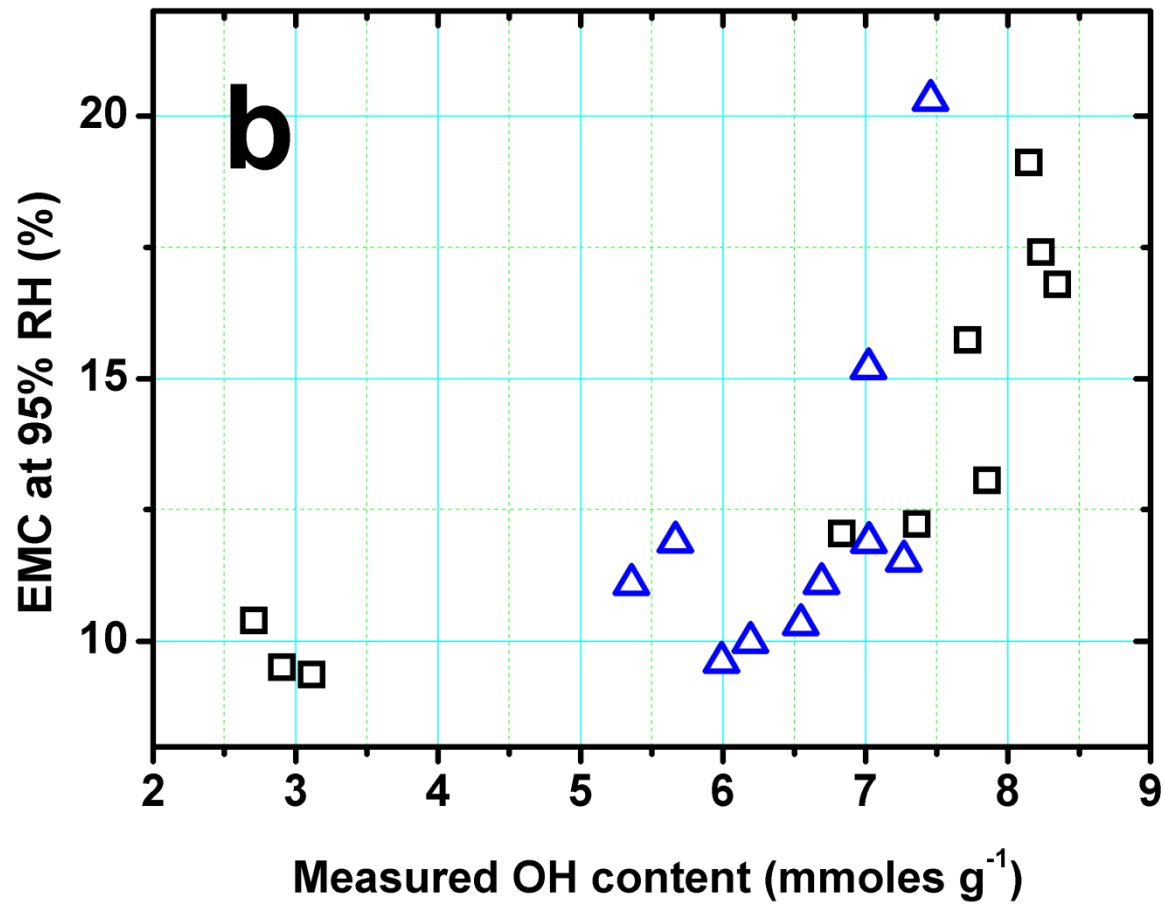
OH content



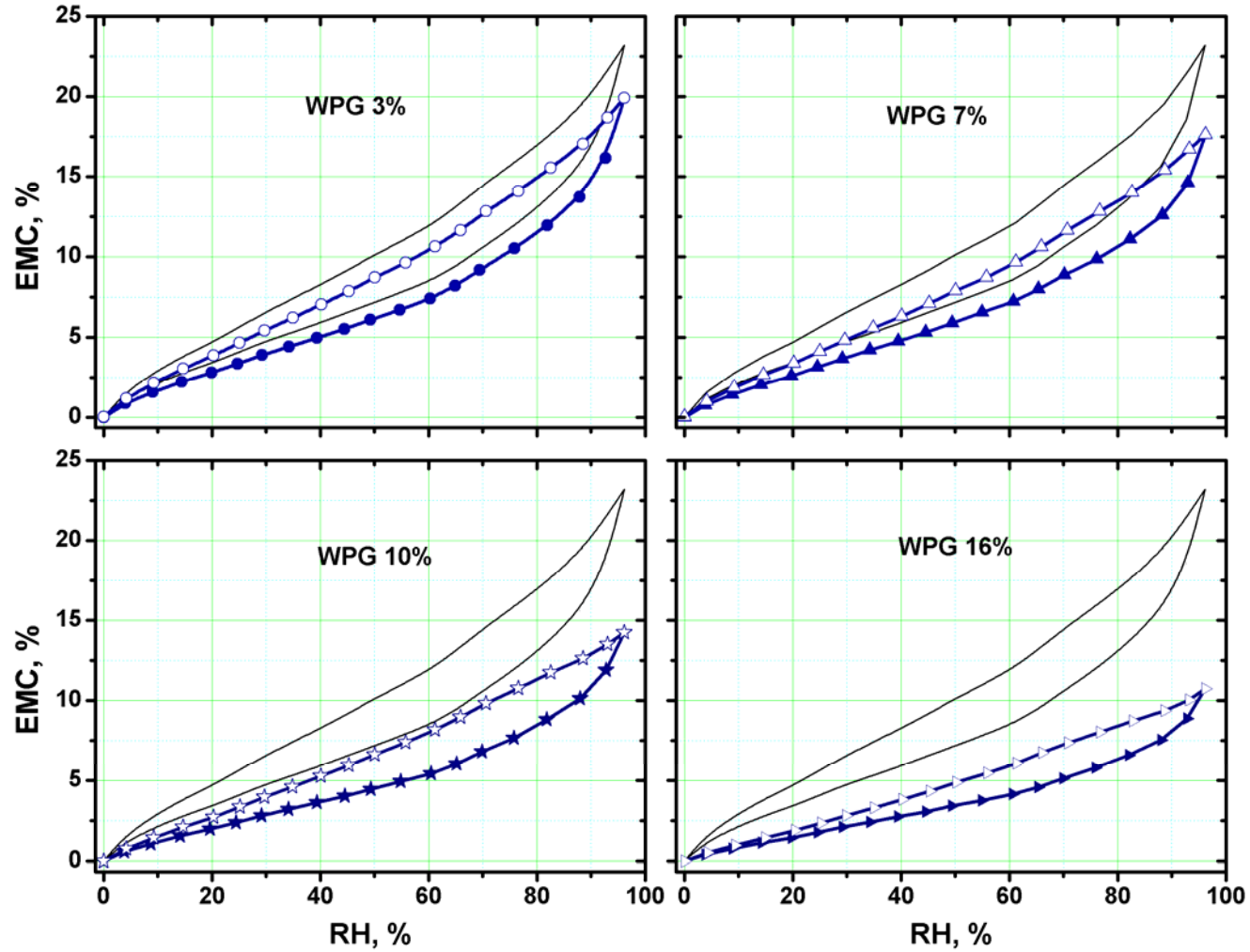
OH content



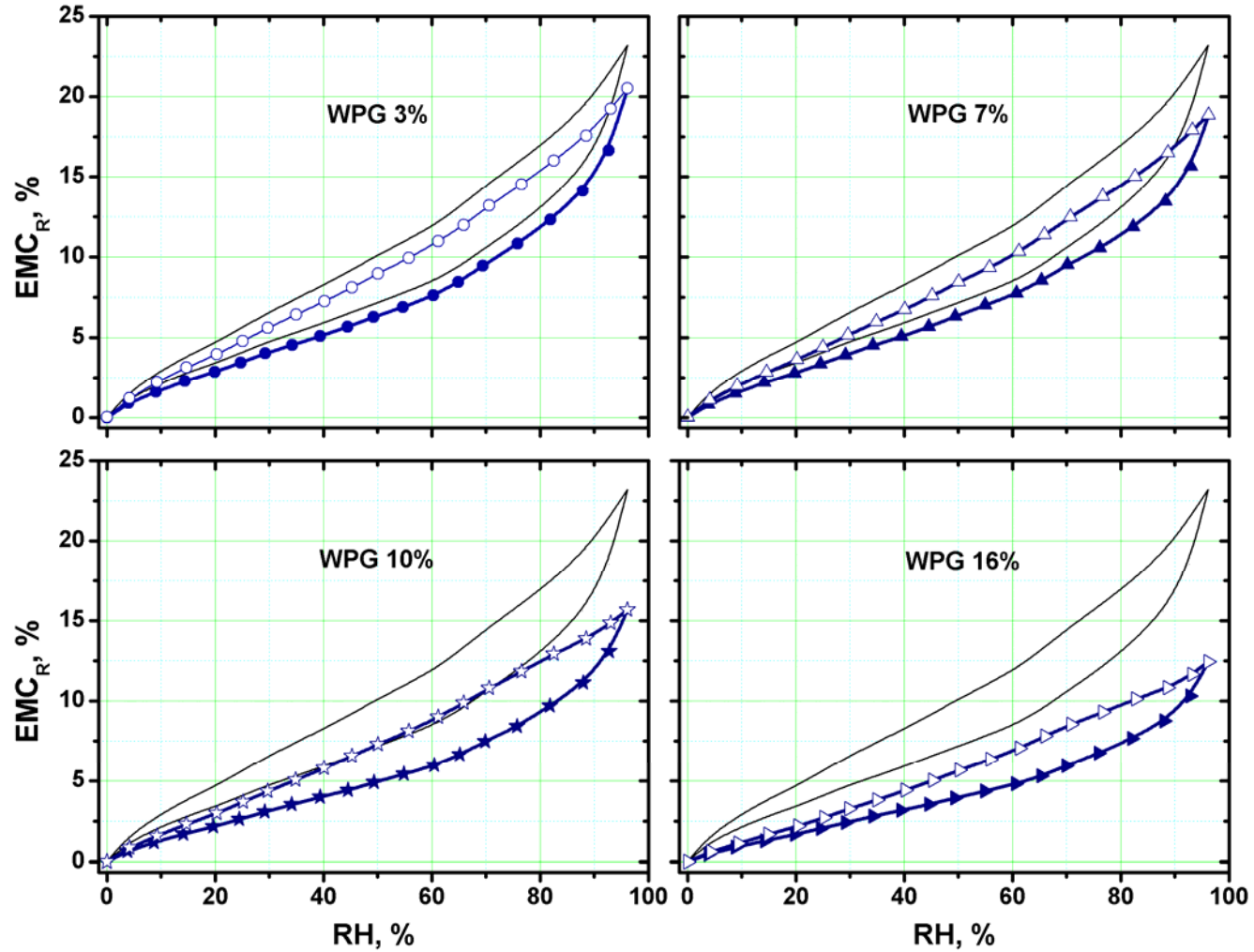
OH content



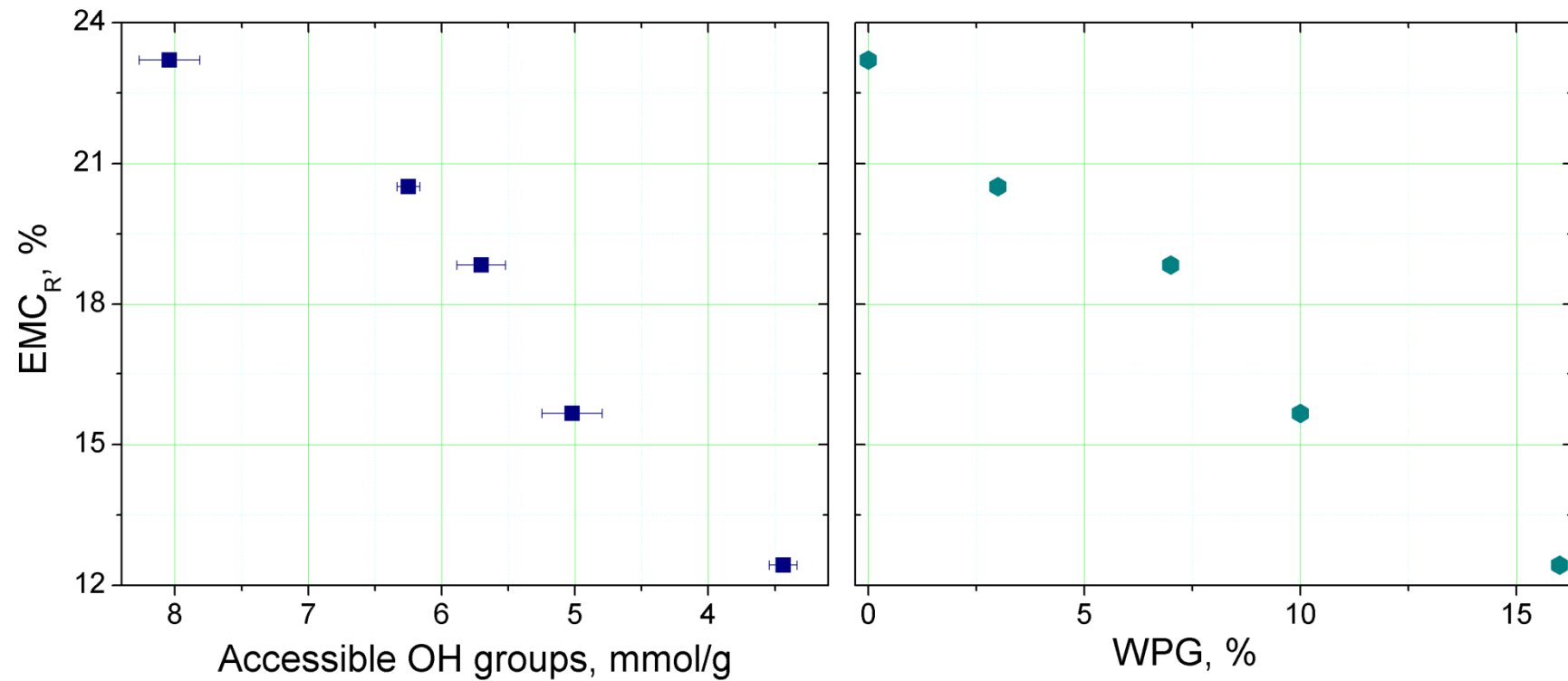
Acetylated birch (EMC)



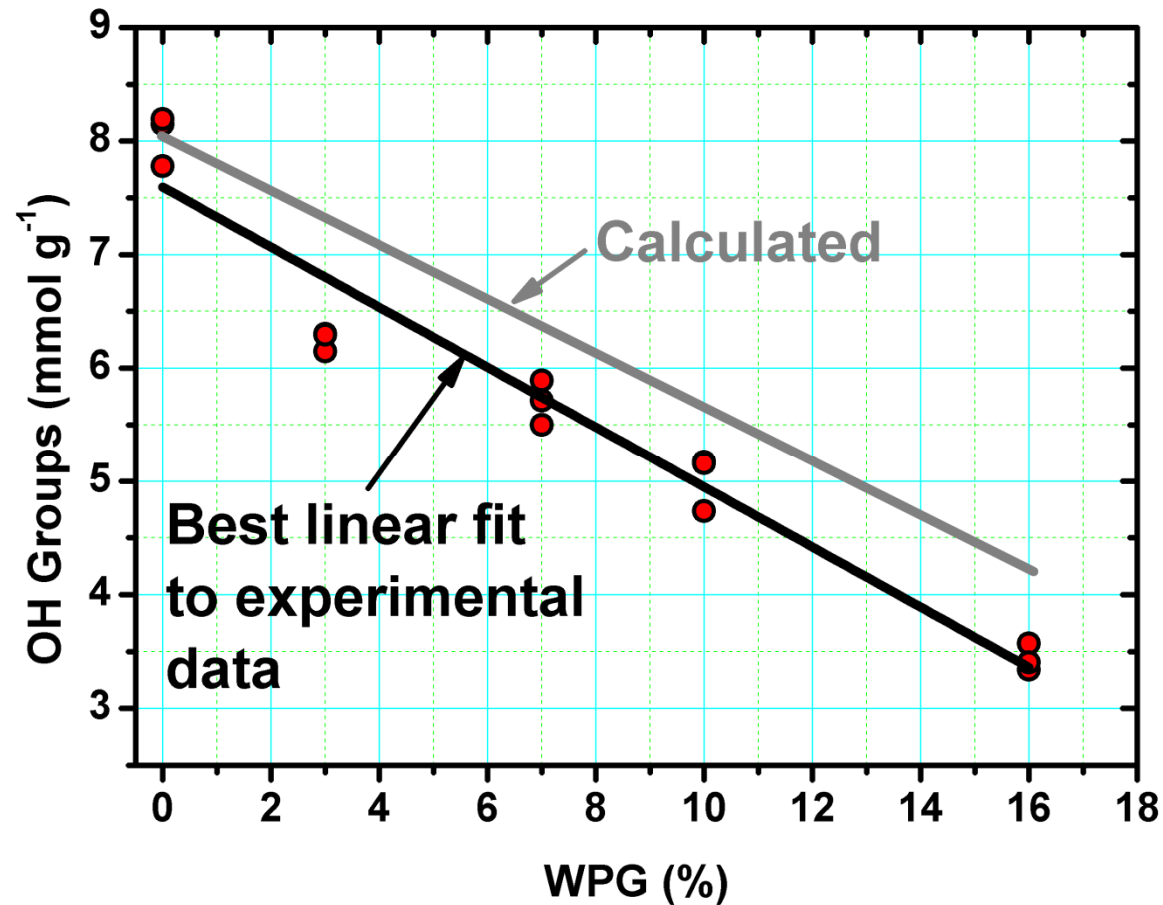
Acetylated birch EMC_R



Bulking or OH groups?



Acetylated birch



Conclusions

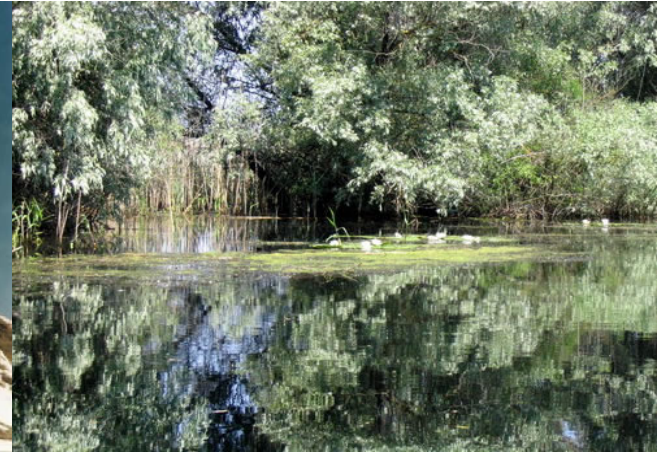
- ✓ Direct measurement of OH content of modified and unmodified wood has been undertaken using a newly developed DVS analytical method involving deuterium exchange.
- ✓ The relationship between accessible OH content and EMC has been examined.
- ✓ It has been found that with thermally modified wood there is a poor correlation between hygroscopicity and OH content, whereas with acetylated wood a good correlation has been found.

Acknowledgements

Simon Curling
Graham Ormondroyd
Lauri Rautkari
Yanjun Xie
Zaihan Jalaludin

COST FP1006





Thank you for your attention!

Romania

