

# Surface Modification of Wood

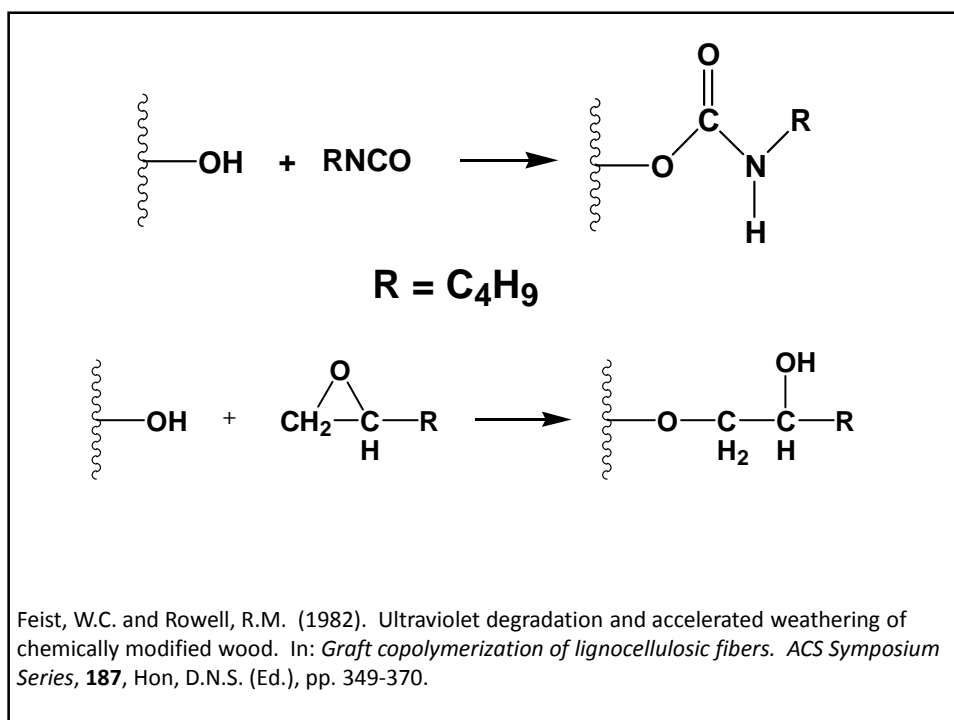
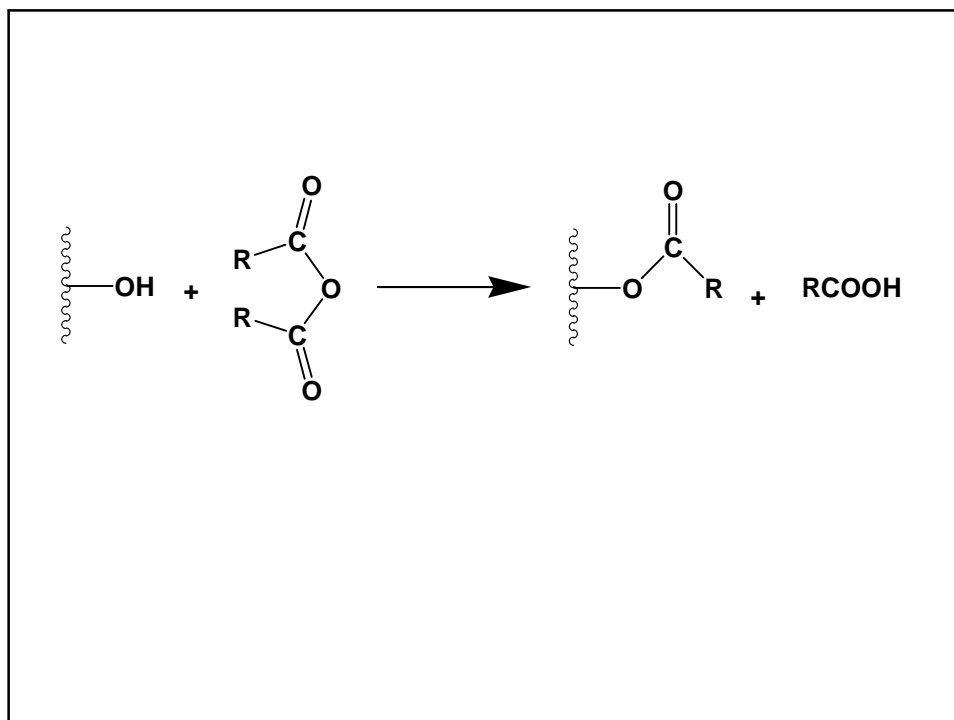
Professor Callum Hill FIAWS FIWSc

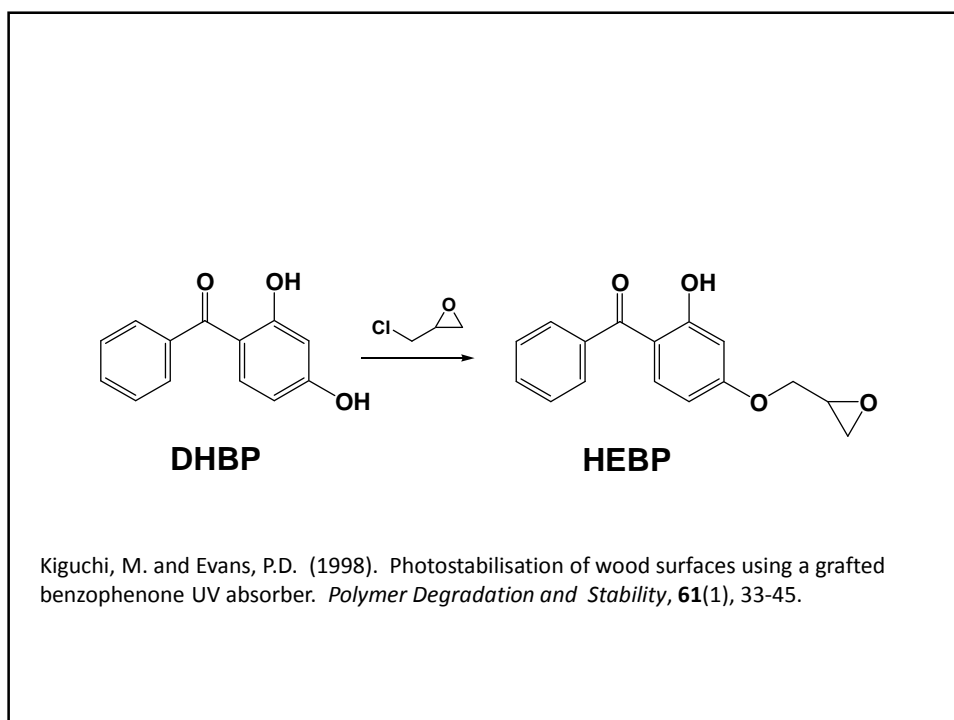
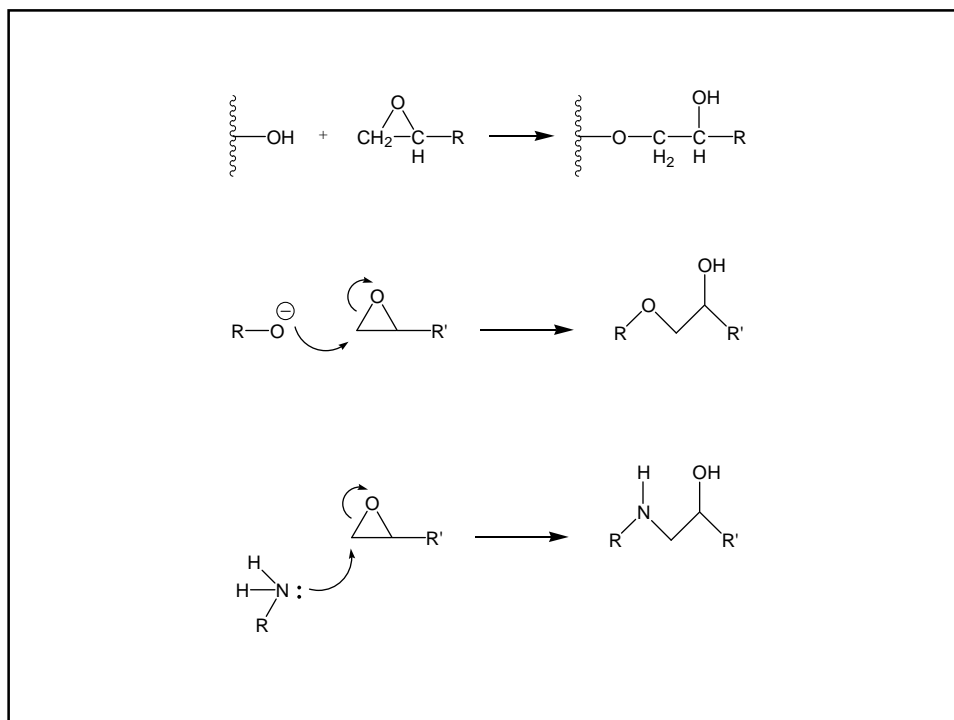
Forest Products Research Institute  
(Edinburgh Napier University)  
(JCH Industrial Ecology Limited)  
(Renuables)

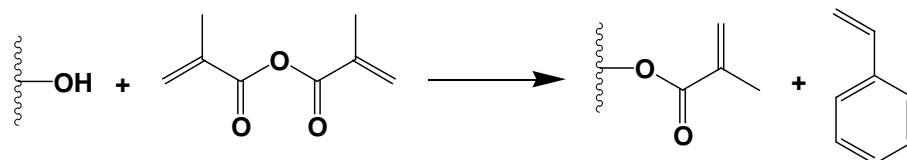


## Structure

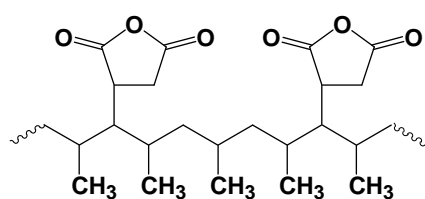
- Surface modification to improve UV stability
- Surface modification for bonding
- What is surface?



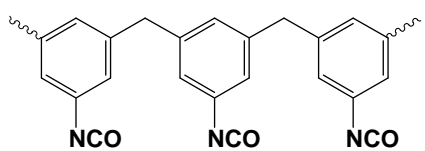




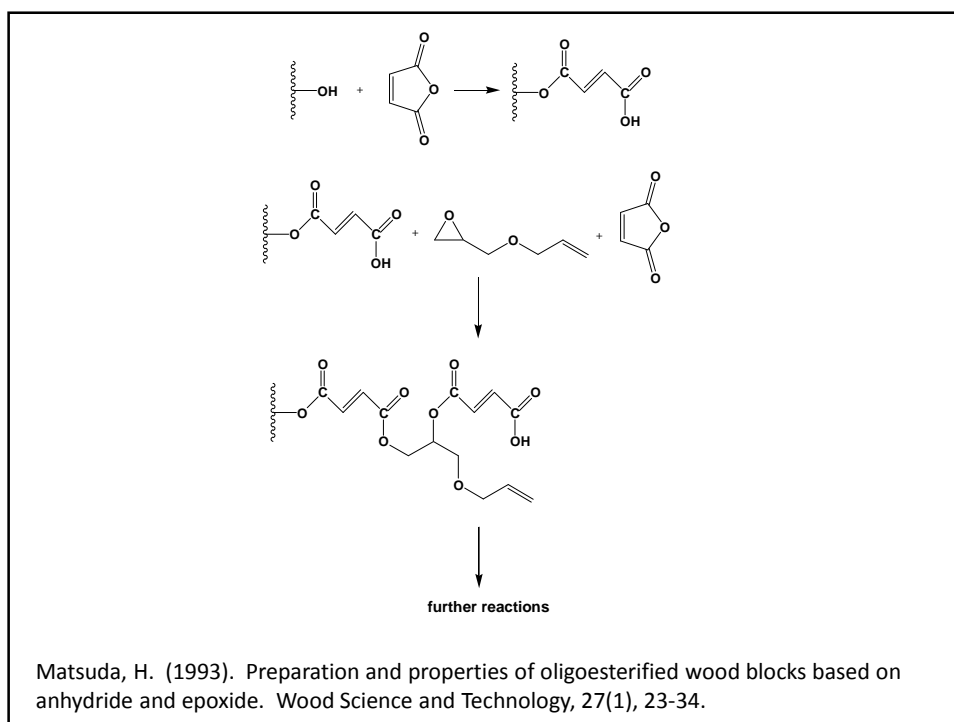
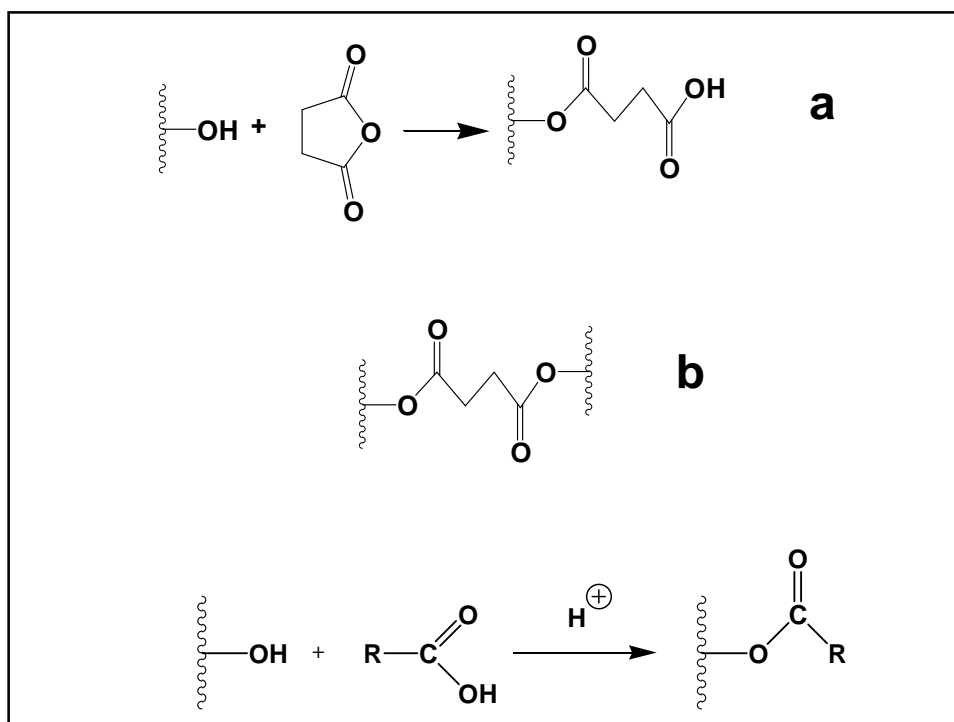
Hill, C.A.S., Çetin, N.S., Quinney, R.F., Derbyshire, H. and Ewen, R.J. (2001). An investigation of the potential for chemical modification and subsequent polymeric grafting as a means of protecting wood against photodegradation. *Polymer Degradation and Stability*, 72(1), 133-139.

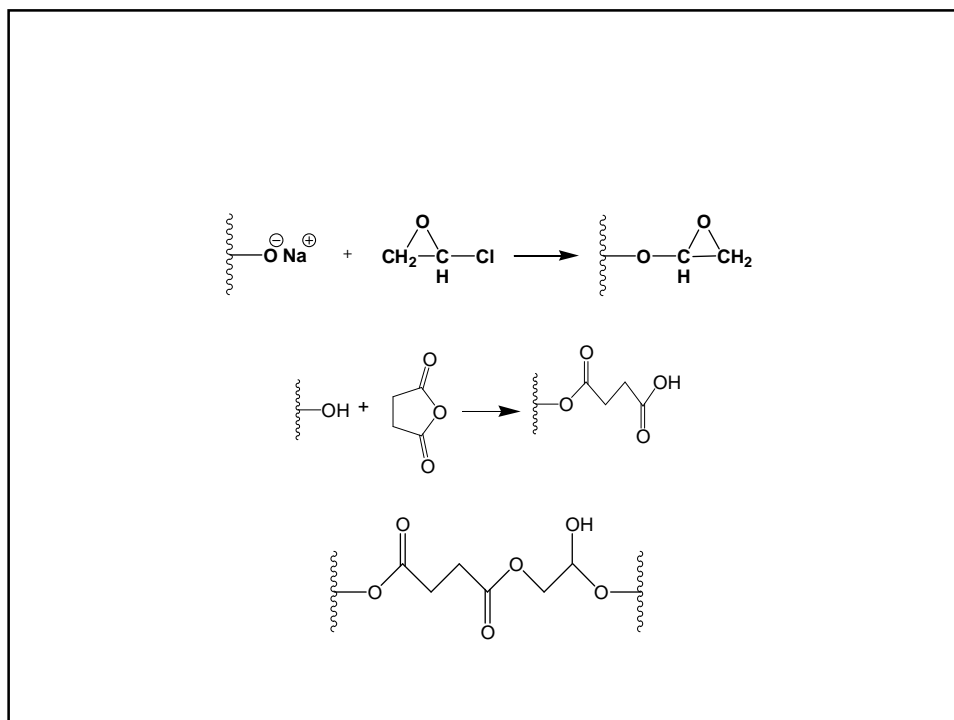


**MAPP**

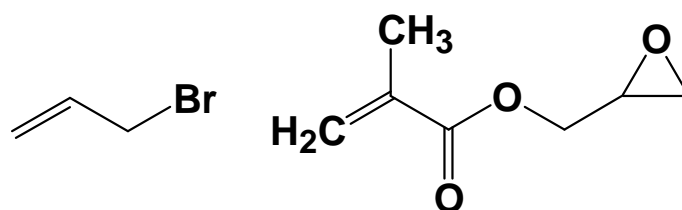


**PMPPIC**

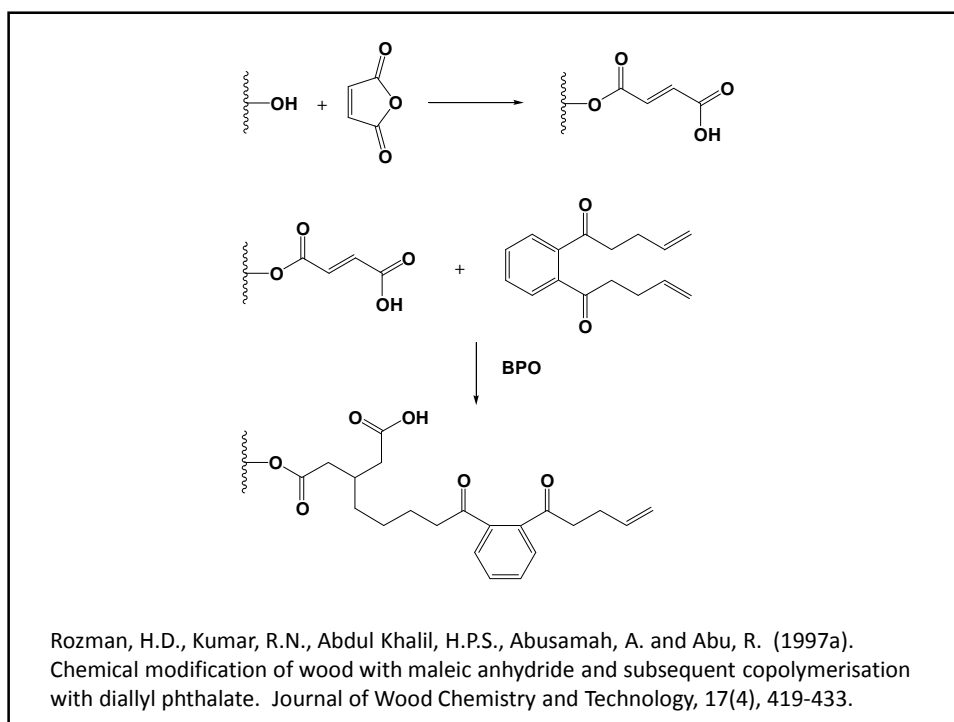
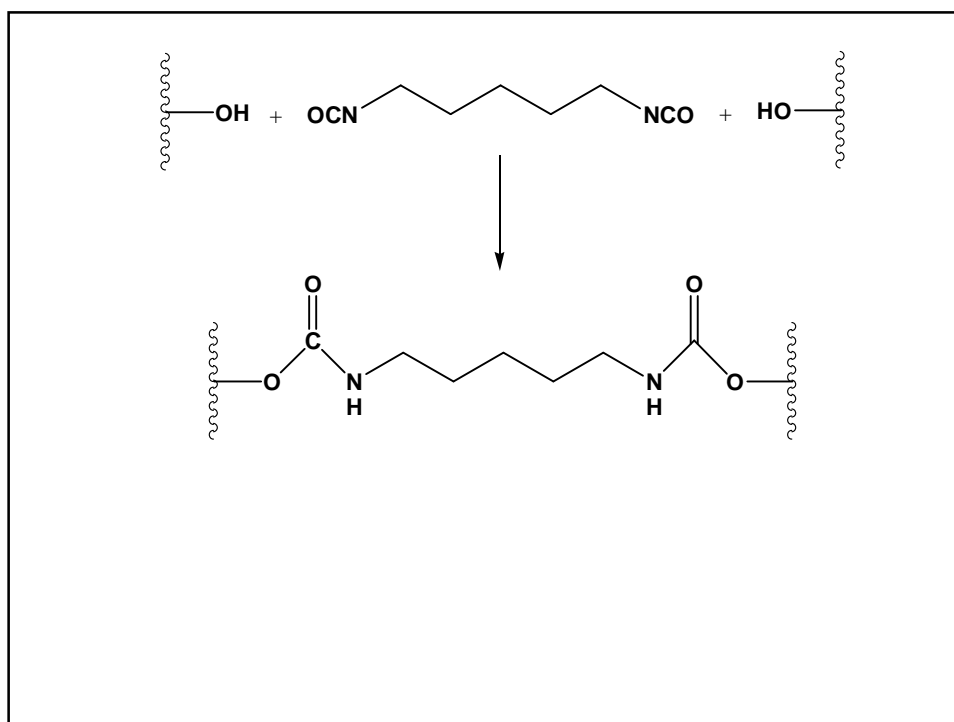




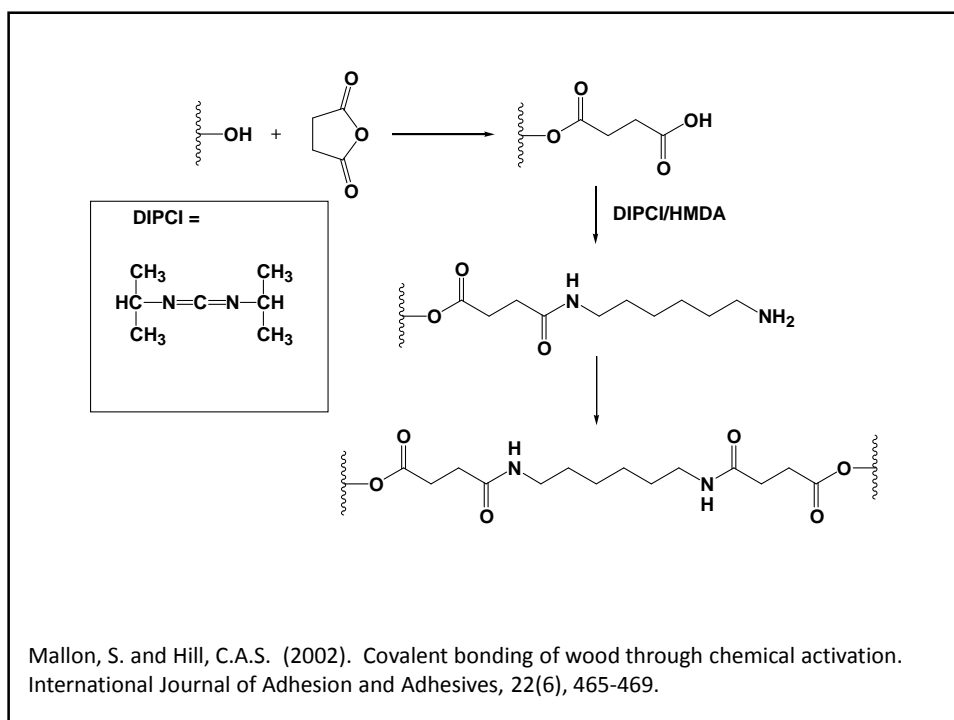
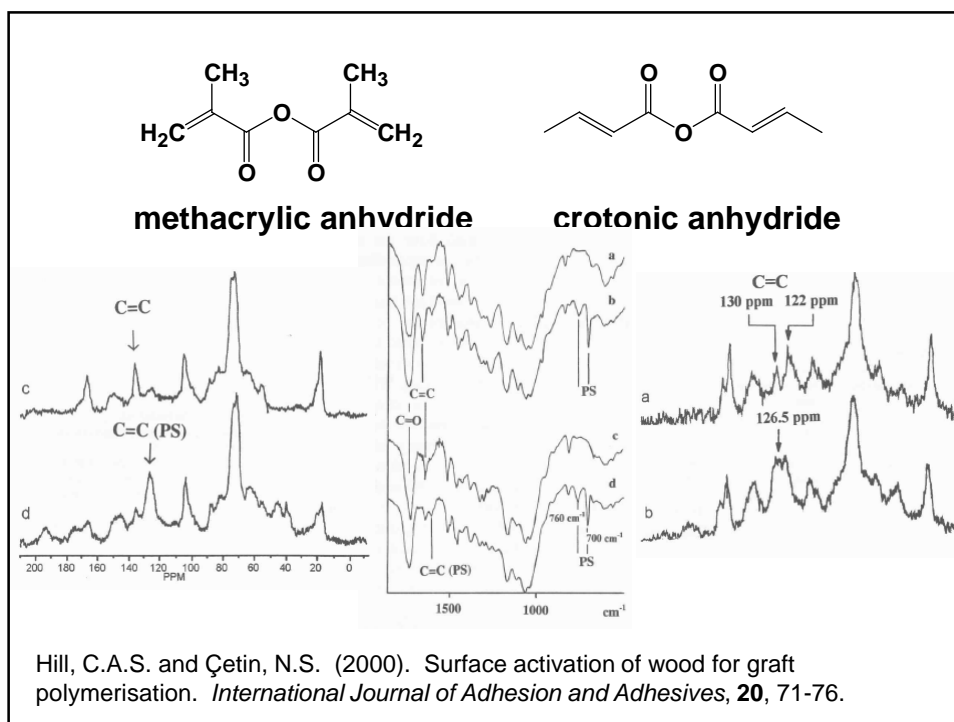
Banks *et al.* (1995)



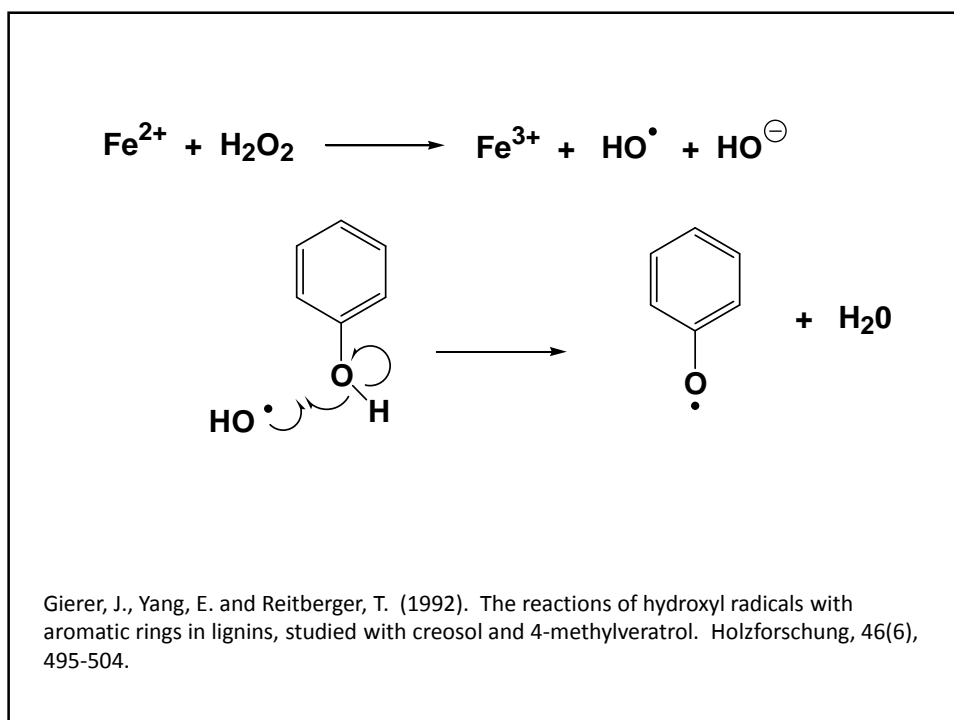
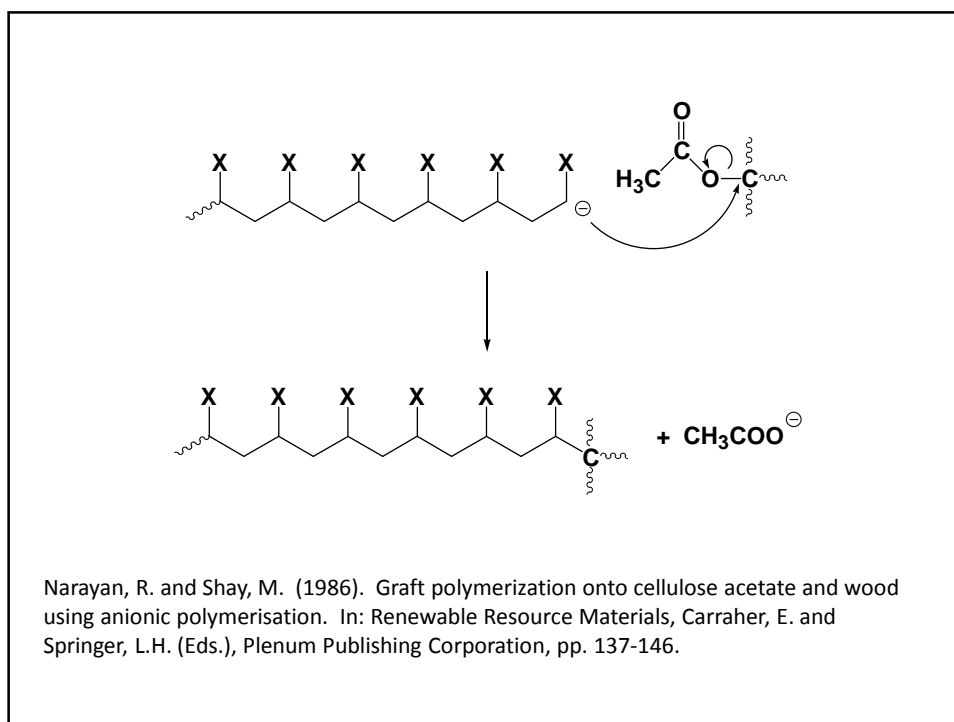
Ohkoshi, M. (1990). Bonding of wood by thermoplasticising the surfaces I. Effects of allylation and hot-press conditions. *Mokuzai Gakkaishi*, 36(1), 57-63.

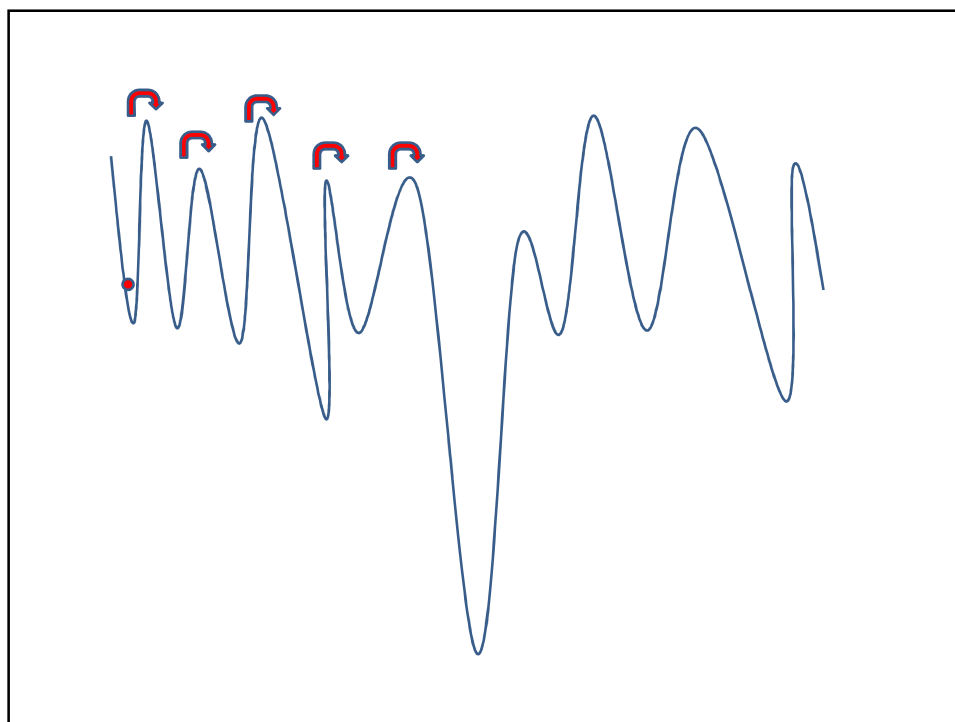
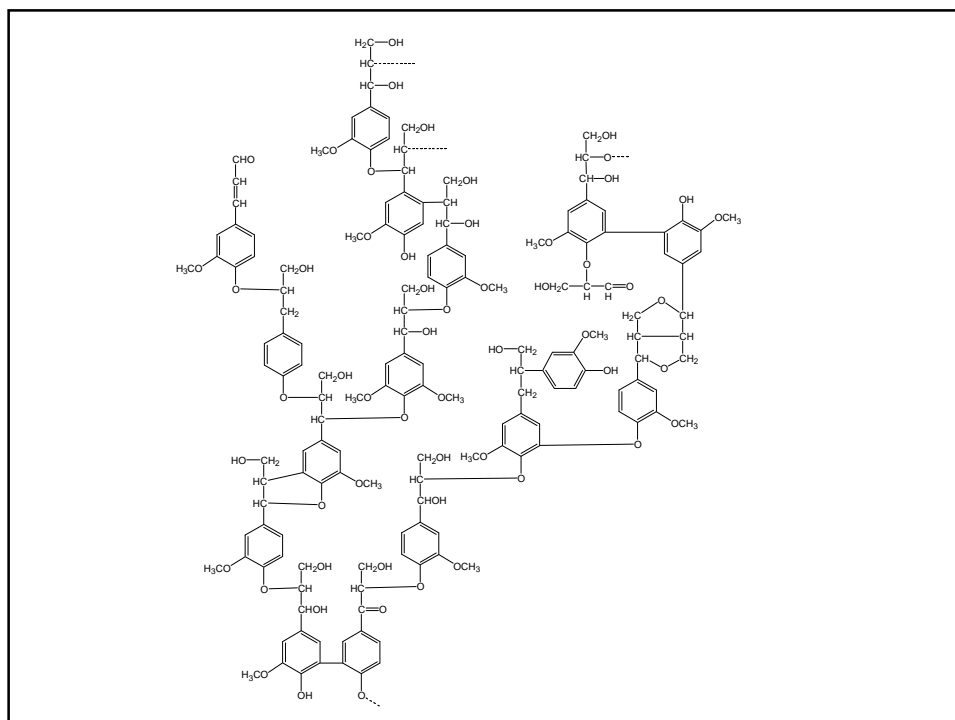


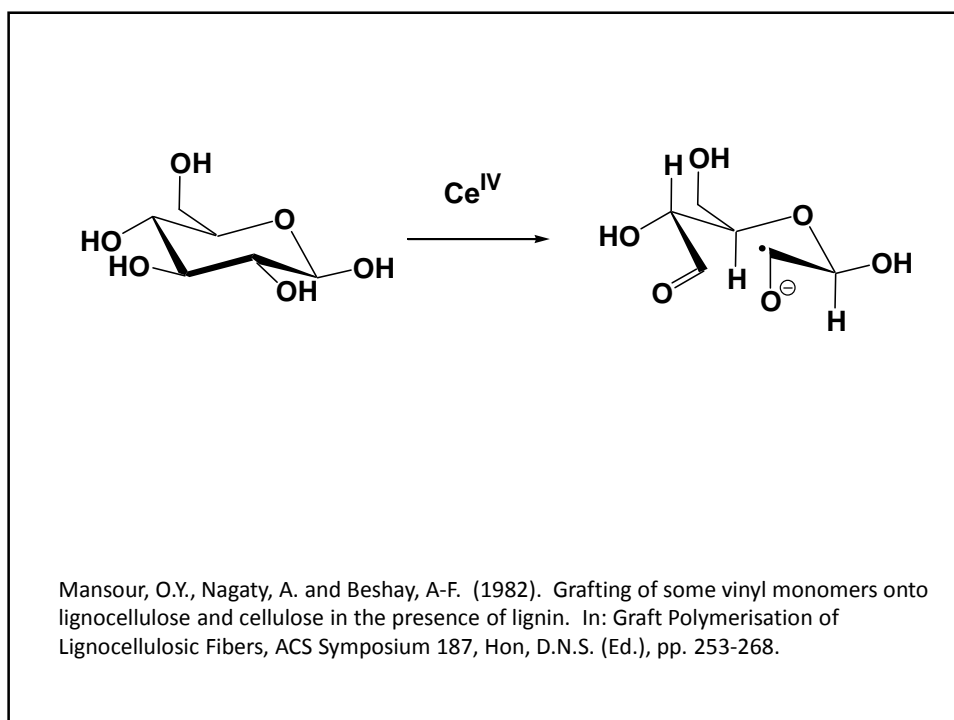
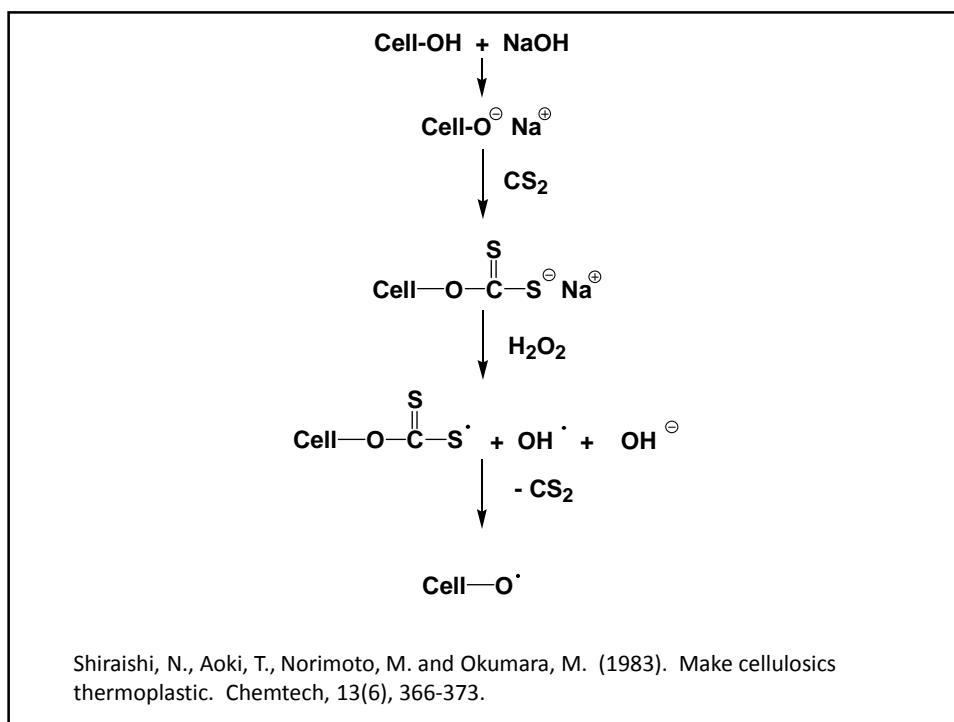
Rozman, H.D., Kumar, R.N., Abdul Khalil, H.P.S., Abusamah, A. and Abu, R. (1997a). Chemical modification of wood with maleic anhydride and subsequent copolymerisation with diallyl phthalate. *Journal of Wood Chemistry and Technology*, 17(4), 419-433.

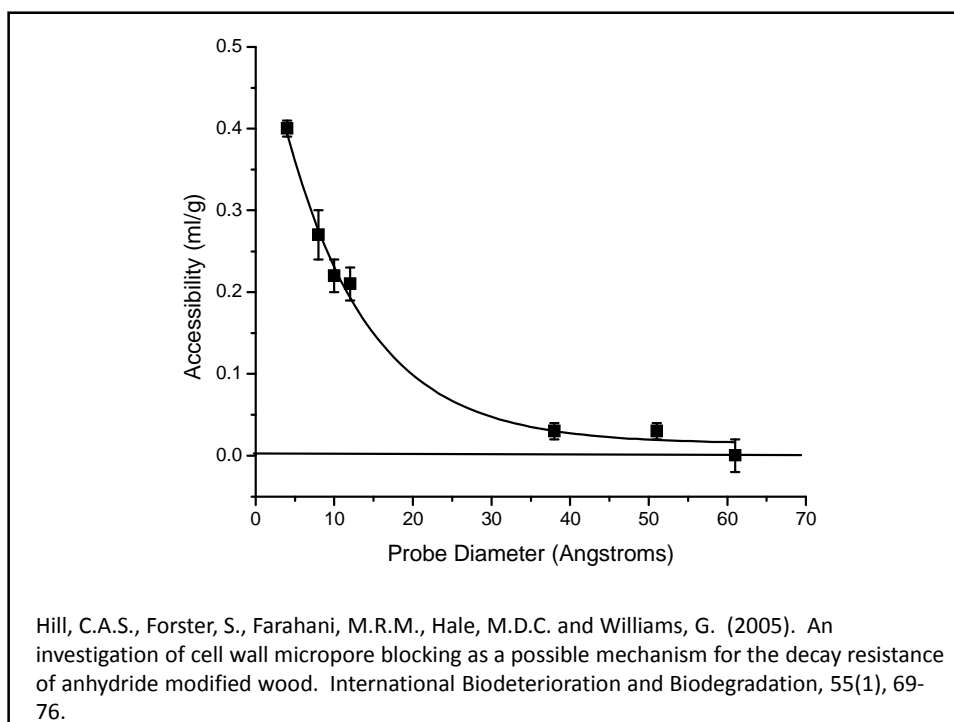
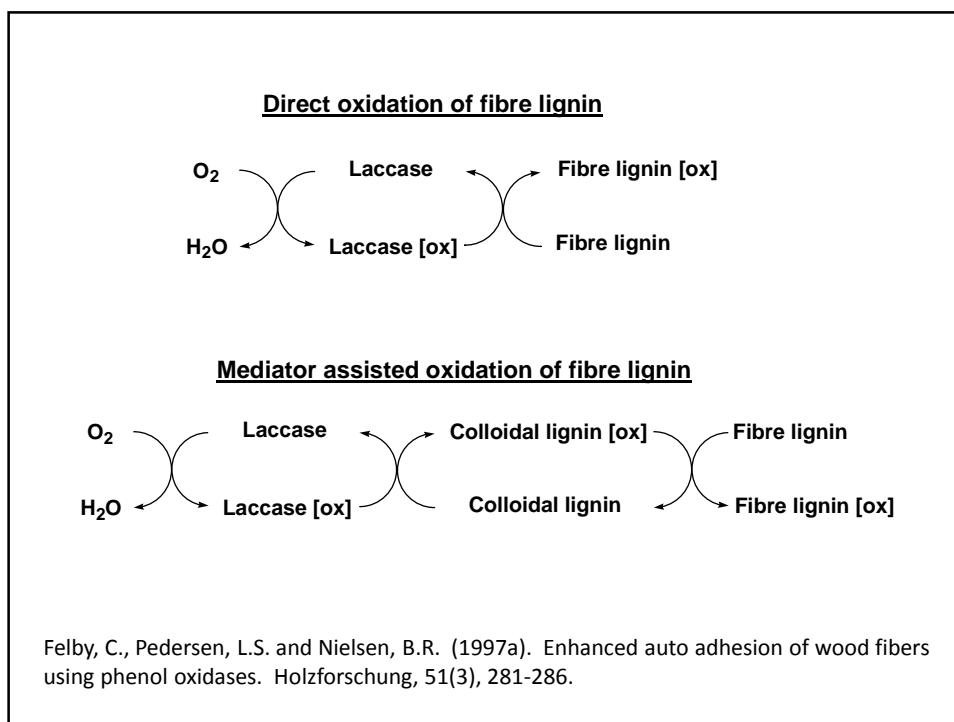


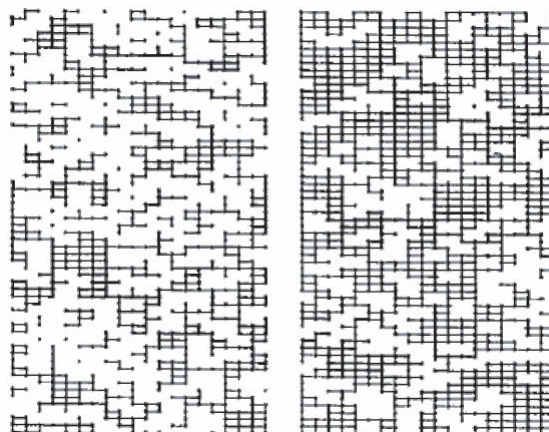




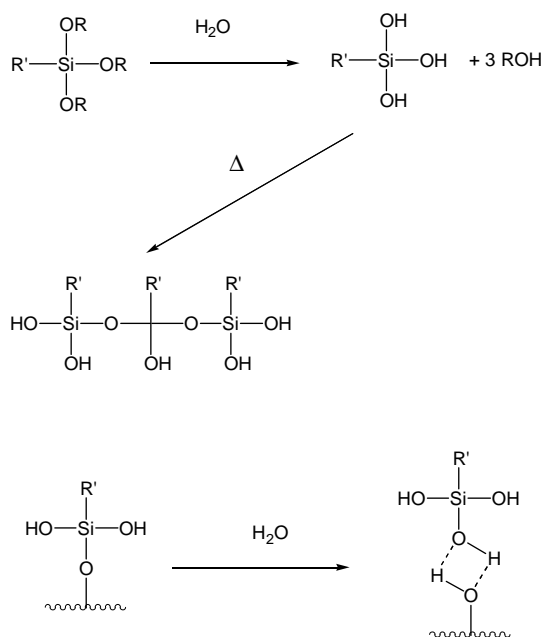








Hill, C.A.S. and Hillier, J. (1999). Kinetic studies of the reaction of carboxylic acid anhydrides with wood. Experimental determination and modelling of kinetic profiles. *Physical Chemistry and Chemical Physics*, 1, 1569-1576.



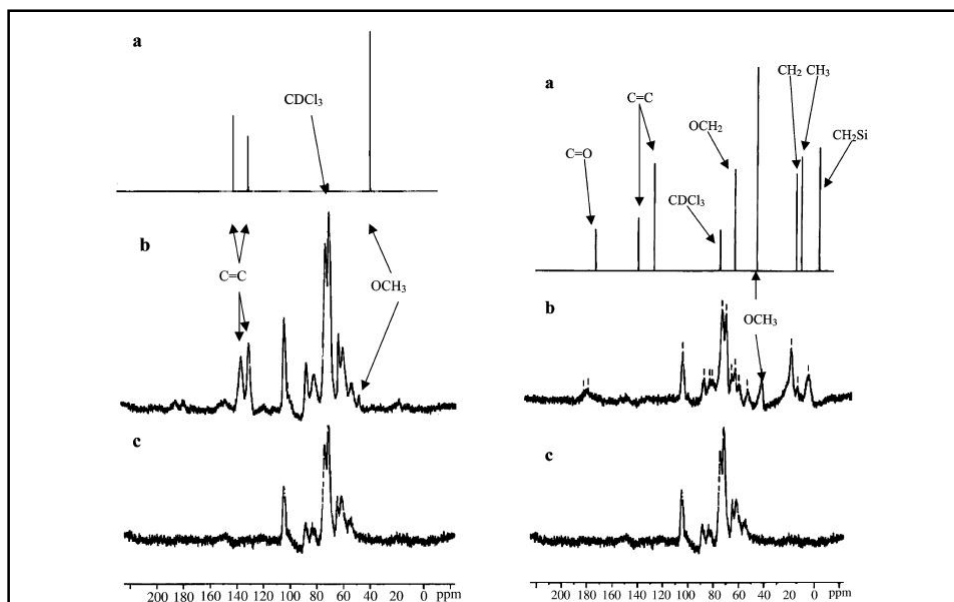
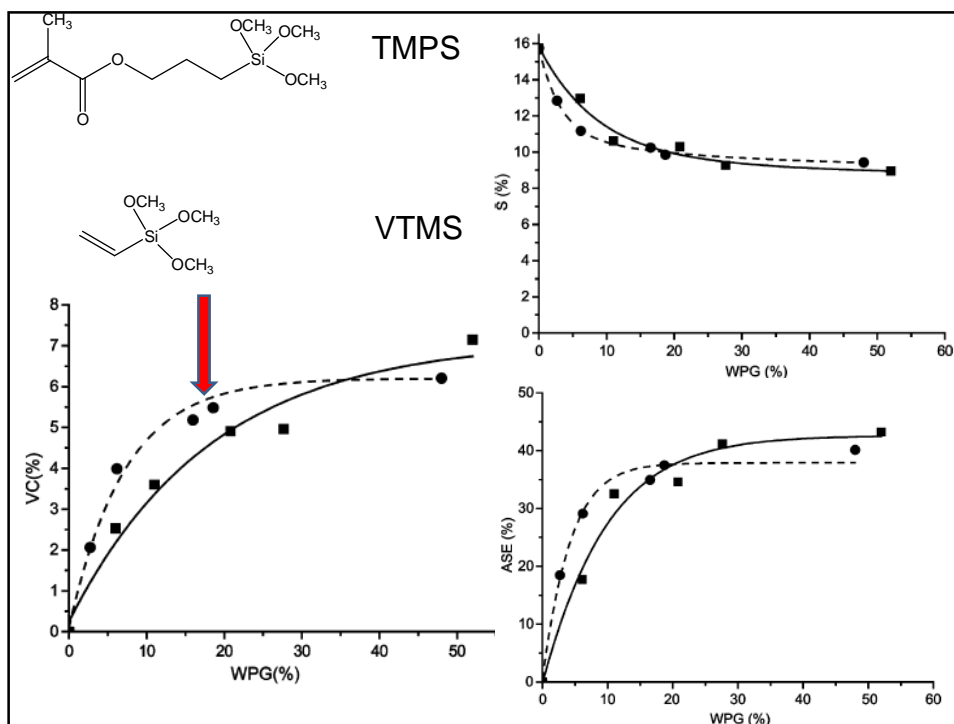
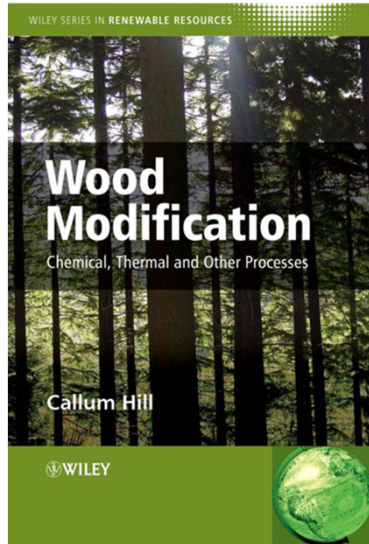


Figure 5 Solution  $^{13}\text{C}$  NMR spectrum of VTMS (a), solid-state NMR spectra of VTMS treated wood (b) and untreated wood (c).

Figure 6 Solution  $^{13}\text{C}$  NMR spectrum of TMPS, solid-state NMR spectra of TMPS treated wood (b) and untreated wood (c).

Hill, C.A.S., Farahani, M.R.M. and Hale, M.D.C. (2004b). The use of organo alkoxy silane coupling agents for wood preservation. *Holzforschung*, **58**(3), 316-325.



Callum Hill



An Introduction to  
Sustainable  
Resource Use

