## Multiscale modelling investigation of wood modification with acetic anhydride



**Fig. S1** Simulated density of (a) pure cellobiose at 300 K and (b) pure lignin-model at 298.15 K. The density values were computed with final 2 ns.



**Fig. S2** Optimized structures of acetylated cellobiose and acetylated lignin model in gas phase: (a) acetylated cellobiose at HO-(C2) position, (b) acetylated cellobiose at HO-(C6) position, (c) acetylated cellobiose at HO-(C3) position, (d) acetylated lignin at HO-( $\gamma$ )-aliphatic position, and (e) acetylated lignin at HO-(C4)-aromatic position.



Fig. S3 Atom labelling of acetic anhydride molecule.