

Figure 1. Sub-cycle IR spectrum of an ABC-type ALD cycle, where BTDMASM (A) adsorbs on the surface, the organic acid (B) reacts with the ligands of the precursor molecule, and water (C) is used to replenish hydroxyl groups and remove organic acid groups from the surface. The deposition temperature is 150 °C.

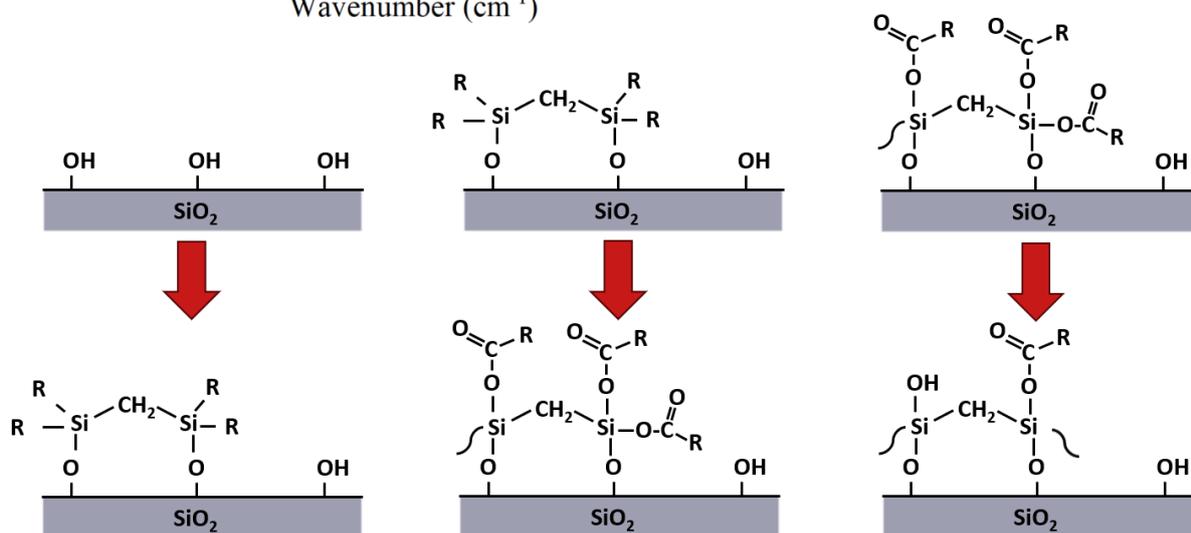


Figure 2. The schematic shows the hydroxyl groups that were identified as key species for adsorption of BTDMASM. In addition, the carbon bridge is identified as the species that will help to reach high-quality SiOCH.

Figure 3. The schematic shows the different identified surface groups that remain upon adsorption of the organic acid. C=O and C-O bonds are present at the surface after reaction with the ligands of BTDMASM.

Figure 4. The schematic shows the surface groups that were formed and remained after the reaction of water with the adsorbed acid. Some reactive surface sites are created in the form of hydroxyl groups.

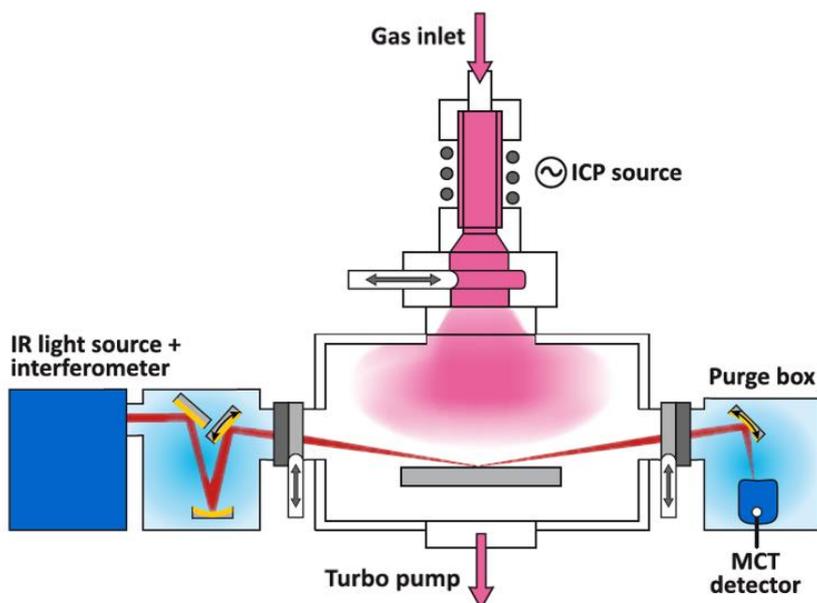


Figure 5. Schematic of the used ALD reactor for the in-situ study of the surface chemistry. The figure shows the IR setup where an incoming broadband IR beam is reflected from the substrate onto the detector. This setup allows for the detection of changing surface species upon exposure to reactants.