

Figure 1: Schematic illustration of the original ABC-type ALD cycle and the improved ABDC-type ALD cycle. In the original process inhibitor molecules are dosed during step A which selectively adsorb on a predefined pattern. Subsequently, the precursor is dosed in step B which is prevented from adsorbing on the non-growth area by the adsorbed inhibitor molecules. Lastly, the substrate is exposed to the O₂ plasma in step C which removes the inhibitor molecules and the precursor ligands from the surface. The improved process includes an additional step (step D) prior to the O₂ plasma during which the substrate is exposed to a H₂ plasma. During this step the inhibitor molecules are more effectively removed from the non-growth area.

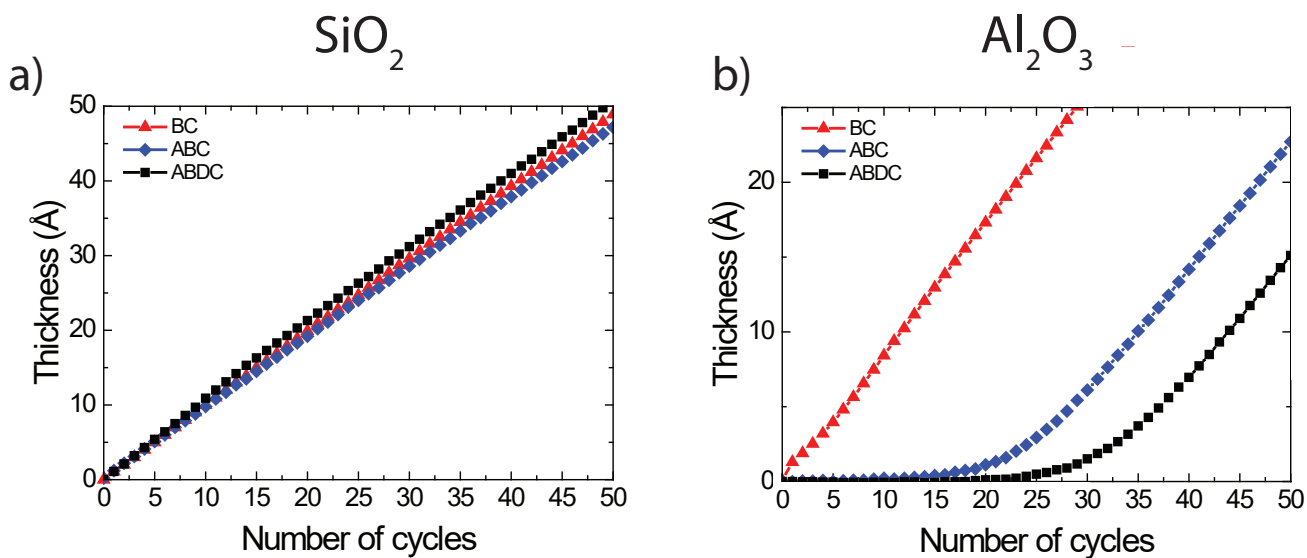


Figure 2: SiO₂ deposition as measured by ellipsometry on a) SiO₂ and b) Al₂O₃-coated substrates for: the regular (BC) ALD process, the ABC-type ALD process, and the process with the added H₂ plasma step (ABDC).

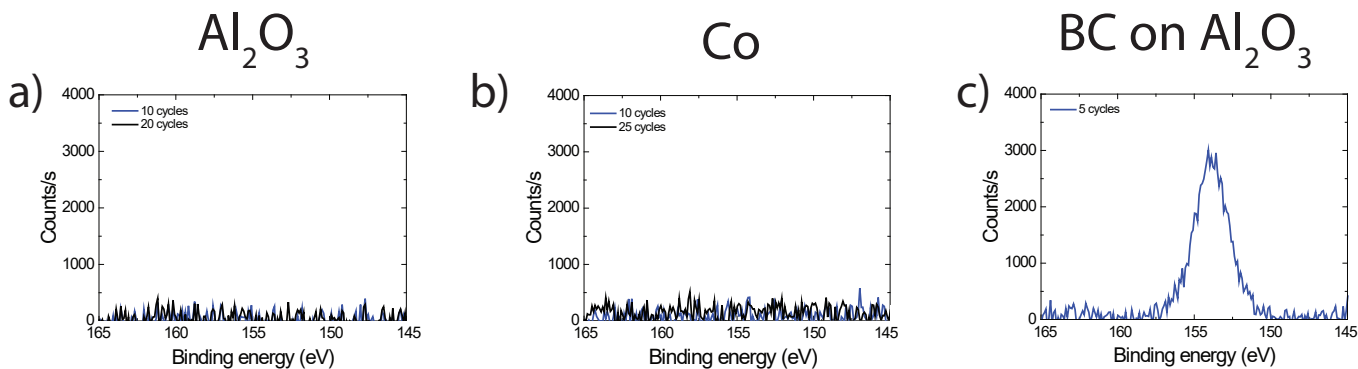


Figure 3: Si 2p peak as function of ABDC-type ALD cycles measured by XPS on (a) Al₂O₃ and (b) Co substrates. (c) Reference XPS peak for 5 BC-type ALD cycles on Al₂O₃