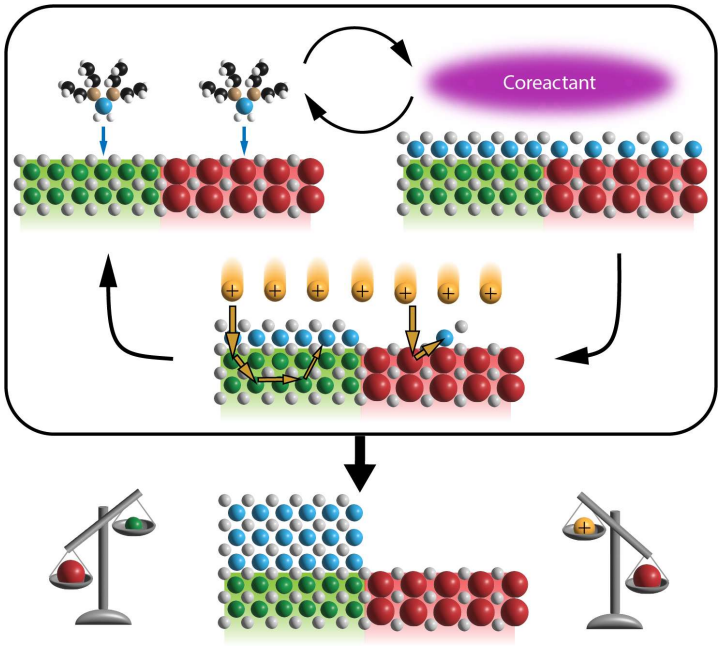

Figure 1: Schematic of a physical approach to ASD. A non-selective ALD process is combined with sputter etching by ions. These ions are much more effective at etching material on substrates containing heavy atoms, resulting in a net deposition only on surfaces without heavy atoms.

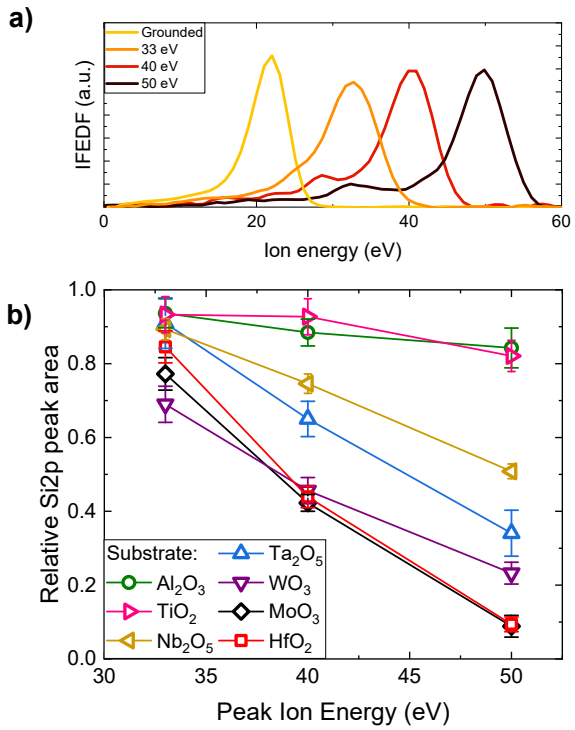

Figure 2: a) Ion flux energy distribution functions (IFEDFs) of the Ar plasmas, as measured by a retarded field energy analyzer. b) Relative Si2p peak area as measured by x-ray photoelectron spectroscopy (XPS) of SiO_2 after a $5.6 \cdot 10^{17}$ cm^{-2} Ar ion dose, for various peak ion energies. The SiO_2 was deposited by three ALD cycles on different substrates. This relative Si2p peak area after etching is normalized to the Si2p peak area before etching.

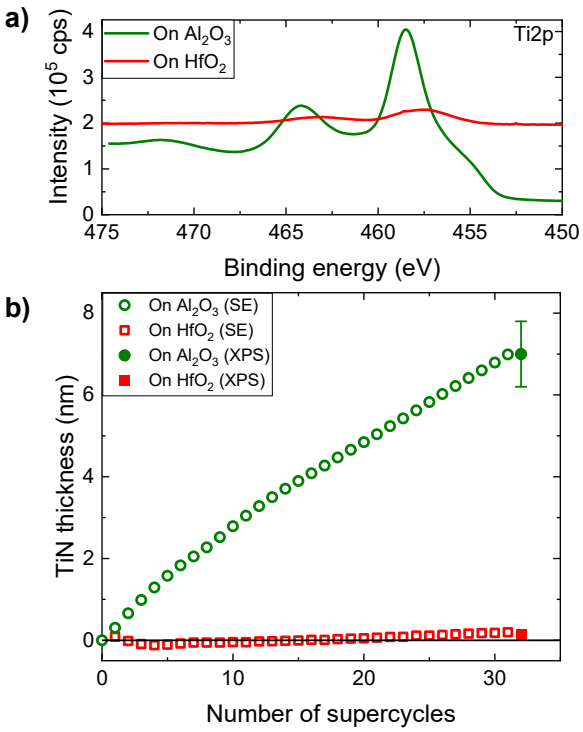

Figure 3: a) Ti2p (XPS) spectra after 32 supercycles consisting of 6 TiN ALD cycles followed by a $5.0 \cdot 10^{17}$ cm^{-2} Ar ion dose at 50 V DC bias on HfO_2 and Al_2O_3. b) TiN thickness on HfO_2 and Al_2O_3 as measured by in-situ spectroscopic ellipsometry (SE, open symbols) after each deposition-etch supercycle. The TiN thickness has also been determined by XPS after 32 supercycles (closed symbols).