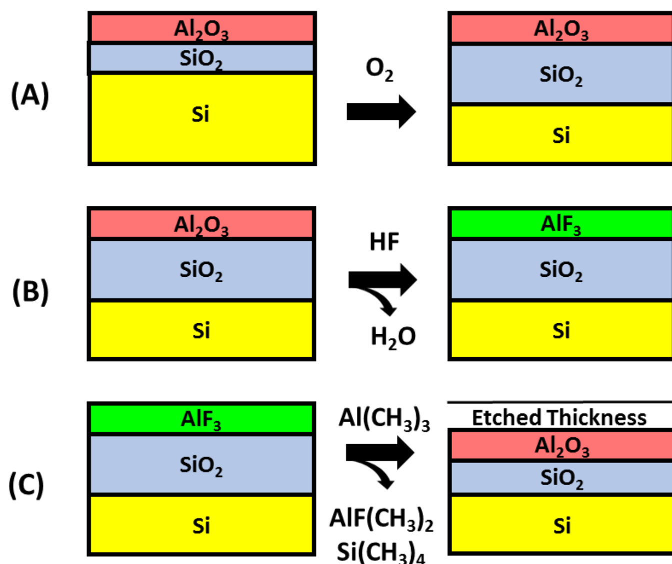

Figure S1. Schematic for thermal Si ALE based on (A) oxidation; (B) fluorination; and (C) ligand-exchange and conversion.

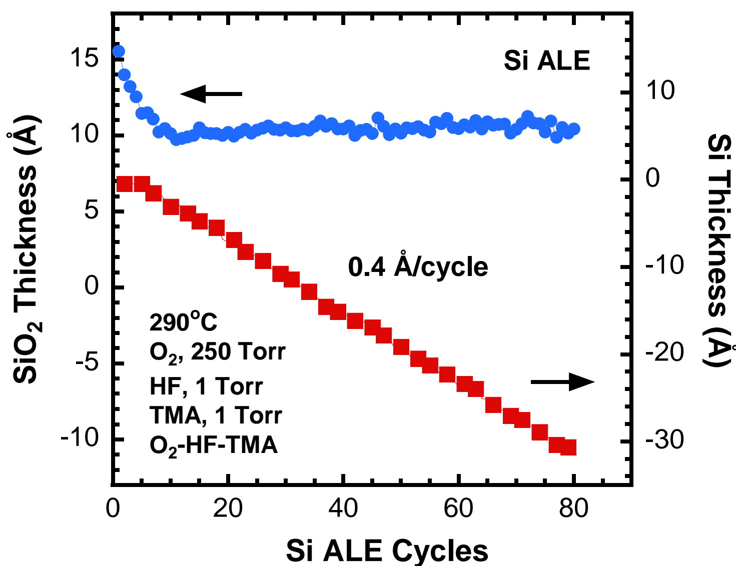

Figure S2. Si and SiO_2 film thicknesses during thermal Si ALE at 290°C using sequential exposures of O_2, HF and TMA. The Si film thickness is reduced at 0.4 Å/cycle while the SiO_2 film thickness remains nearly constant.