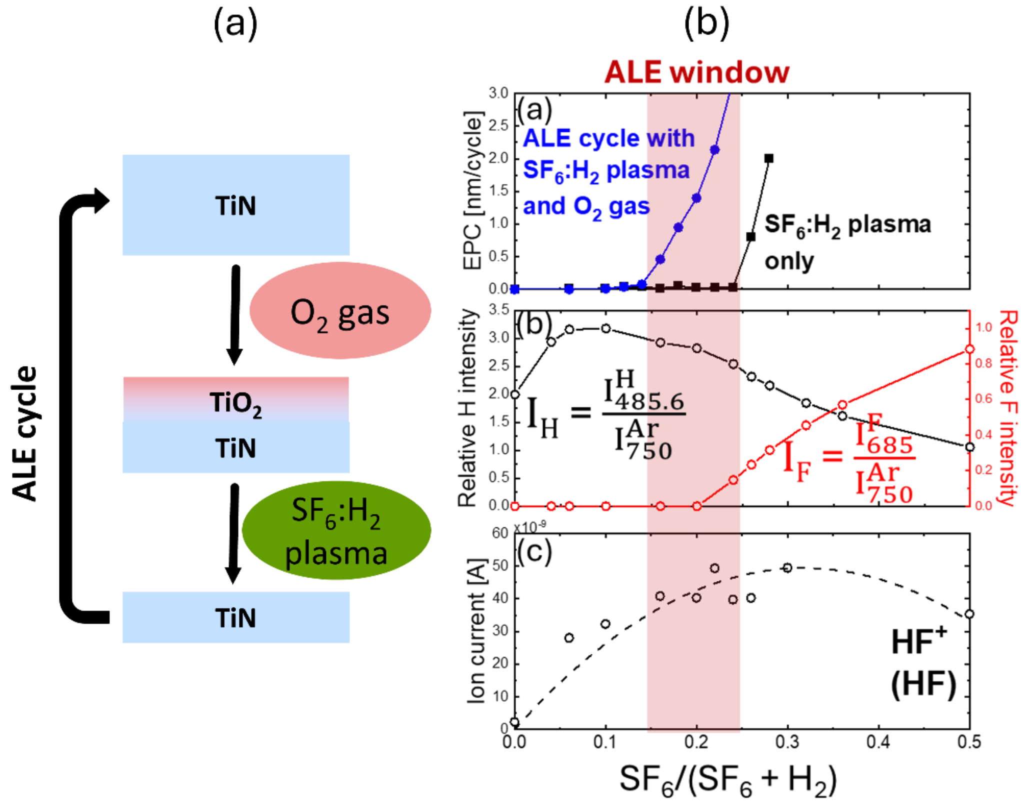

Figure 1 (a) Schematic representation of the ALE recipe with the A step being the O_2 gas exposure step and the B step being the SF_6:H_2 plasma. (b) Different trends as a function of the $SF_6/(SF_6 + H_2)$ ratio. Etch rate of TiN as a function of a SF_6:H_2 plasma (black curve) or the full ALE cycle (blue curve) on the top panel. H and F* intensity from OES normalized to the Ar (5 sccm) for the middle panel. The emission line used for Ar, H and F are respectively at 750 nm, 485.6 nm and 685 nm. Evolution of the HF^+ (m/z=20) ion-current intensity measured by QMS at the bottom panel.*

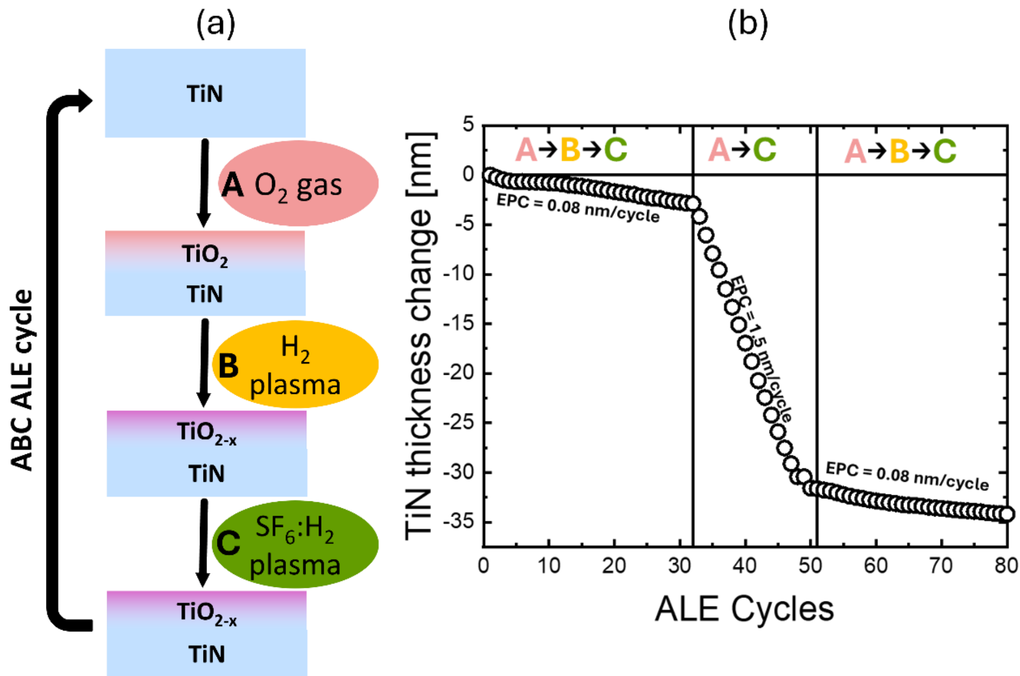

Figure 2 (a) ABC recipe schematic with the oxidation being the A step, the reduction with an H_2 plasma the B step and the C step being the SF_6:H_2 plasma with a gas ratio within the ALE window. (b)Thickness decrease of TiN for ABC or AC recipe, with the C step at $SF_6/(SF_6 + H_2) = 0.2$. When the TiO_2 layer is reduced by the H_2 plasma, the EPC drops by 95%.