Plasma isotropic ALE of GaN using SF_6 plasma and TMA - Supplementary Figures

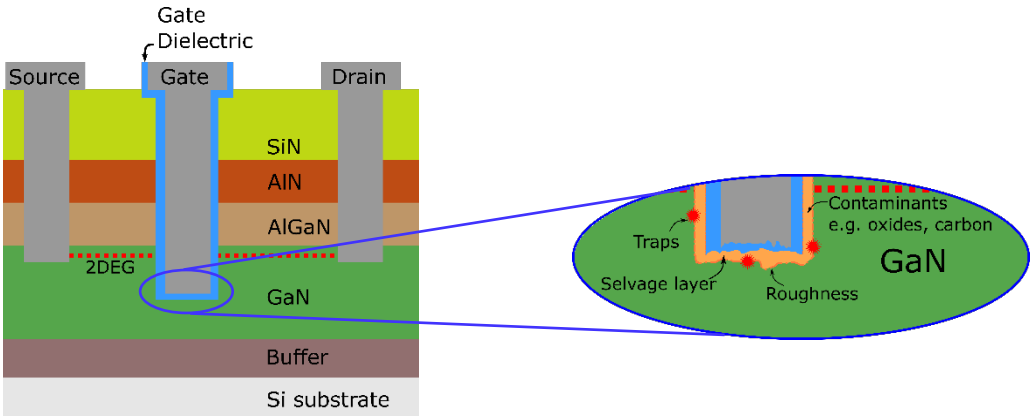

Figure 1 – GaN MISHEMT device, where the GaN has been recessed, using RIE for the etching can lead to damage and roughness at the GaN etch front and sidewalls, which degrades the device performance. Additionally, GaN is oxyphilic and quickly forms a thick oxide layer if exposed to atmosphere.

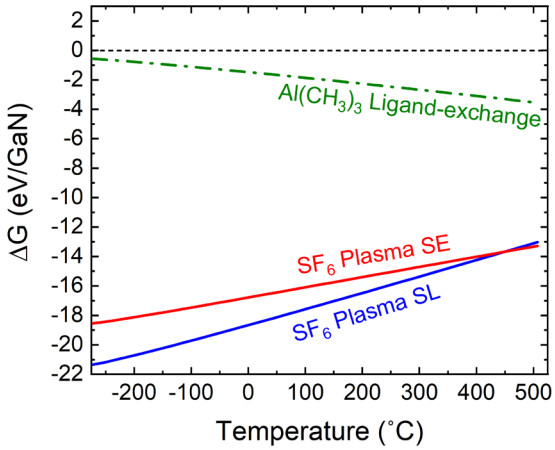

Figure 2 – The self-limiting (SL) and spontaneous etch (SE) Gibbs free energy (ΔG) change for fluorination by fluorine radicals (solid line). The ligand-exchange half-cycle between GaF_3 and TMA is also included (dash-dot line) and shows a negative ΔG over the entire evaluated temperature range.

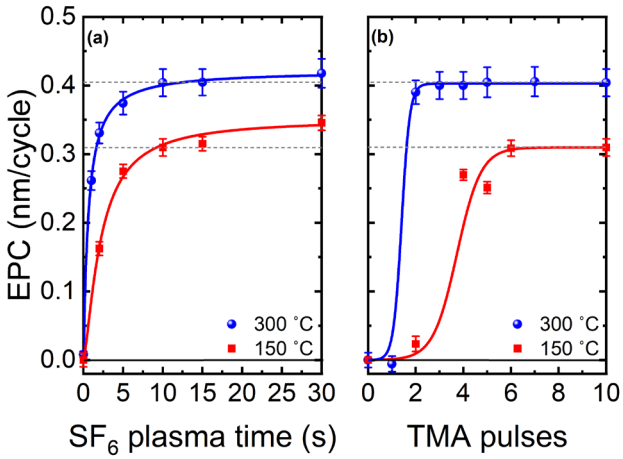

Figure 3 - Saturation curves at 150 ˚C and 300 ˚C for (a) SF_6 plasma exposure using 10x100 ms TMA pulses and (b) 100 ms TMA pulses using a 10 s SF_6 plasma exposure. The lines are guides to the eye.