Thermal Atomic Layer Etching of the Indium Gallium Zinc Oxide (IGZO) Family by Fluorination and Ligand-Substitution Hydrogen-Transfer Reactions

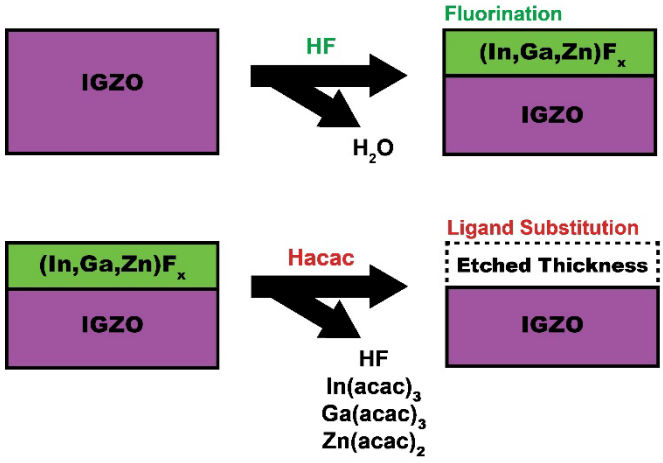

Figure 1. Proposed mechanism for IGZO ALE using HF for fluorination and acetylacetone (Hacac) for ligand-substitution hydrogen-transfer.

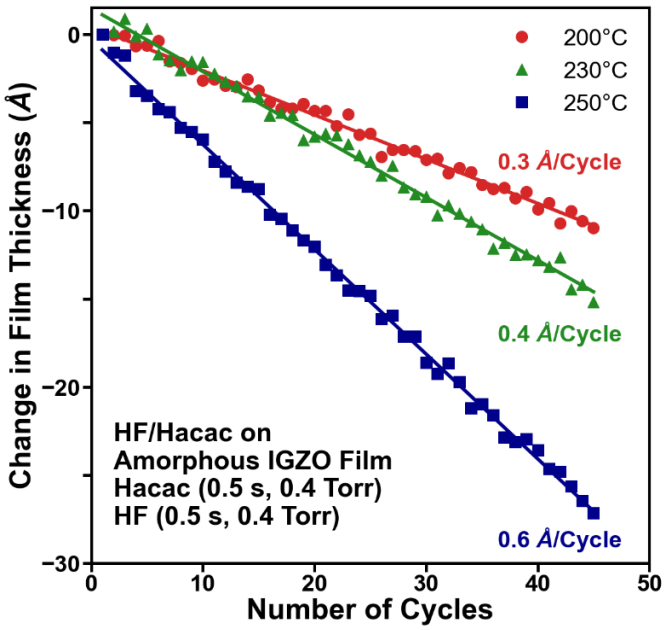

Figure 2. Change in IGZO film thickness as measured by *in situ* spectroscopic ellipsometry data using sequential doses of HF and Hacac at 200°C, 230°C, and 250°C.