WO_3 and W Thermal Atomic Layer Etching Using "Conversion-Fluorination" and "Oxidation-Conversion-Fluorination" Etching Mechanisms

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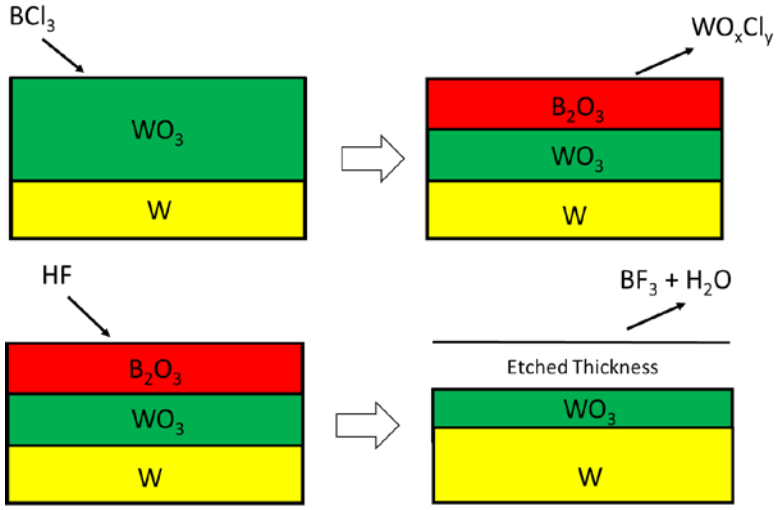

Figure S1. "Conversion-fluorination" etching mechanism where the WO_3 surface is first converted to a B_2O_3 layer and then the B_2O_3 layer is etched by forming volatile BF_3 and H_2O.

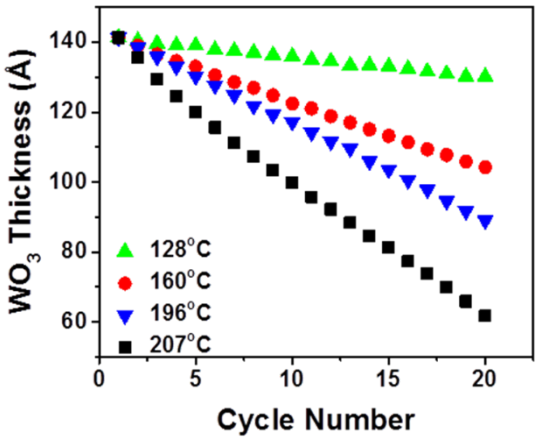

Figure S2. WO_3 thickness versus cycle number during WO_3 ALE using BCl_3 and HF as the reactants for different temperatures. The WO_3 ALE etch rates increase with temperature from 0.55 Å/cycle at 128°C to 4.19 Å/cycle at 207°C.