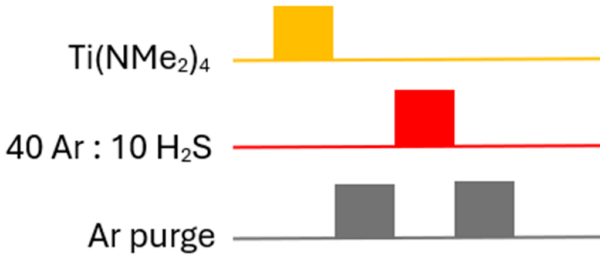

Figure 1: Schematic representing one ALD cycle with tetrakis(dimethylamido) titanium (IV) and Ar/H_2S as reactants

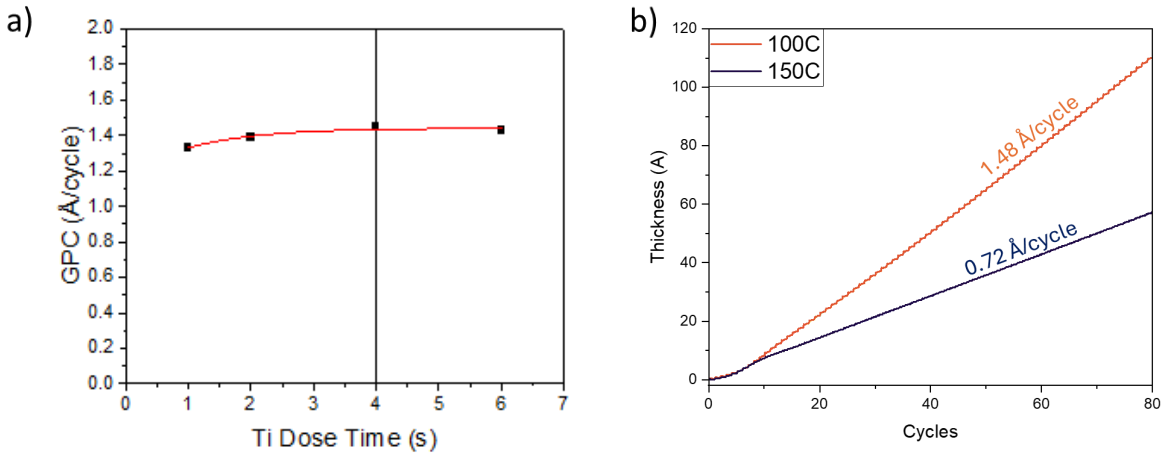

Figure 2: a) saturation curve for tetrakis(dimethylamido) titanium(IV) b) growth curve of TiS_2 at 100°C and 150°C

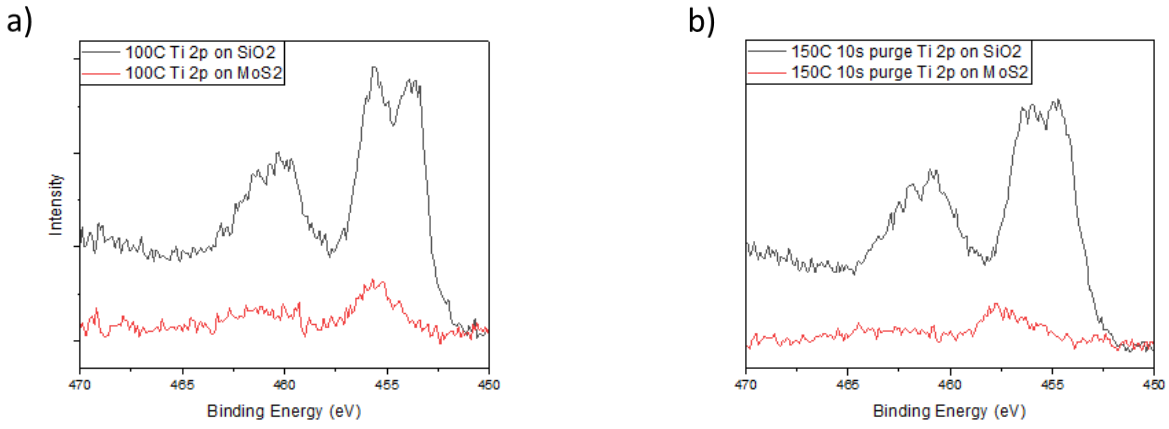

Figure 3: XPS core scan of the Ti 2p region on SiO_2 substrate and CVD MoS_2 flake post deposition of TiS_2 at a) 100°C b) 150°C. Less Ti intensity on the CVD MoS_2 points towards less material deposition on the TMD.

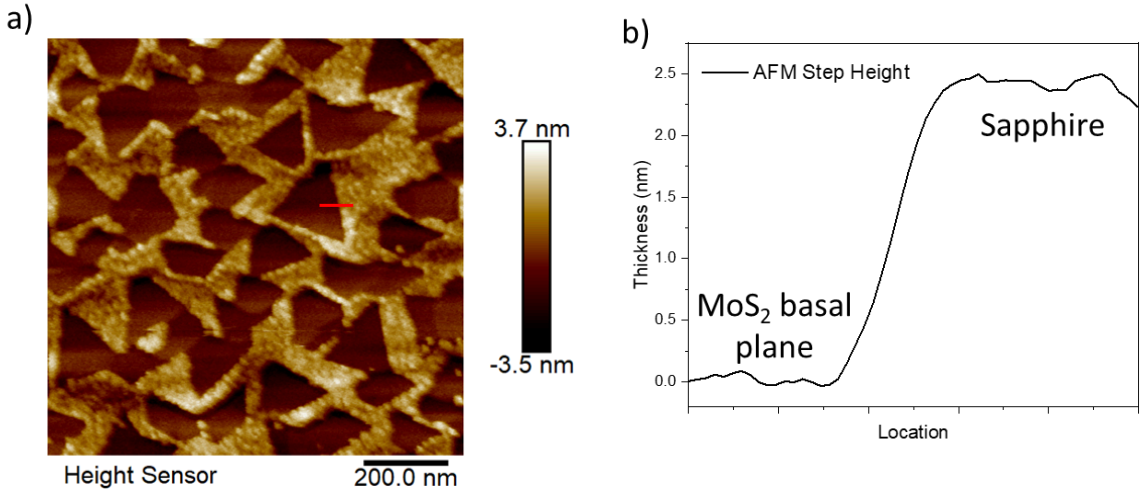

Figure 4: a) AFM of CVD MoS_2 flakes post-deposition of TiS_2 b) AFM step height showing the difference in thickness between the basal plane of MoS_2 and the sapphire substrate. The height difference demonstrates that TiS_2 was preferentially deposited on the sapphire substrate

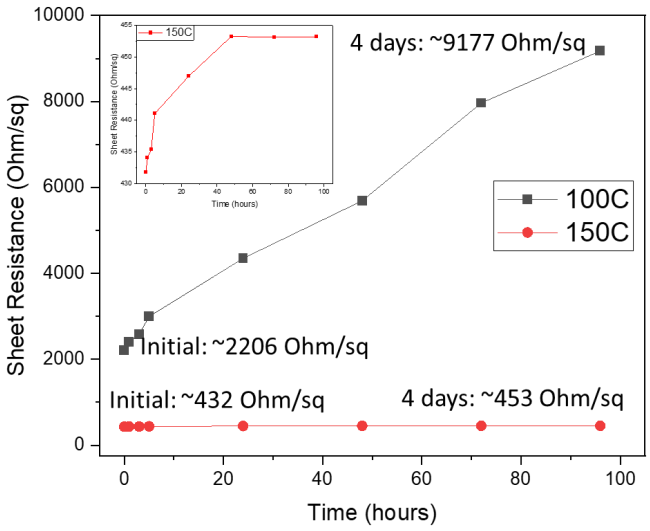

Figure 5: The change in sheet resistance of TiS_2 after exposure to ambient conditions over time. The film deposited at 100°C, which has no excess Ti, sees large increases in resistance, while the film deposited at 150°C sees significantly less changes. This demonstrates the two films with different stoichiometry have different modes of conductance.