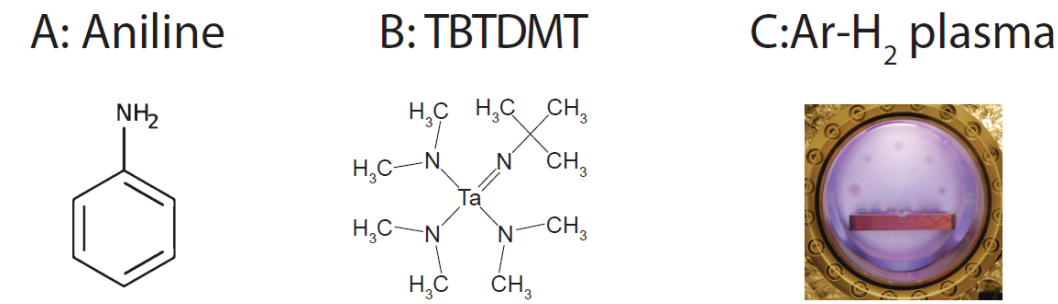

Figure 1: Schematic illustration of the ABC-type ALD cycle that was used to achieve area-selective TaN ALD.

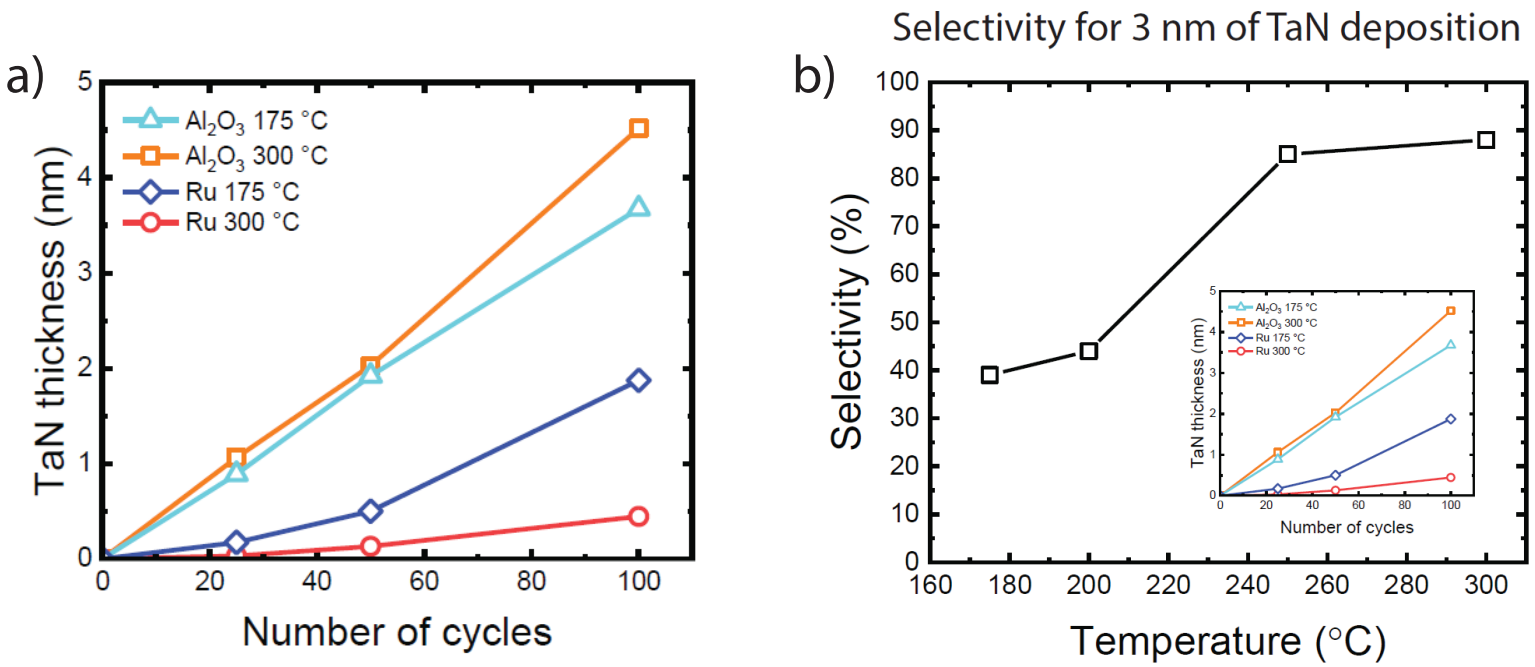

Figure 2: a) Nucleation behavior as measured by XPS for area-selective ALD of TaN on Al_2O_3 growth and Ru non-growth areas at two different substrate temperatures. b) Selectivity of the area-selective TaN ALD process as function of temperature for a target thickness of 3 nm.

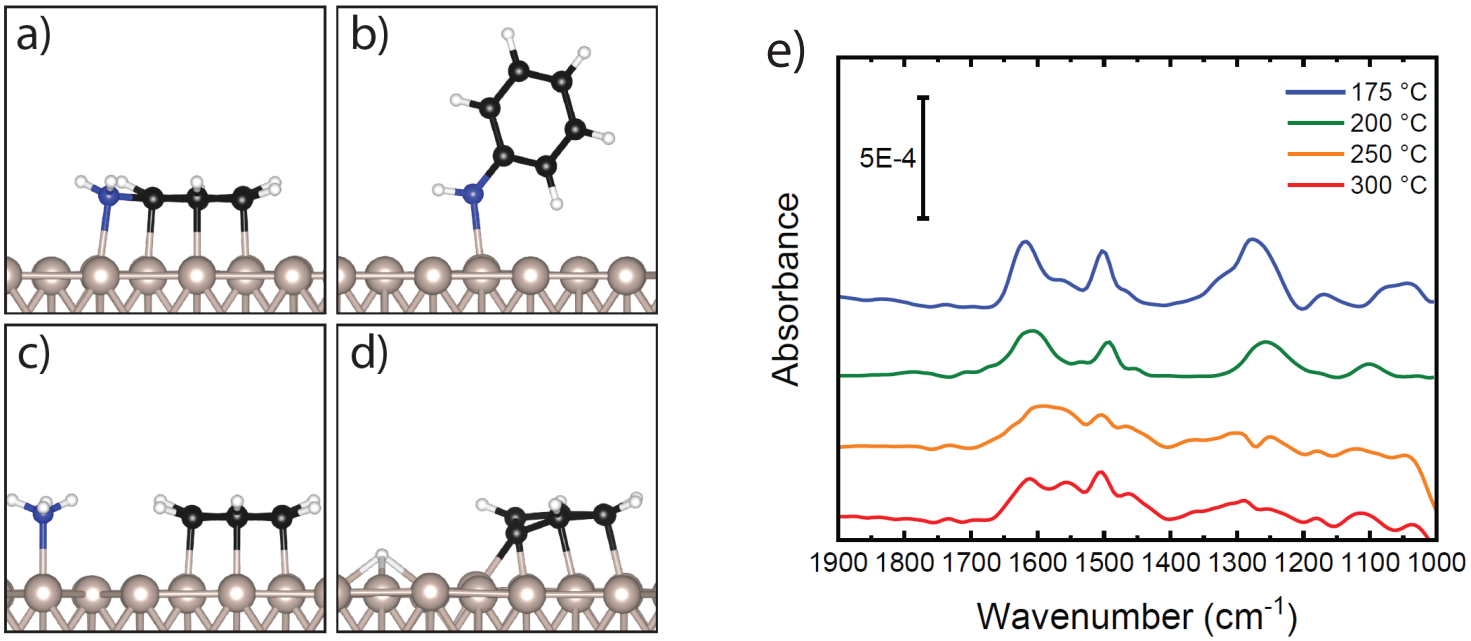

Figure 3: Illustrations based on DFT for (a) aniline in the flat configuration, (b) aniline in the vertical configuration, (c) aniline after hydrogenolysis, (d) benzene after dehydrogenation all adsorbed on a Ru(0001) surface. e) RAIRS data showing aniline adsorption on a Ru surface at different temperatures indicating that hydrogenolysis takes place above 250 °C.