

Figure 1: a) Transmission Electron Micrograph (TEM) of Ru ASD in a 25nm feature, b) Ru thickness measured in nanopattern features of different sizes. Each thickness is measured after 83 Ru ALD cycles corresponding to 4nm Ru on blanket TiN substrates (red line).

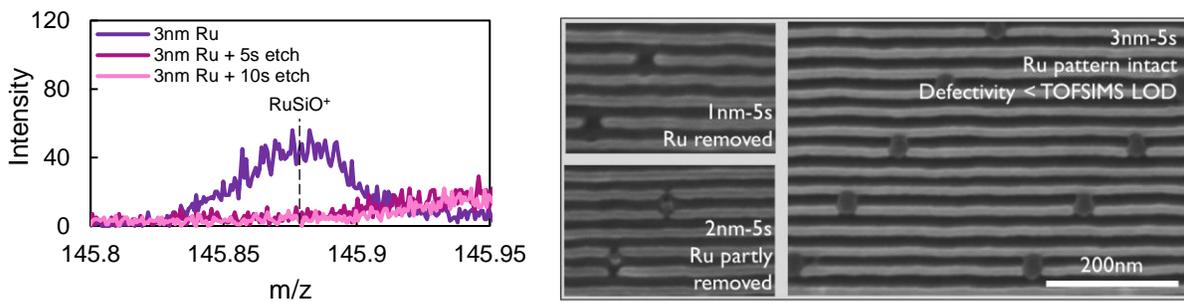


Figure 2: a) Self-Focusing Secondary Ion Mass Spectrometry (SF-SIMS) on a TiN/SiO₂ nanopattern with 3nm selective Ru on TiN, in which the RuSiO⁺ ion intensity is plotted for various Ru etch times. b) patterns of ASD Ru circles of different thickness after 5s etch, as shown by Scanning Electron Microscopy (SEM)

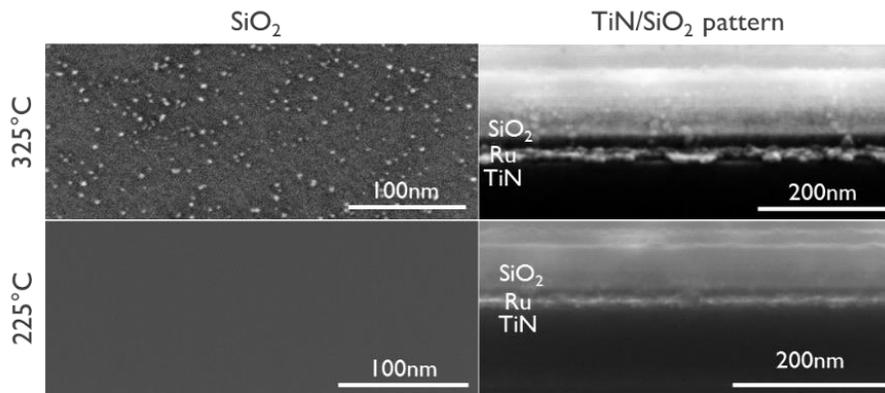


Figure 3: Lowering the ALD temperature strongly limits ASD defectivity on dielectrics for EBECHRu/O₂ ALD, as shown by SEM on blankets (left) and nanopatterns (right). In each case, the amount of Ru ALD cycles corresponds to 4nm Ru growth on TiN at each respective temperature.