



Figure S1 – XPS spectra and compositional analysis of the silica and alumina surfaces. Elemental analysis shows that both surfaces are chemically pure oxides. The alumina sample had no traces of silicon present, confirming that the ALD film completely covered the substrate and was pinhole-free. A brief argon sputtering removed most of the carbon signal, demonstrating that this carbon was adsorbed on the surface and not part of the bulk material. The presence of a sub-monolayer amount of carbon on the surface is typical for any sample not prepared and maintained in a UHV environment. Contact angle measurements on the surfaces showed that both were extremely hydrophilic.