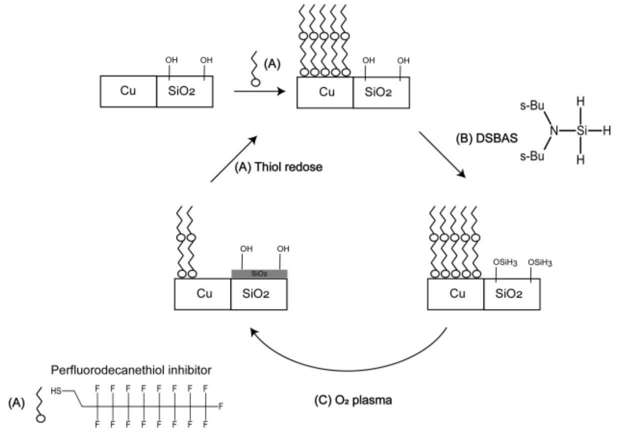
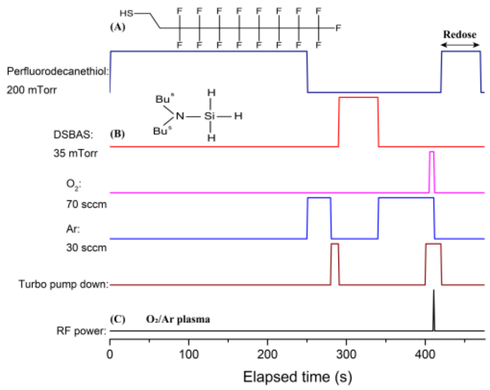
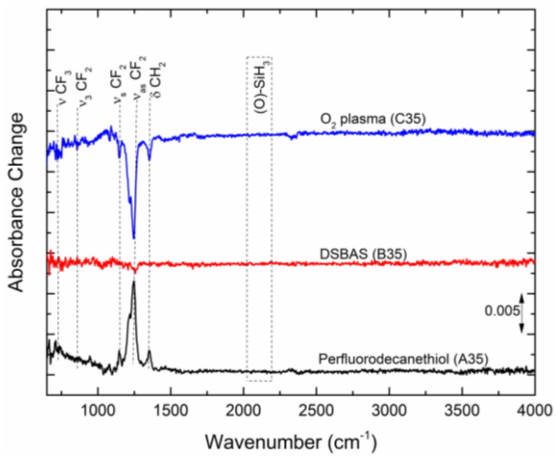
Fig 1. a) Schematic of A-B-C type ALD process (**A: PFDT, B: DSBAS, C: O_2 plasma)**



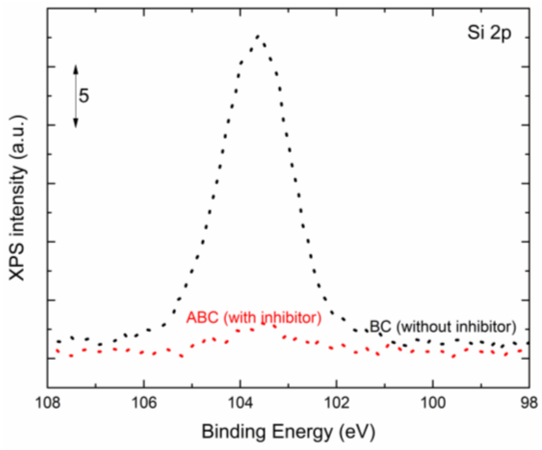
b) Dosing sequence during A-B-C type ALD



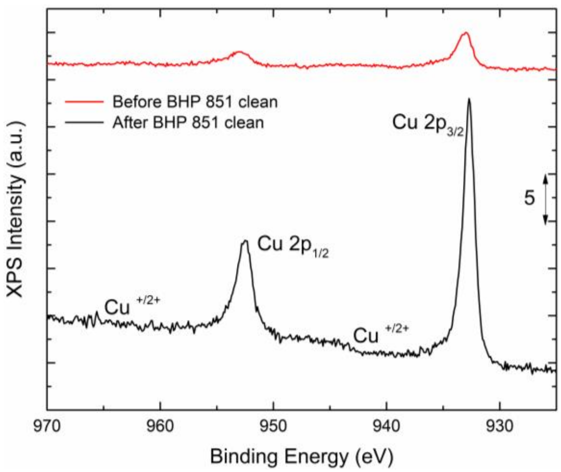
c) In situ RAIRS spectra of 35th ABC cycle on CMP Cu



d) HR-XPS of Si 2p region after 35 ABC cycles on CMP Cu



e) HR-XPS of Cu 2p region after thiol removal



f) HR-XPS of Si 2p region after thiol removal