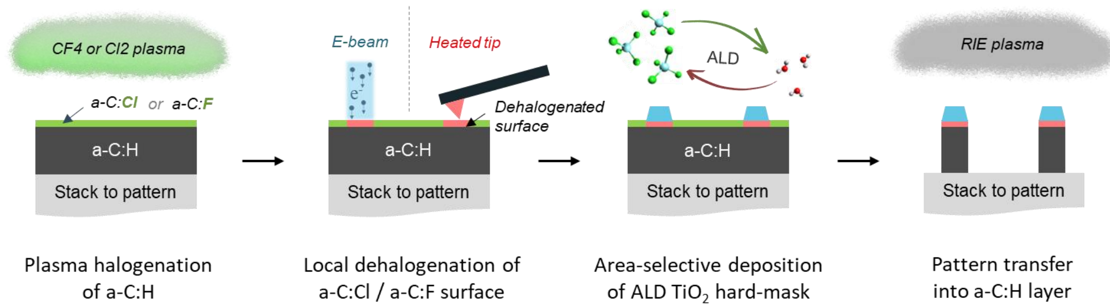

Figure 1. The proposed scheme for resistless e-beam/t-SPL lithography based on area-selective deposition of metal oxides hard-mask in the exposed areas of plasma halogenated amorphous carbon surface.

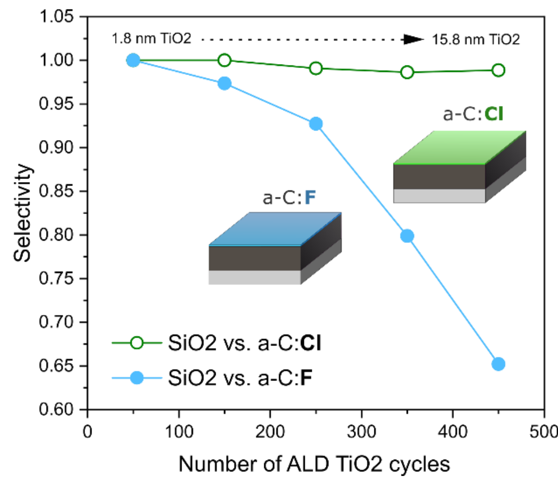

Figure 2. Selectivity of ALD TiO_2 ($TiCl_4$/H_2O) growth performed at 200°C on native SiO_2 (growth surface) over halogenated amorphous carbon (non-growth surface) calculated based on Ti signal recorded by Rutherford backscattering spectrometry. The values of TiO_2 thickness in the graph show the range of TiO_2 thickness variation when the deposition takes place on SiO_2 surface (GPC = 0.035 nm/cycle).

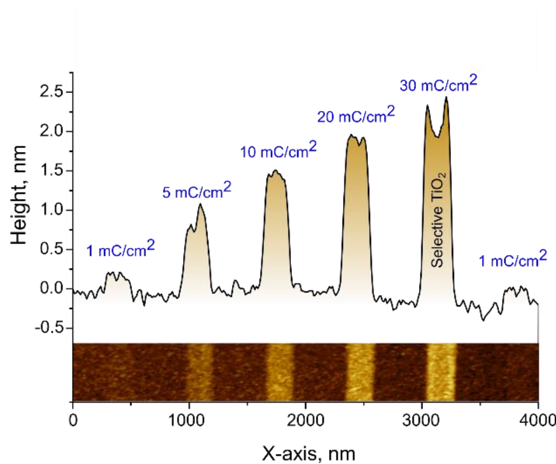

Figure 3. The sensitivity of chlorinated amorphous carbon to e-beam (20 kV) evaluated by AFM height profile. Measurements were done over 200 nm wide lines of ALD TiO_2 formed via e-beam scanning with different dose and successive processing with 500 cycles $TiCl_4$/H_2O followed by a defect etch treatment.

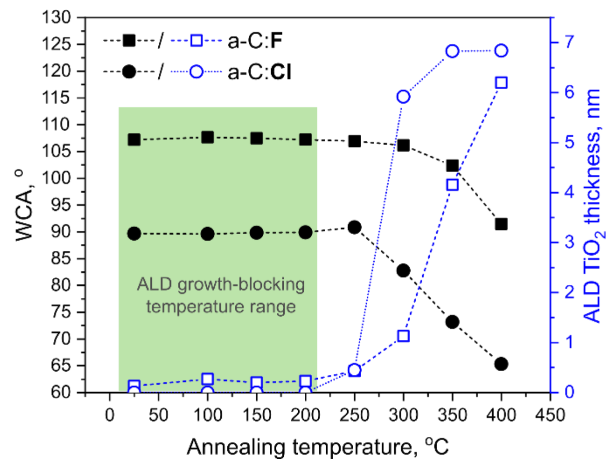

Figure 4. Thermal stability of halogenated amorphous carbon surface estimated via reduction of water contact angle and via associated growth of ALD TiO_2 upon 200 cycles of $TiCl_4$/H_2O applied.