Supplementary Material

Formation and Oxygen Intercalation of Vitreous 2D Silica Bilayer Films on Ir(111)

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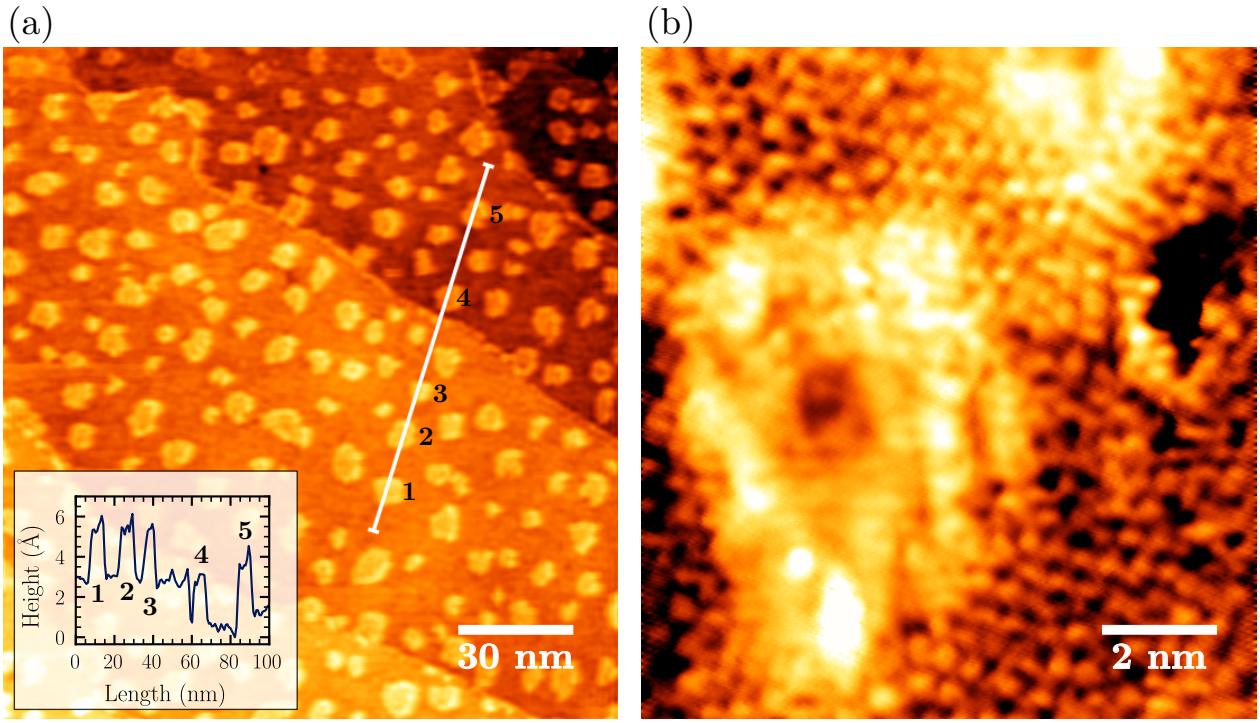

Fig. S1 (a) ($V_t = 1213.7\,\mathrm{mV}$, $I_t = 0.170\,\mathrm{nA}$) shows an STM image of the 2D silica film across multiple steps of Ir(111). The presence of islands is associated with multilayer growth. The inset graph shows the height profile of the line scan, which runs across five islands and a Ir step edge. Each of the five islands have been numbered from 1–5, both in the image and in the height profile. In (b) ($V_t = 1213.7\,\mathrm{mV}$, $I_t = 0.120\,\mathrm{nA}$), an STM image at atomic resolution shows the structural difference between a multilayer island (left-hand side) and the underlying 2D silica bilayer. The film exhibits good coverage of the Ir(111) substrate, with few holes. Multilayer growth is attributed to the deposition of Si in excess.

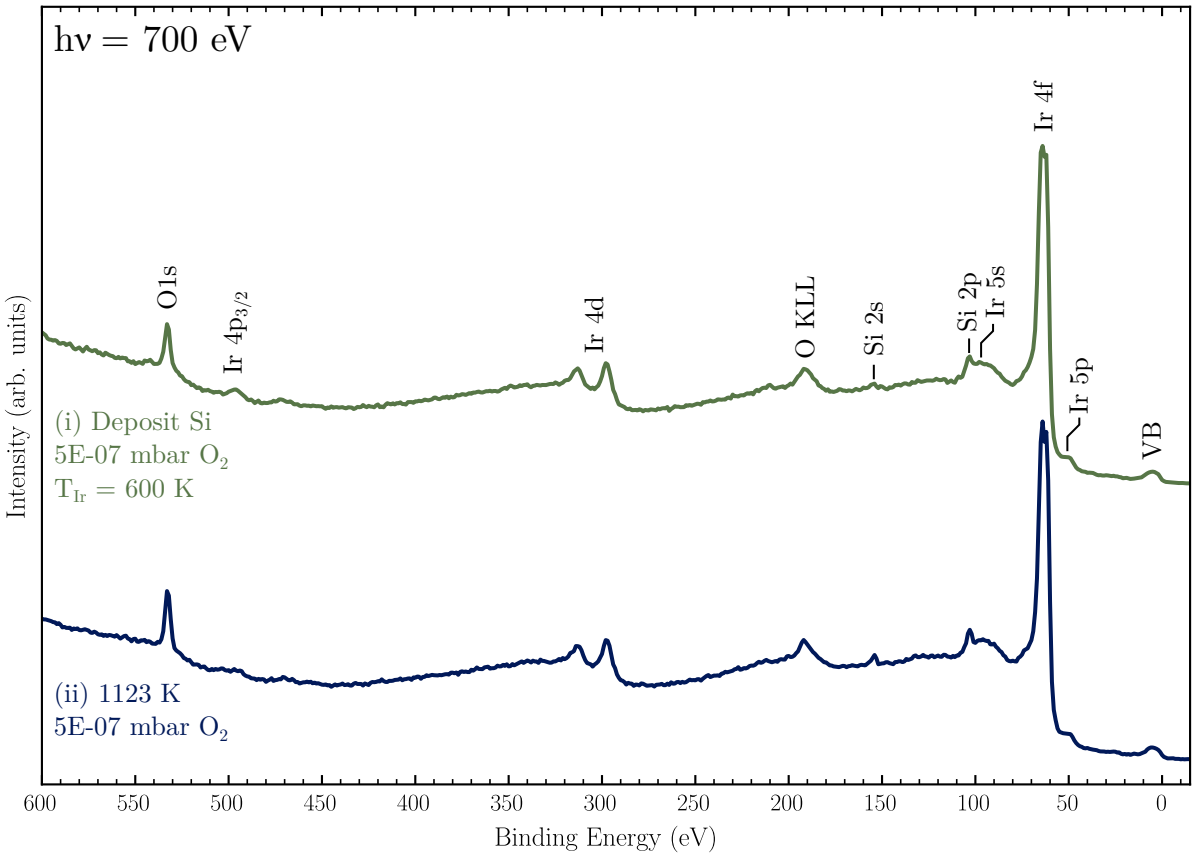

Fig. S2 Survey spectra measured for the 2D silica film described in Section 3.3 of the main text. (i), in green, shows the survey spectrum for Si as-deposited on Ir(111) in a 5×10^{-7} mbar O_2 partial pressure, with the Ir(111) substrate held at 600 K. (ii), in blue, shows the survey spectrum measured following annealing to 1123 K in a 5×10^{-7} mbar O_2 partial pressure. Peaks in (i) have been labelled with their respective core-level assignments. (ii) shows the same peaks as (i). Both spectra were recorded with a step size of 1 eV and a pass energy of 100 eV using the Low Angular Dispersion lens mode of the PHOIBOS 150 1D-DLD analyser.