

### Supplementary Information

Supplementary Figure S 1: X-ray Photoelectron Spectroscopy (XPS) on pure Ru films deposited by ALD. The escape depth of the photoelectrons is around 1nm. The spectrum shows clear peaks of Ru and that of O (marked in red). The Ru 3d 5/2 overlaps with the C 1s making adventitious C determination difficult. Assuming a typical surface C of 10 at% we get a Ru:O of 1.00:0.42 indicating a sub oxide-like RuO<sub>x</sub> phase.

