Electronic Supplementary Information

Understanding KO⁴Bu in Atomic Layer Deposition *in situ* Mechanistic Studies of the KNbO₃ Process

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Supplementary Figure A:



Supplementary Figure A: Net cycle difference FT-IR spectra, showing the changes in surface species after the Nb(OEt)₅ (green) and H₂O (blue) pulse, respectively.



Supplementary Figure B: Extrapolation of increasing growth per cycle (GPC) for different pulsed concentrations of KO'Bu:Nb(OEt)₅ to estimate the GPC of the binary KO'Bu + H₂O process.

Supplementary Figure C:



Supplementary Figure C: Highest possibly areal density of the KO^tBu tetramer on the surface oxygen lattice of Nb₂O₅. Blue circles indicate the projected diameter of the KO^tBu molecule, while red dots represent the oxygen lattice. The black dashed line represents the surface unit cell of Nb₂O₅.



Supplementary Figure D: Net cycle difference FT-IR spectra, showing the changes in surface species after the KO'Bu (purple) and H₂O (blue) pulse, respectively.