Supplemental Information for:

Atomic layer epitaxy of zinc oxide on c-plane sapphire from diethylzinc and water using pulsed-heating atomic layer deposition

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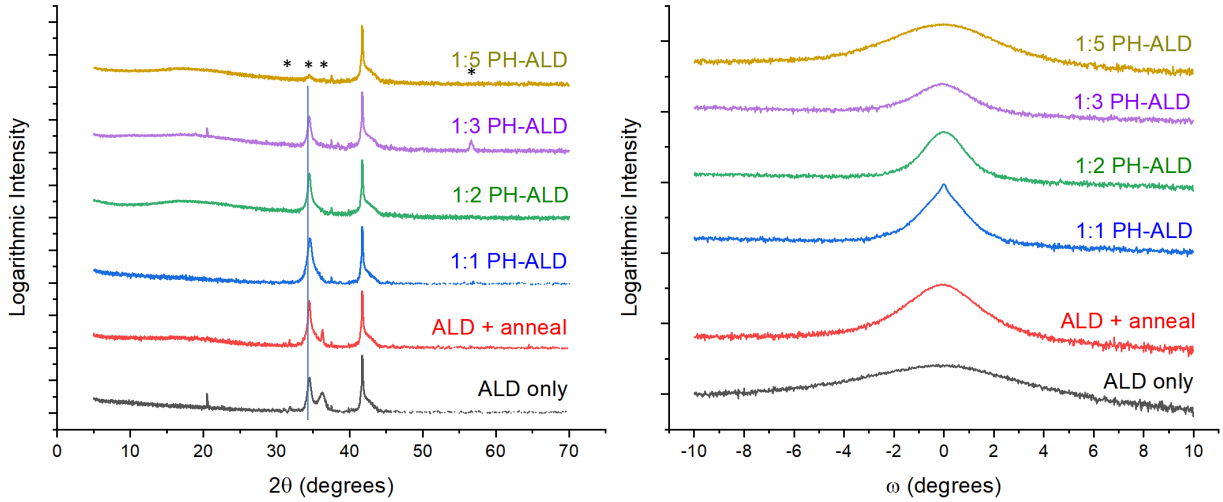
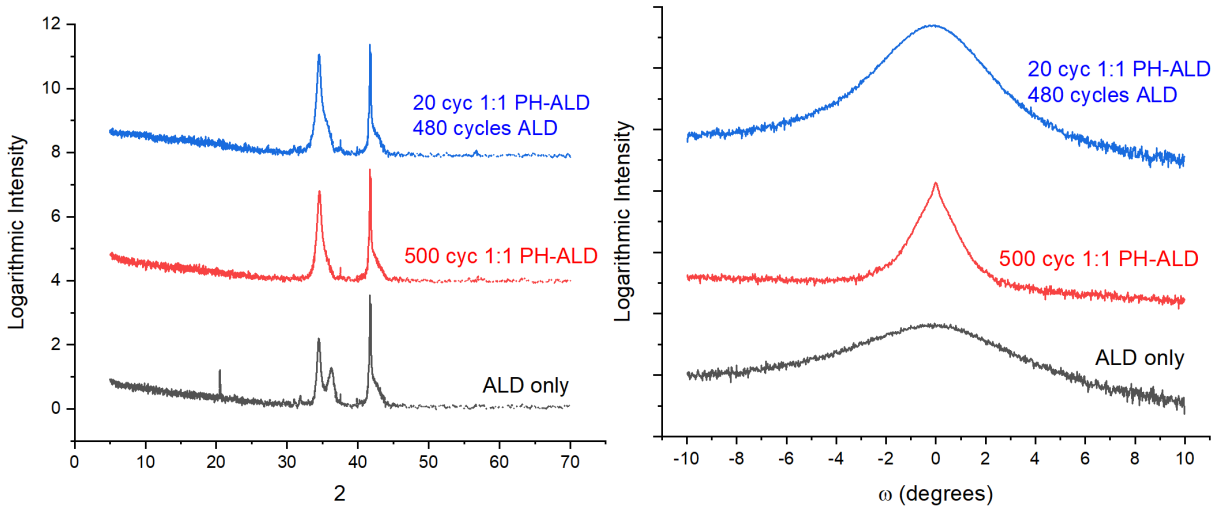


XRD measurements of ZnO deposited on c-sapphire using ALD and pulsed-heating ALD (PH-ALD) at 900˚C. Different ratios of "heat pulse":"# ALD cycles" are studied. θ-2θ (left) and ZnO rocking curve (right) measurements are shown. PH-ALD processing suppresses peaks that are not c-axis aligned. With increasing PH:ALD ratio, the FWHM and crystal quality decreases.



XRD comparison of PH-ALD and templated PH-ALD ZnO. In templating, a thin layer of PH-ALD ZnO is grown first, followed by standard thermal ALD. With 20 cycles of templating, a strong *002* ZnO peak is observed, similar to 500 cycles of 1:1 PH-ALD (left). Other ZnO peaks are also suppressed. The ZnO rocking curve (right) of the templated film shows a wider FWHM than the full PH-ALD film, but is still significantly more intense than the as-deposited ALD film.