

Supporting Information

Atomic Layer Deposition of Nanometer-Sized CeO₂ Layers in Ordered Mesoporous ZrO₂ Films and Their Impact on the Ionic/Electronic Conductivity

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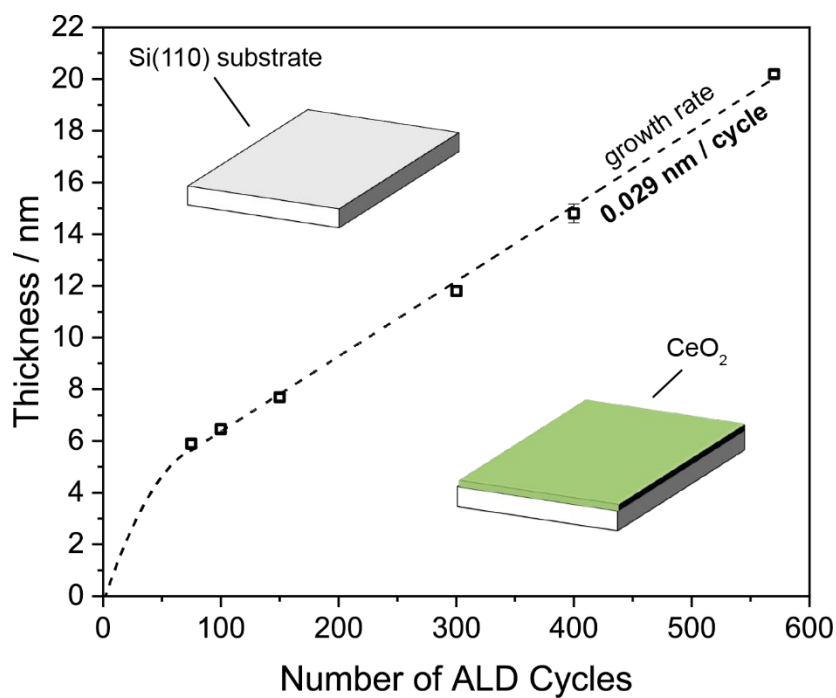


Figure S1: Thickness of the CeO_2 -deposited Si[110] substrates in dependency of the number of ALD cycles. The dashed line illustrates the assumption concerning the growth rate.

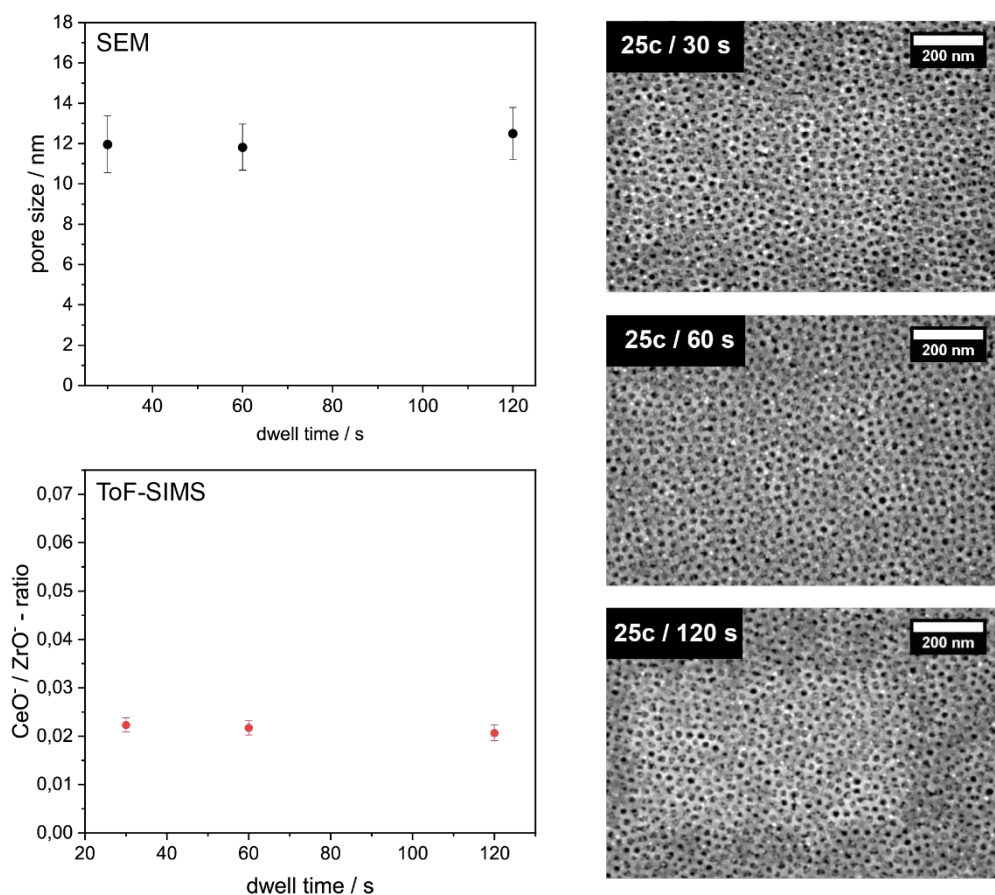


Figure S2: SEM and ToF-SIMS analyses of the CeO_2 -coated ZrO_2 thin films after 25c with different dwell time. No significant differences are observed proving that the saturation of the precursor chemisorption is already performed after 30s.

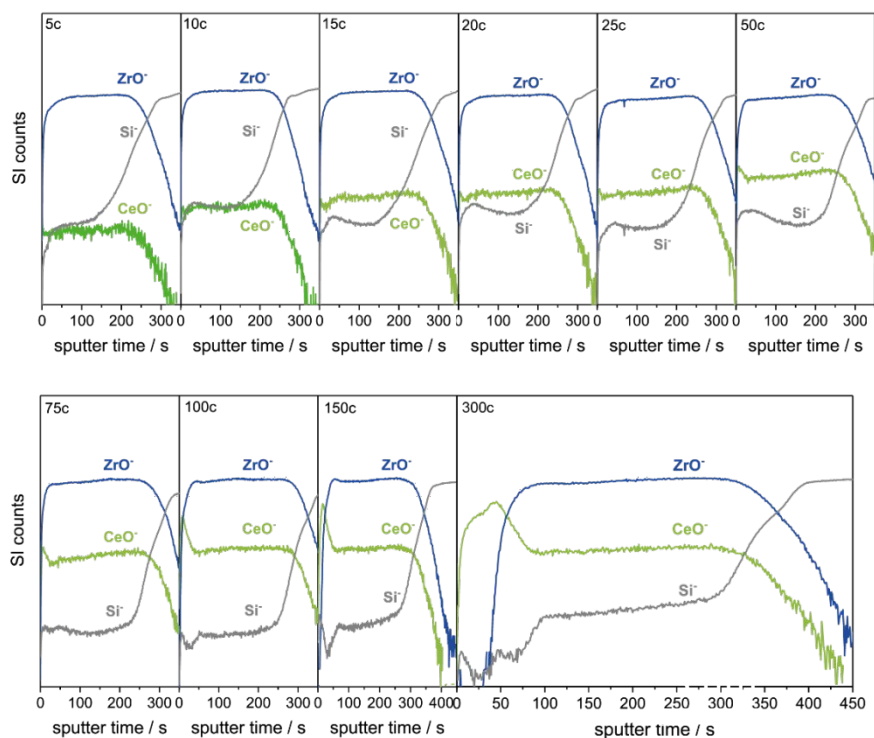


Figure S3: ToF-SIMS depth profiles of the mesoporous ZrO_2 film after different amount of ALD cycles. Next to the ions deriving from the thin film (ZrO^+ and CeO^+) the signal from the utilized silicon substrate (Si^+) is depicted by plotting the secondary ion (SI) counts logarithmic dependent on the sputter time.

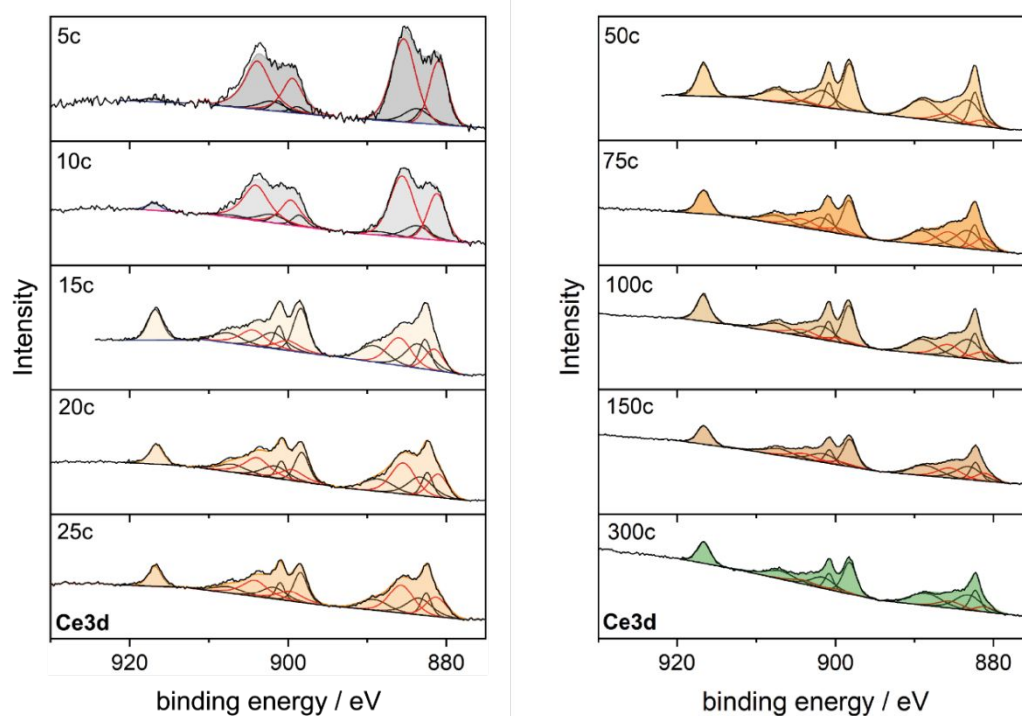


Figure S4: Ce3d spectra of the CeO_2 -coated ZrO_2 thin films using XPS. Next to the six signals deriving from CeO_2 (v , v'' , v''' and u , u'' , u'''), the four additional signals from Ce_2O_3 (v_0 , v' and u_0 , u') were taken into account.

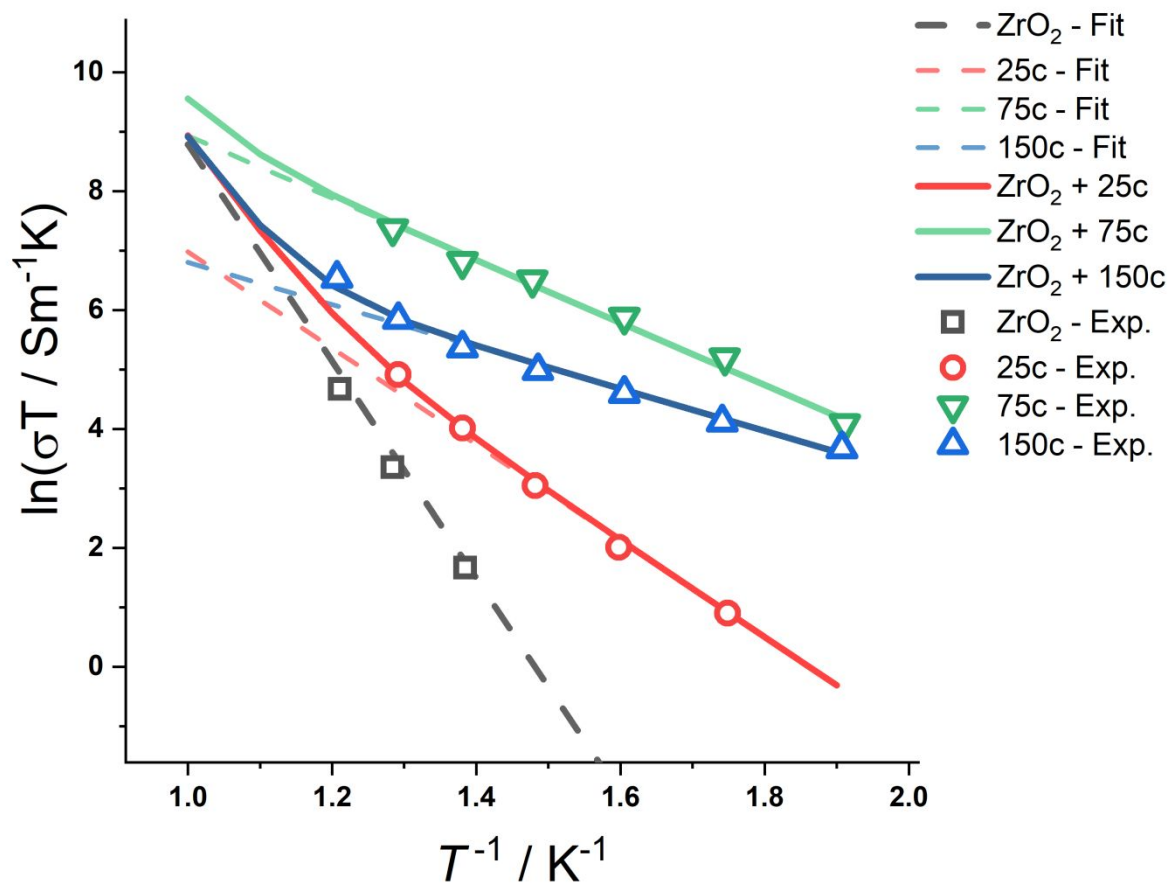


Figure S5: Arrhenius plots of the total conductivity and the corresponding fits for the uncoated ZrO_2 film, after 25, 75 and 150 ALD cycles.