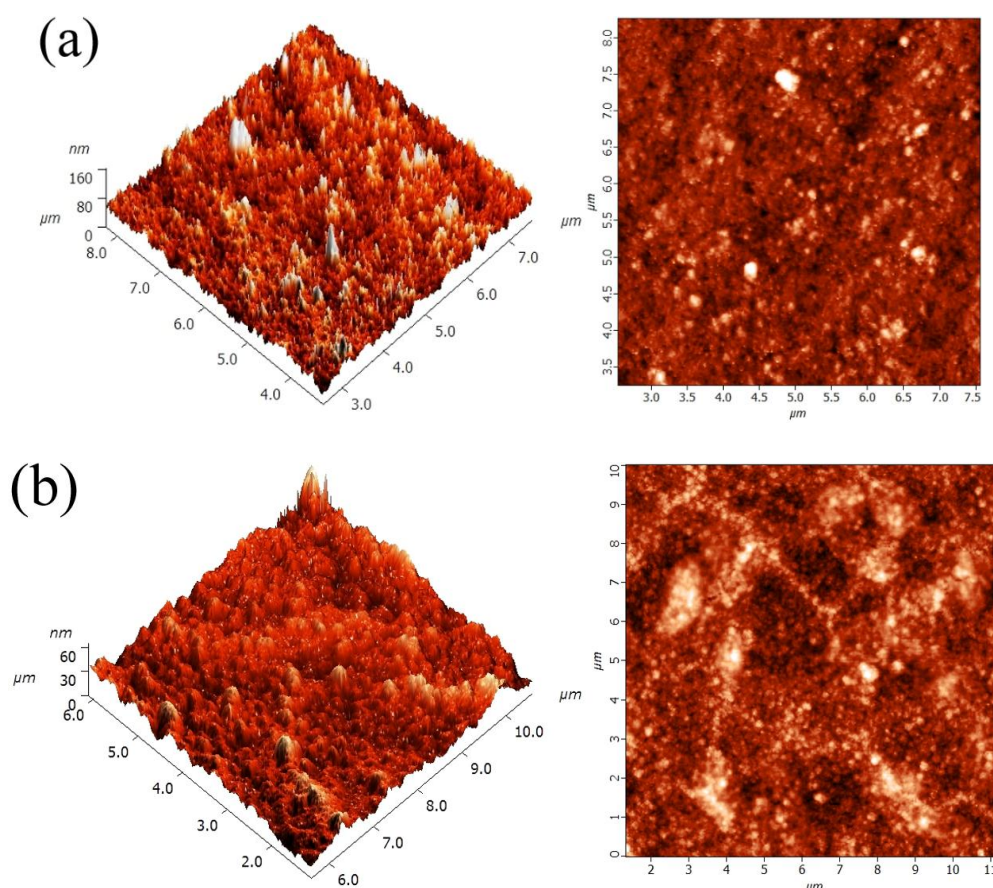


Electronic Supplementary Information

Texturing of pure and doped CeO₂ thin films by EBPVD through target engineering

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Atomic Force Microscope (AFM) analysis was carried out to know the surface morphology of deposited thin film. Figure 5 shows the representative AFM images of CeO₂ and SDC film deposited from the target material annealed at 500 °C. Difference in surface morphology were observed between CeO₂ and SDC film. The average roughness (R_a) calculated from the AFM image shows that the CeO₂ film ($R_a = 9.754$ nm) have higher roughness compared to SDC film ($R_a = 4.871$ nm). The crystallite size calculated from Scherer's formula shows that the SDC film have lower crystallite compared to CeO₂ film. Thus the lower crystallite size for SDC film leads to the lower R_a compared to that of CeO₂ film under similar deposition condition. Both CeO₂ and SDC film have R_a value lower than 10 nm indicates the lower aggregation of grain with minimum pore formation during the growth of the thin film.



Supplementary Figure 1. AFM image of (a) CeO₂ and (b) SDC film deposited from the target material annealed at 500 °C were taken in non-contact mode using a Solver Pro from NTMDT, Russia.