Electronic Supplementary Material (ESI) for CrystEngComm.

Electronic Supplementary Information

Synthesis, Structural Characterization and Magnetic Properties of Ordered Mesoporous $Pr_{1-x}Ca_xMnO_3$ Thin Films

Lidija Androš Dubraja,*[ac] Di Wang[ab] and Torsten Brezesinski*[a]

[a] *Institute of Nanotechnology and* [b] *Karlsruhe Nano Micro Facility, Karlsruhe Institute of Technology, Hermann-von-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen, Germany. E-mail: torsten.brezesinski@kit.edu; Phone: +49 721 60828827*

[c] *Ruđer Bošković Institute, Bijenička cesta 54, 10000 Zagreb, Croatia. E-mail: lidija.andros@irb.hr; Phone: +385 1 4561184*

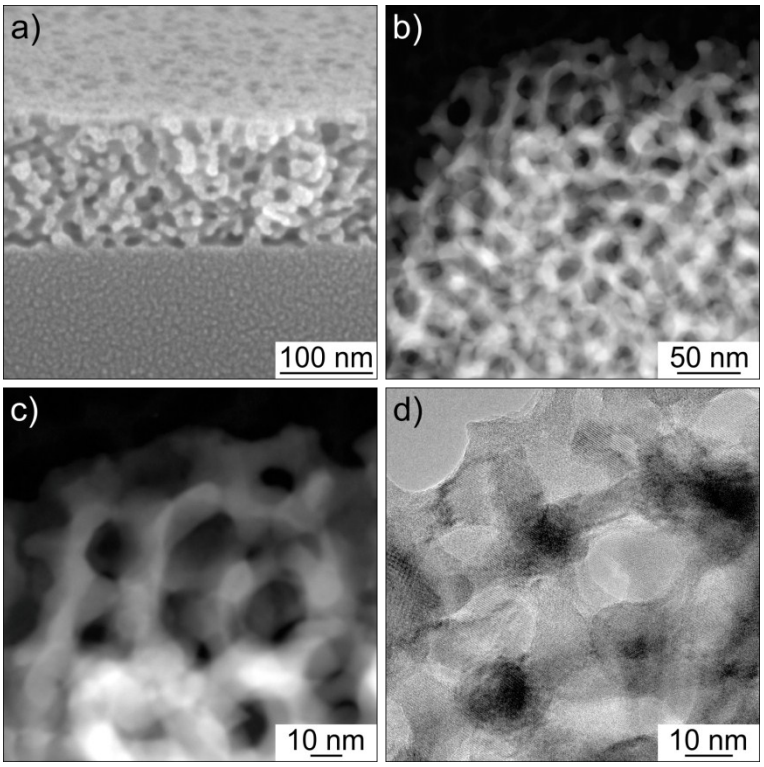

Fig. S1 Electron microscopy of polymer-templated mesostructured PCMO thin films heated at 750 °C. (a) Cross-sectional SEM, (b, c) HAADF STEM and (d) HRTEM micrographs demonstrating both the structural integrity and crystallinity of the sol-gel derived material.

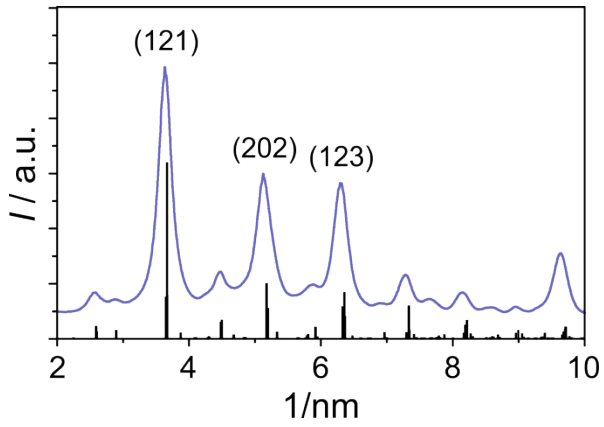

Fig. S2 Radial integration pattern of SAED data (see Fig. 1e in the manuscript). The reflections match the ICSD reference code 56634 for $Pr_{0.7}Ca_{0.3}MnO_3$ with an orthorhombic structure with space group *Pnma*.

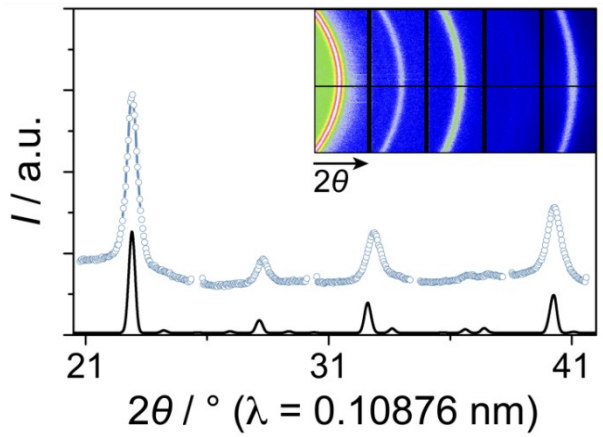

Fig. S3 Synchrotron-based 1D and 2D GIWAXS patterns of a polymer-templated mesostructured PCMO thin film heated at 750 °C. For data analysis, DPDAK 1.2.0 was used and a geometric correction was performed on the data. The GIWAXS and SAED results are in agreement and demonstrate that the sol-gel derived material is single-phase after calcination and crystallizes in the orthorhombic space group *Pnma*.

Tab. S1 Summary of GIXD Rietveld refinement results for polymer-templated mesostructured PCMO thin films heated at 750 °C.

Space group (no.)	*Pnma* (62)
a / Å	5.390(4)
b / Å	7.653(7)
c / Å	5.444(4)
V / Å^3	224.5(3)
Fitting mode	Structure fit
Profile function	Pseudo-Voigt
U	1.1(8)
V	–0.2(3)
W	0.10(3)
Asymmetry parameter 1	0.07(2)
Peak shape parameter 1	0.4(1)
Peak shape parameter 2	0.010(8)
R(weighted profile) / %	5.681
R(profile) / %	4.442
GOF	1.455
Occupation number	Pr 0.70(5)
	Ca 0.30(5)

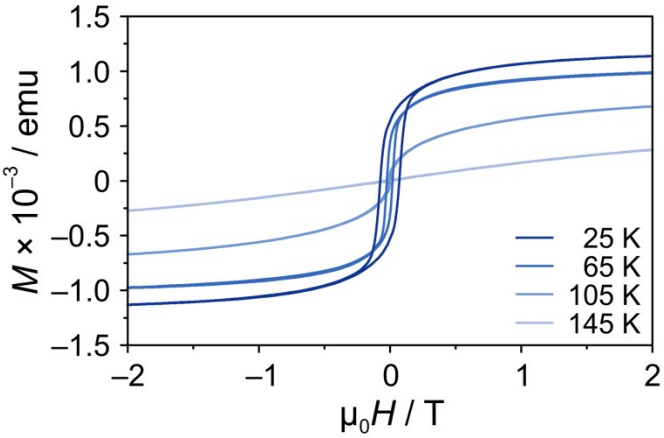

Fig. S4 Hysteresis curves in the field range of ±2 T obtained at different temperatures of 25 K, 65 K, 105 K and 145 K on a polymer-templated mesostructured PCMO thin film heated at 750 °C.