



Supplementary Material

Transformation of Amorphous Terbium Metal–Organic Framework on Terbium Oxide $\text{TbO}_x(111)$ Thin Film on Pt(111) Substrate: Structure of Tb_xO_y Film

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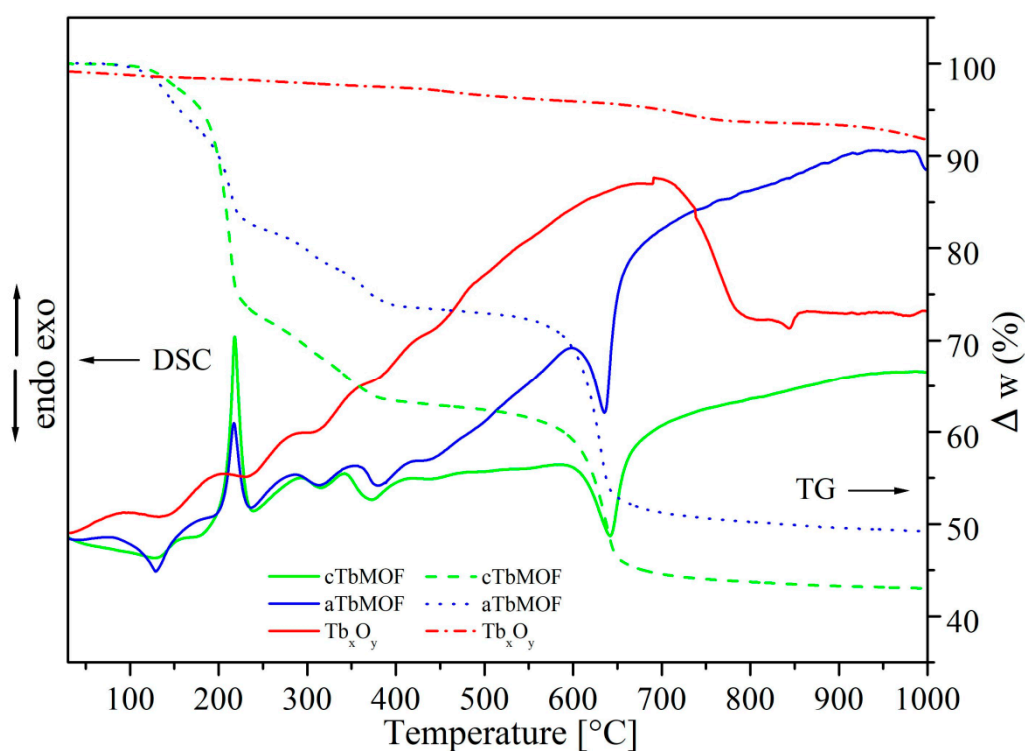


Figure S1. DSC/TG curves of crystalline (cTbMOF), amorphous (aTbMOF), and amorphous aTbMOF, heated at 450 °C (Tb_xO_y) powders.

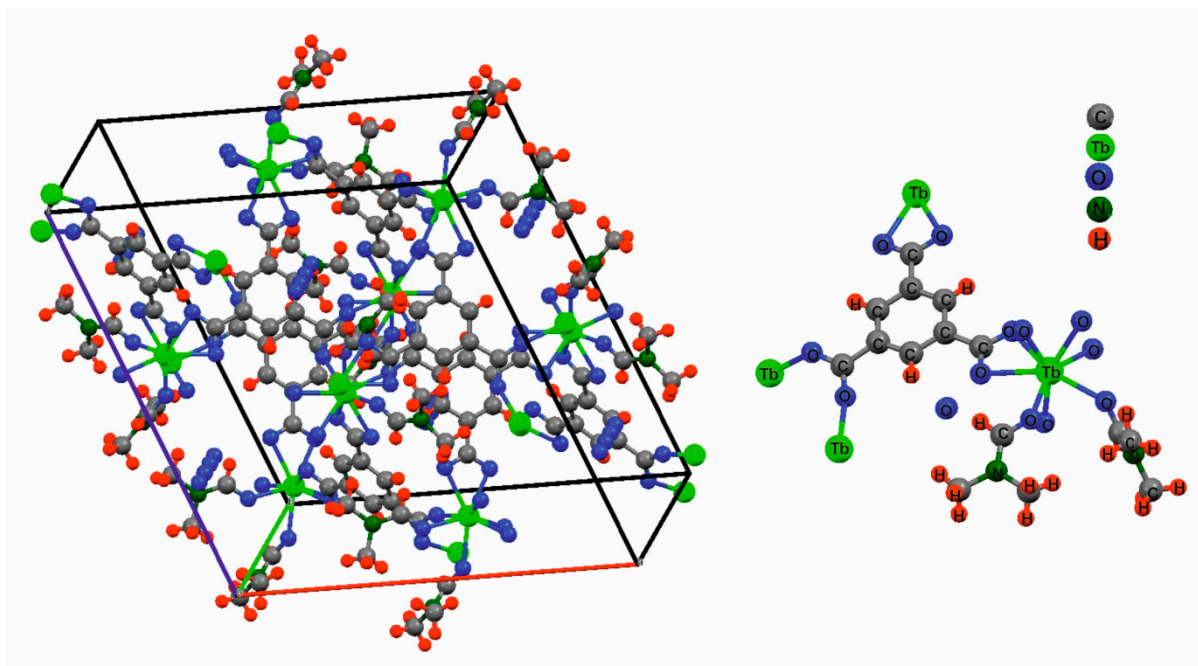


Figure S2. Coordination environment of Tb(BTC)(DMF)₂(H₂O); TbMOF.

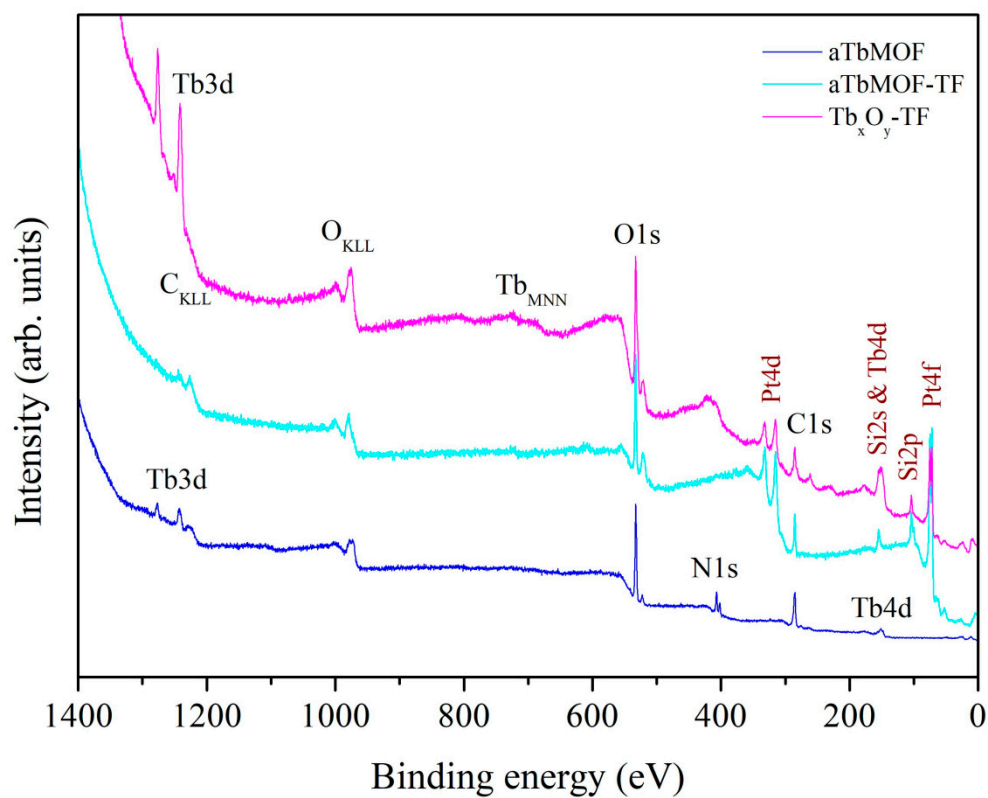


Figure S3. XPS survey spectra of amorphous powder (aTbMOF), amorphous thin film (aTbMOF-TF), and Tb_xO_y-TF on SiO₂/Si substrates with Pt interlayer.

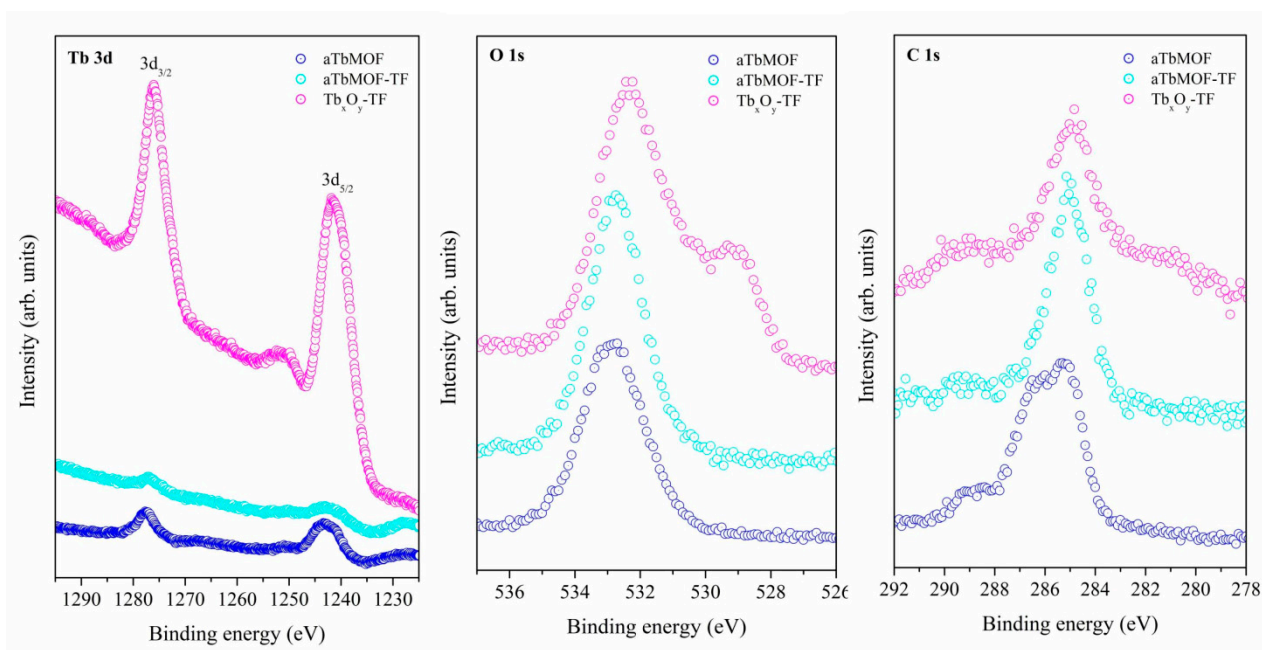


Figure S4. HR XPS spectra of Tb 3d, O 1s, and C 1s for amorphous aTbMOF powder and aTbMOF-TF film and Tb_xO_y-TF film.

Table S1. XPS elemental atomic % of aTbMOF, aTbMOF-TF and Tb_xO_y-TF samples.

Sample	Tb	O	C	N	Pt	Si
aTbMOF	2.00	35.76	45.23	17.00	-	-
aTbMOF-TF	0.56	30.22	30.25	-	20.37	18.61
Tb _x O _y -TF	9.87	44.34	27.29	-	6.61	11.89

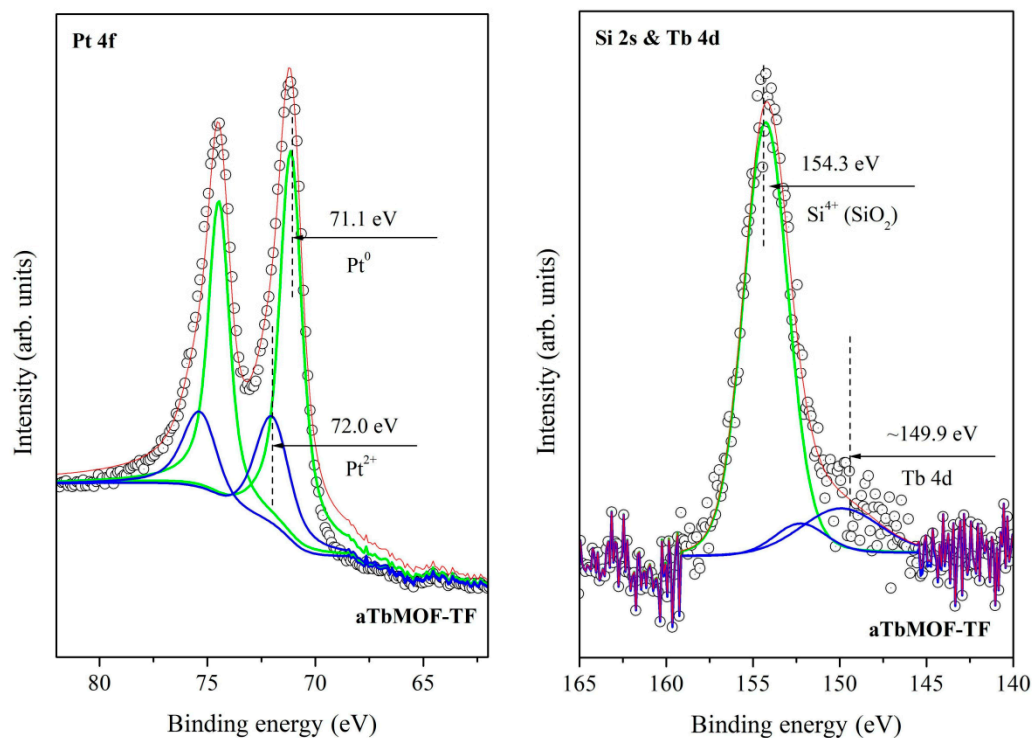


Figure S5. HR XPS spectra of Pt 4f and Si 2s & Tb 4d for amorphous aTbMOF-TF thin film.

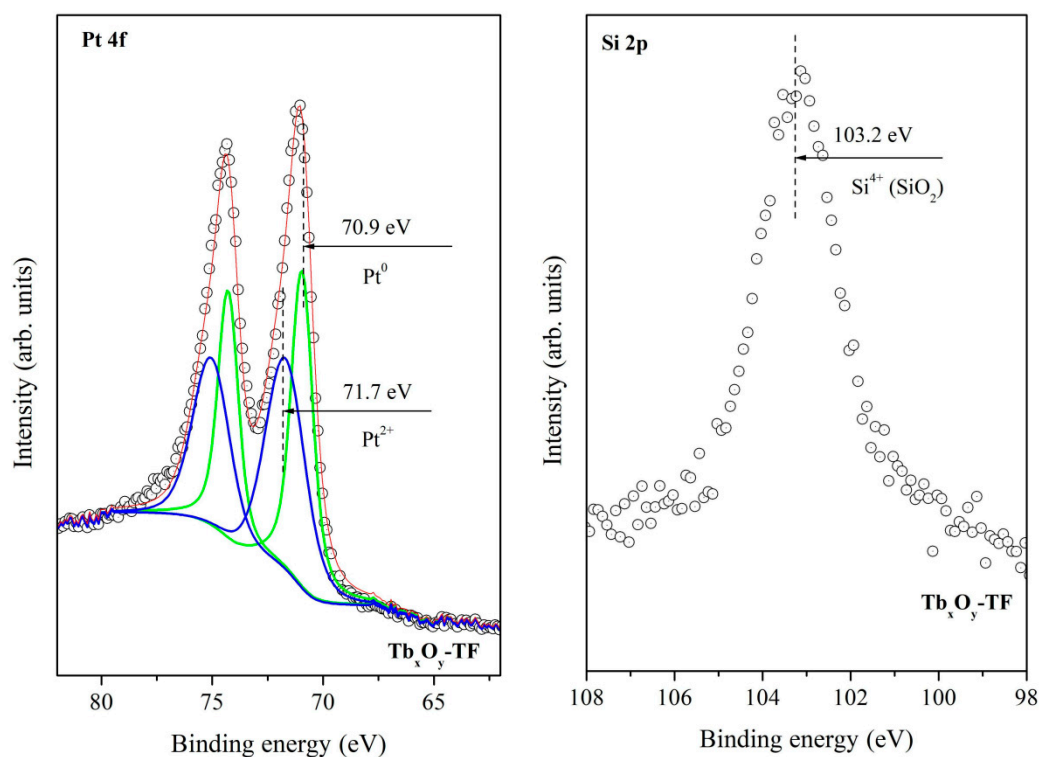


Figure S6. HR XPS spectra of Pt 4f and Si 2p (substrate) for $\text{Tb}_x\text{O}_y\text{-TF}$ thin film.

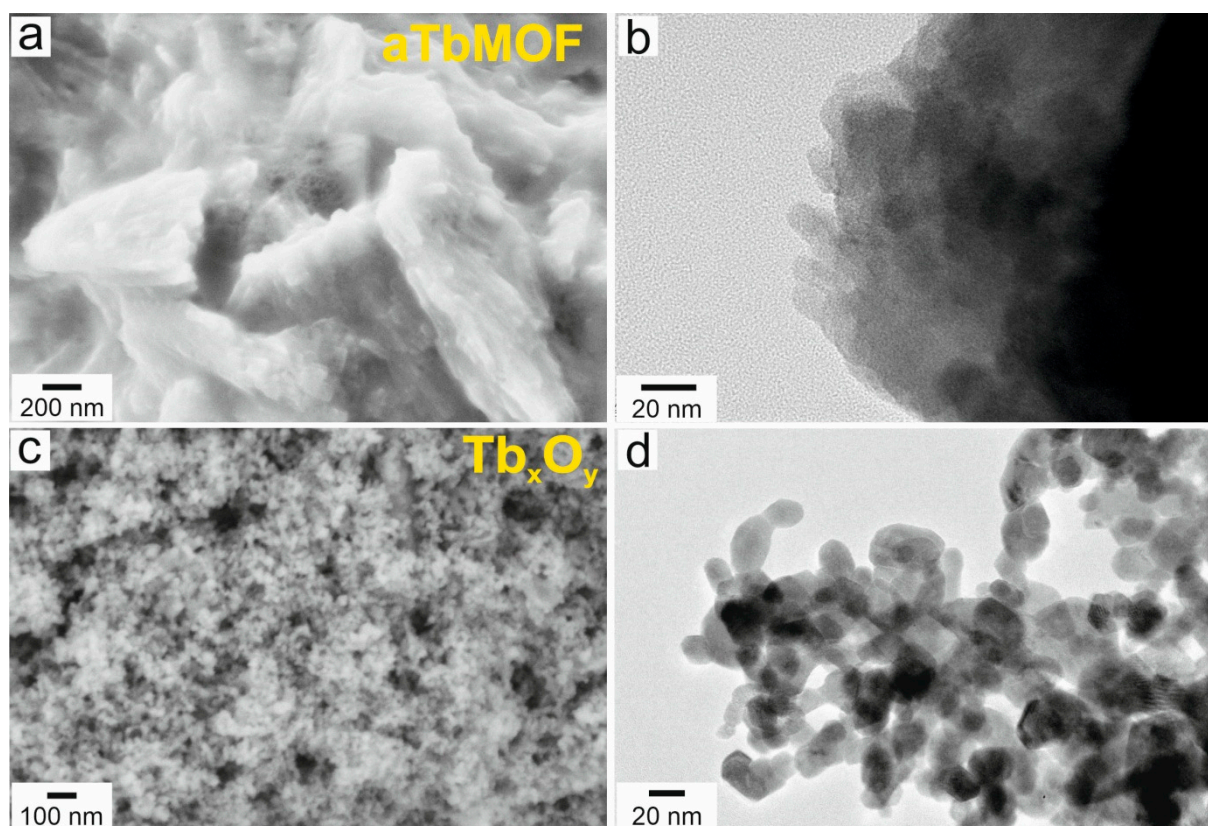


Figure S7. SEM and TEM images of (a,b) amorphous aTbMOF and (c,d) Tb_xO_y powders.

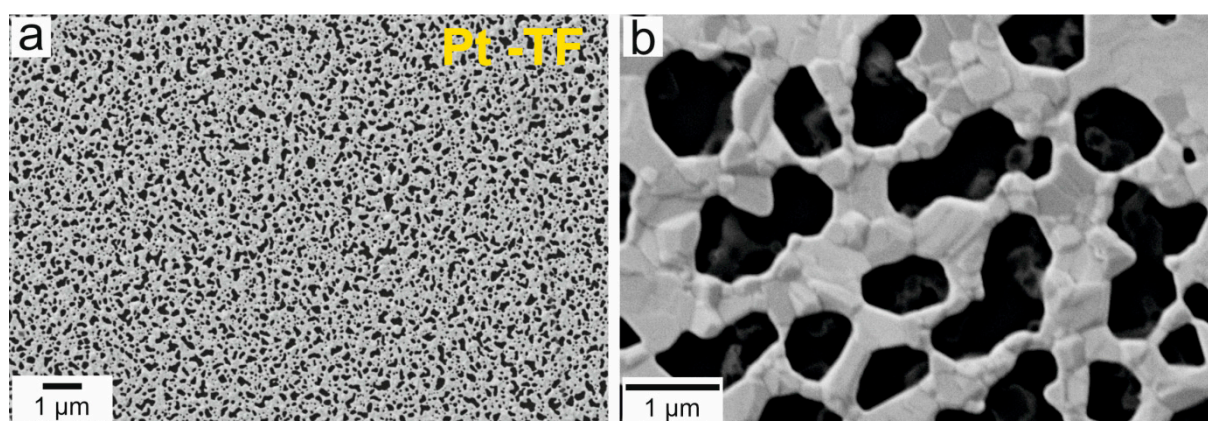


Figure S8. SEM microstructures of Pt/SiO₂/Si substrate sample (a) as-deposited and (b) annealed at 450 $^{\circ}\text{C}$.

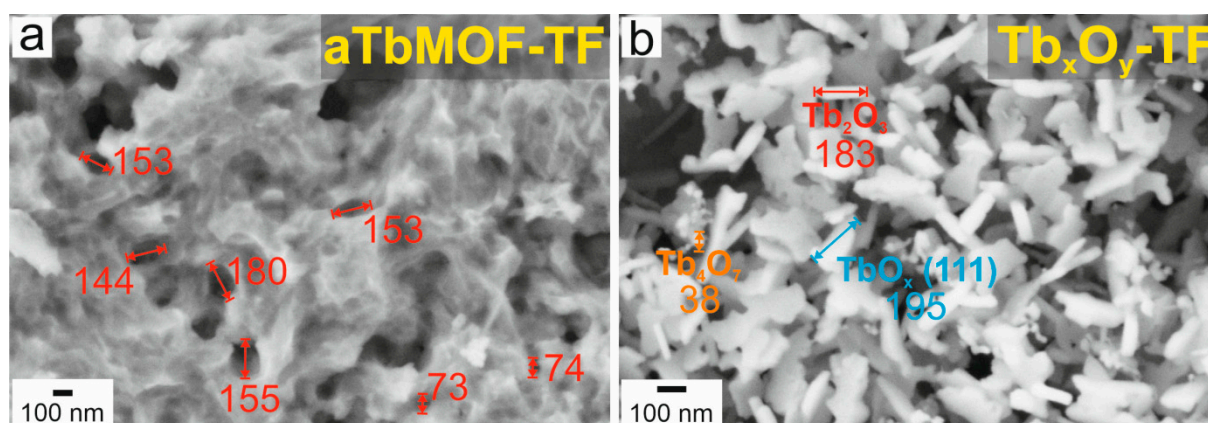


Figure S9. SEM surface microstructures of (a) aTbMOF-TF (with pore sizes) and (b) Tb_xO_y-TF thin films (with particle sizes).

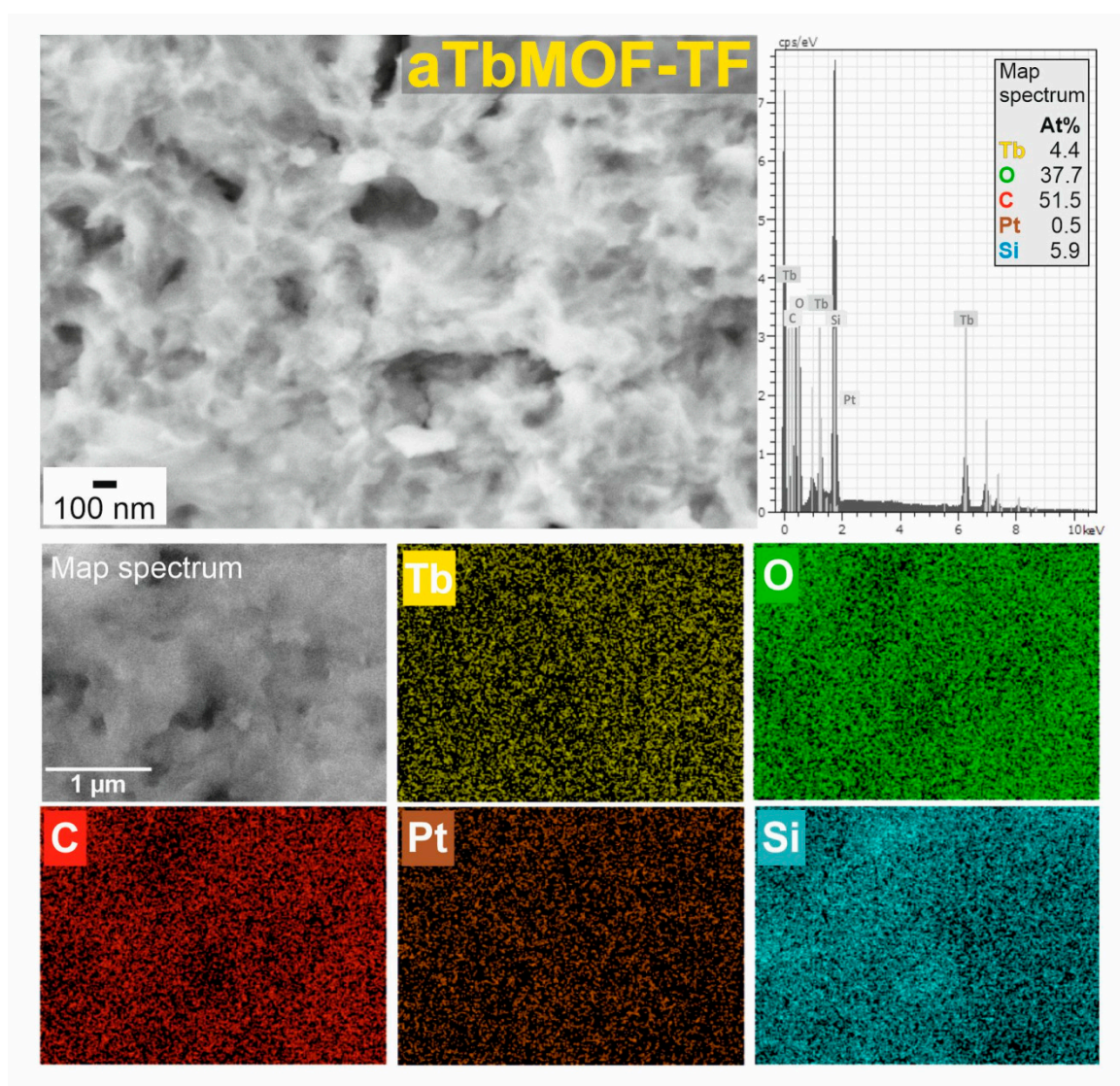


Figure S10. SEM surface microstructures and EDS elemental mapping of the amorphous aTbMOF-TF thin film.

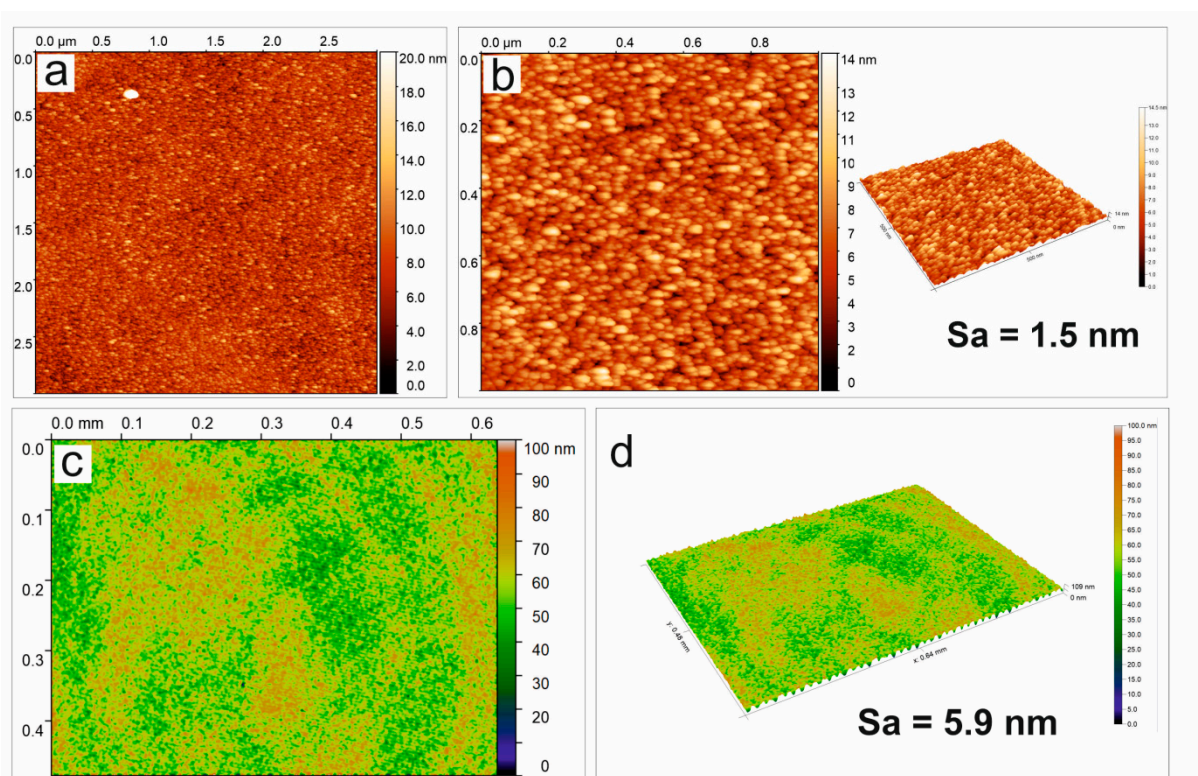


Figure S11. (a,b) 2D and 3D-AFM topography and (c,d) Confocal microscopy (CM) scans of the Pt/SiO₂/Si substrate sample in isometric and 3D representations of Pt-interlayer.