

**Table S1.** Peak positions and FWHM values of XPS spectra.

Thickness	P 2p		Mo 3d <sub>5/2</sub> (Mo <sup>6+</sup> )		Mo 3d <sub>5/2</sub> (Mo <sup>5+</sup> )		Mo 3d <sub>5/2</sub> (Mo <sup>4+</sup> )		O 1s (MoO <sub>3</sub> )		O 1s (CoO <sub>x</sub> )		Co 2p <sub>3/2</sub> (CoO <sub>x</sub> )		Co 2p <sub>3/2</sub> (metallic)	
	Positions	FWHM	Positions	FWHM	Positions	FWHM	Positions	FWHM	Positions	FWHM	Positions	FWHM	Positions	FWHM	Positions	FWHM
BP	130.3770	0.887468														
MoO <sub>3</sub>			232.71	1.06					530.50	1.25						
1 Å			232.64	1.60					530.75	1.31	531.77	1.63	781.41	2.47		
2 Å			232.57	1.92					530.80	1.33	531.41	2.06	781.35	2.74		
4 Å			232.50	1.96	230.73	1.96			530.77	1.33	531.53	2.21	781.25	3.35		
8 Å			232.54	2.04	230.60	2.04			530.69	1.32	531.36	2.20	780.82	3.85	778.65	1.31
15 Å			232.60	2.06	230.60	2.06	229.62	2.06	530.59	1.38	531.39	2.39			778.55	1.45
30 Å			232.60	1.97	230.70	1.97	229.60	1.97	530.49	1.40	531.15	2.33			778.48	1.43
60 Å			232.60	2.03	230.70	2.03	229.59	2.03	530.42	1.53	531.44	2.85			778.43	1.35