Electronic Supplementary Material (ESI) for CrystEngComm.

Insights into inorganic buffer layer-assisted *in situ* fabrication of MOF films with controlled microstructures

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Supporting Information

SI-1 EDXS pattern of prepared Co-Al-CO_3 HTlc buffer layer

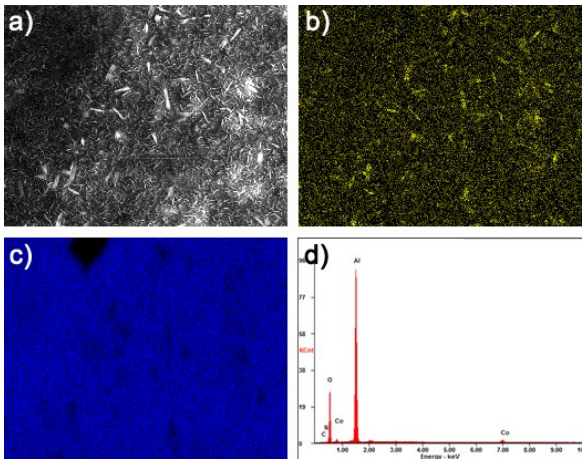

Fig. S1 EDXS pattern of prepared Co-Al-CO_3 HTlc buffer layer. a) The SEM image; element mappings of b) Co and c) Al; d) elemental composition analysis.

SI-2 EDXS analysis of prepared Co-Al HTlc powders

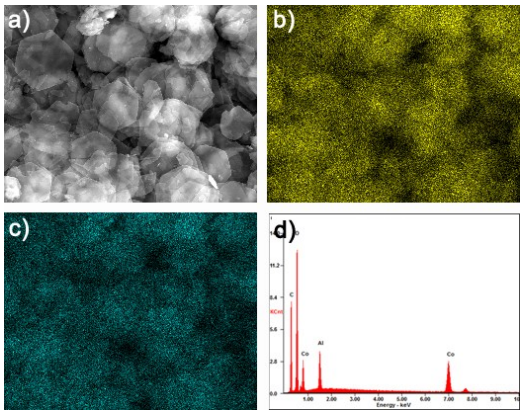

Fig. S2 EDXS pattern of collected Co-Al-CO_3 HTlc powder samples. a) The SEM image; element mappings of b) Co and c) Al; d) elemental composition analysis.

SI-3 XRD pattern of collected Co-Al HTlc powders

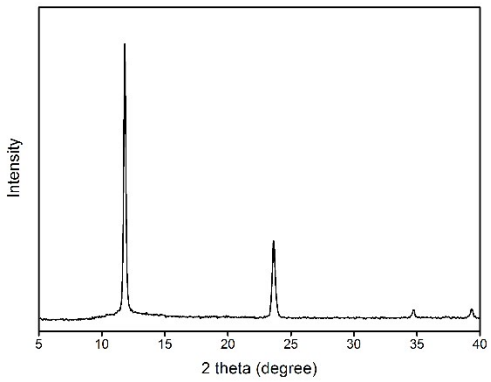

Fig. S3 XRD pattern of collected Co-Al HTlc powders. Synthetic conditions were identical to those of Co-Al HTlc buffer layers.

SI-4 FT-IR spectra of Co-Al HTlc powders

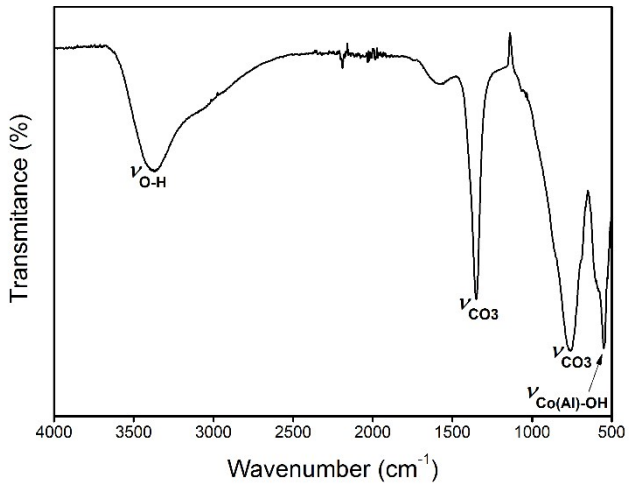

Fig. S4 The FT-IR pattern of collected Co-Al HTlc powders.

SI-5 Characterization of ZIF-7 nanocrystals synthesized with ZnI_2 as the zinc source

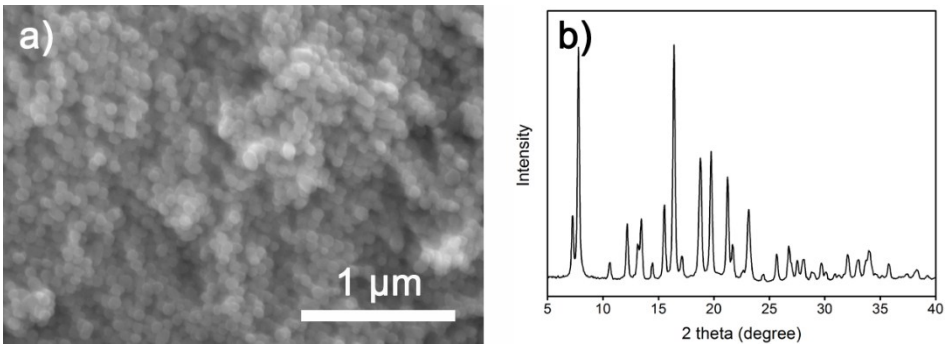

Fig. S5 The a) SEM image and b) XRD pattern of ZIF-7 nanocrystals synthesized with ZnI_2 as the zinc source.

SI-6 Characterization of ZIF-7 films synthesized with different zinc sources

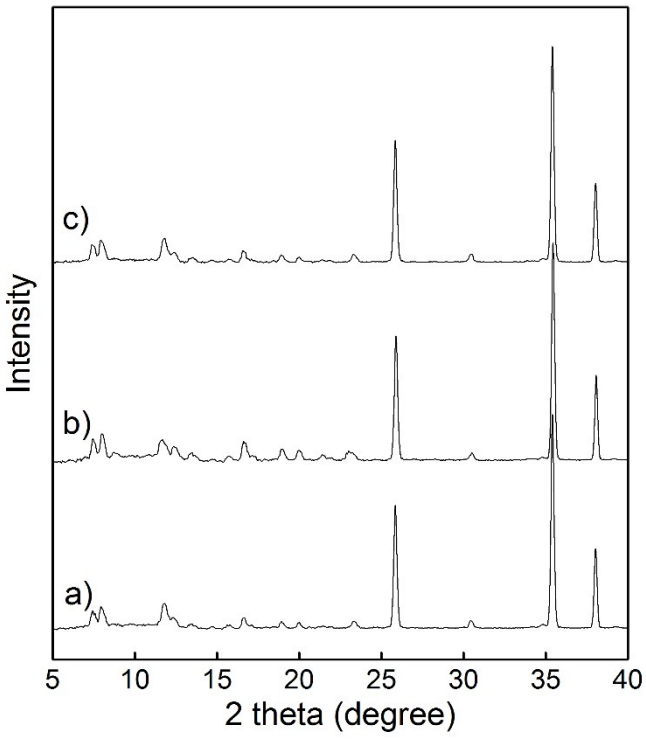

Fig. S6 XRD patterns of ZIF-7 films prepared with a) $ZnCl_2$, b) $ZnBr_2$ and c) ZnI_2 as zinc sources.

SI-7 Characterization of collected Mg-Al HTlc powders

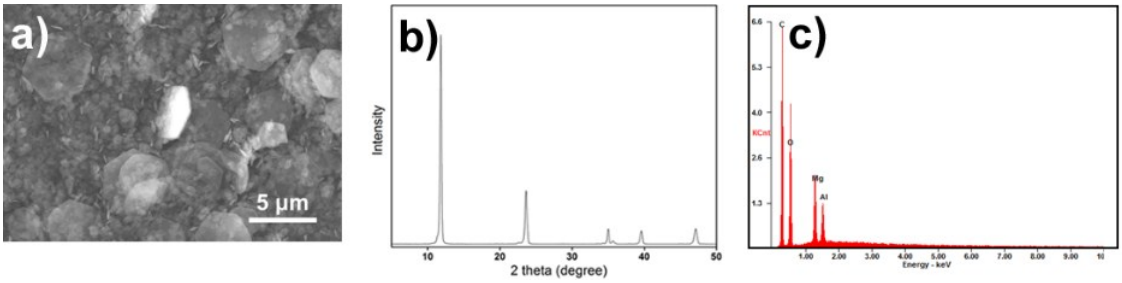

Fig. S7 a) SEM, b) XRD and c) EDXS pattern of collected Mg-Al-CO_3 HTlc powder samples.

SI-8 HKUST films *in situ* synthesized on Zn-Al HTlc-modified γ-Al_2O_3 substrates

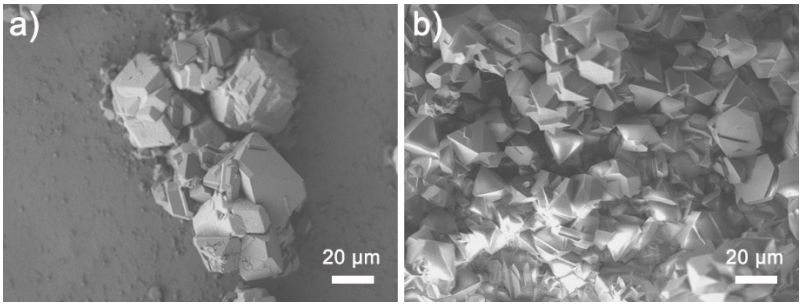

Fig. S8 SEM images of HKUST-1 films grown on a) bare and b) Zn-Al HTlc-modified porous γ-Al_2O_3 substrates.