Supporting Information

Introducing Electrical Conductivity to Metal-Organic Framework Thin Films by Templated Polymerization of Methyl Propiolate

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XRD patterns of (a) 1, (b) 2 and (c) 3 after the modelling the non-oriented structures. Black is always the pristine sample, red loaded with monomer MP and blue after PdCl\textsubscript{2} loading.

**Fig. S2**  
EDXS of the (a) pristine Cu(bpdc) (1). The carbon signal of the MOF caps at 3 cps, which we attribute to the very thin layer of the MOF. The colors from this picture do not match the colors in the EDXM in the paper. (b) PolyMP@1 cross-section. It can be seen, that the carbon signal at 0.25 keV as 5.2 cps and is much larger than the copper signal 3 cps. Compared to EDXS of the pristine (1), we see a higher ratio.
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**Fig. S3** EDXS of the (a) pristine Cu$_2$(bdc)$_2$dabco (2). The overall carbon signal from the sample is not very high, because of the 200 nm thin film formation on the surface. The colors from this picture do not match the colors in the EDXM in the paper. (b) **polyMP@2**. The overall carbon signal has only slightly increased, but the copper signal is diminished compared to the pristine sample. We attribute this to a successful polymerization mainly inside the pores.

**Fig. S4** EDXS of (a) pristine HKUST-1 (3). The carbon signal is rather low at 0.6 cps compared to the copper signal. (b) **polyMP@3**. The carbon signal is more than doubled with 1.4 cps compared to the carbon signal of the pristine HKUST-1. The copper signal is almost the same. We attribute this to the perfect polymer formation in the MOF.

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<table>
<thead>
<tr>
<th>Time constant (s)</th>
<th>HKUST-1</th>
<th>SURMOF-2</th>
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</thead>
<tbody>
<tr>
<td>$T_{0.5}$</td>
<td>18</td>
<td>112</td>
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<tr>
<td>$T_{0.8}$</td>
<td>154</td>
<td>8655</td>
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</table>
Fig. S7 XRD patterns of Cu(bpdc) (a) and HKUST-1 (d) on the QCM sensors with Au and SiO$_2$ toplayer before and after adsorption and desorption experiments; SEM cross-section images (with 0° and 10° tilt angle) of the QCM sensors after the adsorption and desorption experiments of Cu(bpdc) (b, c) and HKUST-1 (e, f), showing the homogeneous 200-250 nm thick MOF-coatings.
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