Supporting Information

Porous metal-organic molecular cage: A promising candidate to highly improve the nanofiltration performance of thin film nanocomposite membrane

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1. **XRD patterns of membranes**

XRD patterns of PA TFC and PA/Fe-cage TFN membranes were obtained from an X-ray D8 Advance instrument with Cu Kα radiation in the 2θ range from 5° to 70° at a rate of 2°/min (40 kV, 20 mA, λ = 0.15406 nm).

![XRD patterns of membranes](image)

**Figure S1.** XRD patterns of PA TFC and PA/Fe-cage TFN membranes.

2. **Chlorine resistant capability of the membranes**

The chlorine resistant capability of the membranes was determined by employing the NaClO solution containing different concentrations of active chlorine. The membranes were immersed into NaClO solution for 1 h, and then taken out. After being washed by DI water, the membranes were measured in terms of the water flux and Na₂SO₄ rejection using a 1 g/L Na₂SO₄ feed solution at 0.5 MPa.
Figure S2. Water flux and Na$_2$SO$_4$ rejection behaviors of the PA TFC membrane and the PA/Fe-cage-1.0 TFN membrane with different chlorine exposure treatment.

3. EDX

Table S1. Element content of PA/Fe-cage-1.0 TFN membranes surface detected by EDX analysis.

<table>
<thead>
<tr>
<th>Filtration time</th>
<th>Element Content (wt%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C</td>
</tr>
<tr>
<td>0</td>
<td>62.67</td>
</tr>
<tr>
<td>1 day</td>
<td>68.65</td>
</tr>
<tr>
<td>5 days</td>
<td>68.62</td>
</tr>
<tr>
<td>20 days</td>
<td>67.93</td>
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