Supporting Information

Eu\textsuperscript{3+} based mesoporous hybrid material with tunable multicolor emission modulated by fluoride ion: application for selective sensing toward fluoride ion

Yajuan Li*, Tao Yu, Xudong Yu

Fig. S1 FTIR spectra for NTA (A), precursor NTA-Si (B) and NTA-functionalized SBA-15 mesoporous hybrid material NTA-S15 (C).

Fig. S2 SEM images of Eu-containing mesoporous hybrid material Eu(NTA-S15)\textsubscript{L}. 

This journal is © The Royal Society of Chemistry 2017
**Fig. S3** Excitation spectra of the Eu-containing mesoporous hybrid Eu(NTA-S15)\(\text{L}\).

**Fig. S4** Luminescence time decay curves for the sample Eu(NTA-S15)\(\text{L}\) (black line: experimental data; red line: fitted data).
**Fig. S5** Emission spectra of Eu(NTA-S15)_3L in THF solutions (1 mg/mL) upon the addition of $F^-$ (10^{-3} mol/L) in the presence of other mixture anions (10^{-3} mol/L).

**Fig. S6** Emission spectra of organic ligand L (c=10^{-3} mol/L) in THF solution (a) and ligand NTA (c=10^{-3} mol/L) in THF solution (b). Measurement parameters: EX Slit: 2.5 nm; EM Slit: 2.5 nm; PMT Voltage: 600 V.
**Fig. S7** Thermogravimetry trace (—) and differential thermogravimetry trace (---) curves (DTG) of pure complex Eu(NTA)$_2$L.

**Table S1** The main bands and their assignments of IR spectra for NTA(a), NTA-Si (b) and NTA-S15 (c).

<table>
<thead>
<tr>
<th>compounds</th>
<th>$\nu$(CH$_2$)</th>
<th>$\nu$(C=O)</th>
<th>$\nu$(N-H)</th>
<th>$\delta$(N-H)</th>
<th>$\nu$(Si-O)</th>
<th>$\nu$(C-Si)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTA</td>
<td>3118</td>
<td>1607</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NTA-Si</td>
<td>2926</td>
<td>1697,1631</td>
<td>3399</td>
<td>1538</td>
<td>1128</td>
<td>1189</td>
</tr>
<tr>
<td>NTA-S15</td>
<td>2973</td>
<td>1660</td>
<td>3424</td>
<td>1469</td>
<td>1086,798,459</td>
<td></td>
</tr>
</tbody>
</table>