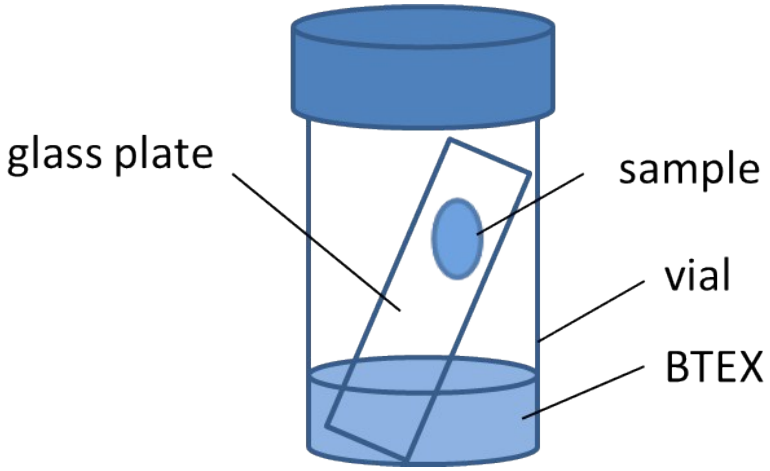
Electronic Supplementary Material (ESI) for Dalton Transactions.

Supporting Information

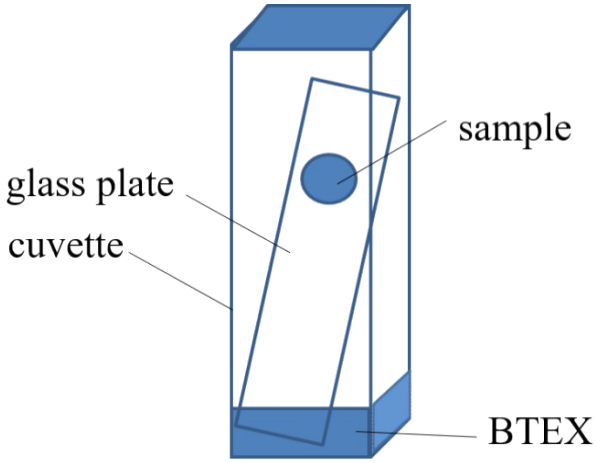
N-GQDs and Eu^{3+} co-encapsulated anionic MOF : two-dimensional luminescent platform for decoding benzene homologues

Han Weng, Bing Yan*

Department of Chemistry, Tongji University, Siping Road 1239, Shanghai 200092, China



Scheme S1 The device for sensing BTEX volatiles.



Scheme S2 The device for time-dependent sensing experiment.

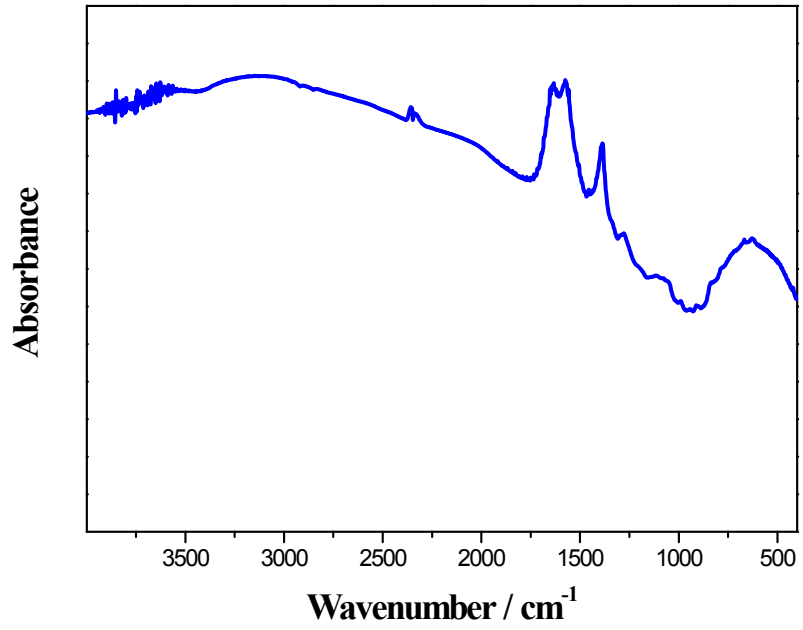


Fig. S1 FTIR spectra of as-synthesized N-GQDs.

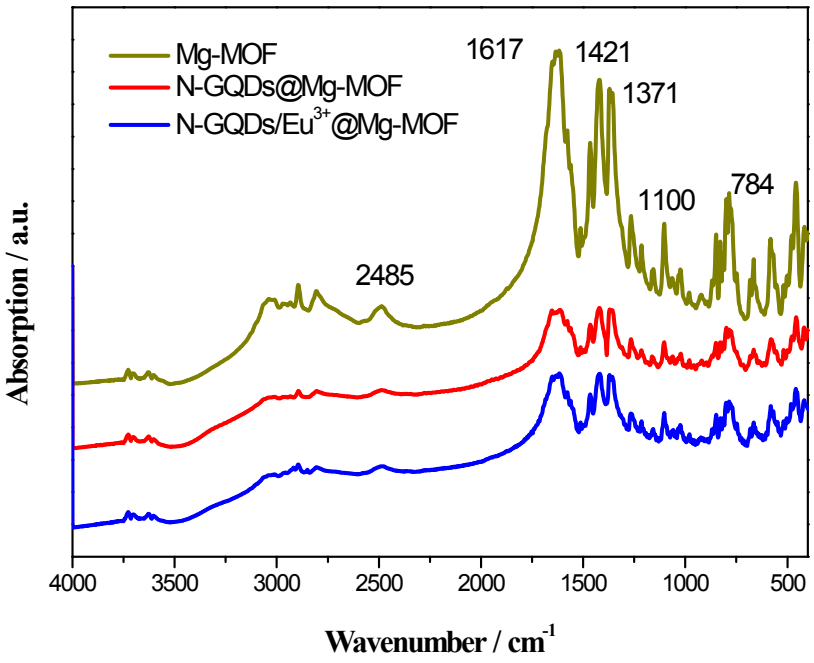


Fig. S2 FTIR spectras of N-GQDs@Mg-MOF and N-GQDs/ Eu^{3+}@Mg-MOF

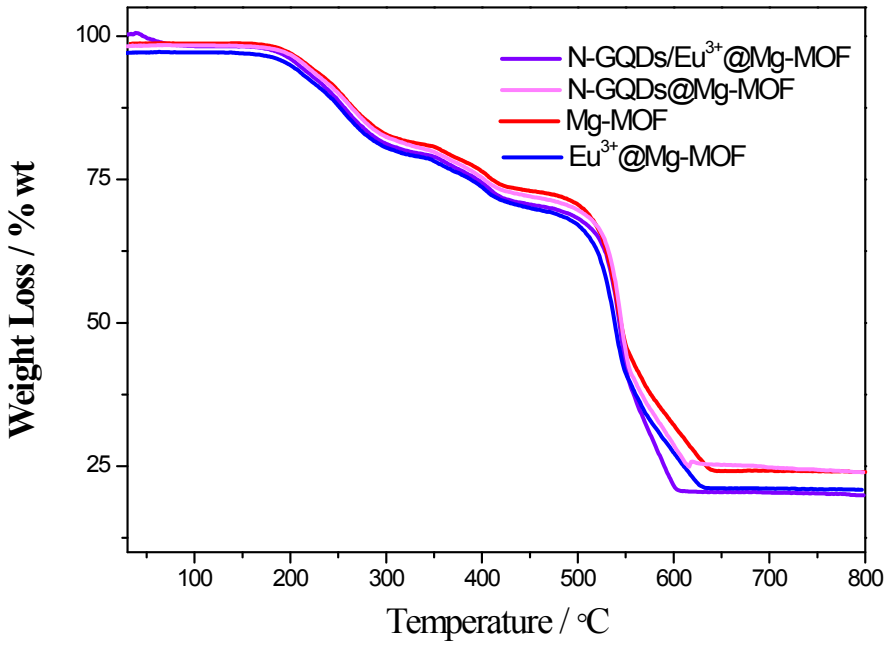


Fig. S3 Thermogravimetric analysis of N-GQDs@Mg-MOF and N-GQDs/ Eu^{3+}@Mg-MOF

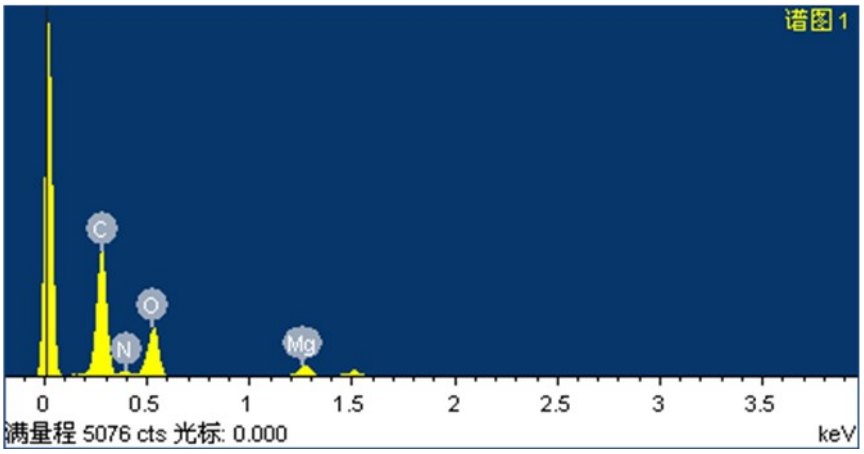


Fig. S4 EDS spectrogram of N-GQDs/ Eu^{3+}@Mg-MOF

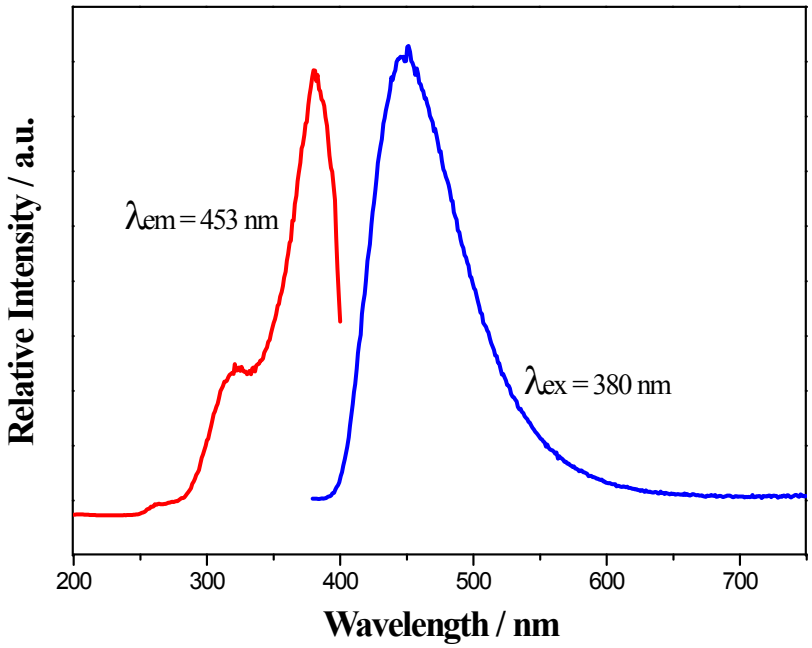


Fig. S5 Excitation (red line) and emission (blue line) spectrum of unpurified N-GQDs.

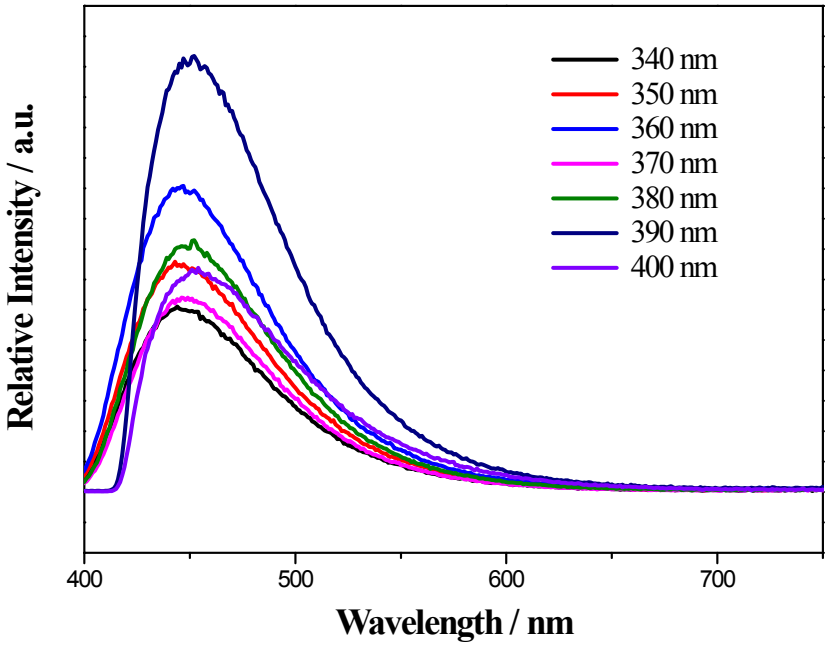


Fig. S6 Emission spectra of unpurified N-GQDs in different excitation wavelength.

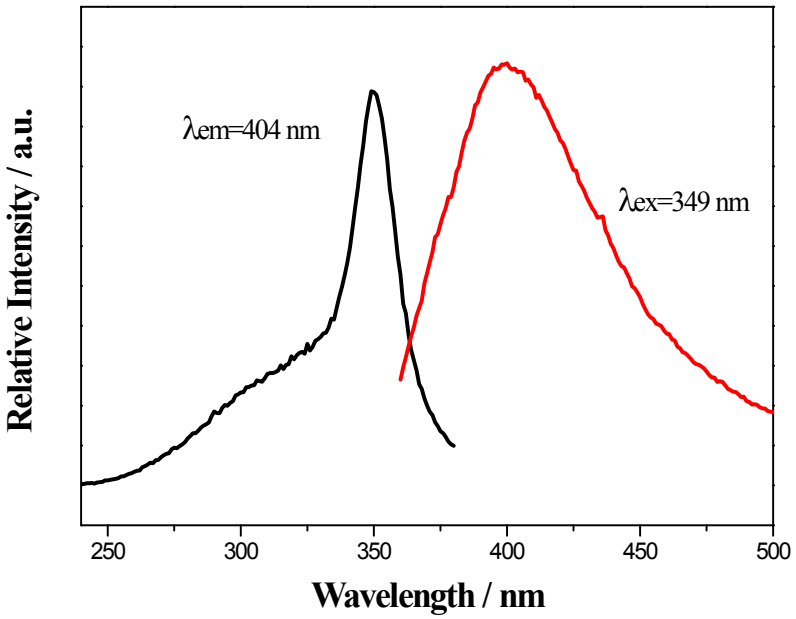


Fig. S7 Excitation (black line) and emission (red line) spectrum of pure Mg-MOF

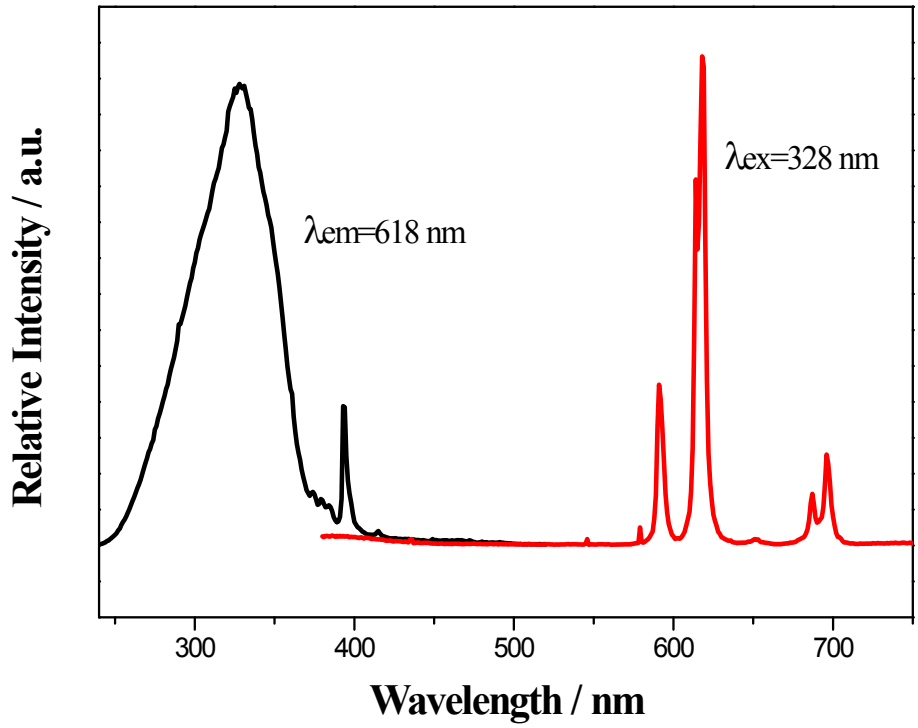


Fig. S8 Excitation (black line) and emission (red line) spectrum of Eu^{3+}@Mg-MOF

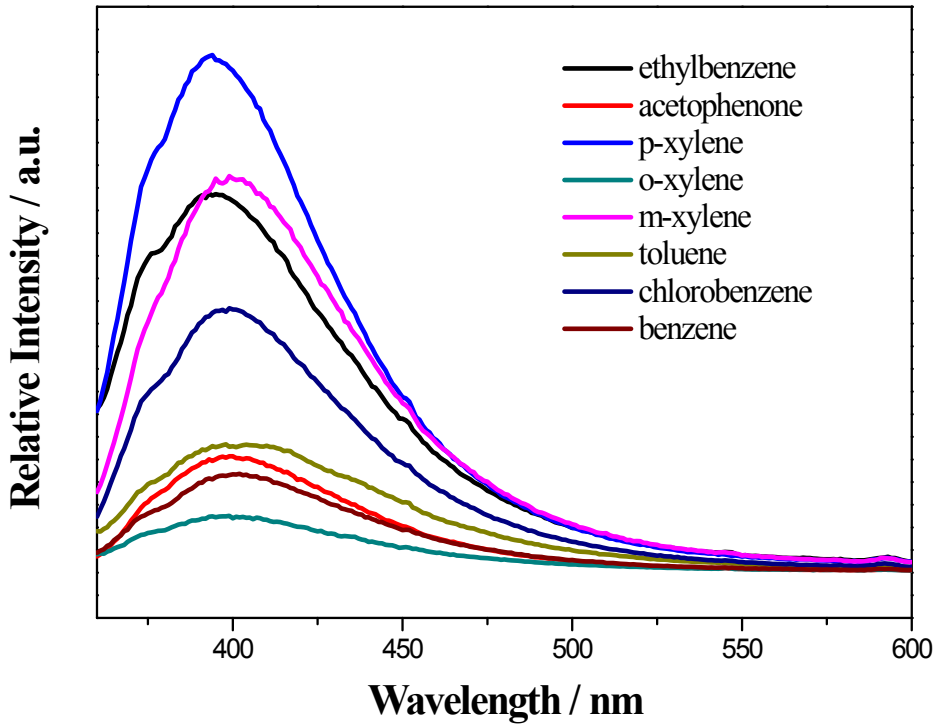


Fig. S9 Emission spectra of pure Mg-MOF towards BTEX excited at 404 nm.

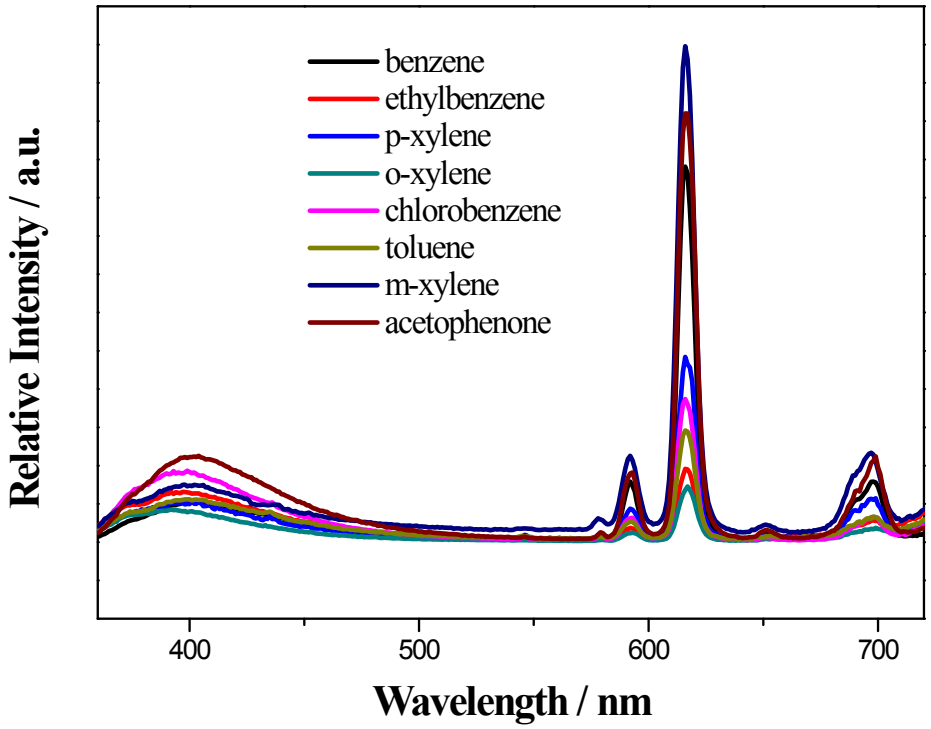


Fig. S10 Emission spectra of Eu^{3+}Mg-MOF towards BTEX excited at 618 nm.

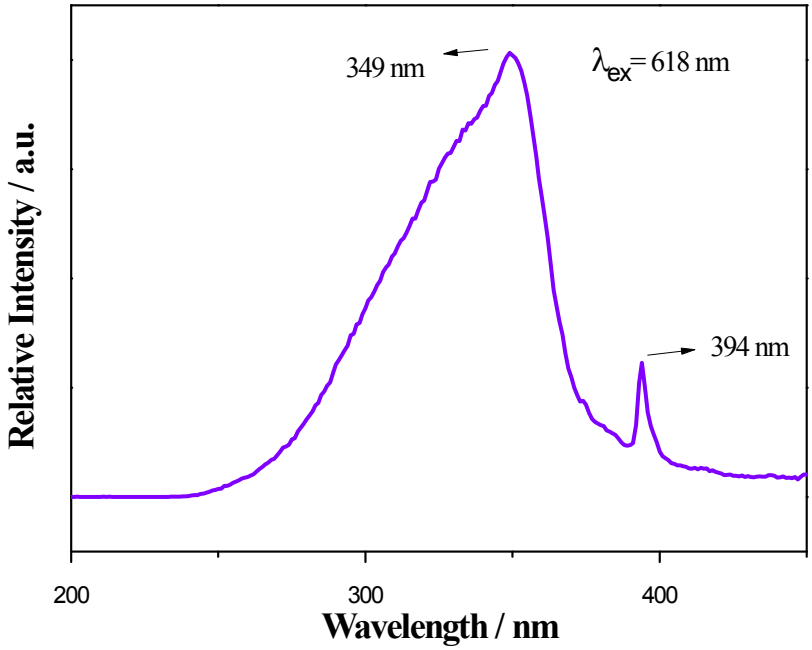


Fig. S11 Excitation spectrum of N-GQDs/ Eu^{3+}@Mg-MOF with the emission wavelength of 618 nm.

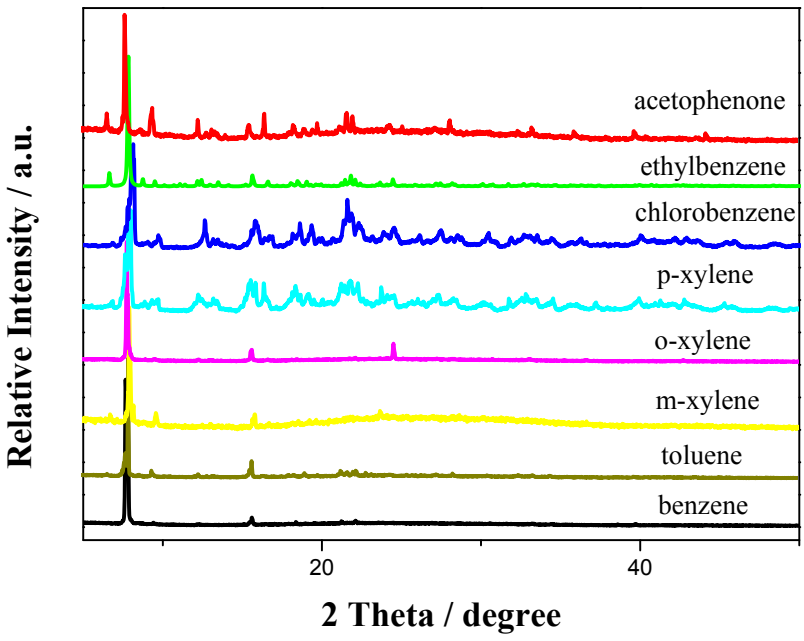


Fig. S12 PXRD patterns of N-GQDs/Eu^{3+}@Mg-MOF towards BTEX.

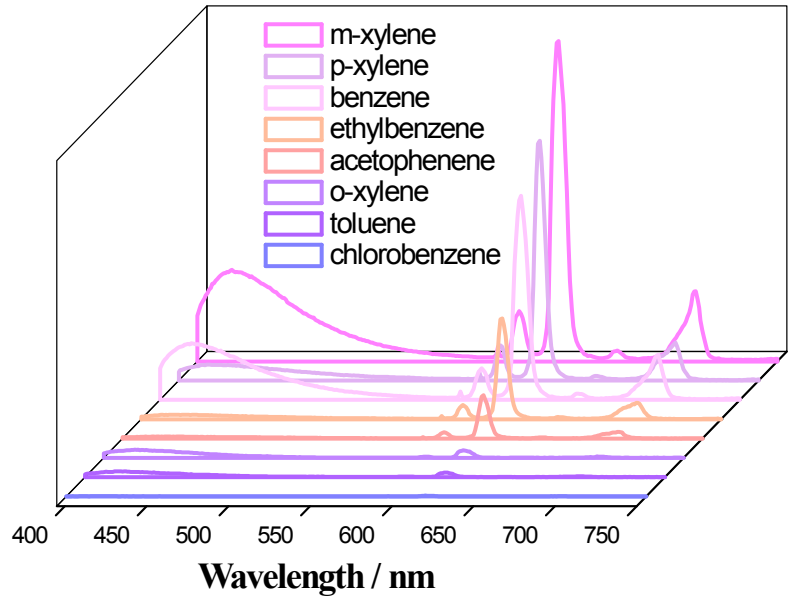
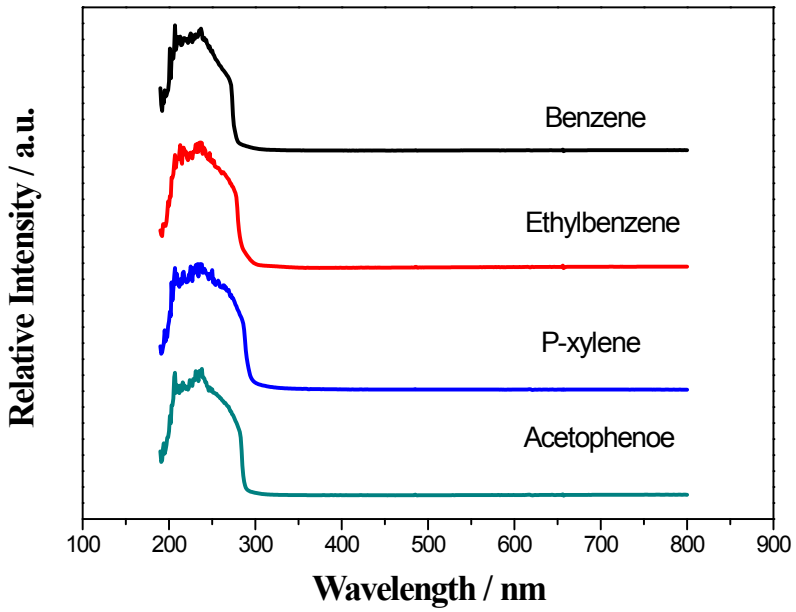


Fig. S13 Emission spectrums of N-GQDs/Eu^{3+}@Mg-MOF after the encapsulation of BTEX when excited at 349 nm.



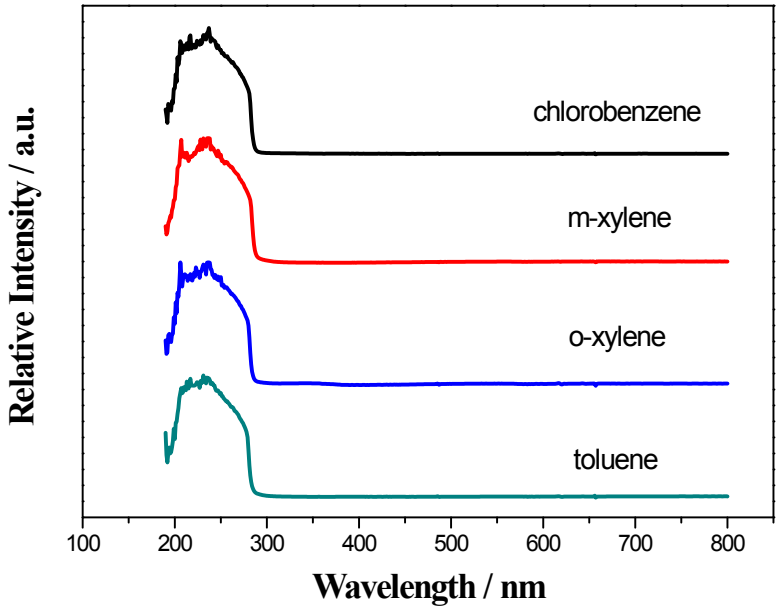


Fig. S14 UV-Vis spectra of BTEX

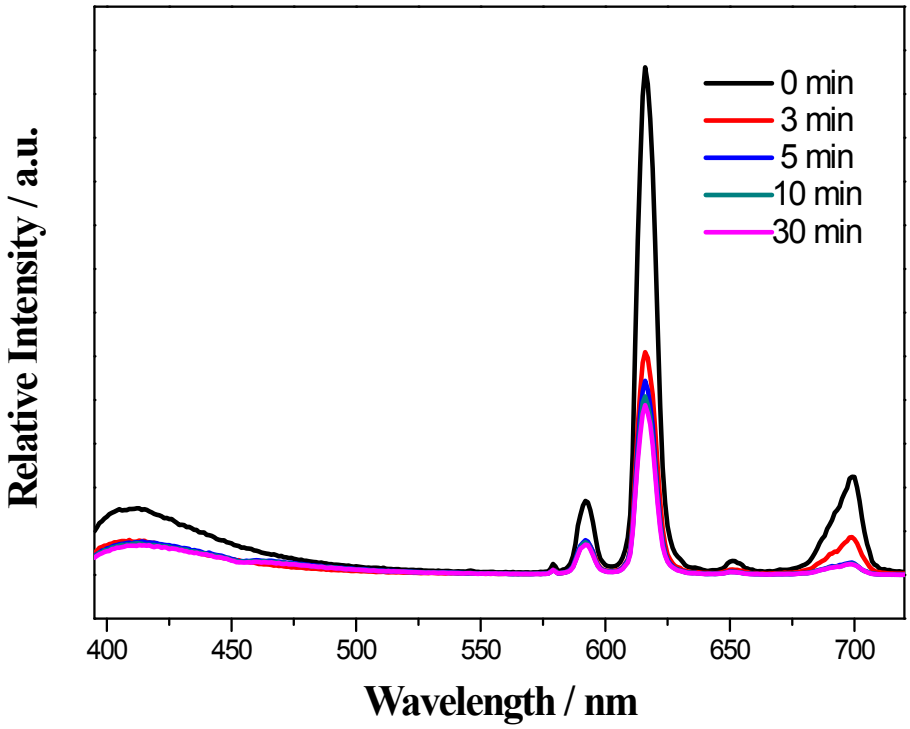


Fig. S15 Emission spectra of N-GQDs/Eu^{3+}@Mg-MOF exposed to m-xylene for different time when excited at 349 nm.

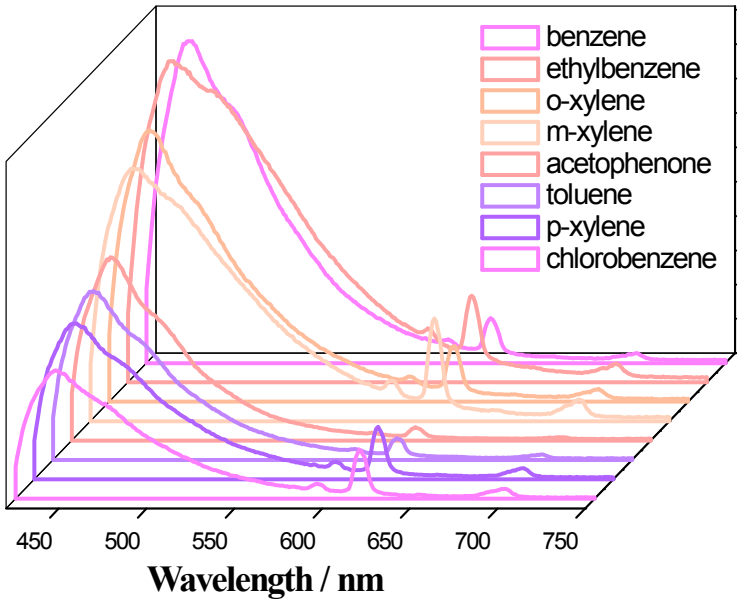


Fig. S16 Emission spectrums of N-GQDs/Eu^{3+}@ Mg-MOF after the encapsulation of BTEX when excited at 394 nm.

Table S1 The detailed EDS and ICP-OES studies of N-GQDs/Eu^{3+}@Mg-MOF

EDS data:

Material	Weight / %	Atomic / %
N-GQDs/Eu^{3+}@Mg-MOF	52.90	59.55
	8.40	8.11
	36.34	30.71
	3.05	1.69

ICP-OES data:

Samples	Mg^{2+}(mg / L)	Eu^{3+}(mg / L)	atomic ratio of Mg^{2+} : Eu^{3+}
N-GQDs/Eu^{3+}@Mg-MOF	242.362	7.519	1 : 0.031

Table S2 Lifetime and quantum yield of prepared samples

Samples	τ/μs	η/(%)
Mg-MOF	9.3859	1.17
Eu^{3+}@ MOF	1424.7102	15.24
N-GQDs@ Mg-MOF	15.3699	16.21
N-GQDs/ Eu^{3+}@Mg-MOF (349 nm)	946.9158	16.52
N-GQDs/ Eu^{3+}@Mg-MOF (394 nm)	12.7204	14.87

Table S3 Lifetime of N-GQDs/Eu^{3+}@ Mg-MOF exposed to BTEX when excited at 349 nm.

BTEX vapor	τ/μs
toluene	821.5303
o-xylene	732.4129
Benzene	442.5415
m-xylene	412.3429
chlorobenzene	387.5201
p-xylene	112.3973
ethylbenzene	109.2107
acetophenone	107.3241