

# Supporting Information

## **A ratiometric fluorescent probe dye-functionalized MOFs integrated with logic gate operation for efficient detection of acetaldehyde**

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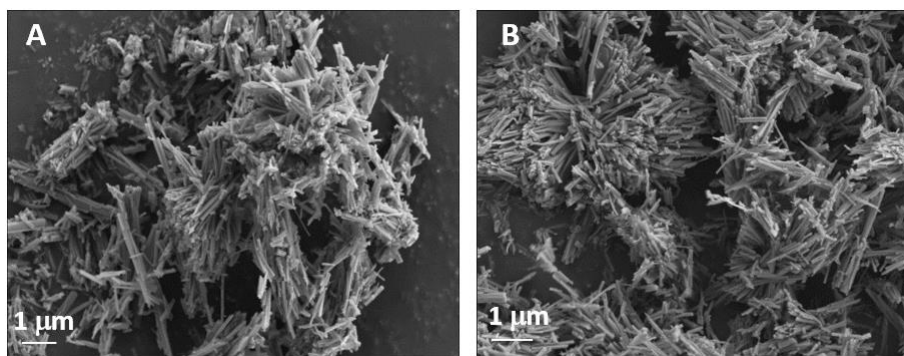
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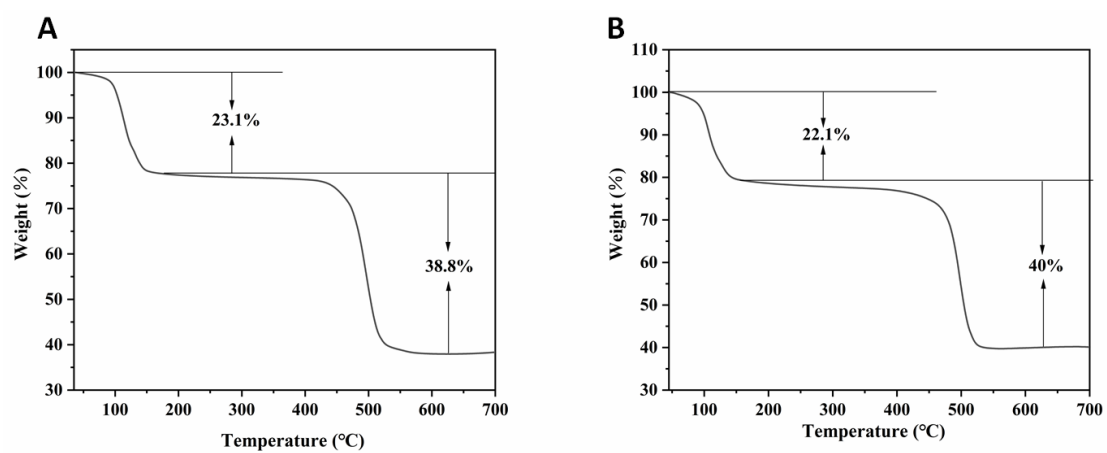
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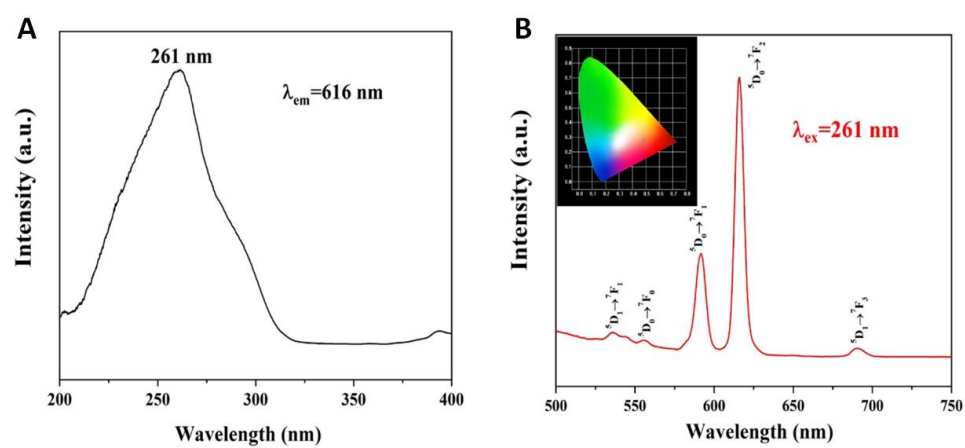
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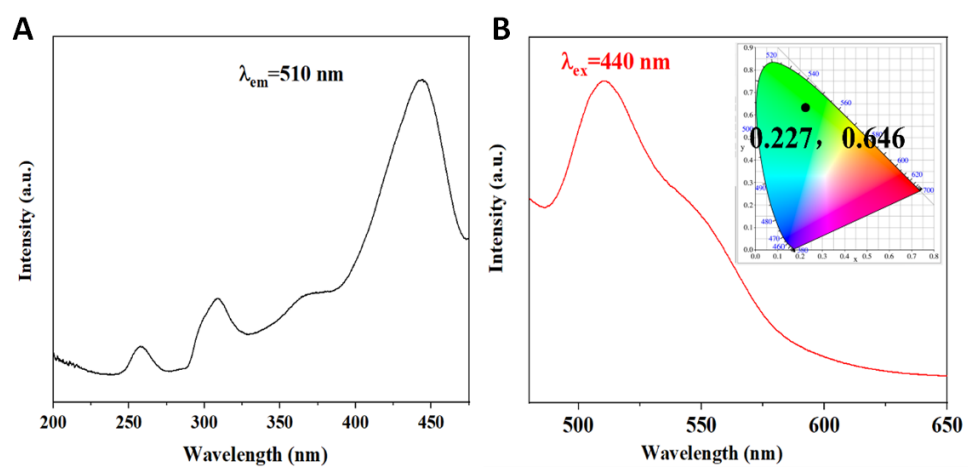
**Fig. S1** SEM images of (A) Eu-MOFs and (B) Dye@Eu-MOFs



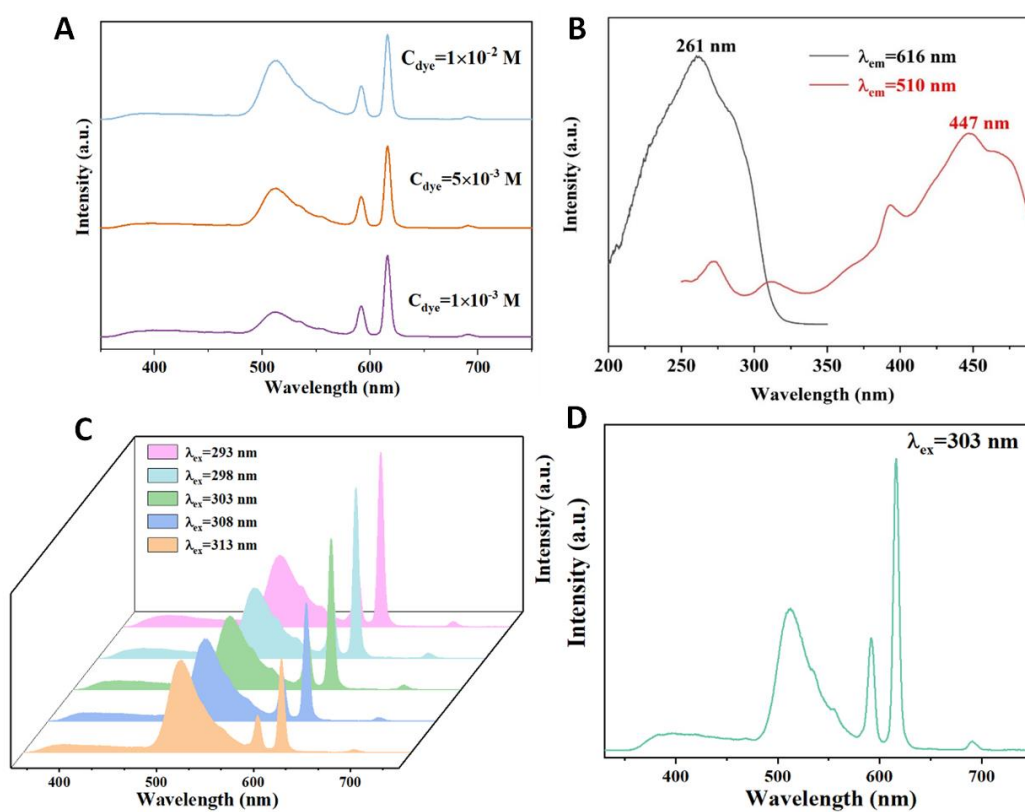
**Fig. S2** The thermogravimetric curves of Eu-MOFs and Dye@Eu-MOFs in the same temperature range



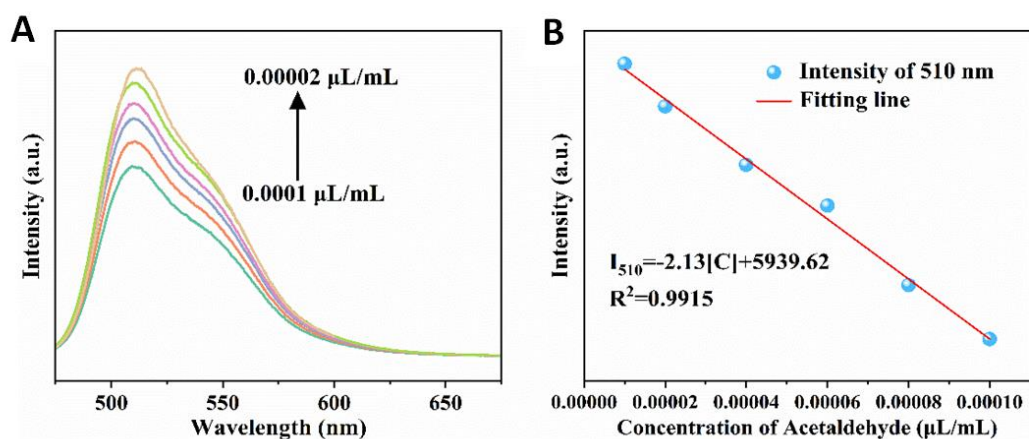
**Fig. S3** (A) Excitation spectra of Eu-MOFs; (B) Emission spectra of Eu-MOFs



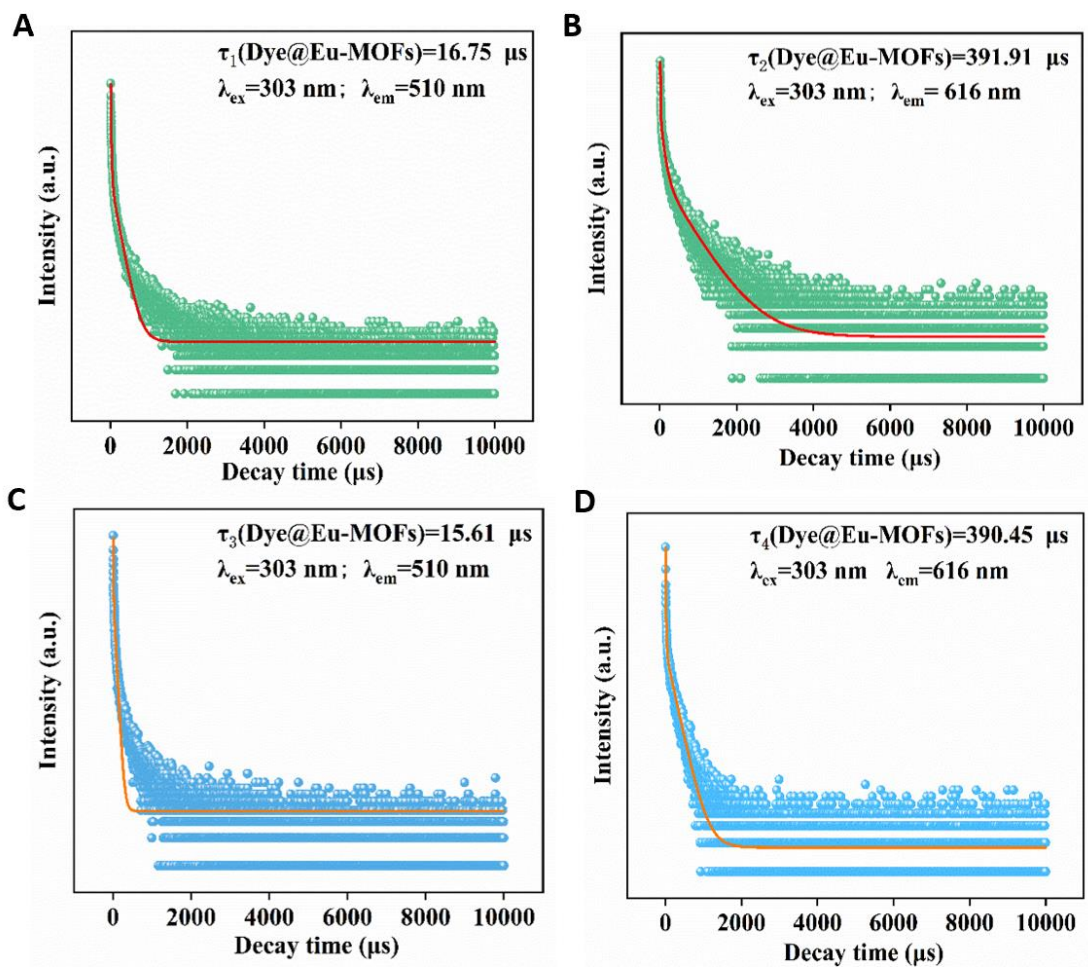
**Fig. S4** (A) Excitation spectra of fluorescein dyes; (B) Emission spectra of fluorescein dyes



**Fig. S5** Emission spectra of Dye@Eu-MOFs with different dye concentrations; (B) Excitation spectra of Dye@Eu-MOFs; (C) Emission spectra of Dye@Eu-MOFs at different excitation wavelengths; (D) Emission spectra of Dye@Eu-MOFs at excitation wavelength 303 nm



**Fig. S6** (A) Emission spectra of fluorescein dye in aqueous solutions of different concentrations of acetaldehyde; (B) Linear plot of fluorescence emission intensity of fluorescein dye versus different acetaldehyde concentrations



**Fig. S7** (A) Fluorescence lifetime of Dye@Eu-MOFs located at 510 nm; (B) Fluorescence lifetime of Dye@Eu-MOFs located at 616 nm; (C) Fluorescence lifetime of Dye@Eu-MOFs located at 510 nm after recognizing acetaldehyde; (D) Fluorescence lifetime of Dye@Eu-MOFs located at 616 nm after recognizing acetaldehyde