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Supplementary Materials

A Facile One-Pot Approach to the Synthesis of Gd-Eu Based Metal-Organic Frameworks and Applications to Sensing of Fe^{3+} and $Cr_2O_7^{2-}$ Ions

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Citation: Puglisi, R.; Pellegrino, A.L.; Fiorenza, R.; Scirè, S.; Malandrino, G. A Facile One-Pot Approach to the Synthesis of Gd-Eu Based Metal-Organic Frameworks and Applications to Sensing of Fe^{3+} and $Cr_2O_7^{2-}$ Ions. *Sensors* **2021**, *21*, 1679. https://doi.org/10.3390/s21051679

Academic Editor: Georgia-Paraskevi Nikoleli

Received: 30 December 2020
Accepted: 24 February 2021
Published: 1 March 2021

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Gd-MOF characterization: The Gd-MOF have been characterized by Fourier transform infrared (FT-IR) in the 4000-500 cm^{-1} range.

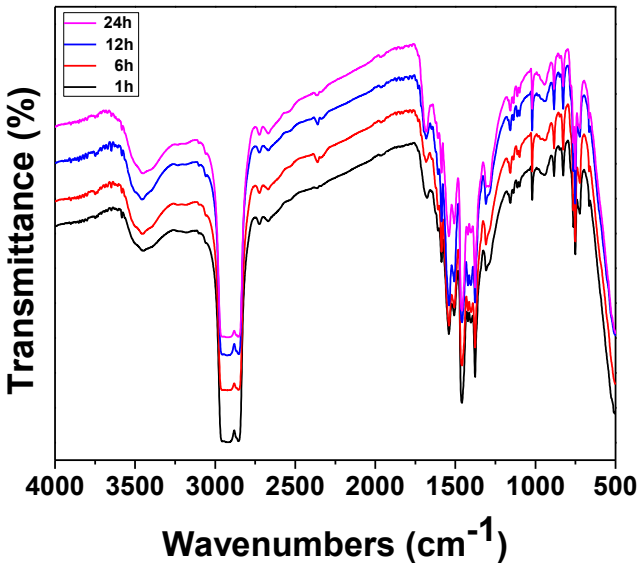


Figure S1. Comparison of IR spectra of the $Gd_2(BDC)_3(H_2O)_4$ complexes synthesized for 1, 6, 12 and 24 h.

The energy dispersive X-ray (EDX) analysis of the sample obtained in a 6 hours synthesis is reported to verify the composition of the MOF.

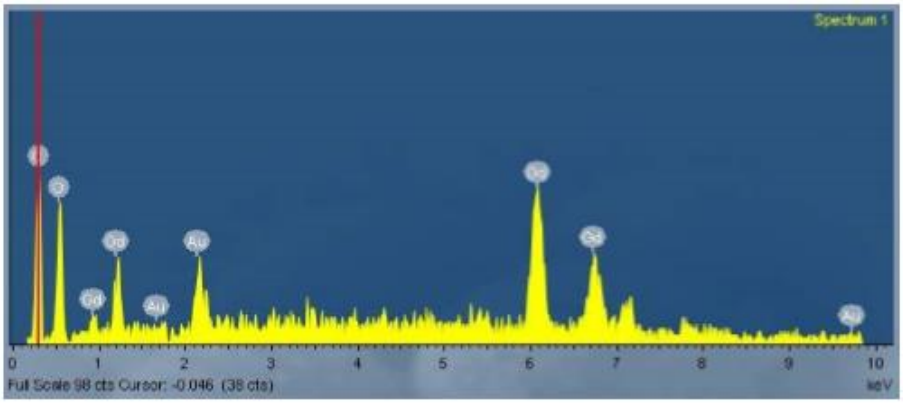


Figure S2. EDX spectrum of the $[Gd_2(BDC)_3(H_2O)_4]$ complex synthesized for 6h.

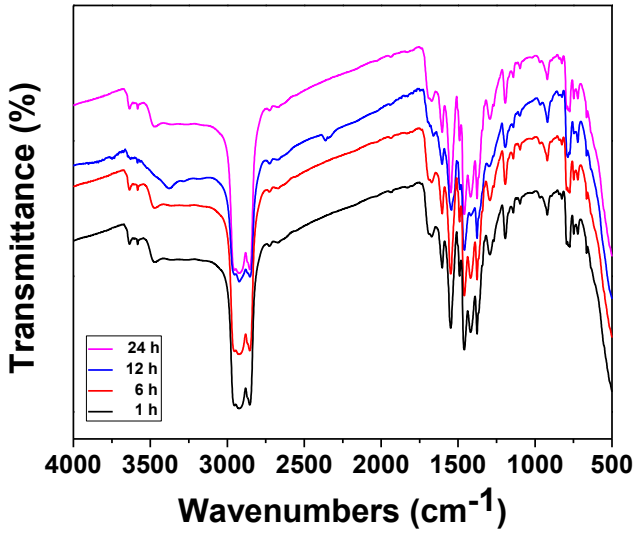


Figure S3. Comparison of IR spectra of the $[Gd_2(NDC)_3(H_2O)]\cdot(H_2O)_2$ complexes synthesized for 1, 6, 12 and 24 h.

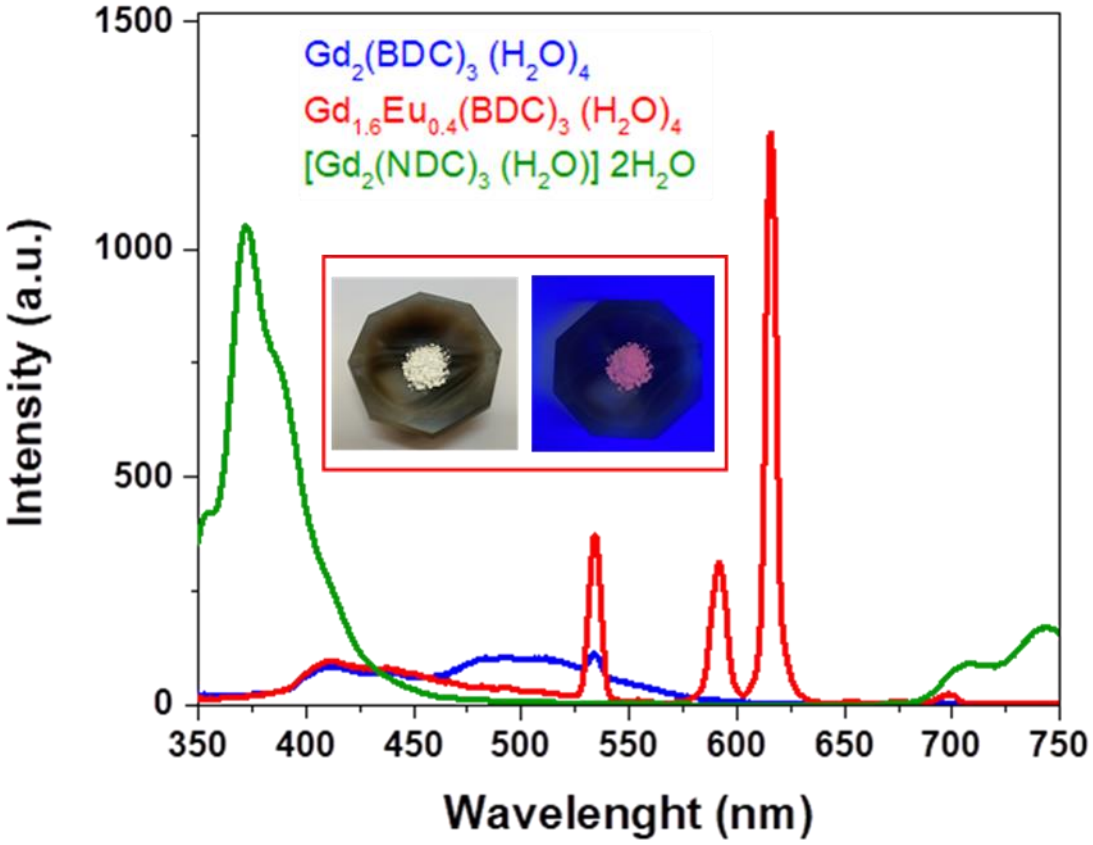


Figure S4. Photoluminescence spectra of aqueous dispersions of the $[Gd_2(BDC)_3(H_2O)_4]$ (blue line), the $[Gd_2(NDC)_3(H_2O)]\cdot(H_2O)_2$ (green line) and the $[Gd_{1.6}Eu_{0.4}(BDC)_3(H_2O)_4]$ (red line) obtained at 1h (λ ecc: 265 nm for the BDC based MOFs and 285 nm for the Gd-NDC).

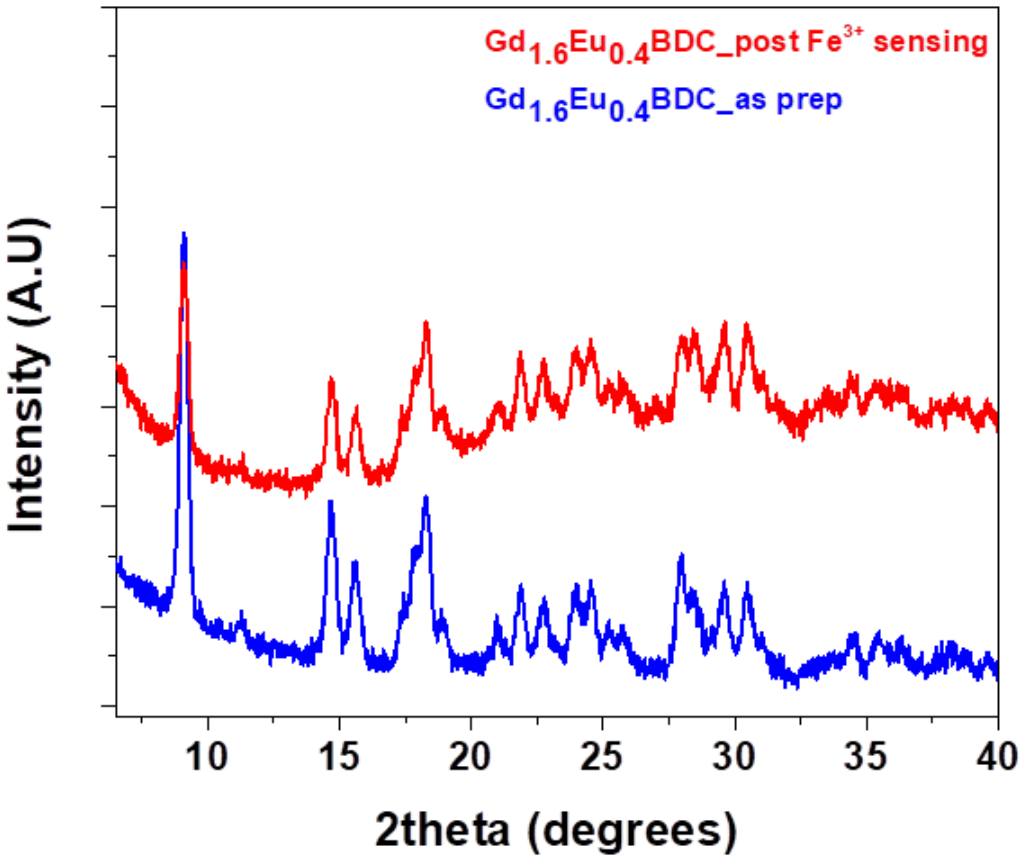
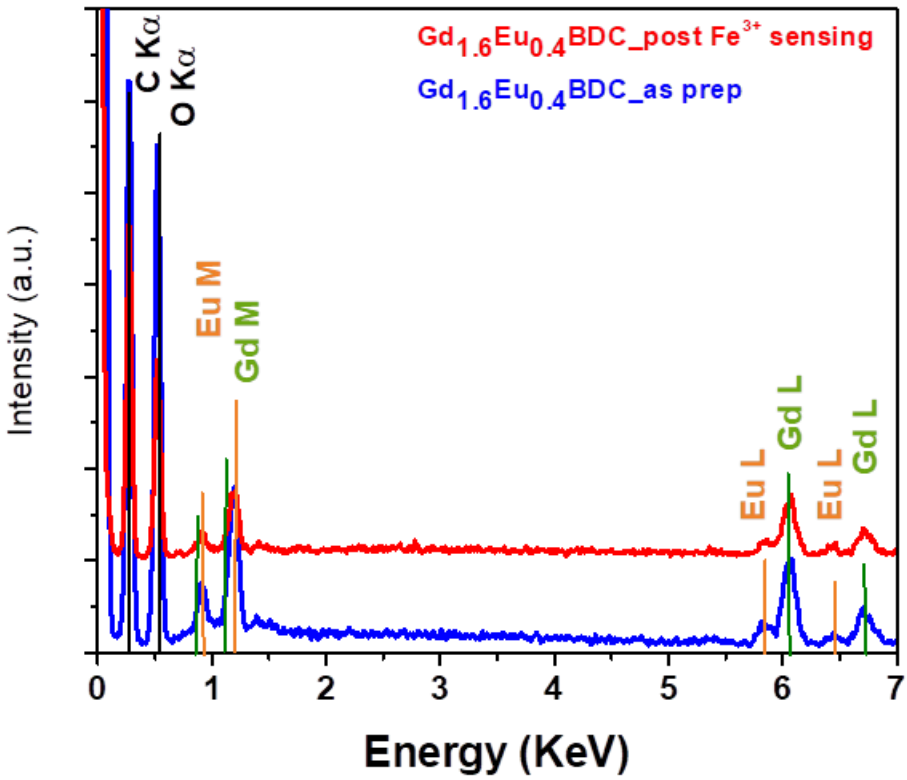


Figure S5. Comparison of the X-ray powder patterns of the $[Gd_{1.6}Eu_{0.4}(BDC)_3(H_2O)_4]$ complex synthesized for 1h before and after Fe^{3+} sensing test.



Sample	Quantitative analysis			
	C (K)	O (K)	Eu (L)	Gd (L)
As prep	63.09%	31.56%	0.98%	4.37%
Post Fe^{3+} sensing	69.86%	23.36%	1.04%	5.15%

Figure S6. EDX spectra and quantitative analysis of $[Gd_{1.6}Eu_{0.4}(BDC)_3 \cdot (H_2O)_4]$ complexes synthesized for 1h before and after Fe^{3+}sensing test.

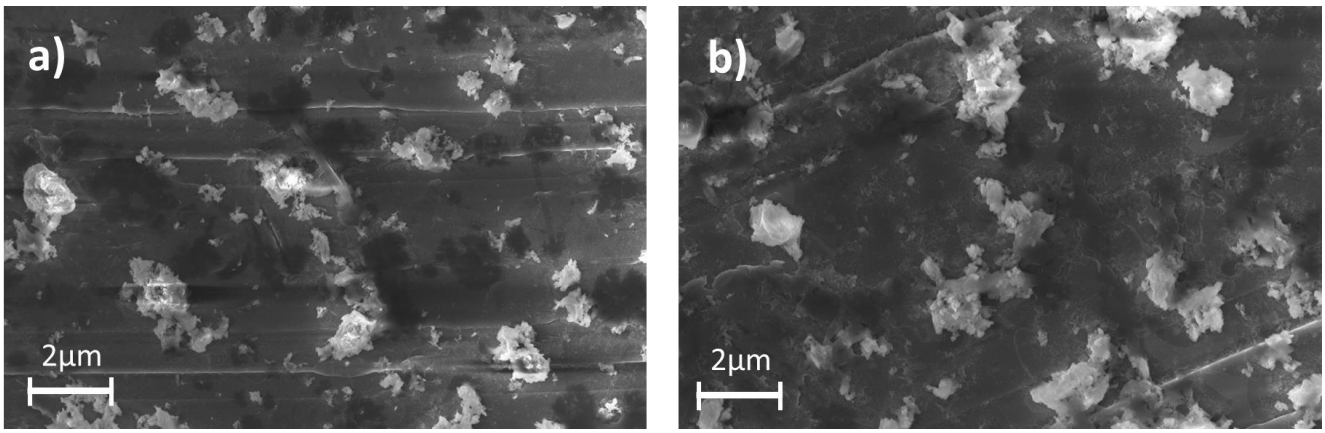


Figure S7. FE-SEM images of (**a**) the $[Gd_2(BDC)_3(H_2O)_4]$ and (**b**) the $[Gd_{1.6}Eu_{0.4}(BDC)_3(H_2O)_4]$ as aggregate distribution after suspension processes.

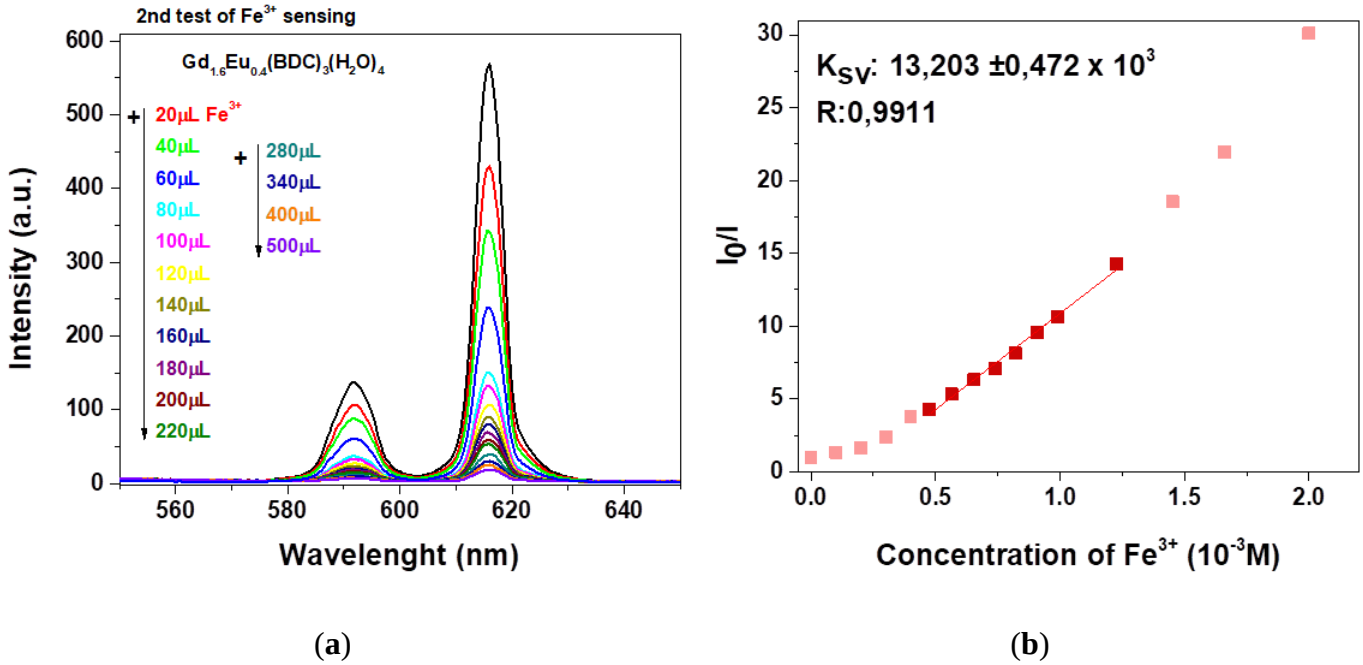


Figure S8. (**a**) Emission spectra and (**b**) Ksv curve of second set of sensing test on $Gd_{1.6}Eu_{0.4}(BDC)_3(H_2O)_3$ (2 mg) dispersed into aqueous solution in the presence of various concentrations of Fe^{3+} under excitation at 265 nm.

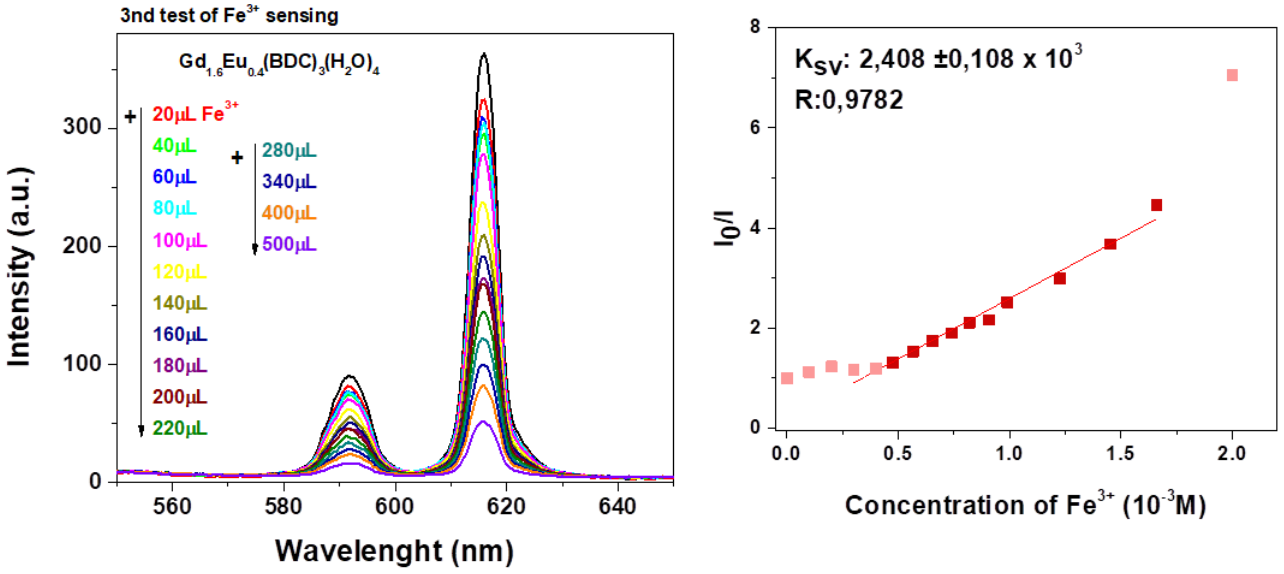


Figure S9. (**a**) Emission spectra and (**b**) Ksv curve of third set of sensing test on $Gd_{1.6}Eu_{0.4}(BDC)_3(H_2O)_3$ (2 mg) dispersed into aqueous solution in the presence of various concentrations of Fe^{3+} under excitation at 265 nm.

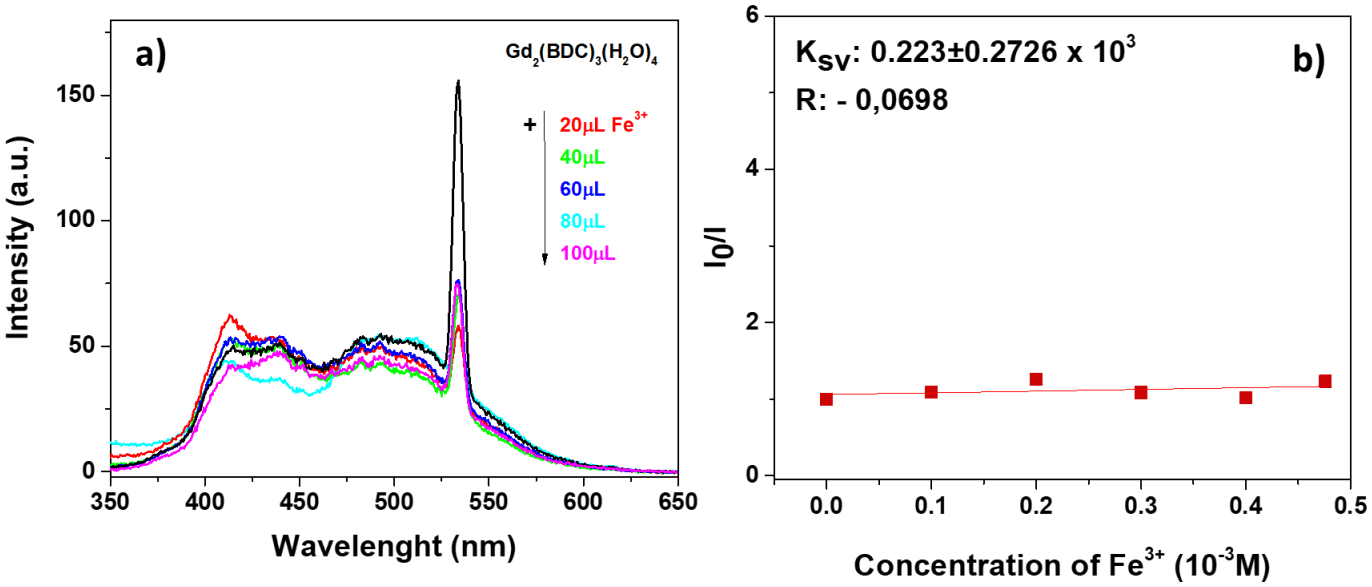


Figure S10. (**a**) Emission spectra and (**b**) Ksv curve of sensing test on $Gd_2(BDC)_3(H_2O)_3$ (2 mg) dispersed into aqueous solution in the presence of various concentrations of Fe^{3+} under excitation at 265 nm.

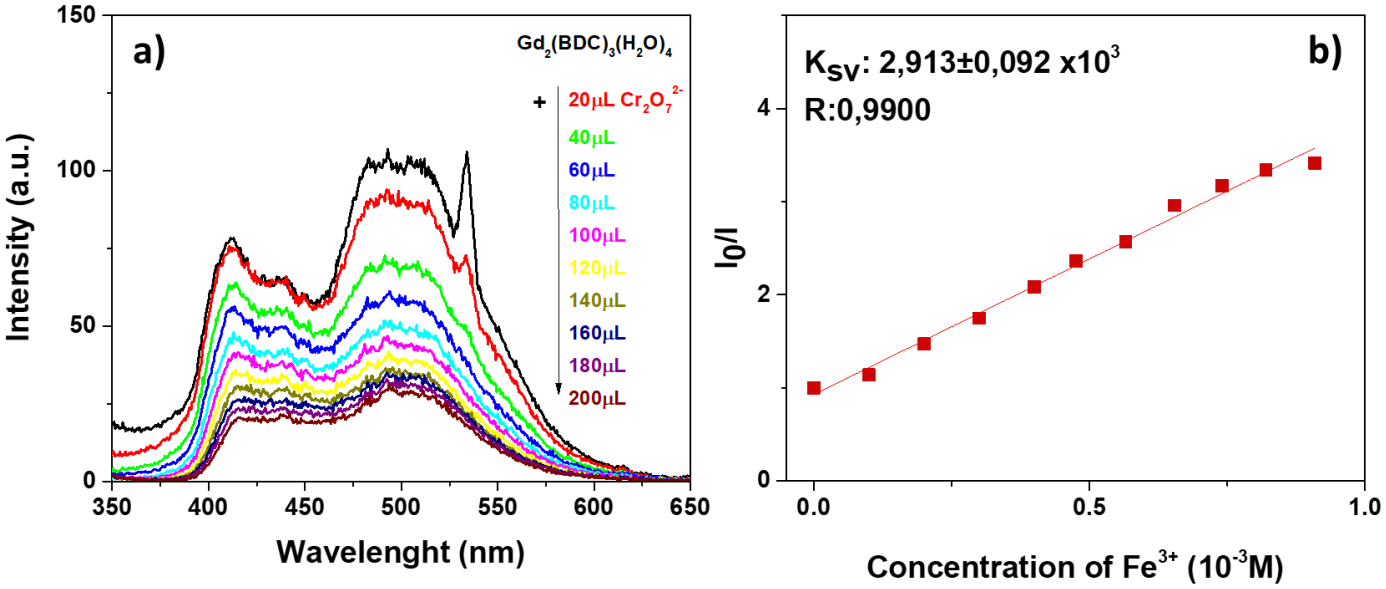


Figure S11. (**a**) Emission spectra and (**b**) Ksv curve of sensing test on $Gd_2(BDC)_3(H_2O)_3$ (2 mg) dispersed into aqueous solution in the presence of various concentrations of $Cr_2O_7^{2-}$ under excitation at 265 nm.