

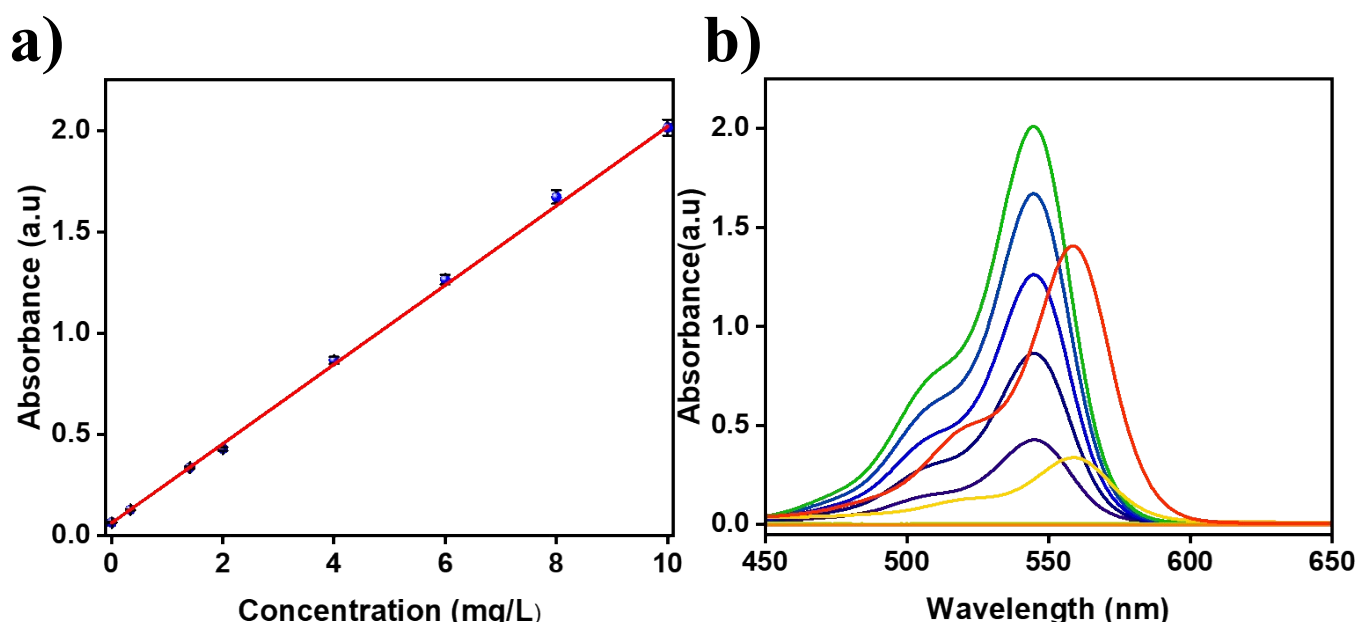
# A hierarchically porous RhB encapsulated ZIF-7 as a dual emission fluorescence probe for ultrasensitive detection of melamine in infant formulations

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## Supplementary Information



**Figure S1.** Standard absorbance curve of RhB aqueous solution and absorbance of acid hydrolysis solution for pristine ZIF-7, RhB<sub>10</sub>@ZIF-7, RhB<sub>30</sub>@ZIF-7, RhB<sub>50</sub>@ZIF-7, and RhB standard aqueous solutions.

## Acid hydrolysis of RhB<sub>x</sub>@ZIF-7 and pristine ZIF-7 in controlled experiments

50 mg RhB<sub>x</sub>@ZIF-7 and pristine ZIF-7 were dispersed in 1 ml 1M HCl and allowed to decompose fully. The obtained solutions were diluted appropriately and were collected by filtration using a 0.45 µm PTFE syringe filter. Absorbance of these solutions was measured. The RhB solution concentration is calculated by the RhB standard curve, and the loaded weight percentage (w%) is determined.

**Table S1:** Loaded weight percentage of RhB in different samples.

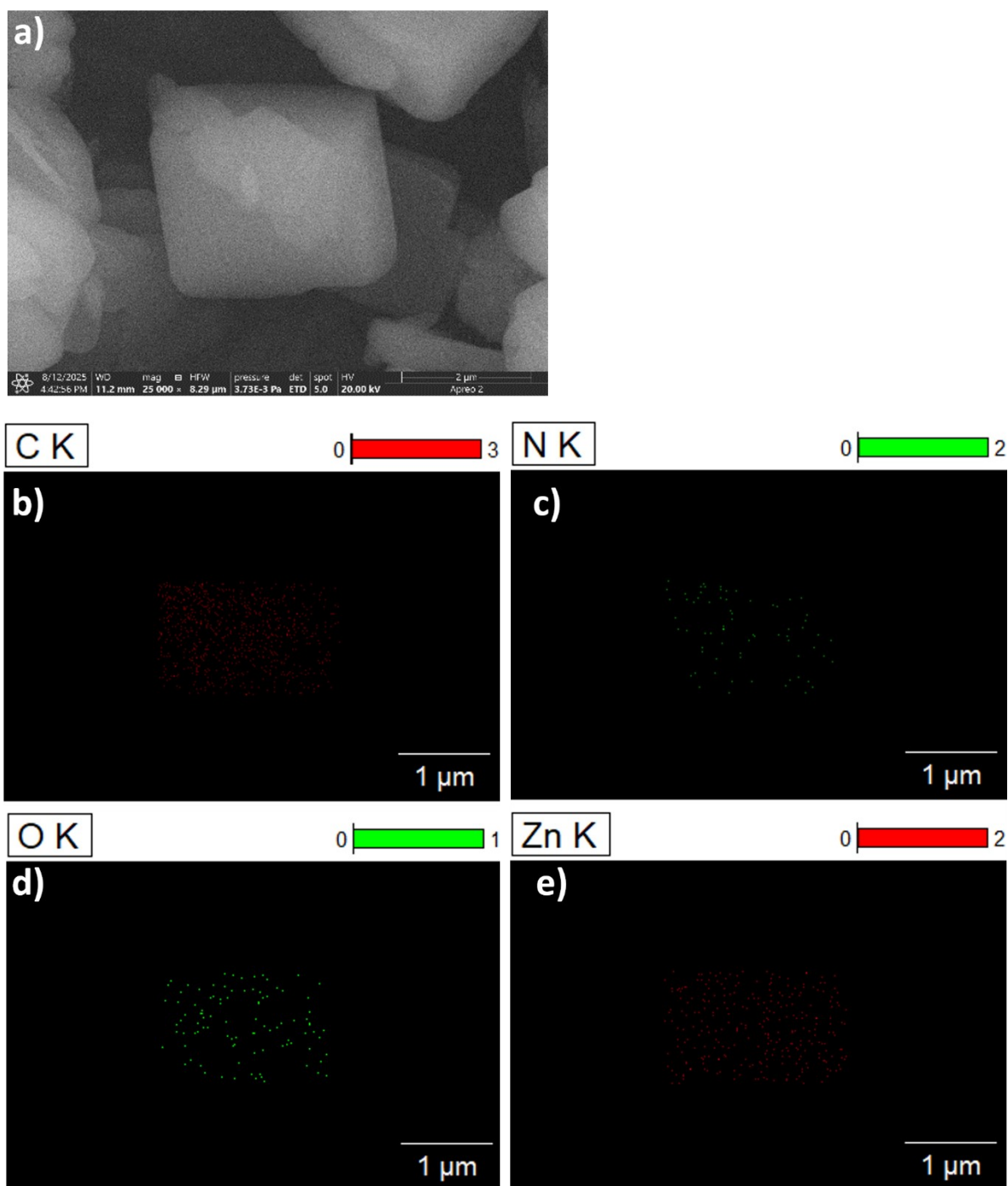
	Samples	M <sub>RhB<sub>x</sub>@ZIF-7</sub> (mg)	C <sub>RhB</sub> (mg/L)	M <sub>RhB</sub> (mg)	X <sub>RhB</sub> (w%)
1.	ZIF-7	50	0	0	0
2.	RhB <sub>10</sub> @ZIF-7	50.0	0.01149	$3.449 \times 10^{-5}$	0.069
3.	RhB <sub>30</sub> @ZIF-7	50.0	0.3321	$9.962 \times 10^{-4}$	2
4.	RhB <sub>50</sub> @ZIF-7	50.0	1.399	$4.196 \times 10^{-3}$	8.4

M<sub>RhB<sub>x</sub>@ZIF-7</sub> = mass of composite hydrolyzed

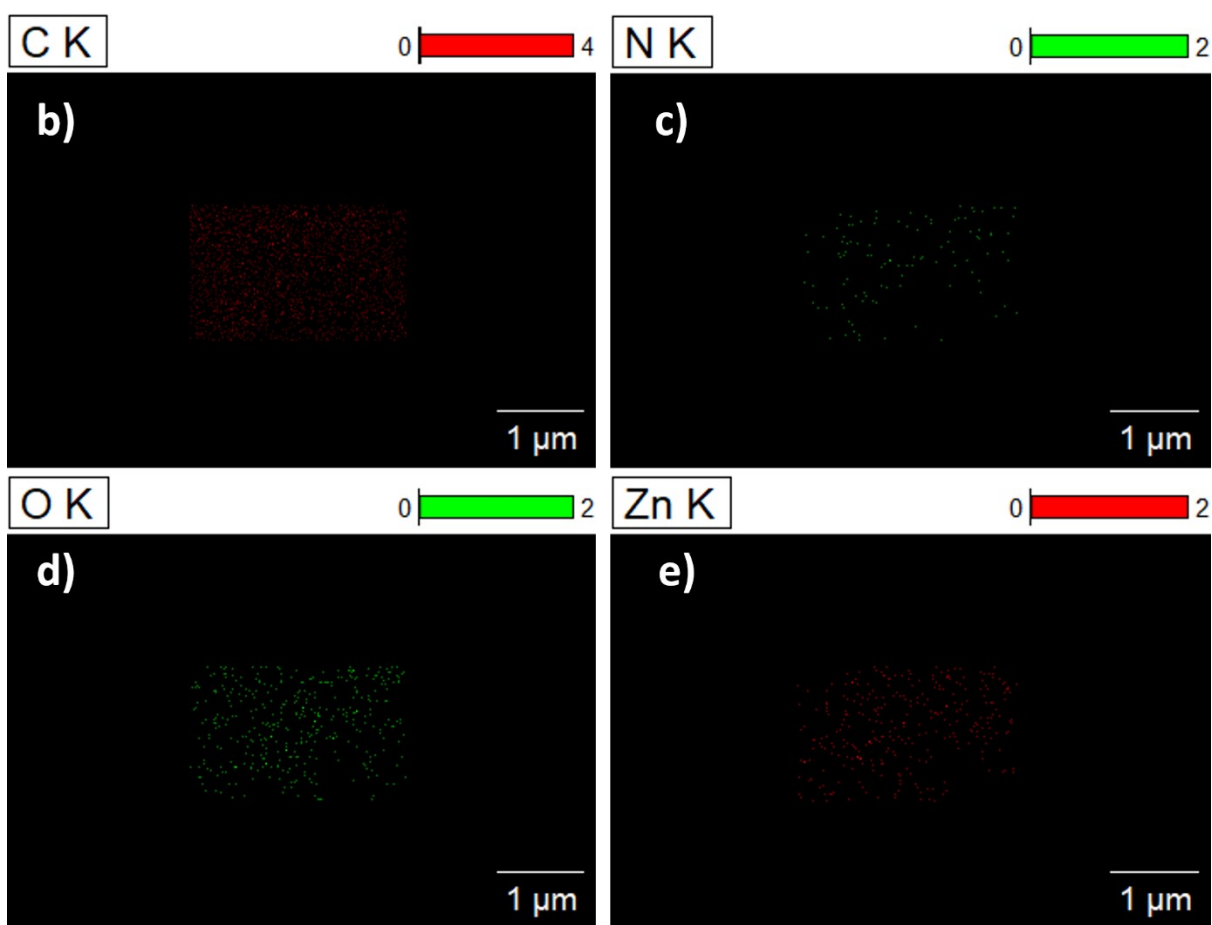
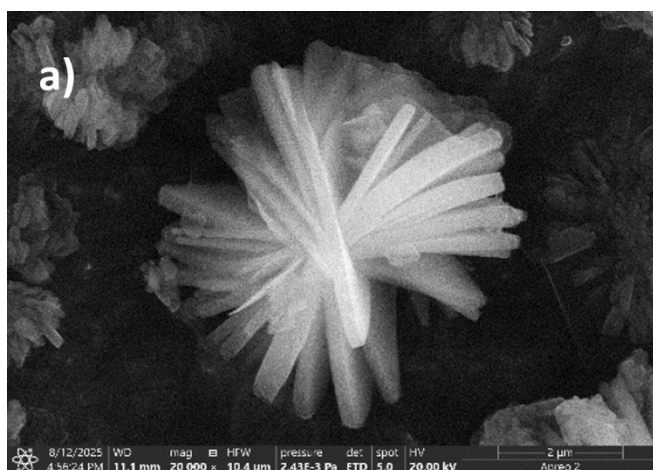
C<sub>RhB</sub> = Concentration of RhB after hydrolysis

M<sub>RhB</sub> = Mass of RhB recovered

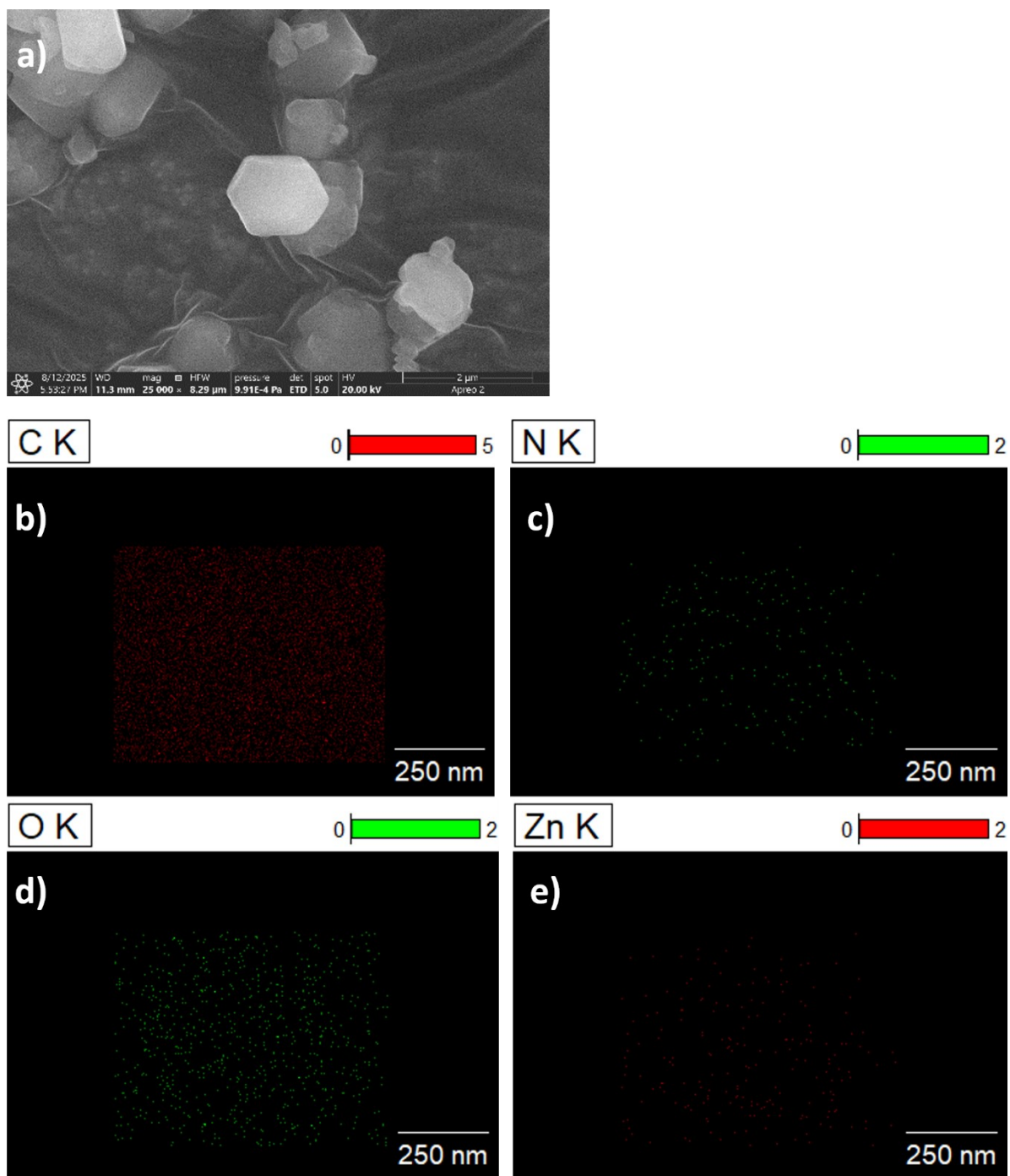
X<sub>RhB</sub> = RhB loading as weight %



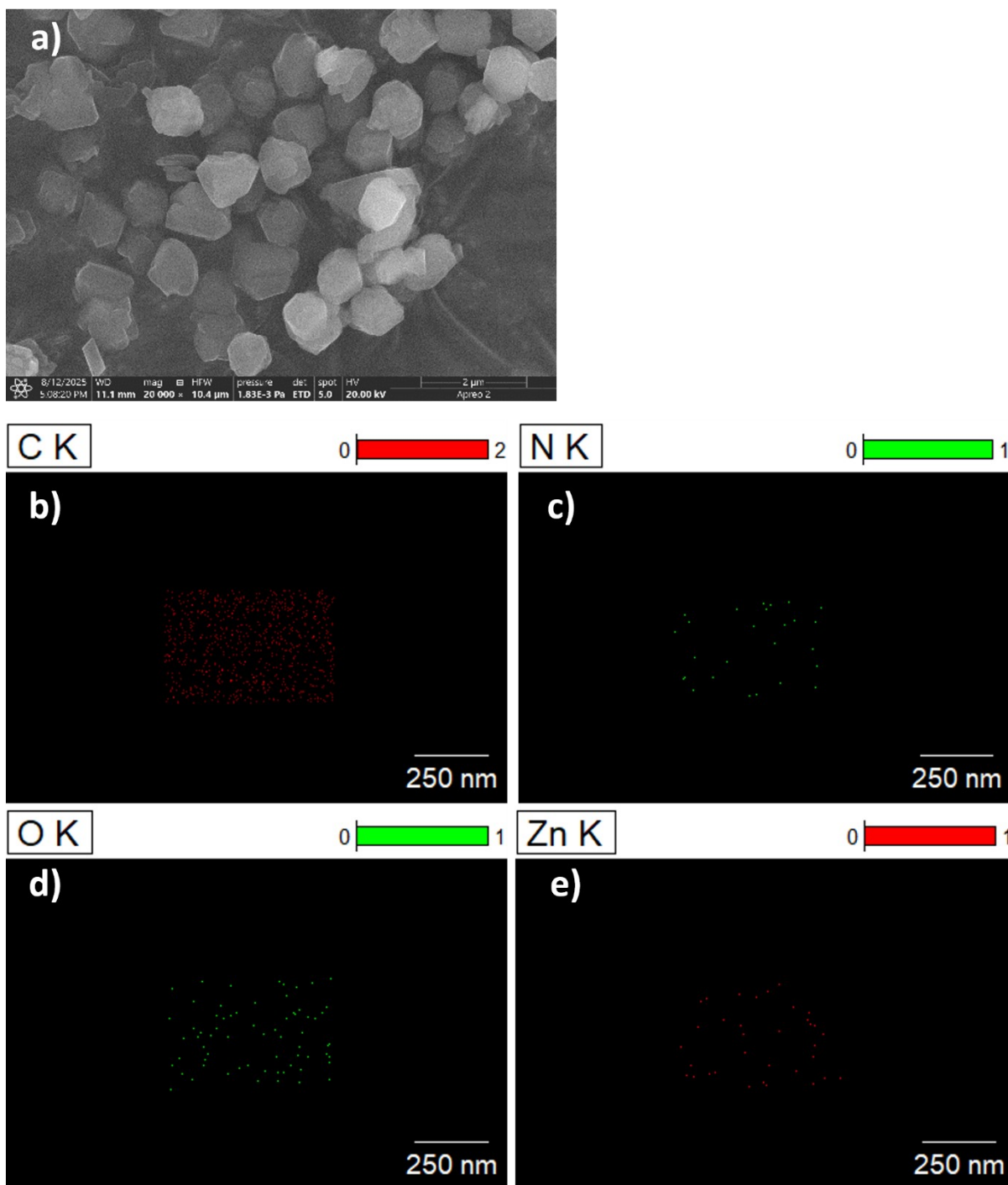
**Figure S2.** SEM image and elemental mapping of pristine ZIF-7.



**Figure S3.** SEM image and elemental mapping of RhB<sub>10</sub>@ZIF-7.

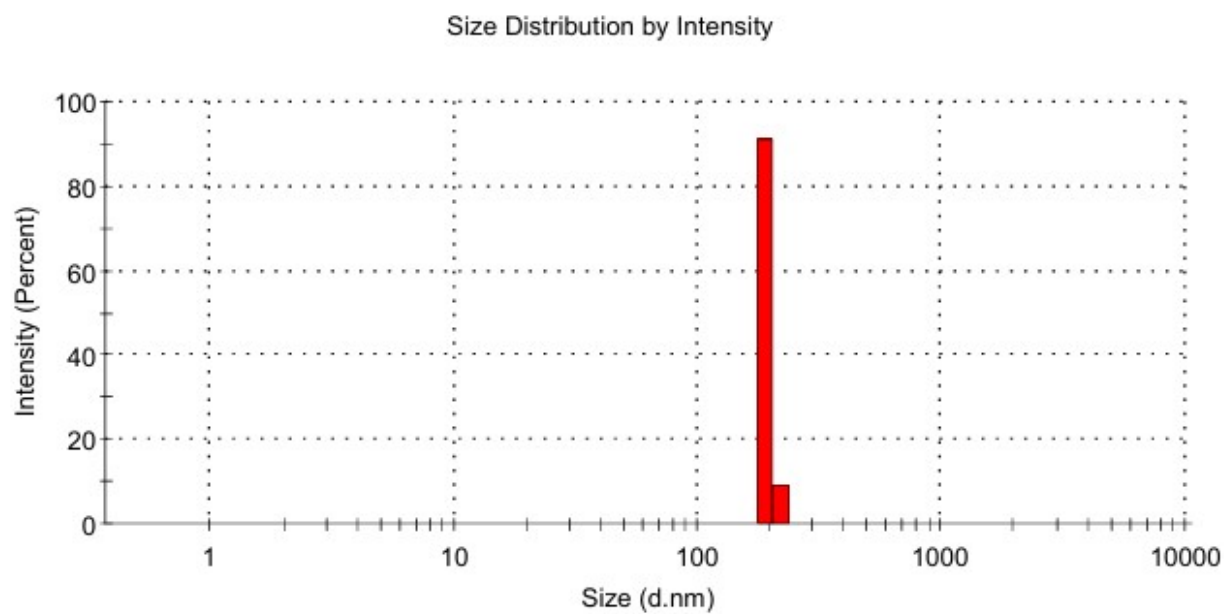


**Figure S4.** SEM image and elemental mapping of RhB<sub>30</sub>@ ZIF-7.

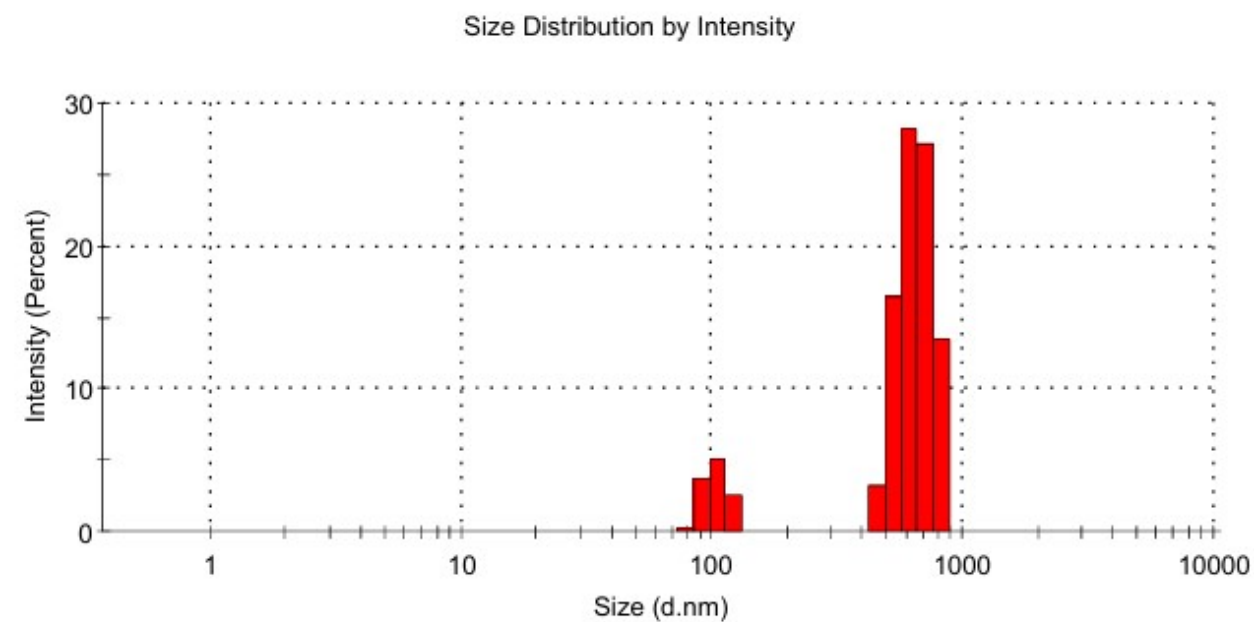


**Figure S5.** SEM image and elemental mapping of RhB<sub>50</sub>@ ZIF-7.

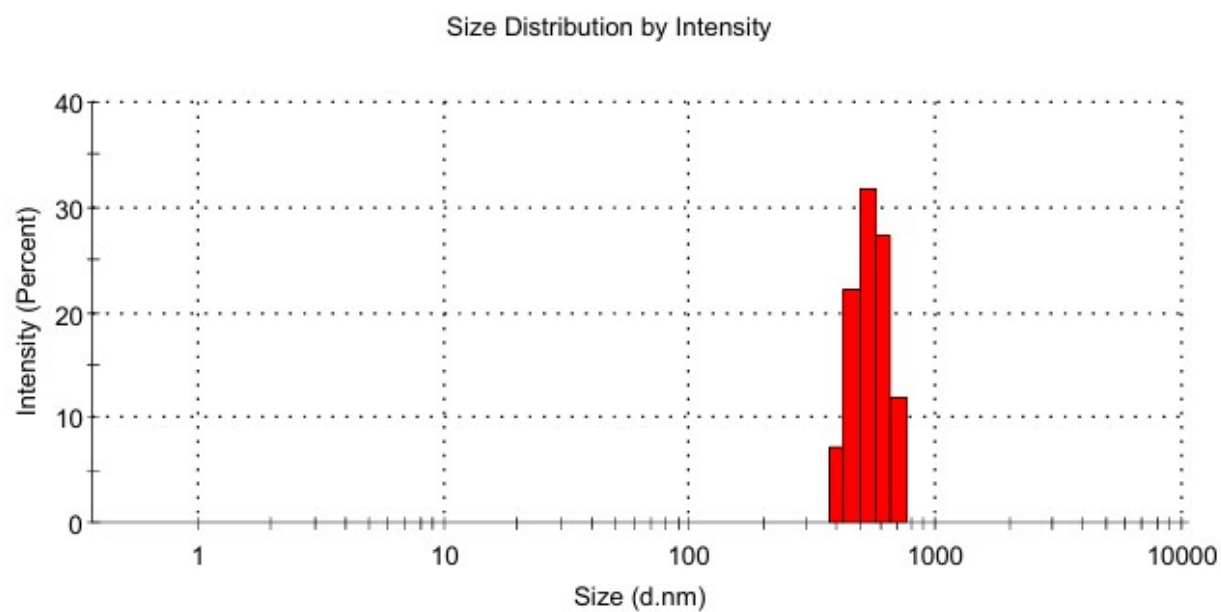
a)



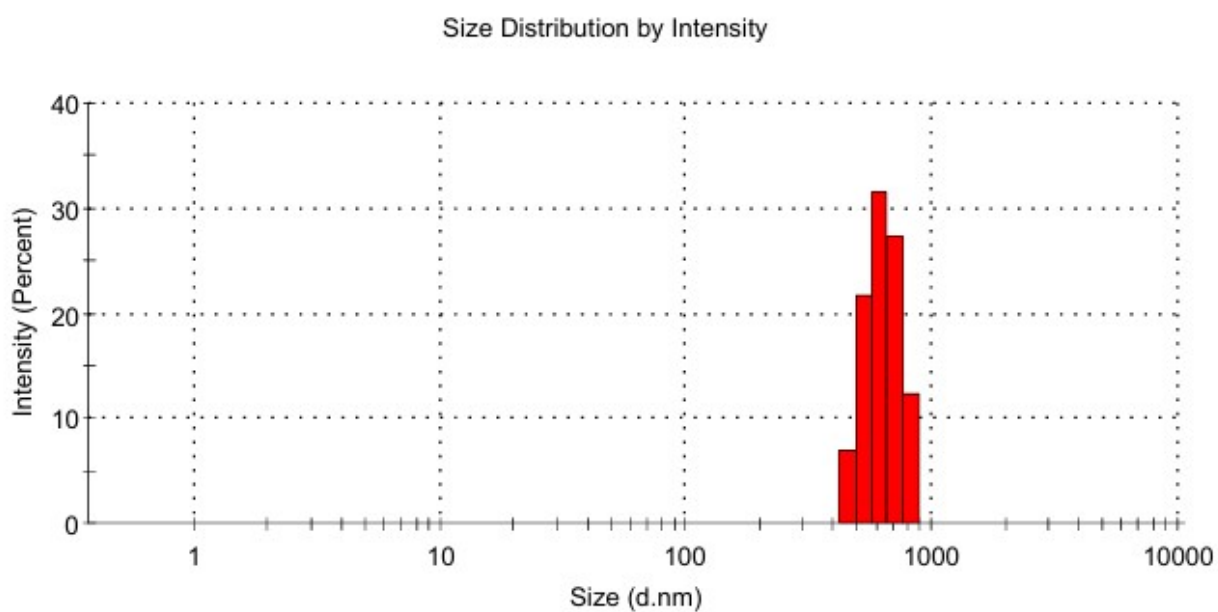
b)



c)

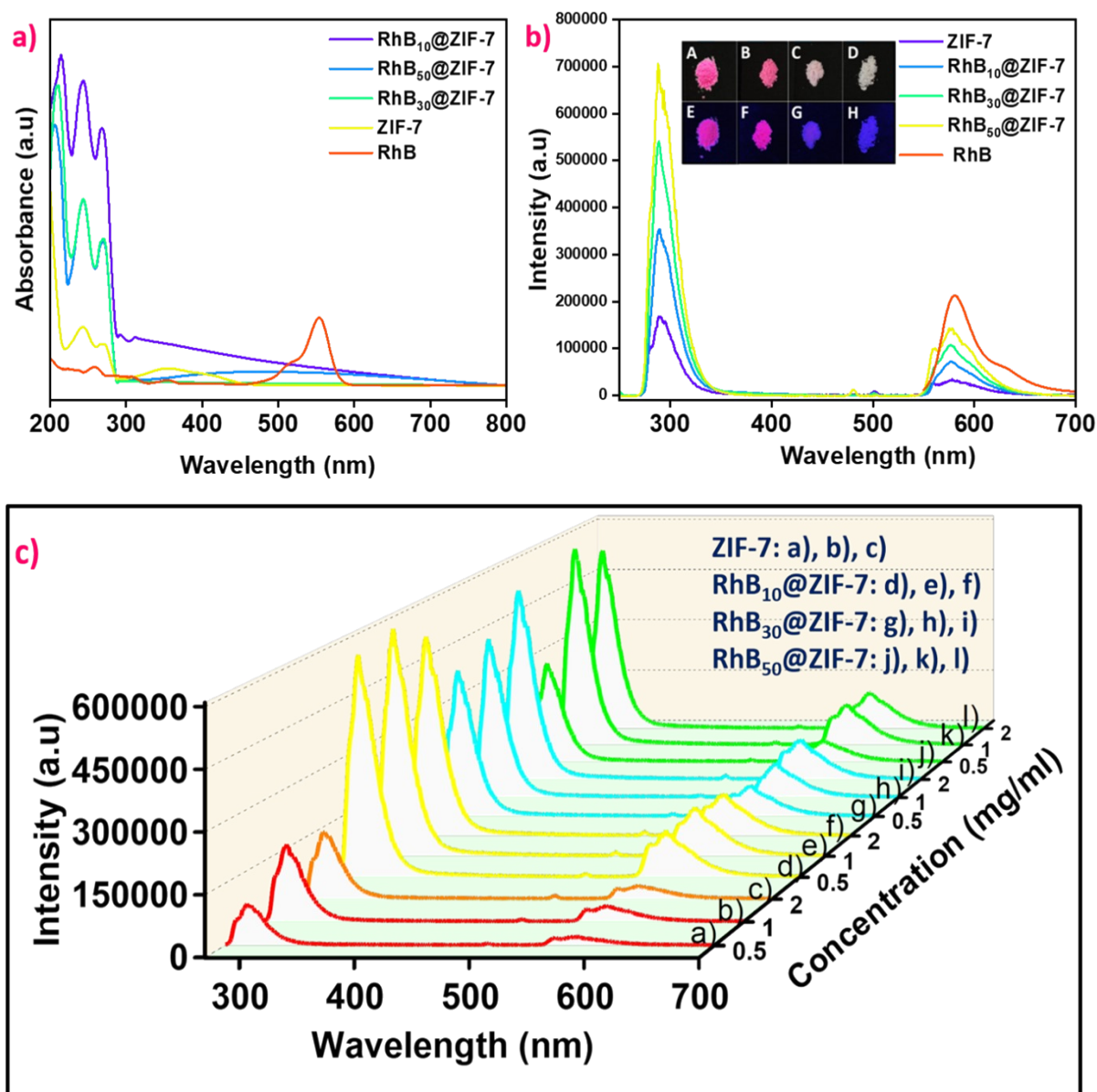


d)

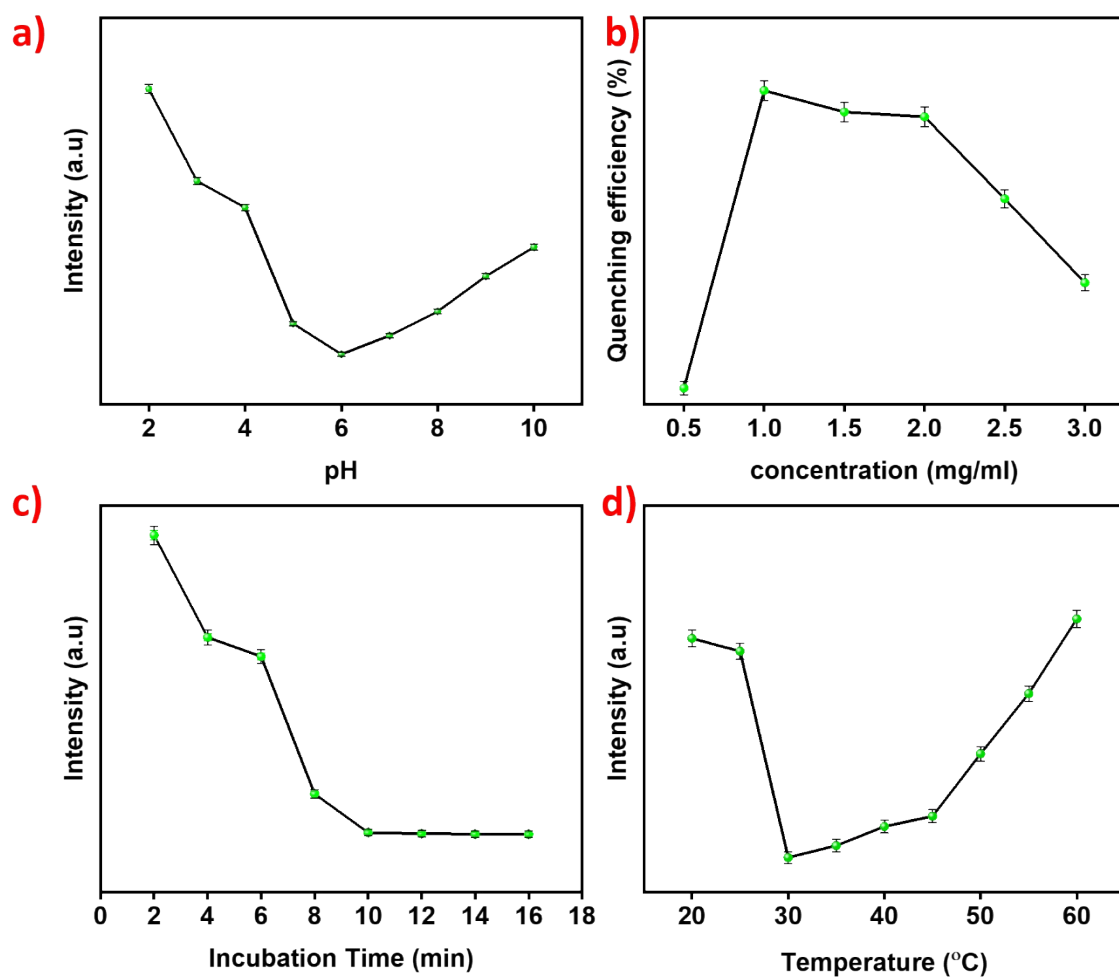


**Figure S6.** DLS Particle size analysis of a) pristine ZIF-7 , b) RhB<sub>10</sub>@ZIF-7, c) RhB<sub>30</sub>@ZIF-7, d) RhB<sub>50</sub>@ZIF-7

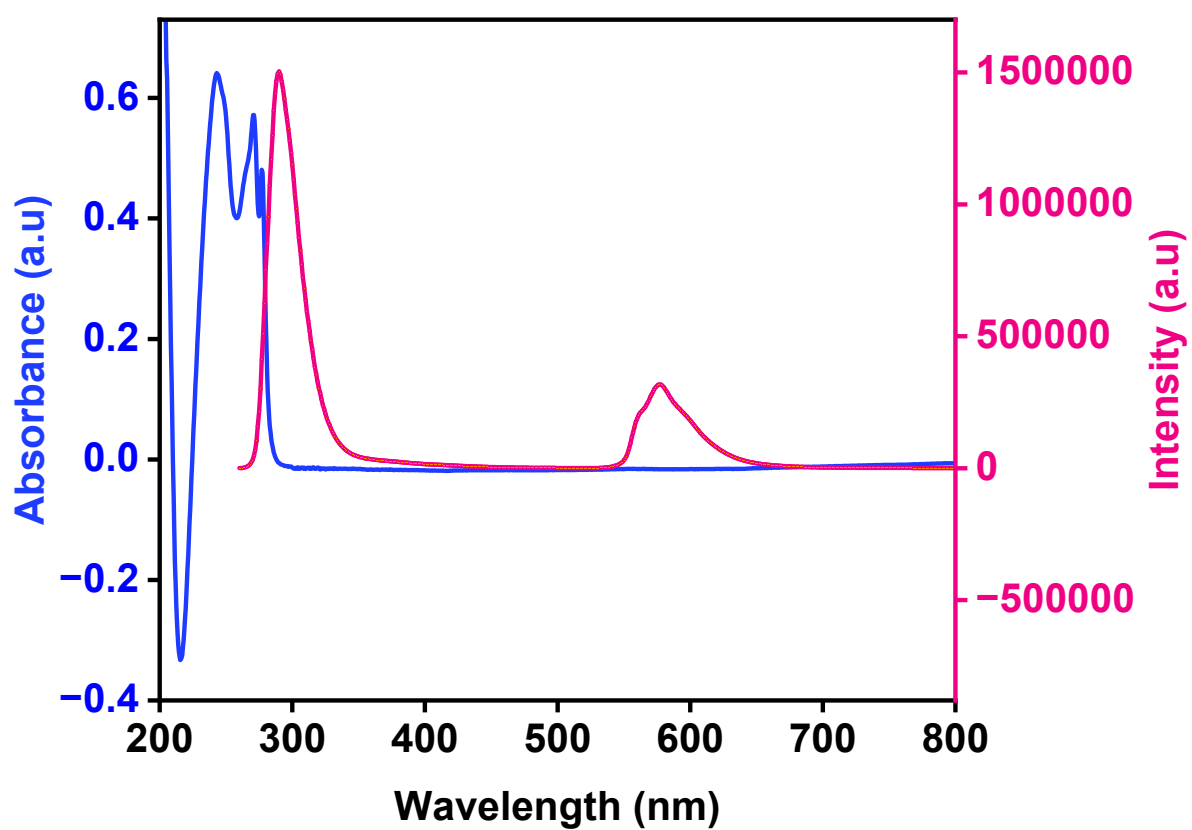




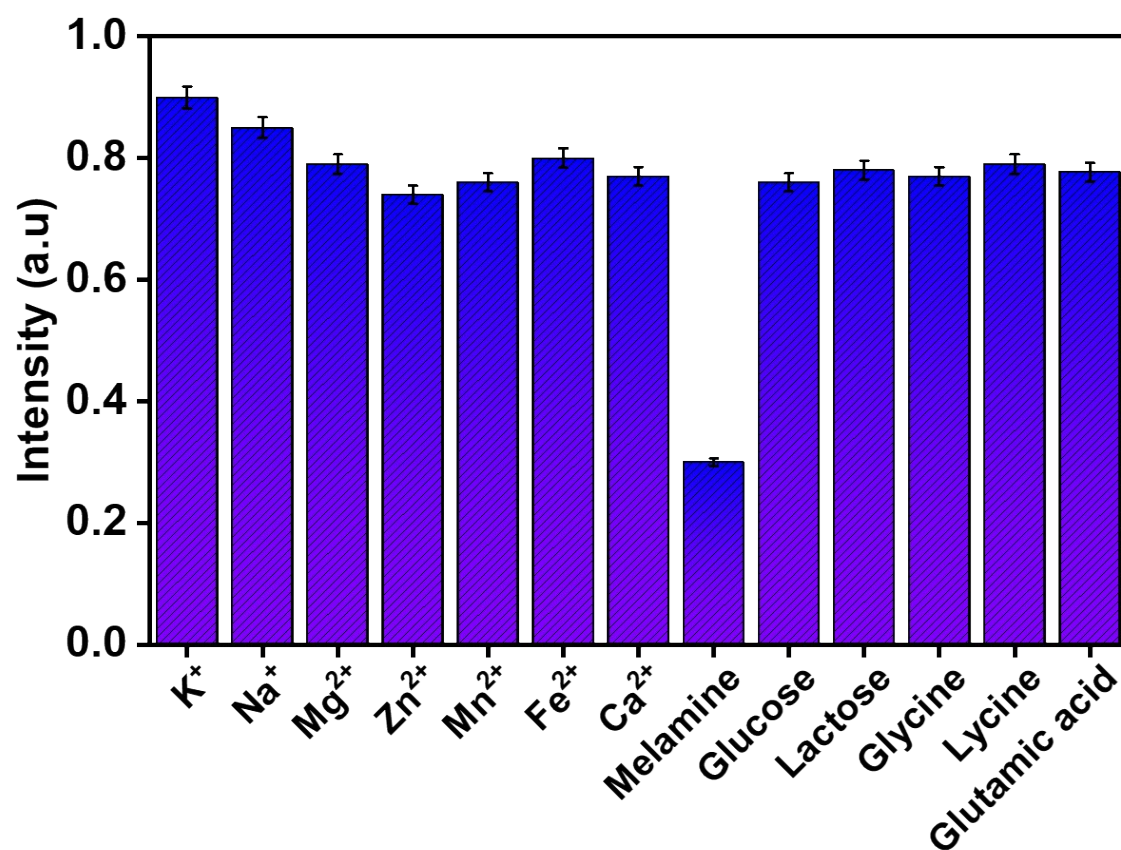
**Figure S7.** a) Absorption and b) Emission spectra of RhB, ZIF-7, and RhB<sub>x</sub>@ZIF-7 ( $x = 10, 30, 50$ ). Inset; Image under visible light A) RhB<sub>50</sub>@ZIF-7, B) RhB<sub>30</sub>@ZIF-7, C) RhB<sub>10</sub>@ZIF-7 and D) ZIF-7 & Image under UV light (365 nm) E) RhB<sub>50</sub>@ZIF-7, F) RhB<sub>30</sub>@ZIF-7, G) RhB<sub>10</sub>@ZIF-7 and H) ZIF-7. c) Emission spectra showing fluorescence response of ZIF-7, RhB<sub>10</sub>@ZIF-7, RhB<sub>30</sub>@ZIF-7, and RhB<sub>50</sub>@ZIF-7 to varying concentrations – 0.5, 1, and 2 mg/ml.



**Figure S8.** Effect of a) pH, b) probe concentration, c) incubation time, and d) temperature on the dual emission fluorescence detection of melamine.



**Figure S9.** Absorption and emission spectra of RhB<sub>30</sub>@ZIF-7.



**Figure S10.** Fluorescent intensity response of RhB<sub>30</sub>@ZIF-7 system towards various ions and molecules (K<sup>+</sup>, Na<sup>+</sup>, Mg<sup>2+</sup>, Zn<sup>2+</sup>, Mn<sup>2+</sup>, Fe<sup>2+</sup>, Ca<sup>2+</sup>, Glucose, Lactose).