Electronic Supplementary Information (ESI)

A novel reversible fluorescent probe for the highly sensitive detection of nitro and peroxide organic explosives using electrospun $BaWO_4$ nanofibers

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Results

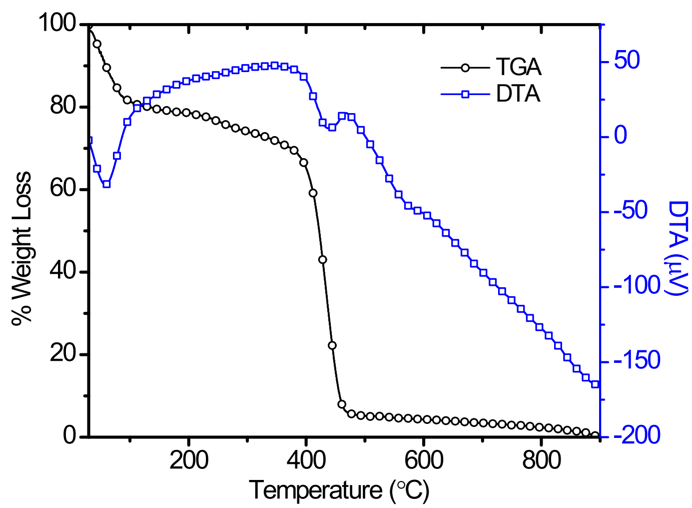

Fig. S1. Thermogravimetric analysis of PVP/$Ba(Ac)_2$/AMT composite nanofibers.

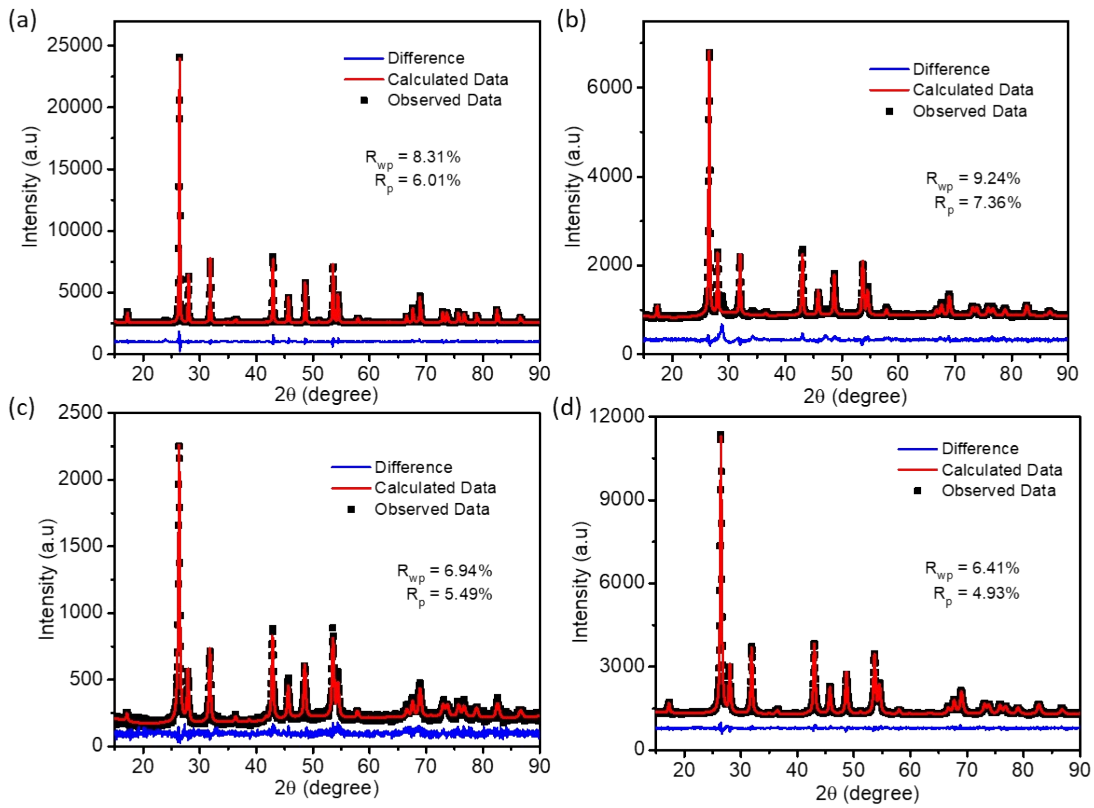

Fig. S2. Rietveld refined XRD patterns of (a) $BaWO_4$, (b) $BaWO_4$:5Tb, (c) $BaWO_4$:5Eu, and (d) $BaWO_4$:5Tb−5Eu nanofibers.

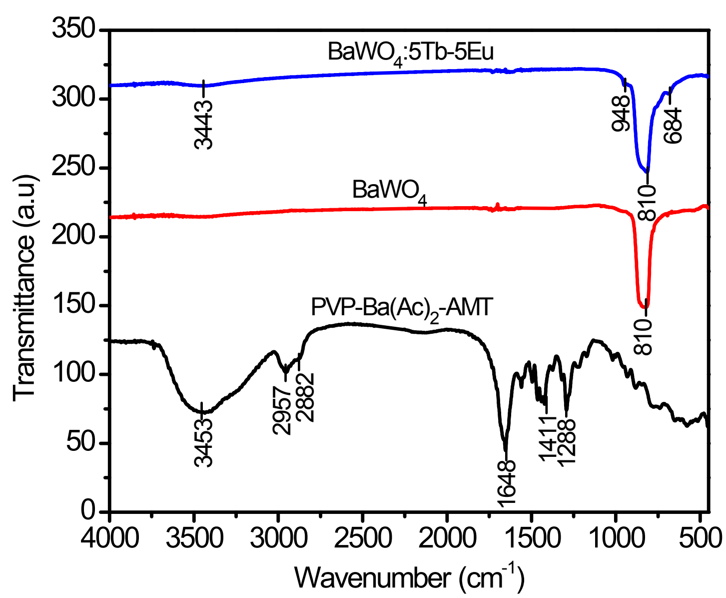

Fig. S3. FTIR spectra comparing the nanofibers before and after calcination.

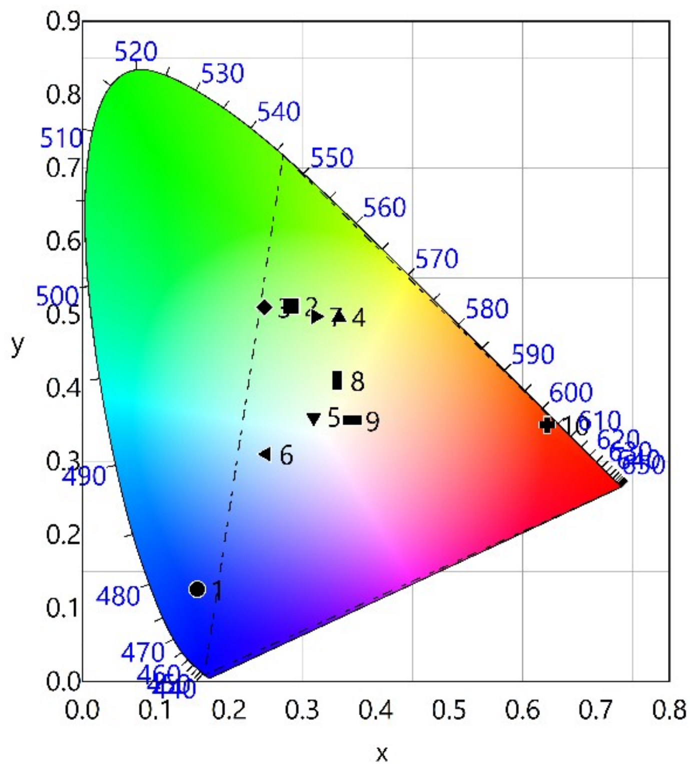

Fig. S4. CIE diagram corresponding to the PL emission of $BaWO_4$ nanofiber phosphors.

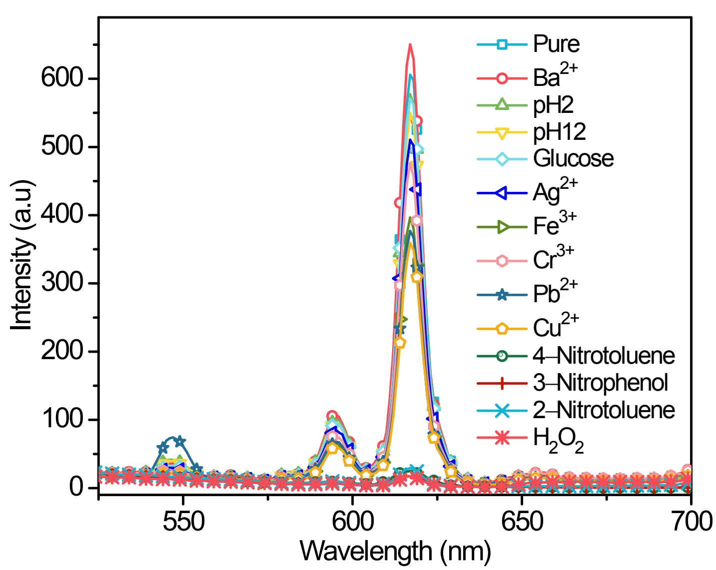

Fig. S5. PL spectra of the $BaWO_4$:5Tb-5Eu nanofiber dispersion in water, in the presence of different analytes.

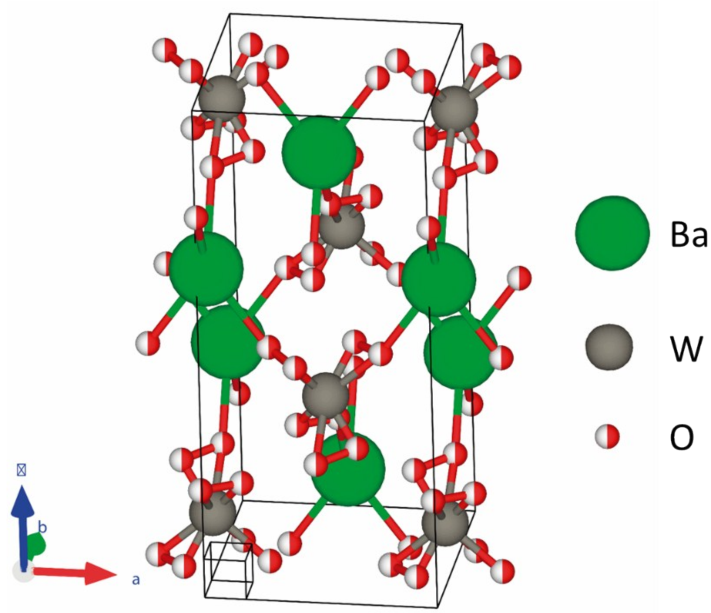

Fig. S6. Crystal Structure of $BaWO_4$.

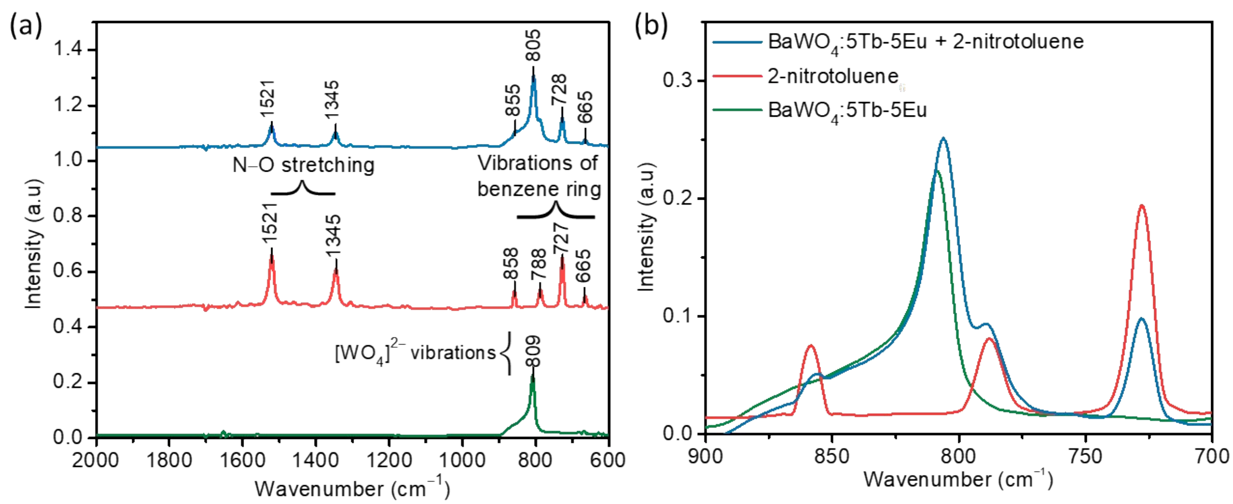

Fig. S7. FTIR spectra of $BaWO_4$:5Tb−5Eu nanofibers in the presence and absence of 2-nitrotoluene, and (b) is the magnified view of (a).

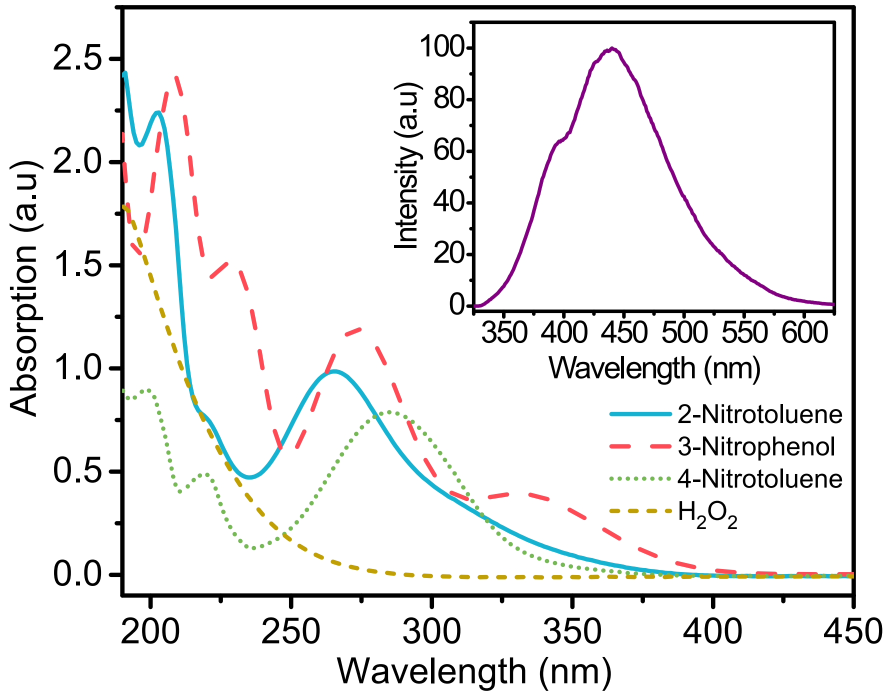

Fig. S8. The comparison of UV spectra of the analytes in water with the emission spectra of the pure $BaWO_4$ nanofibers in the solid state (in the inset).

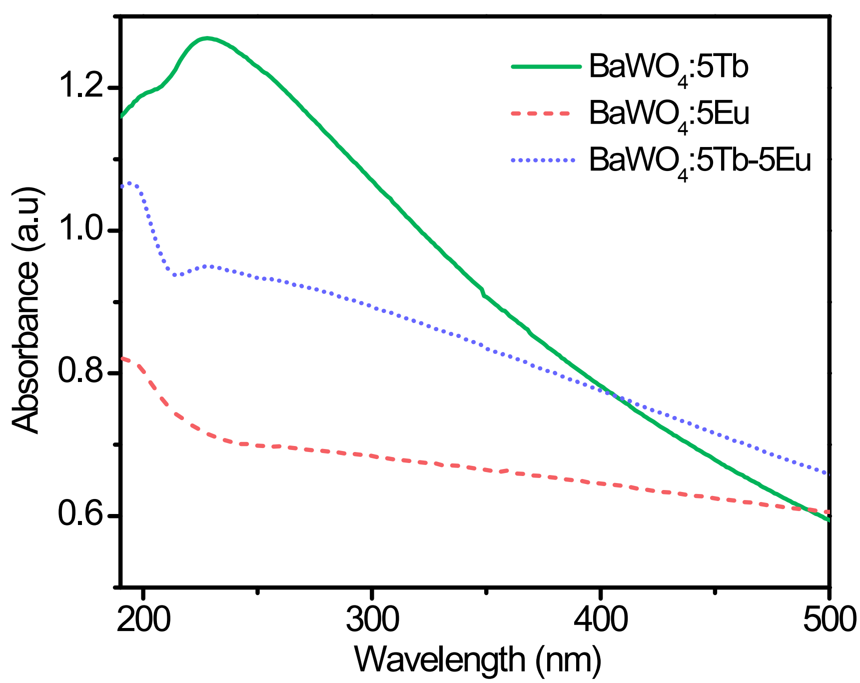

Fig. S9. The UV absorption spectra of RE^{3+} doped $BaWO_4$ nanofibers dispersed in water.

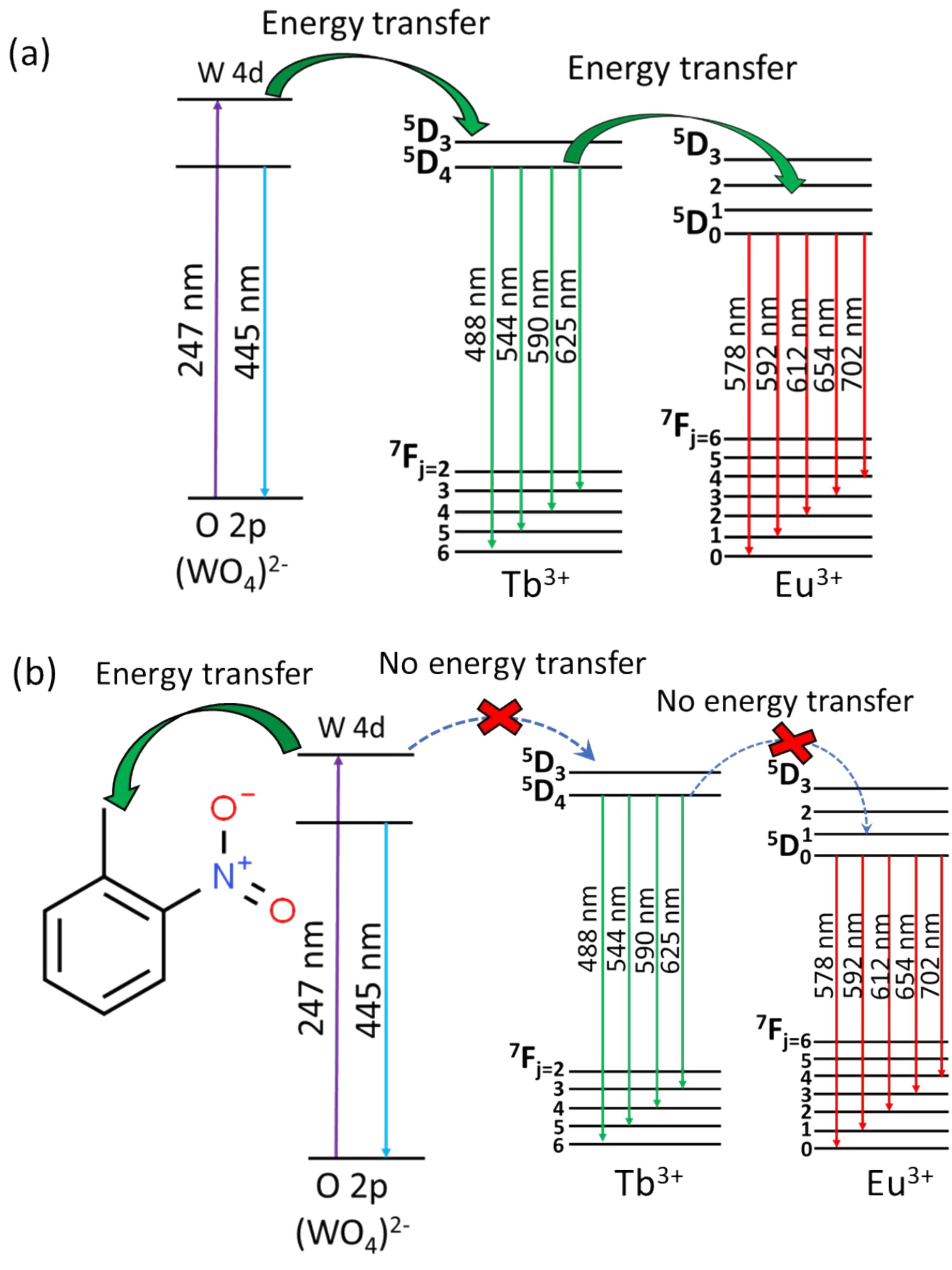

Fig. S10. Schematic of the energy-transfer mechanism in the (a) absence and (b) presence of 2-nitrotoluene, when $BaWO_4$:5Tb-5Eu nanofibers are used as a fluorescent probe.

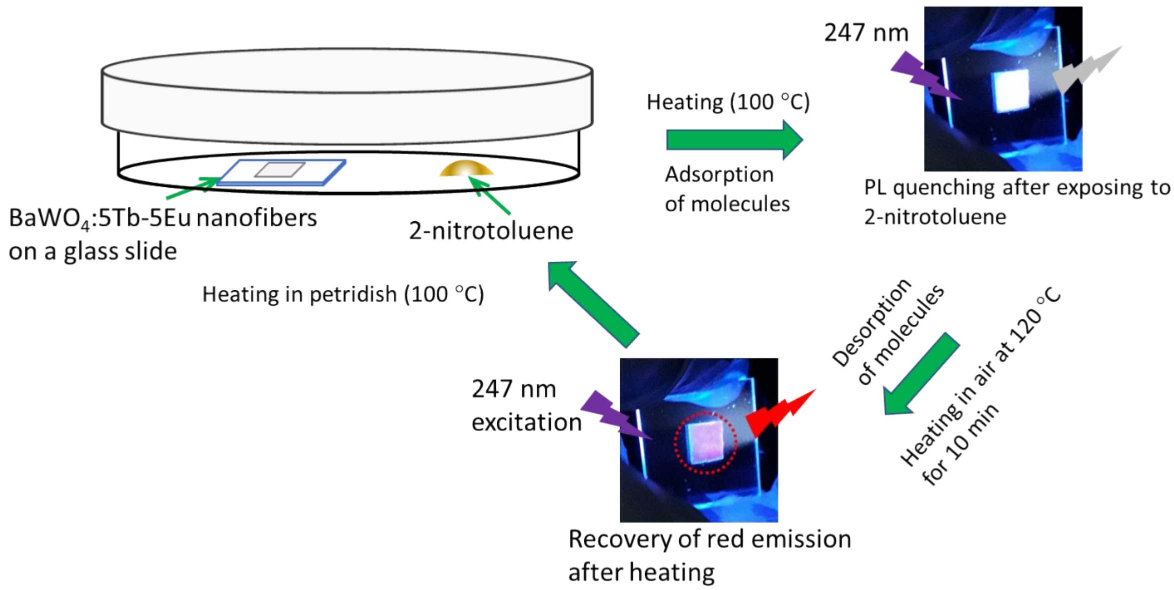

Fig. S11. Schematic representation for testing the cyclic recovery of PL emission from solid-state $BaWO_4$:5Tb-5Eu nanofibers in the absence and presence 2-nitrotoluene vapor and the photographs display the emission from the nanofibers under 247 nm UV excitation in the presence and absence of 2-nitrotoluene during the cycle.

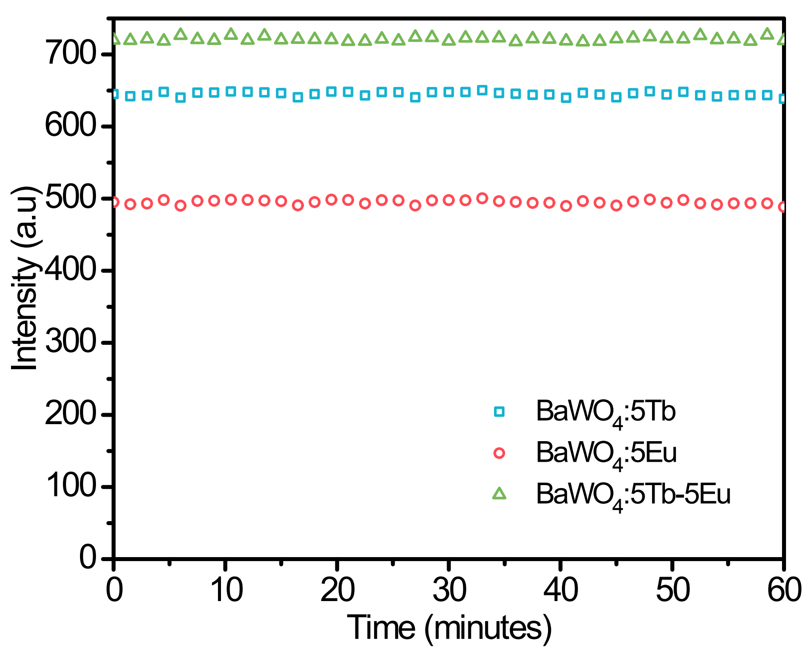

Fig. S12. The photobleaching studies on solid-state RE^{3+} doped $BaWO_4$ nanofibers.