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Supporting Information

Specific recognition of formaldehyde by a cucurbit[10]uril-based porous supramolecular assembly incorporating adsorbed 1,8-diaminonaphthalene

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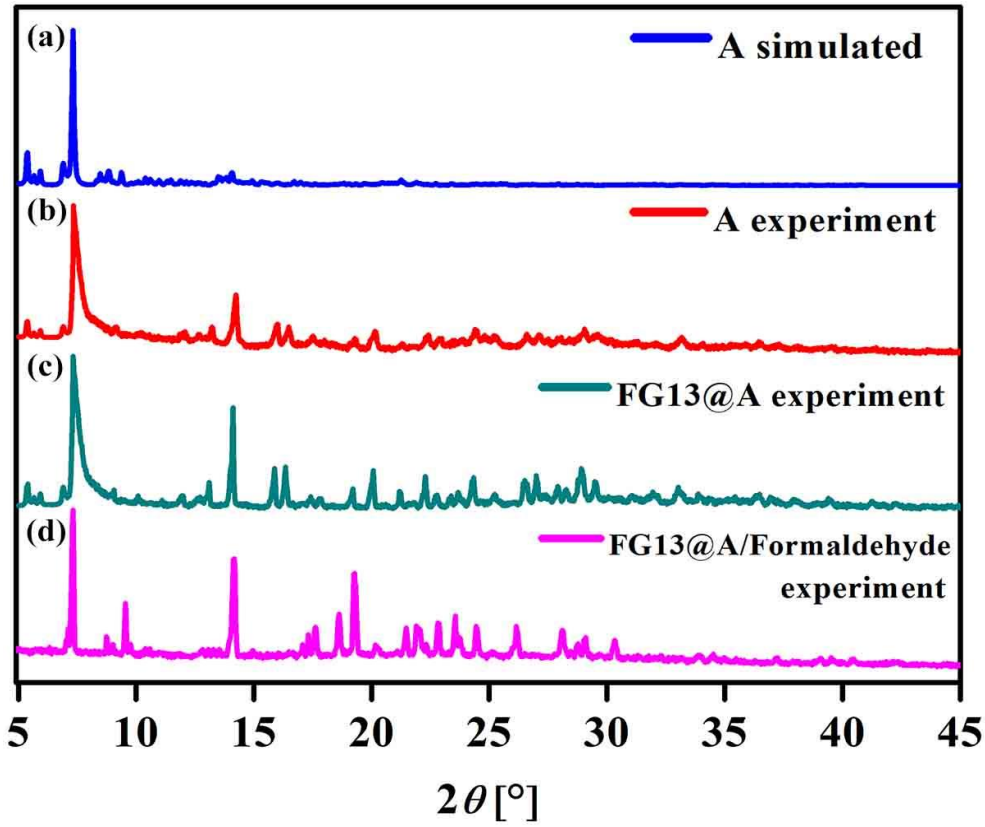


Figure S1. Powder X-ray diffraction analyses of **A** (a) simulation and (b) experiment; (c) FG13@**A** and (d) FG13@**A** with adsorbed formaldehyde.

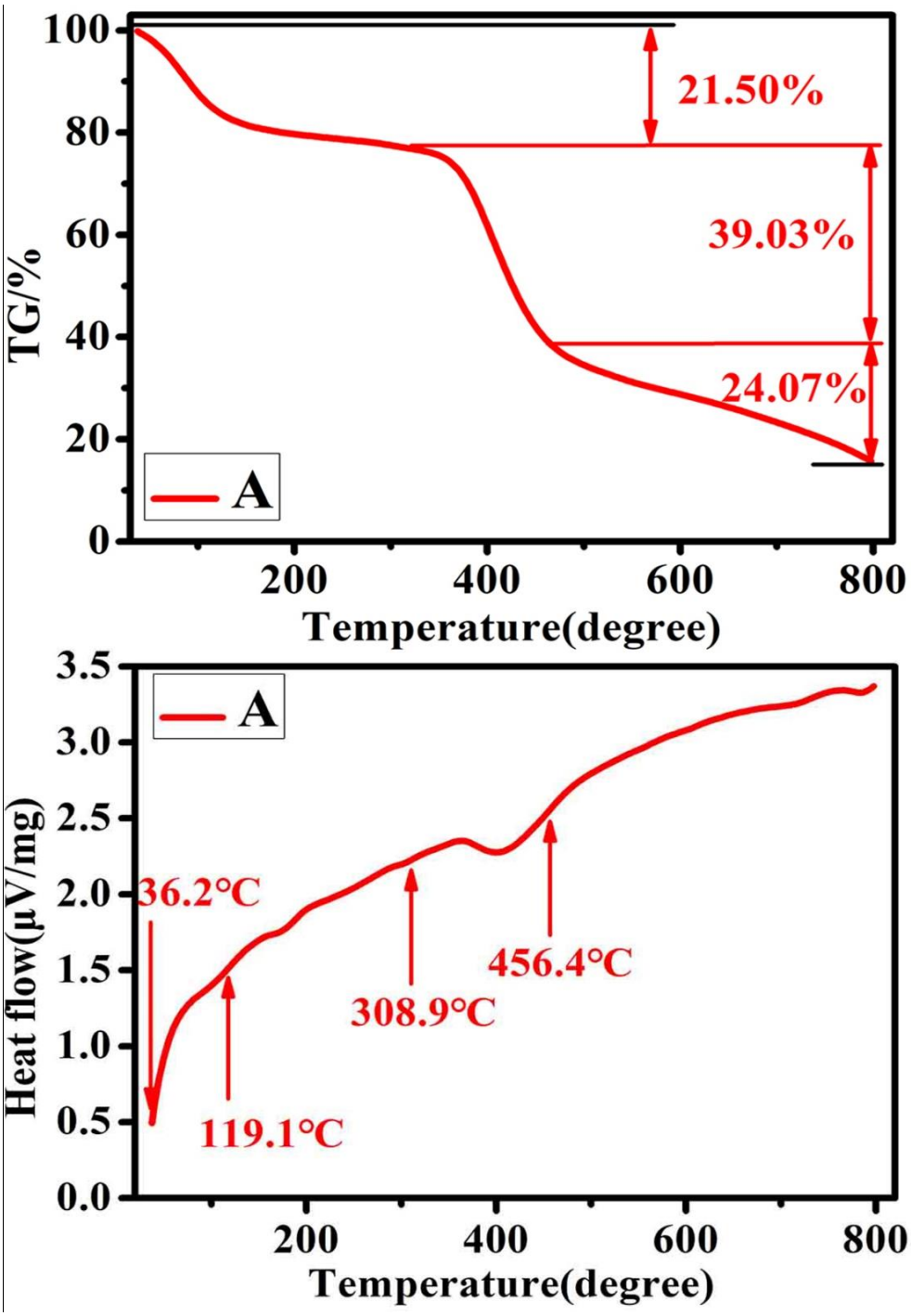


Figure S2. TG (top) and DTA (bottom) curves of **A** in N_2.

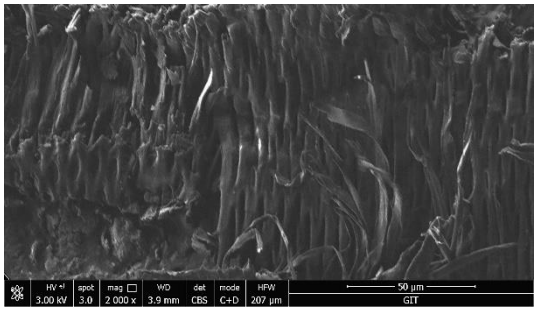


Figure S3. The SEM images of **A**.

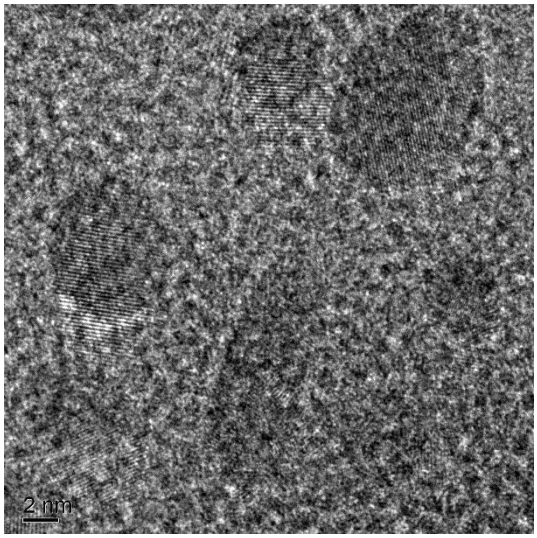
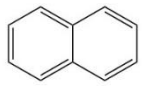
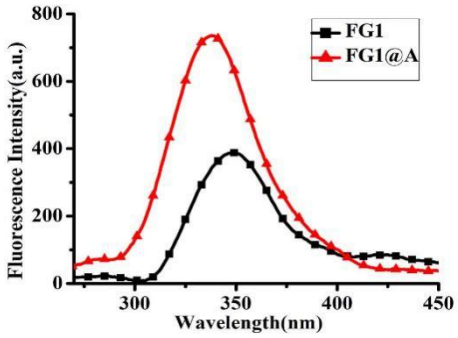
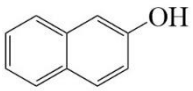
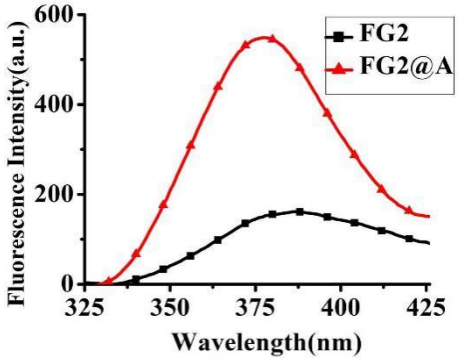
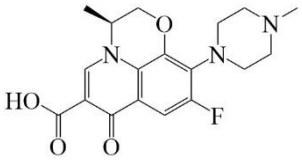
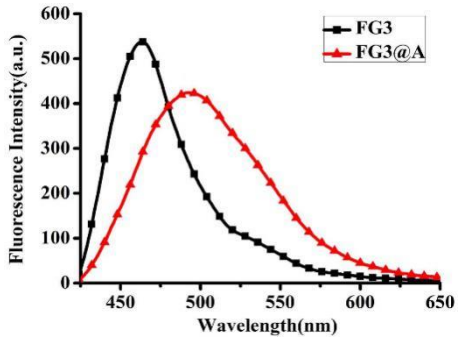
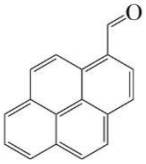
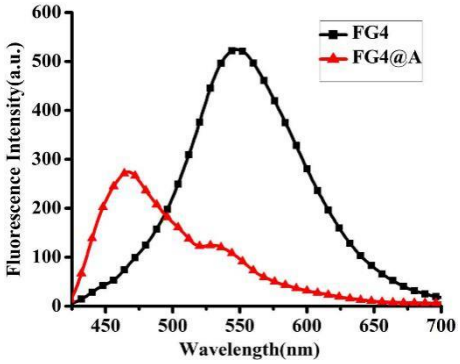
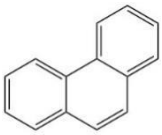
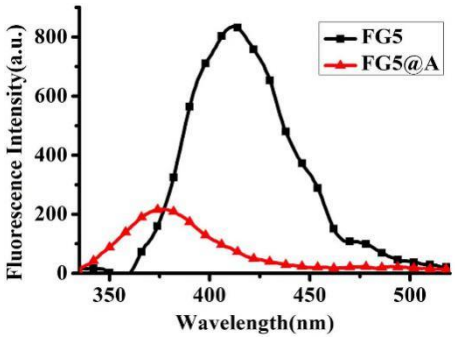
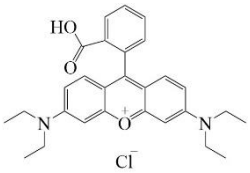
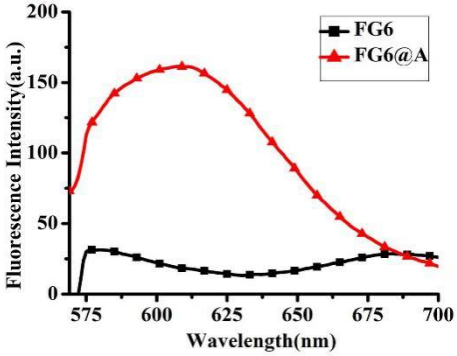
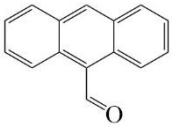
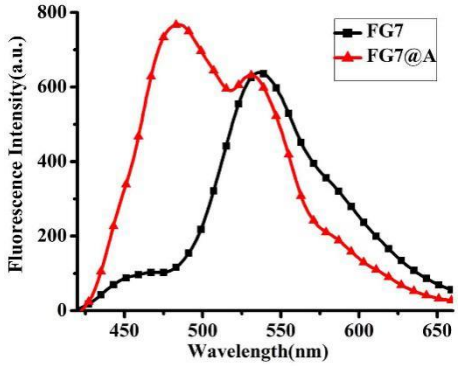
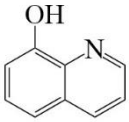
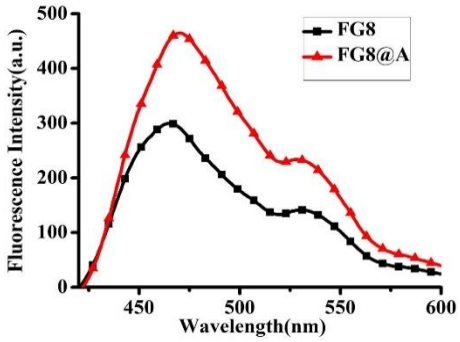
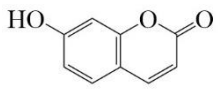
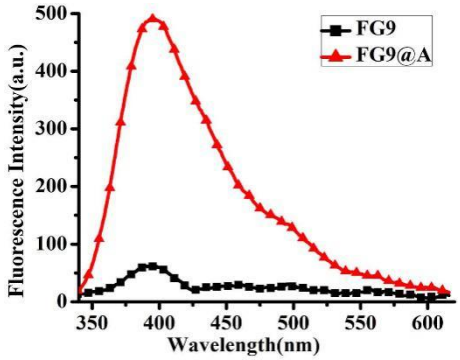
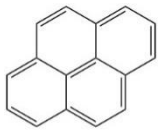
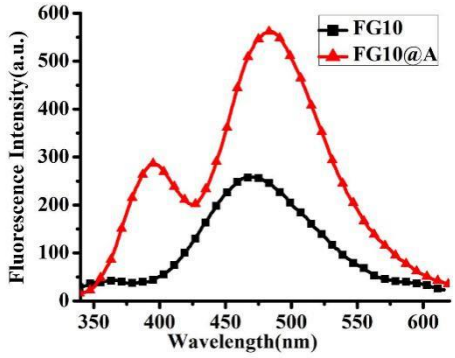
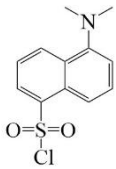
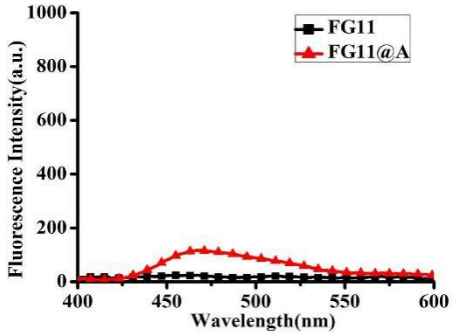
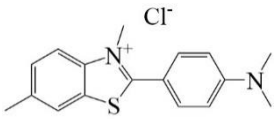
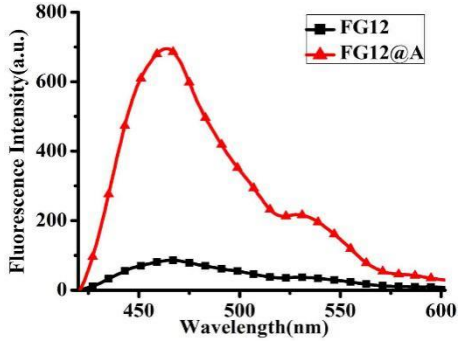


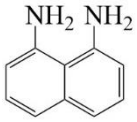
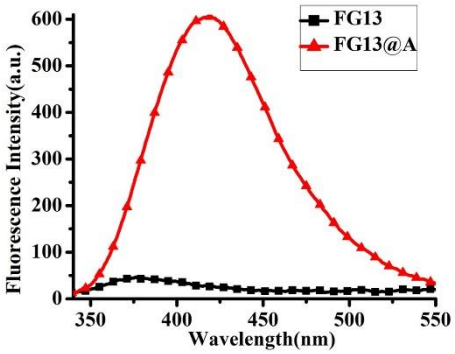
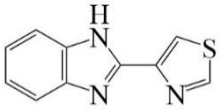
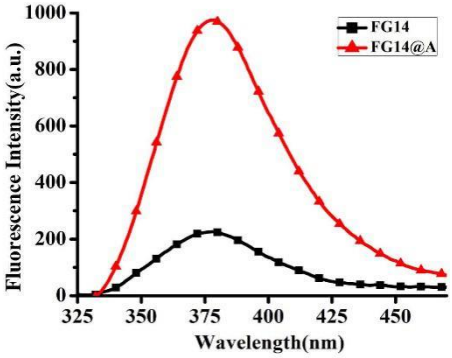
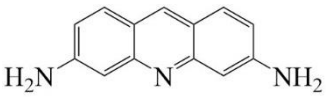
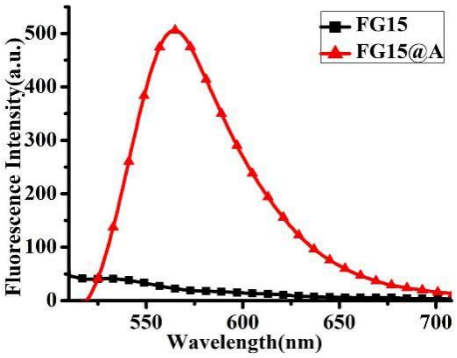
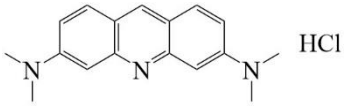
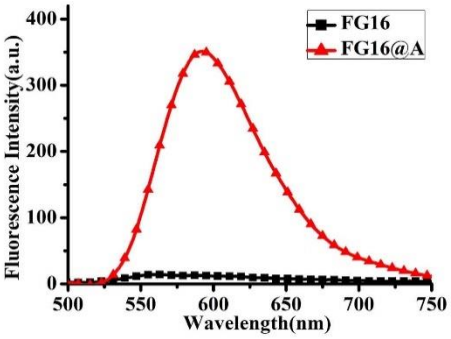
Figure S4. The TEM image of **A**.

Table S1. General survey of loading **A** with 16 FGs to form luminescent FG@**A** assemblies: (first column) FGs; (second column) fluorescence spectra of the solid FGs and the corresponding FG@**A**.

FGs	Survey of loading **A** with FGs (saturated absorption)
 naphthalene FG1	
 naphthalen-2-ol FG2	
 Levofloxacin FG3	
 1-Pyrenecarboxaldehyde FG4	

 Phenanthrene FG5	
 Rhodamine B FG6	
 9-Anthracenecarboxaldehyde FG7	
 8-Hydroxyquinoline FG8	

 7-Hydroxycoumarin FG9	
 Pyrene FG10	
 Dansyl chloride FG11	
 Thioflavin T FG12	

 1,8-Diaminonaphthalene FG13	
 Thiabendazole FG14	
 Acridine-3,6-diamine FG15	
 Acridine Orange FG16	

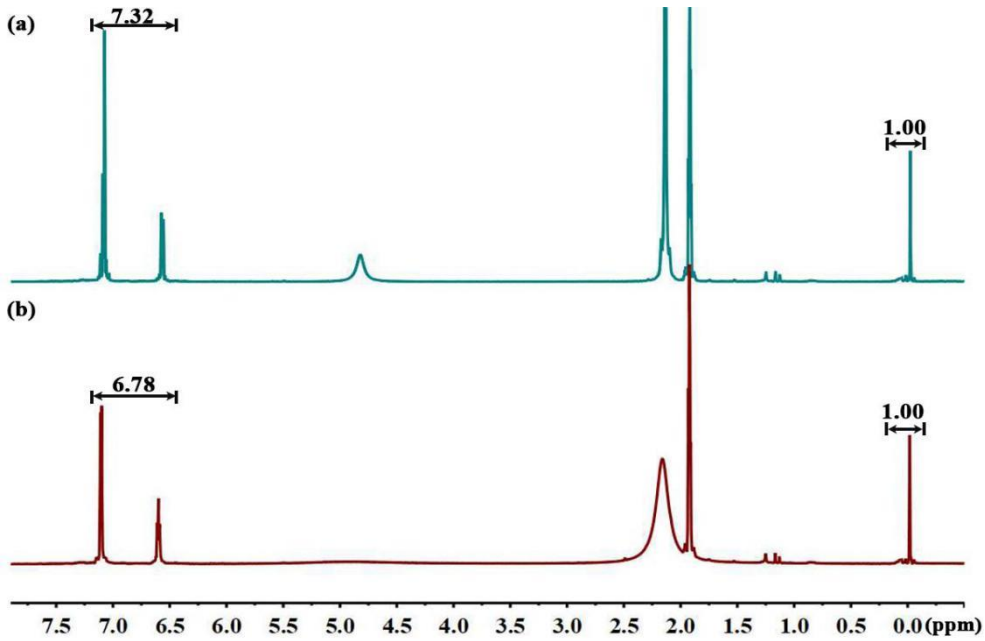


Figure S5. ^{1}H NMR spectra in deuterated acetonitrile: (a) 0.5 mL 0.01 M FG13, (b) 0.5 mL 0.01 M FG13 containing 10 mg of **A**.

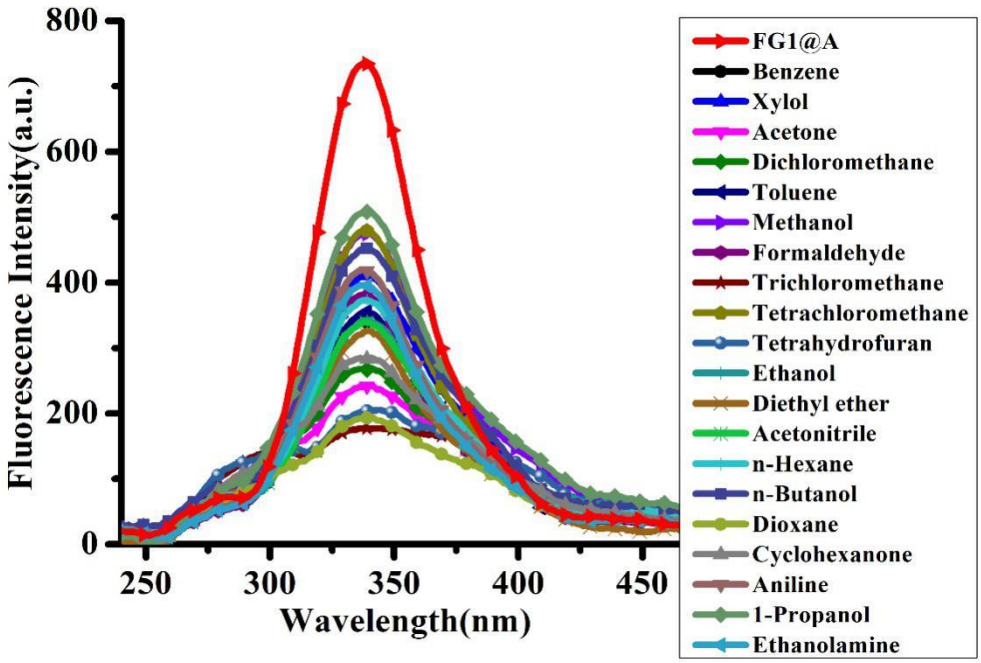


Figure S6. General survey of fluorescence spectra of FG1@**A** loaded with the 20 respective VOCs.

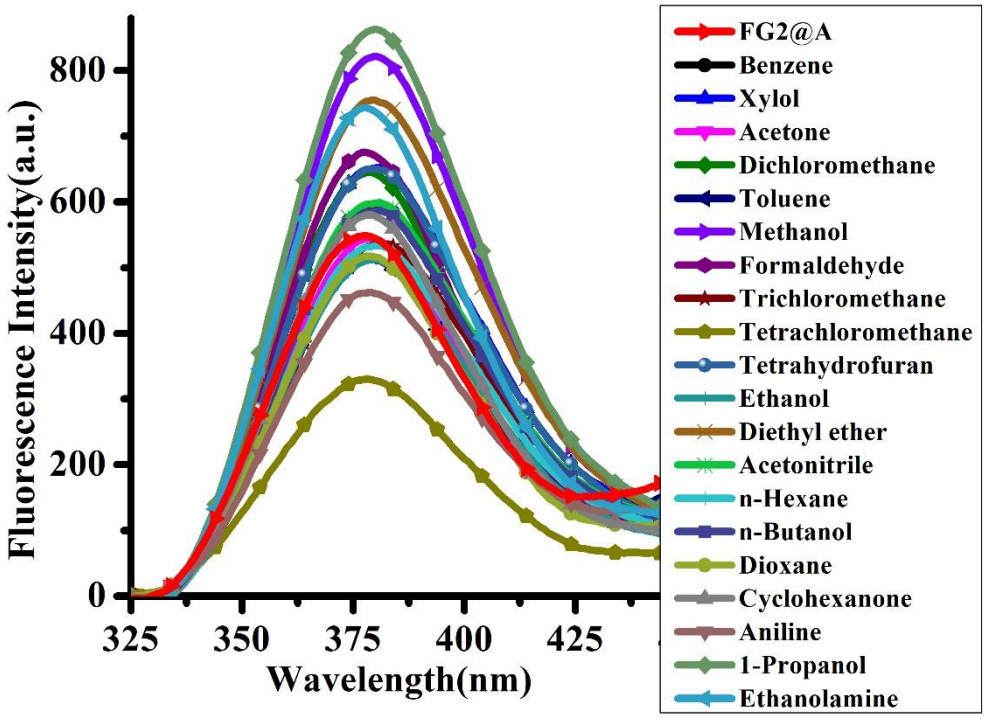


Figure S7. General survey of fluorescence spectra of FG2@**A** loaded with the 20 respective VOCs.

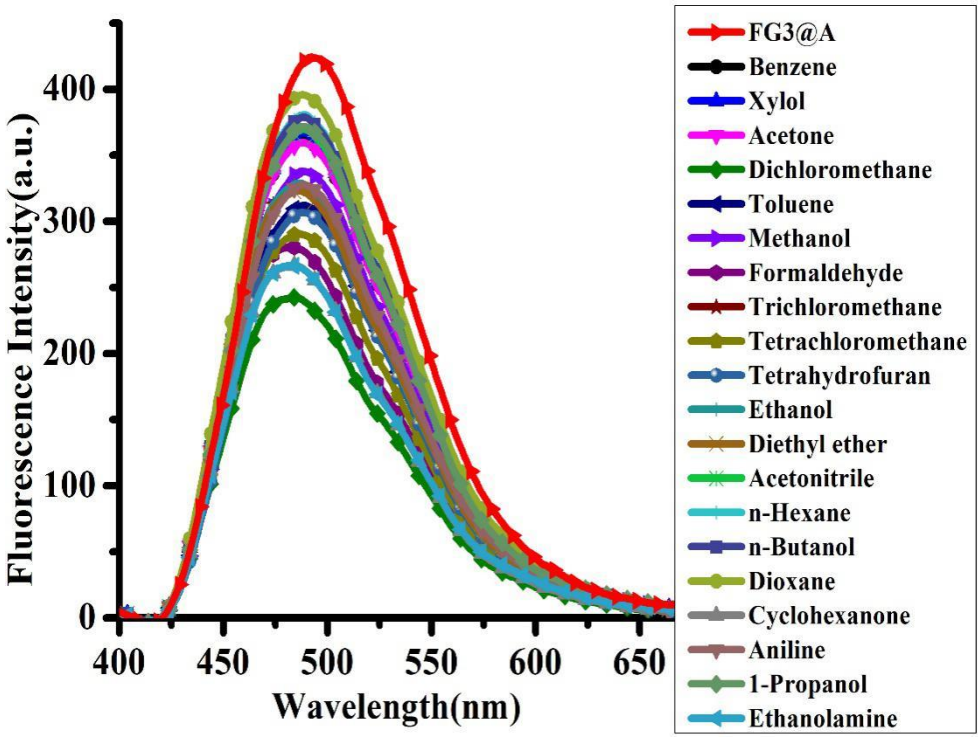


Figure S8. General survey of fluorescence spectra of FG3@**A** loaded with the 20 respective VOCs.

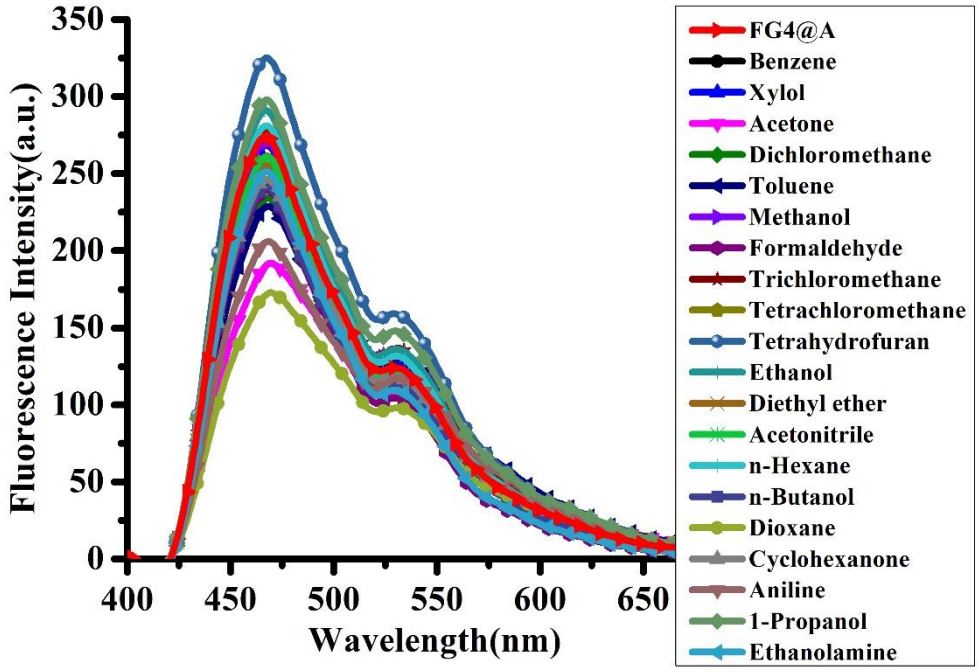


Figure S9. General survey of fluorescence spectra of FG4@**A** loaded with the 20 respective VOCs.

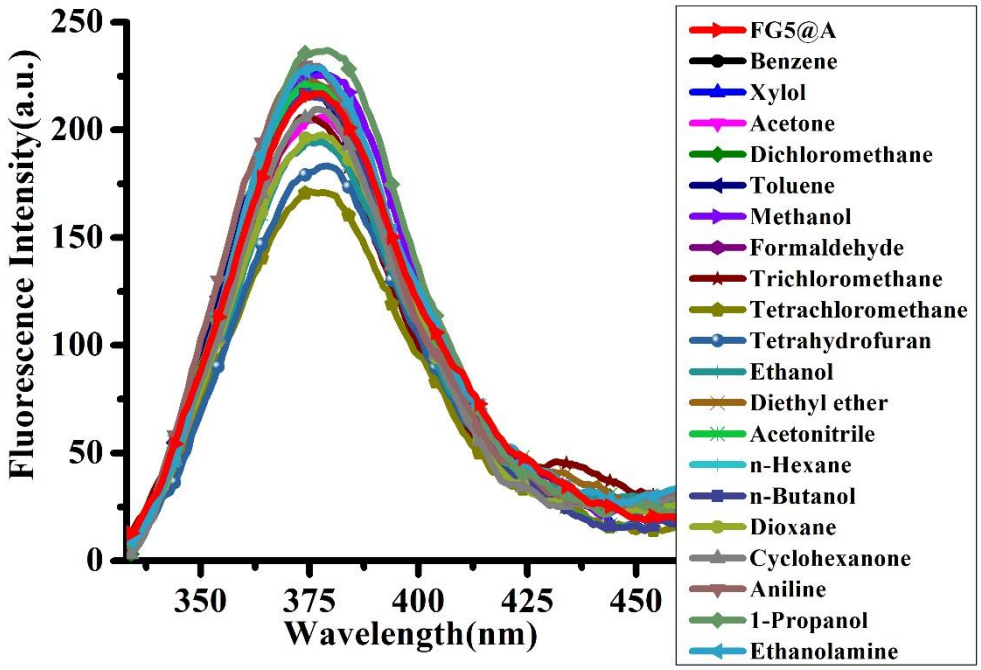


Figure S10. General survey of fluorescence spectra of FG5@**A** loaded with the 20 respective VOCs.

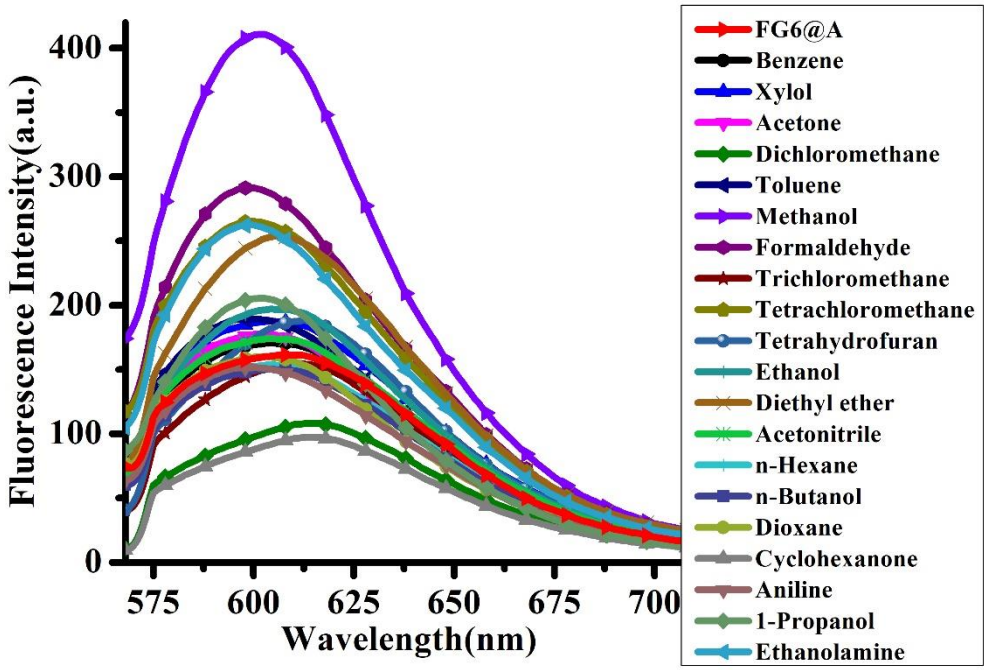


Figure S11. General survey of fluorescence spectra of FG6@**A** loaded with the 20 respective VOCs.

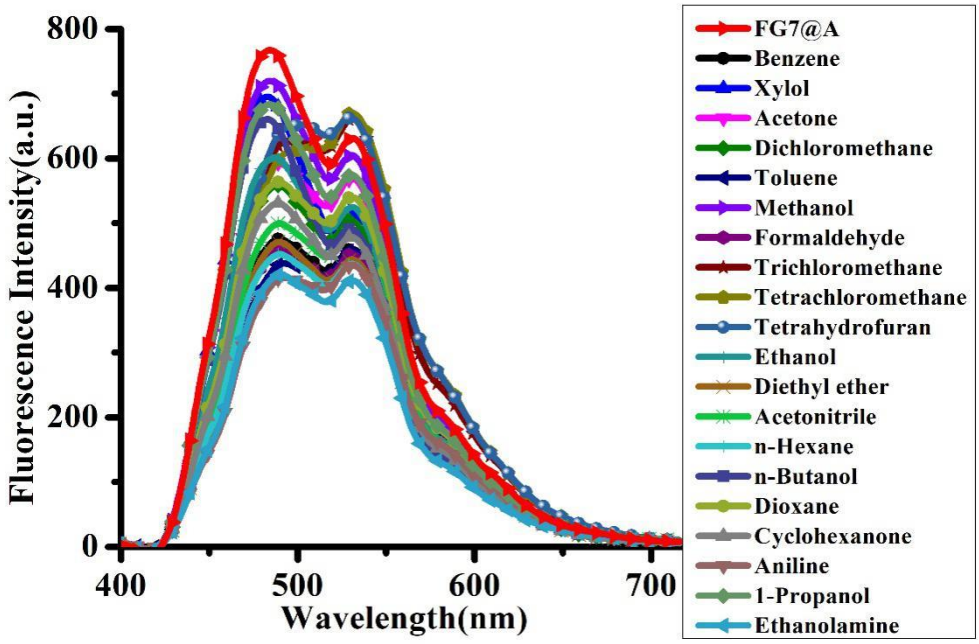


Figure S12. General survey of fluorescence spectra of FG7@**A** loaded with the 20 respective VOCs.

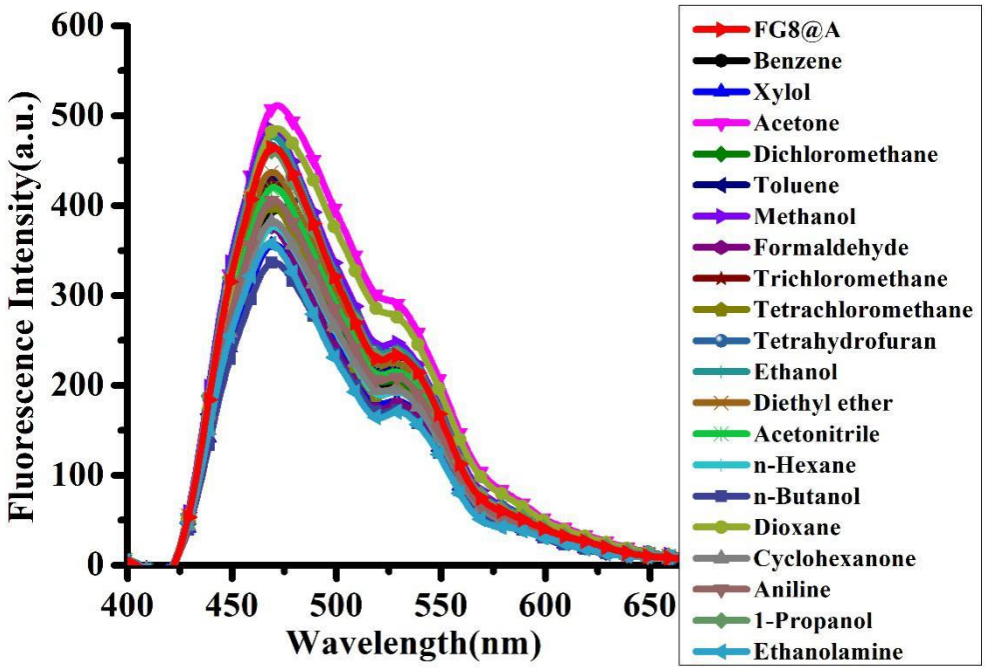


Figure S13. General survey of fluorescence spectra of FG8@**A** loaded with the 20 respective VOCs.

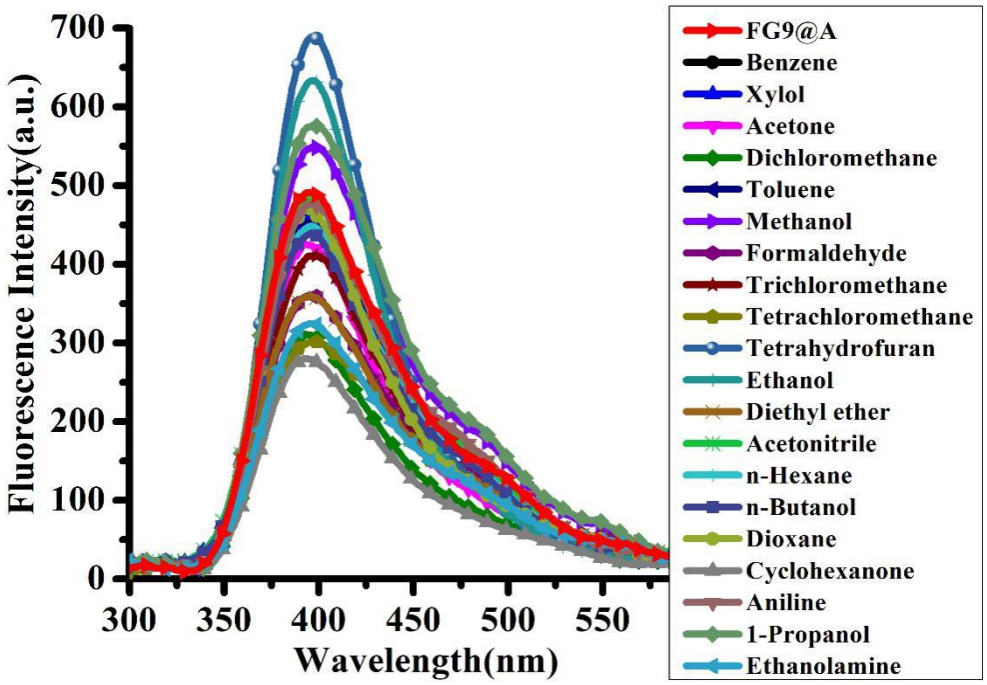


Figure S14. General survey of fluorescence spectra of FG9@**A** loaded with the 20 respective VOCs.

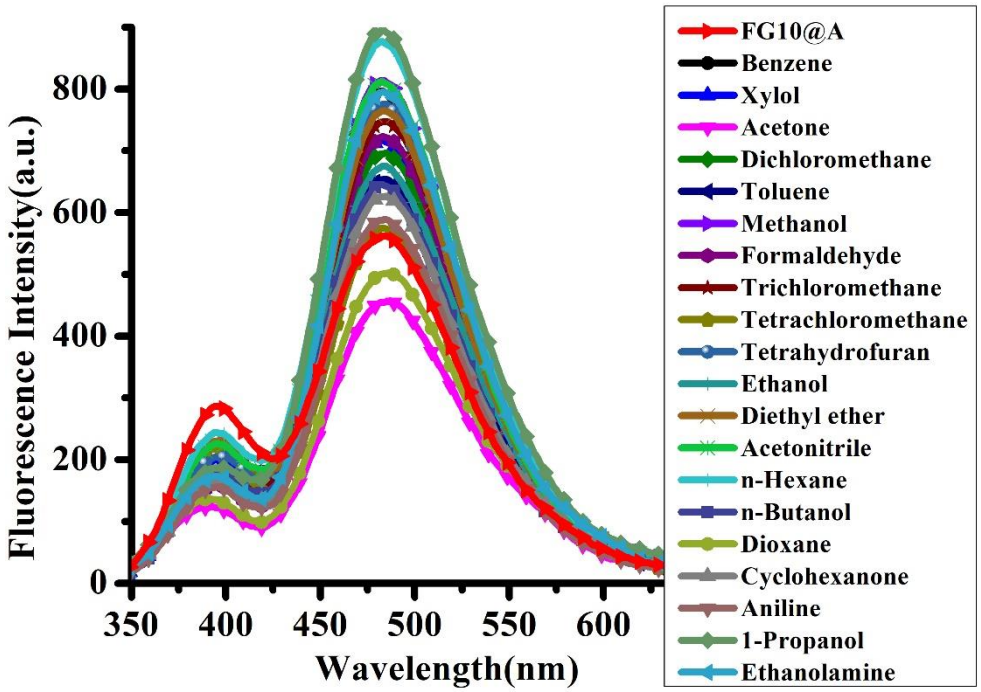


Figure S15. General survey of fluorescence spectra of FG10@**A** loaded with the 20 respective VOCs.

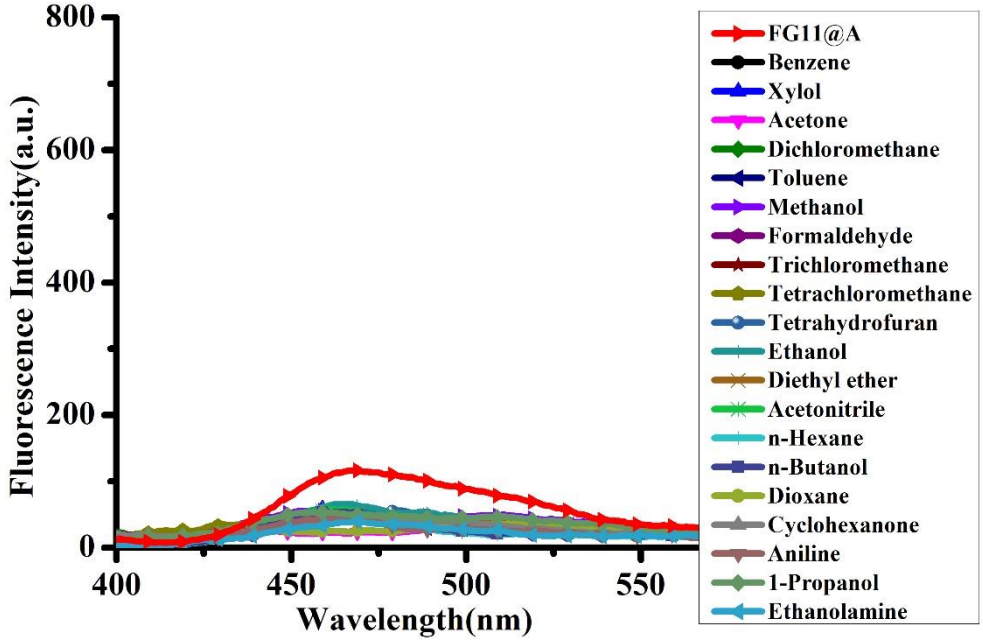


Figure S16. General survey of fluorescence spectra of FG11@**A** loaded with the 20 respective VOCs.

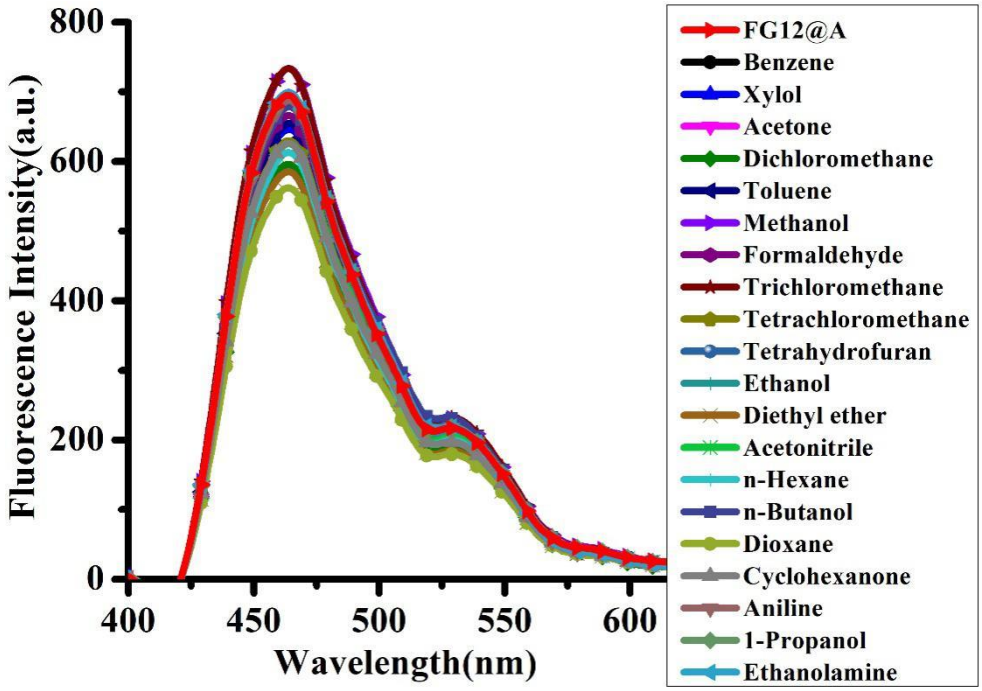


Figure S17. General survey of fluorescence spectra of FG12@**A** loaded with the 20 respective VOCs.

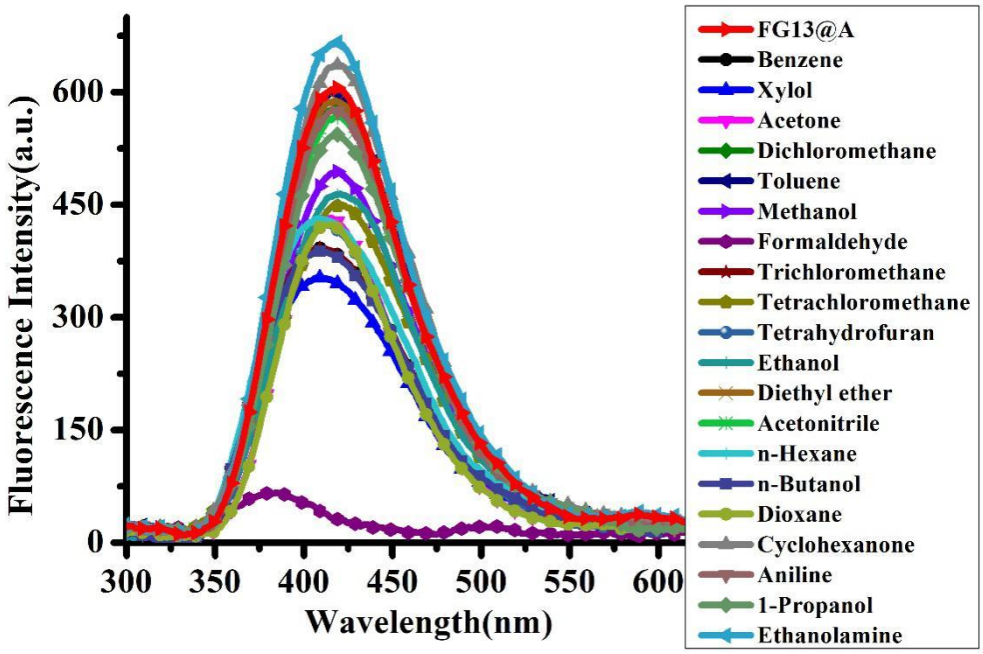


Figure S18. General survey of fluorescence spectra of FG13@**A** loaded with the 20 respective VOCs.

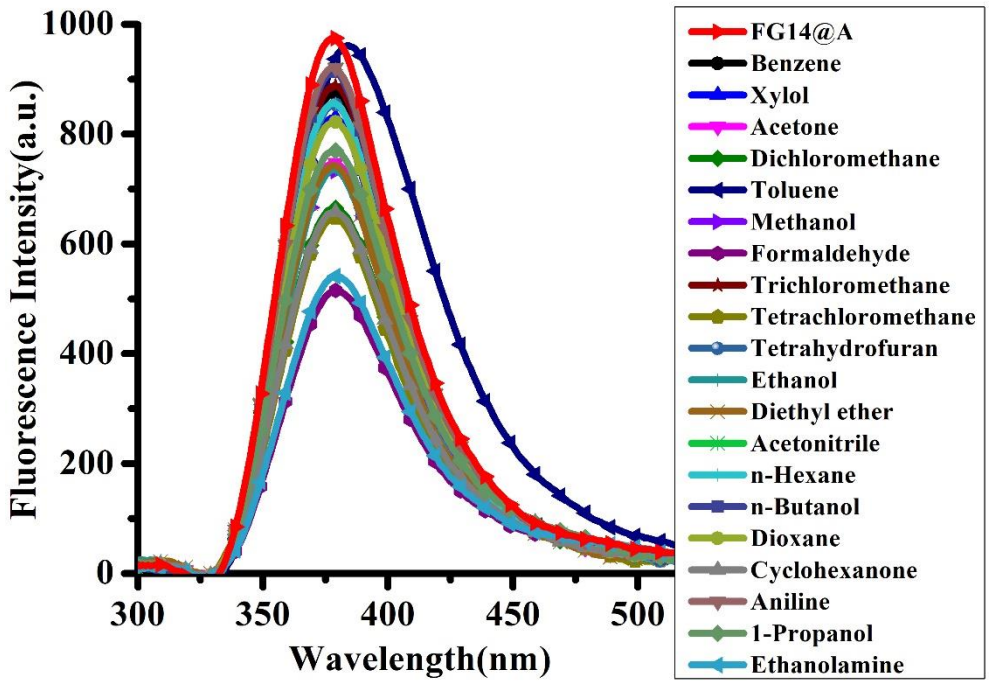


Figure S19. General survey of fluorescence spectra of FG14@**A** loaded with the 20 respective VOCs.

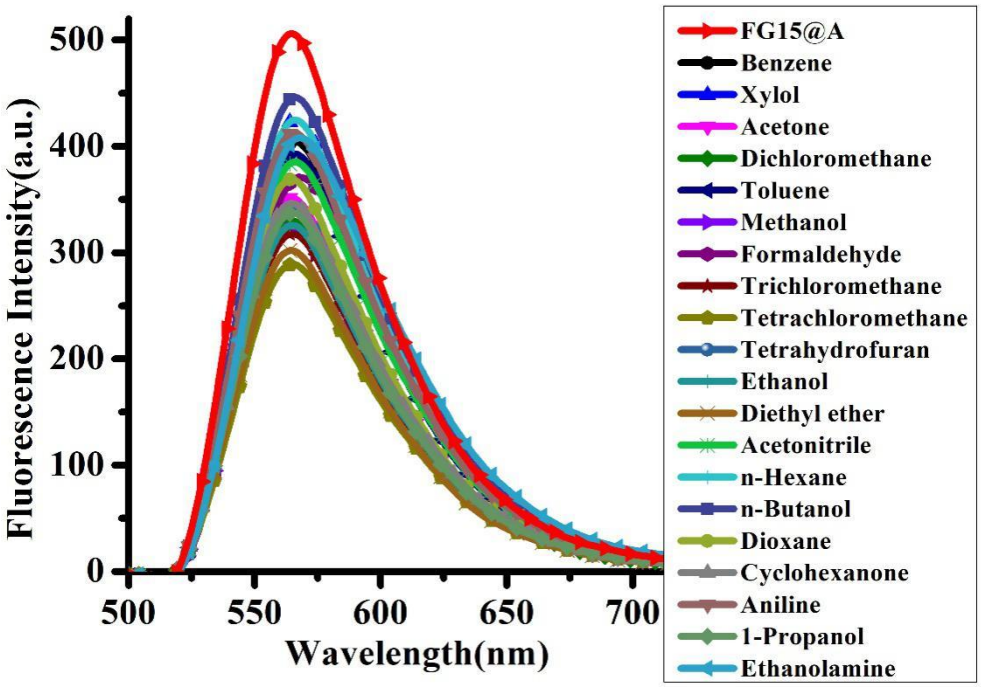


Figure S20. General survey of fluorescence spectra of FG15@**A** loaded with the 20 respective VOCs.

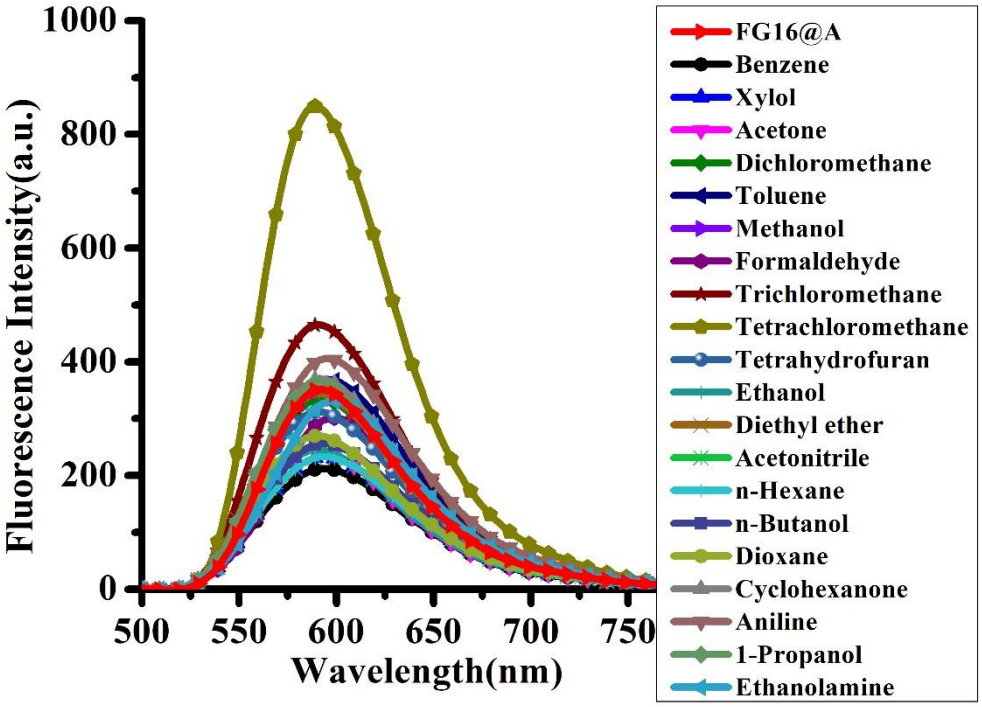


Figure S21. General survey of fluorescence spectra of FG16@**A** loaded with the 20 respective VOCs.

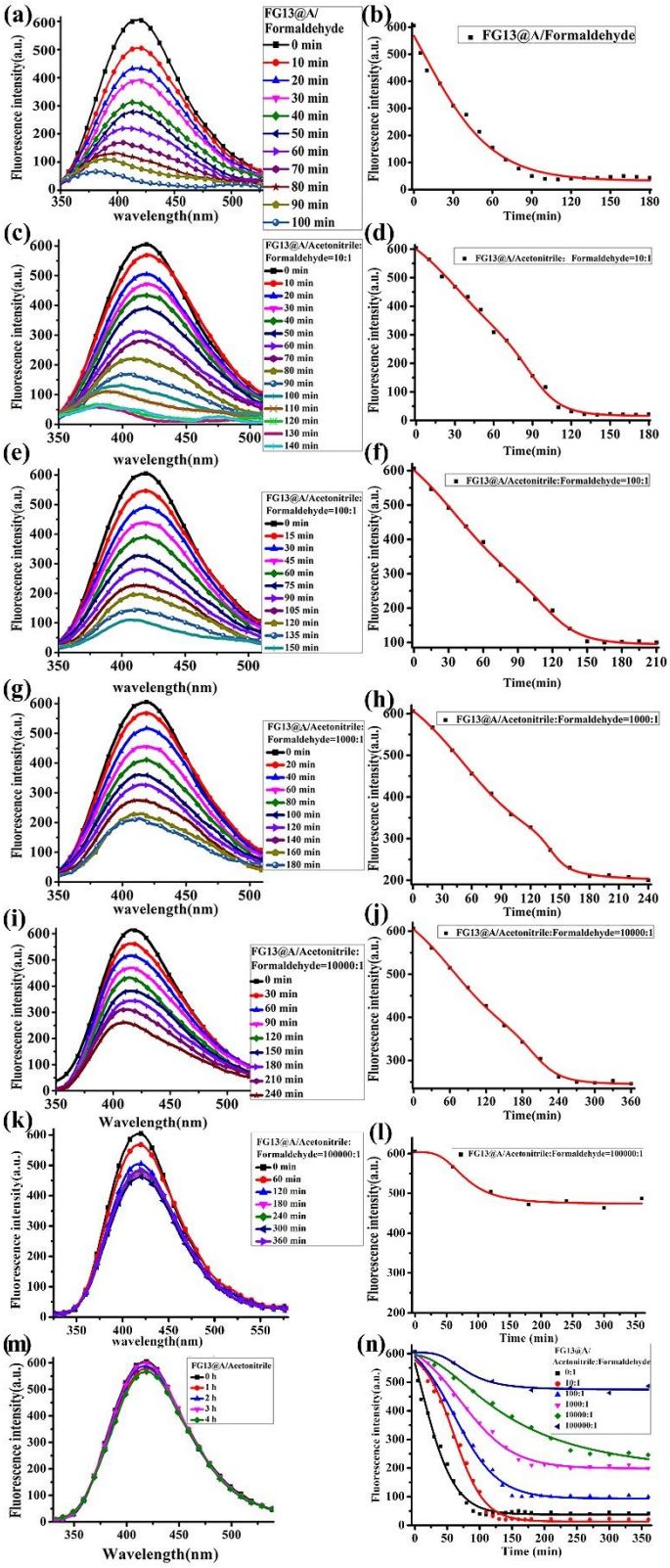


Figure S22. (a, c, e, g, i) Titration fluorescence spectra of the loading of FG13@**A** with acetonitrile:formaldehyde = 0:1, 10:1, 100:1, 1000:1, 10000:1; (b, d, f, h, j) profiles of fluorescence intensity of FG13@**A** *vs*. adsorption time with acetonitrile: formaldehyde = 0:1, 10:1, 100:1, 1000:1, 10000:1; (k) titration fluorescence spectra of the loading of FG13@**A** with acetonitrile; (l) overall profiles of fluorescence intensity of FG13@**A** *vs*. adsorption time.

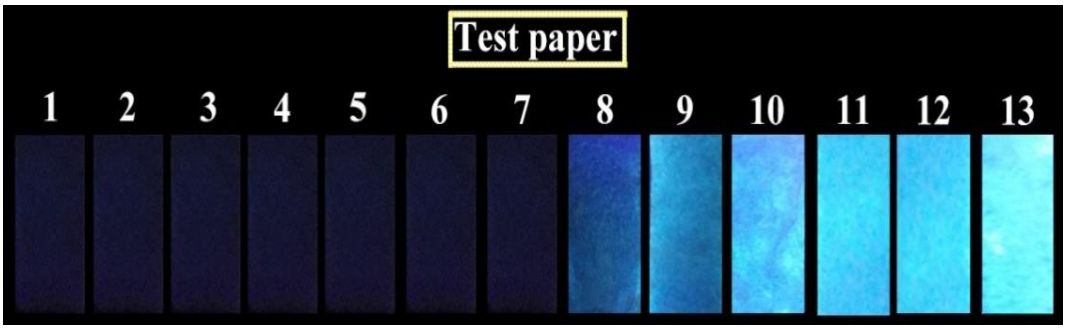


Figure S23. Formaldehyde response experiments of FG13@**A** test paper in acetonitrile: 1, neat; 2, 1.0×10^{-1}; 3, 1.0×10^{-2}; 4, 1.0×10^{-3}; 5, 1.0×10^{-4}; 6, 1.0×10^{-5}; 7, 1.0×10^{-6}; 8, 1.0×10^{-7}; 9, 1.0×10^{-8}; 10, 1.0×10^{-9}; 11, 1.0×10^{-10}; 12, 1.0×10^{-11}; 13, 1.0×10^{-12} mol/L of formaldehyde.

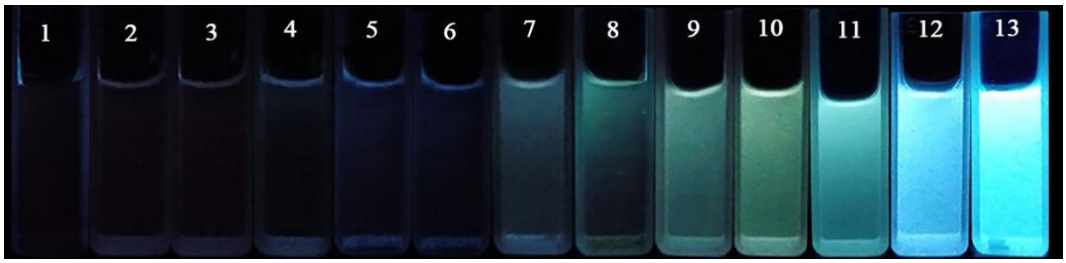


Figure S24. Adsorption experiments on FG13@**A** using formaldehyde at different concentrations: 1, 1.0; 2, 0.5; 3, 0.1; 4, 0.05; 5, 0.01; 6, 5×10^{-3}; 7, 1×10^{-3}; 8, 5×10^{-4}; 9, 1×10^{-4}; 10, 5×10^{-5}; 11, 1×10^{-5}; 12, 5×10^{-6}; 13, 1×10^{-6} mol/L in acetonitrile.

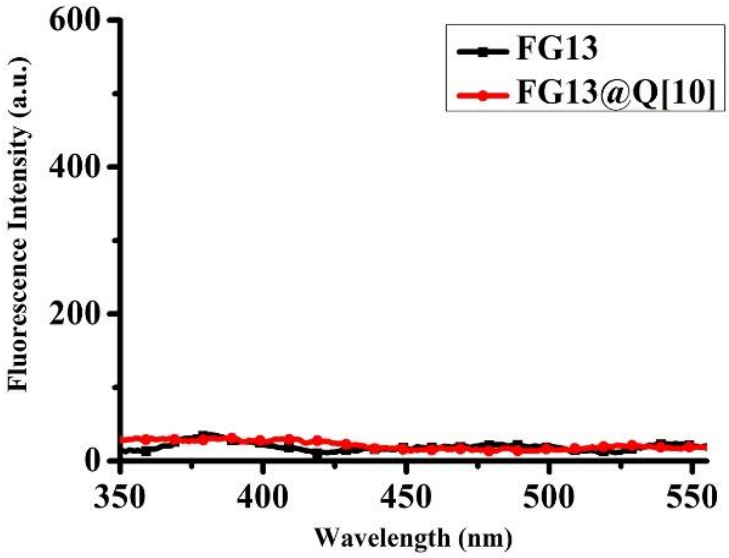


Figure S25. Amorphous Q[10] loaded with FG13 to form luminescent assembly FG13@Q[10]: fluorescence spectra of solid FG13 and FG13@Q[10], respectively.

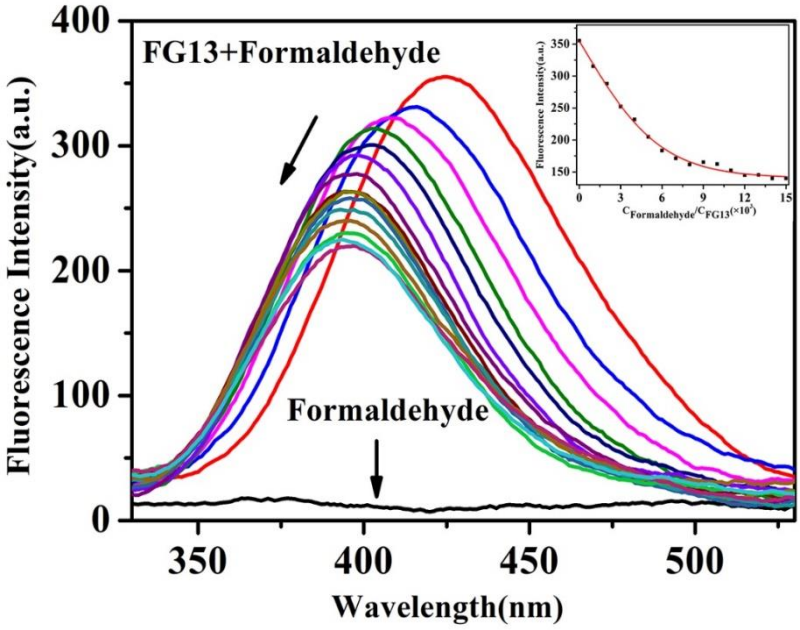


Figure S26. Titration fluorescence spectra of FG13 (1×10^{-5} mol·L^{-1}) upon gradual addition of formaldehyde.

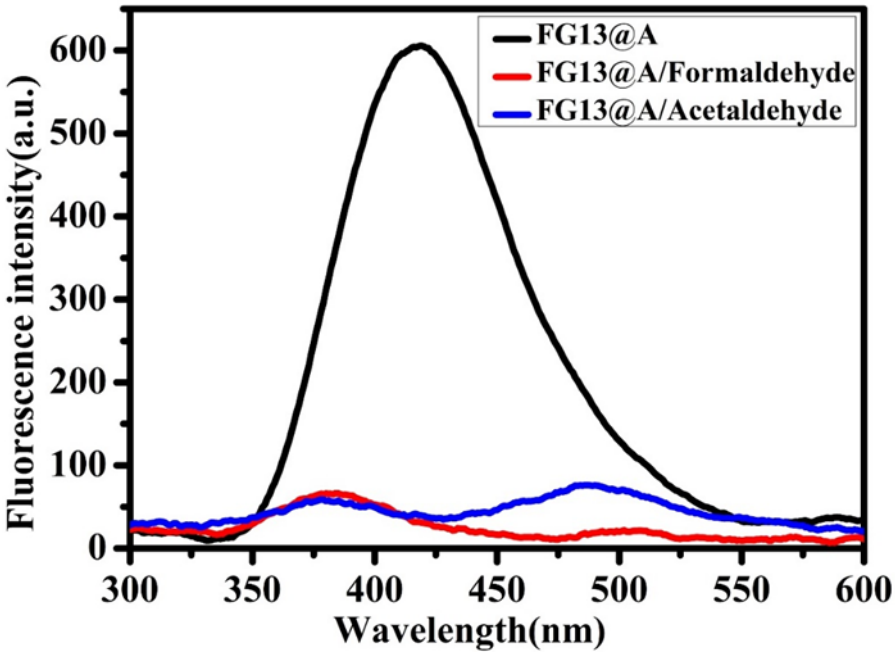


Figure S27. Fluorescence spectra of the solid FG13@**A** and the FG13@**A** loaded with formaldehyde and acetaldehyde, respectively.