Electronic Supplementary Material (ESI) for Journal of Materials Chemistry

Supporting Information

Sensitive Detection of Hazardous Explosives via Highly Fluorescent Crystalline Porous Aromatic Frameworks

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Synthesis and Characterization of Monomer.

Tetrukis[4-(dihydroxyboryl)phenyl]germanium: Tetrakis(4-bromophenyl)germanium (2.86 g, 4.1 mmol) was dissolved in 35 cm^3 of dry ethyl ether and cooled to -70 ℃ in a dry-ice bath. Under nitrogen 8.2 cm^3 of a 2.5 mol dm^{-3}, butyllithium-hexane solution (25% excess) was added slowly with stirring. The mixture turned a dark grey-purple but did not become clear. When addition of butyllithium was complete the solution was allowed to warm to room temperature while stirring continued. The dark slurry was then transferred by syringe with a wide bore needle into a stirred solution of trimethyl borate (2.9 g, 50% excess) in 30 cm^3 of dry ethyl ether. This solution was stirred at room temperature for 1h. The ether was then removed under vacuum from the solution and the borate ester residue was hydrolysed to the tetraboronic acid with 70cm^3 of 2.4mol dm^{-3} HC1 solution. The product was collected by filtration, washed with water and dried in vacuum at room temperature. The acid was purified by dissolving in aqueous alkali, filtration and reprecipitation with dilute acid. Yield, 83%; v_{max}/cm^{-1} (KBr): 3300-3600 (broad OH), 3060, 1597, 1501, 1009, 822; 'H NMR δ_H of potassium salt in D_2O: 'doublets' of equal intensity centred at 7.33 and 7.45.[1,2]

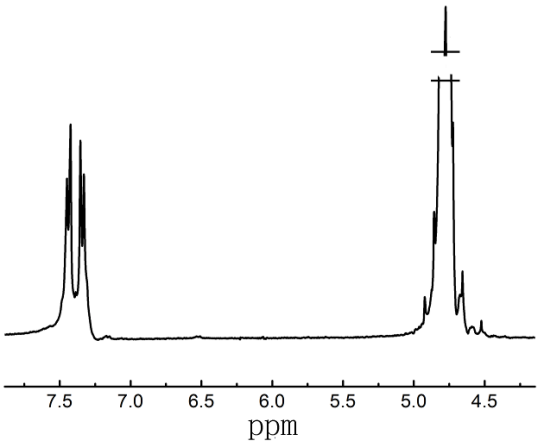
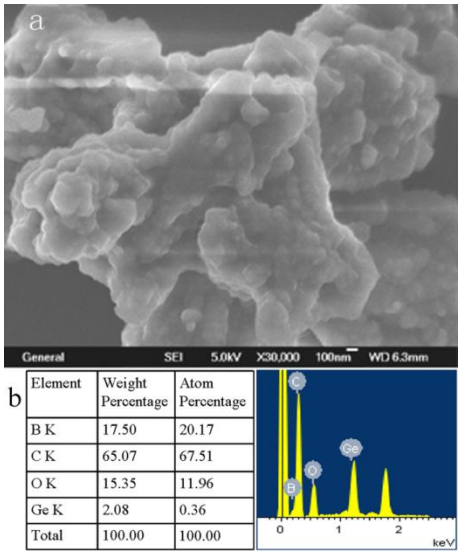


Fig. S1. NMR spectrum of Tetrukis[4-(dihydroxyboryl)phenyl]germanium.

PL Elemental Analysis.

Elemental analysis was performed on a Perkin-Elmer LS55 luminescence spectrometer. The concentration of the $CHCl_3$ solution of the PAF-14 is 150 μg/mL. The solutions do not undergo degradation during a number of dispersion/deposition cycles in different concentrations $CHCl_3$ solution of analytes.



Element	Weight Percentage	Atom Percentage
B K	17.50	20.17
C K	65.07	67.51
O K	15.35	11.96
Ge K	2.08	0.36
Total	100.00	100.00

Fig. S2 SEM image (a) and EDS image (b) of PAF-14.

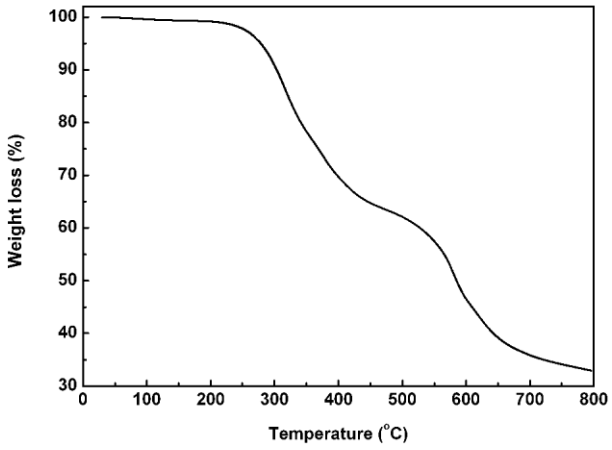


Fig. S3 TGA trace for an activated sample of PAF-14.

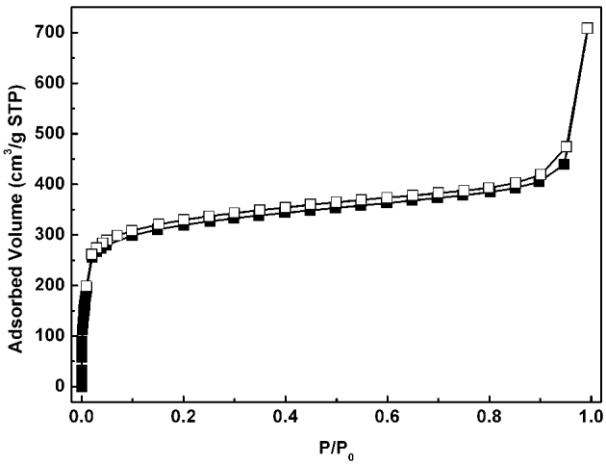


Fig. S4 Reversible argon gas adsorption isotherms for PAF-14 measured at 87 K. STP, standard temperature and pressure.

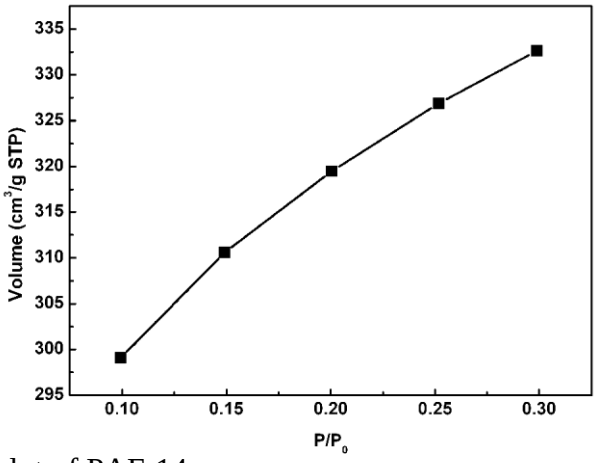


Fig. S5 BET linear plot of PAF-14.

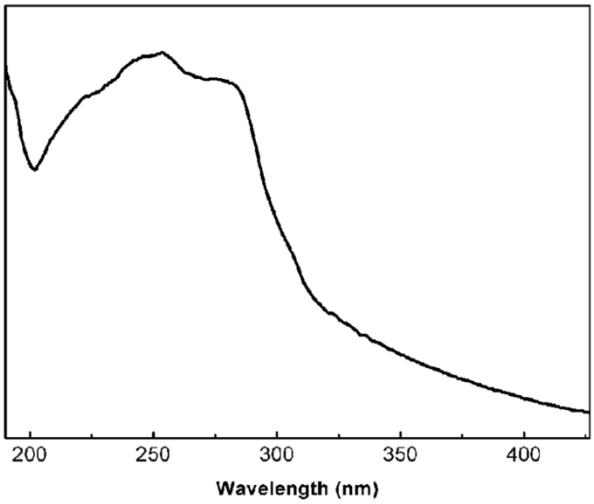


Fig. S6 Solid UV-visible spectra of PAF-14.

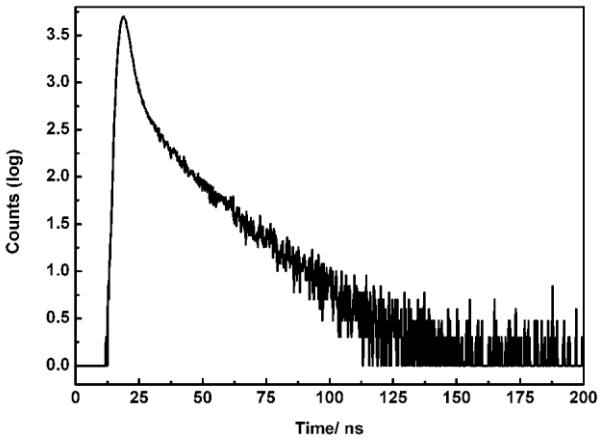


Fig. S7 PL decay curves of PAF-14 in $CHCl_3$ solution (excited: 250 nm).

References

1. L. M. Wilson, A. C. Griffin, *J. Mater. Chem.*, 1993, **3**, 991.
2. Y. Yuan, H. Ren, X. F. Jing, W. Wang, H. P. Ma, H. J. Zhao, F. X. Sun *J. Mater. Res.*, 2012, **27**, 1417.