

Electronic Supporting Information

**Periodic Mesoporous Organosilicas for Ultrahigh Selective
Copper(II) Detection and The Sensing Mechanism**

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1. ¹H NMR Spectra of BRh and BRh-Si₄.

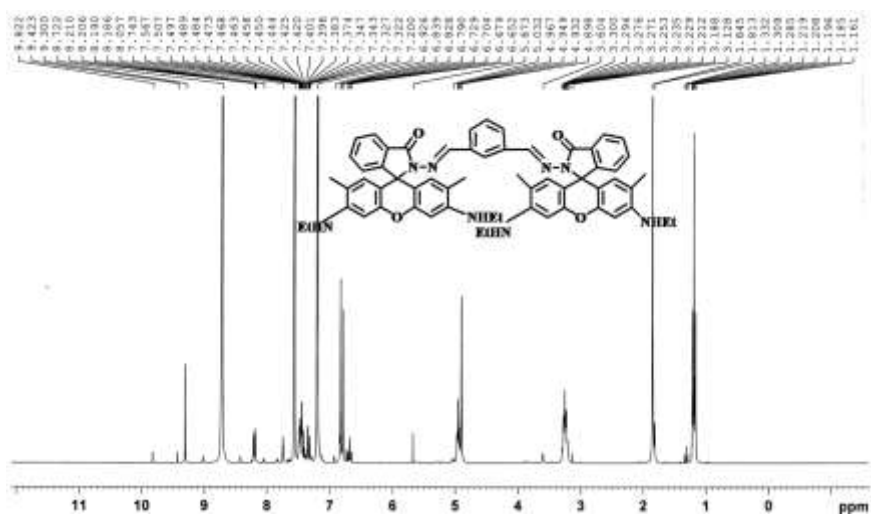


Figure S1. ¹H NMR spectrum of BRh.

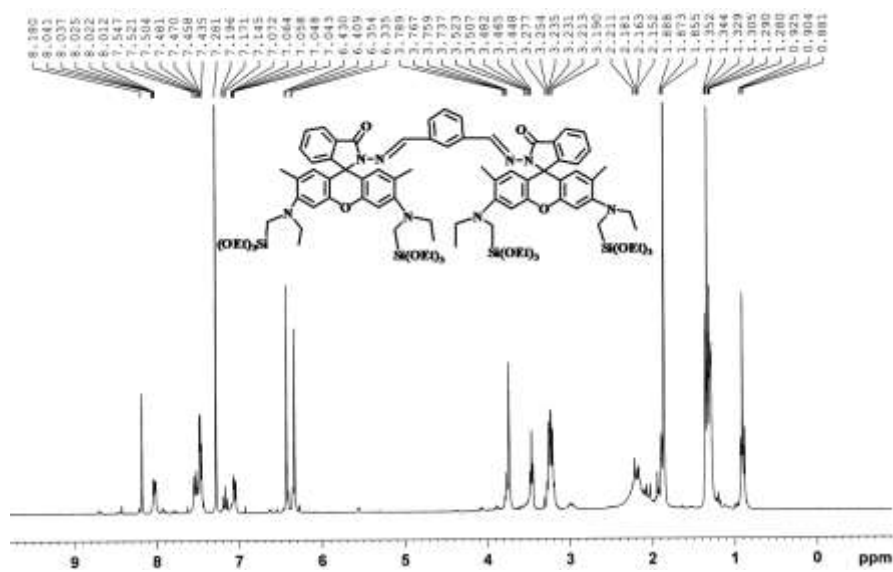


Figure S2. ¹H NMR spectrum of BRh-Si₄.

2. Structural Characterization of BRhPMOs.

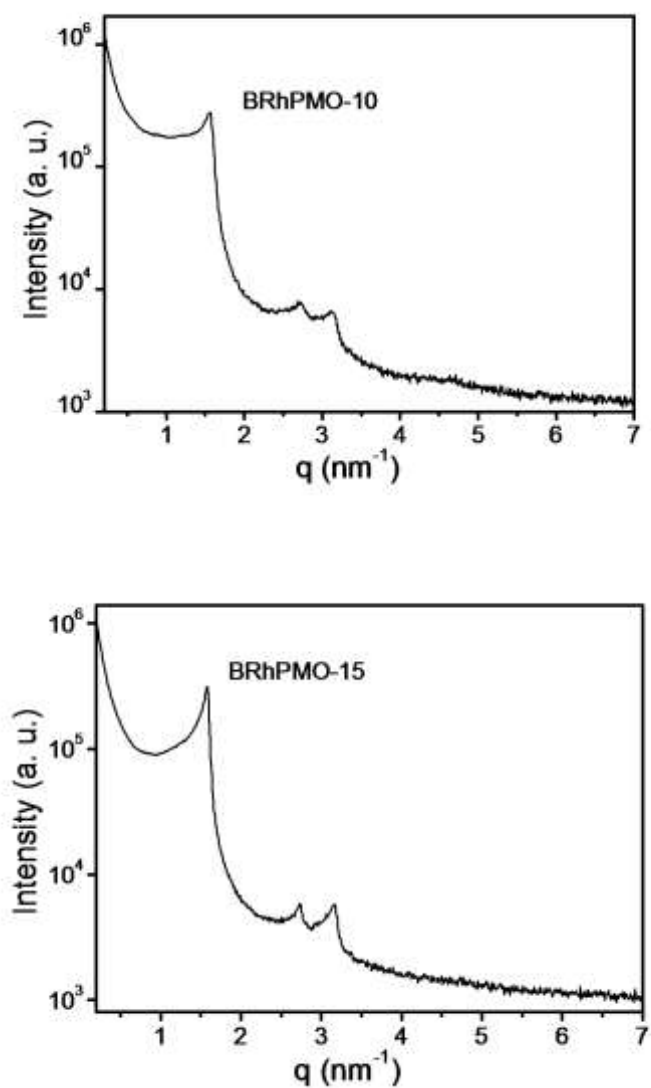
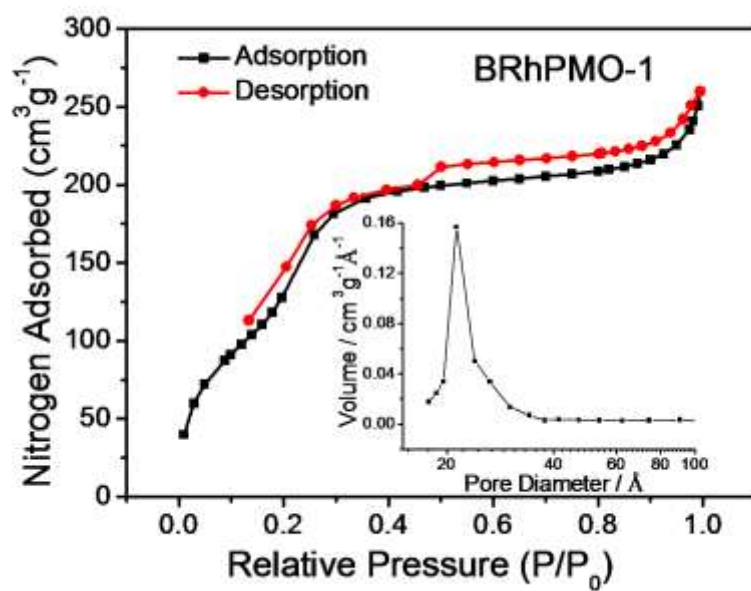
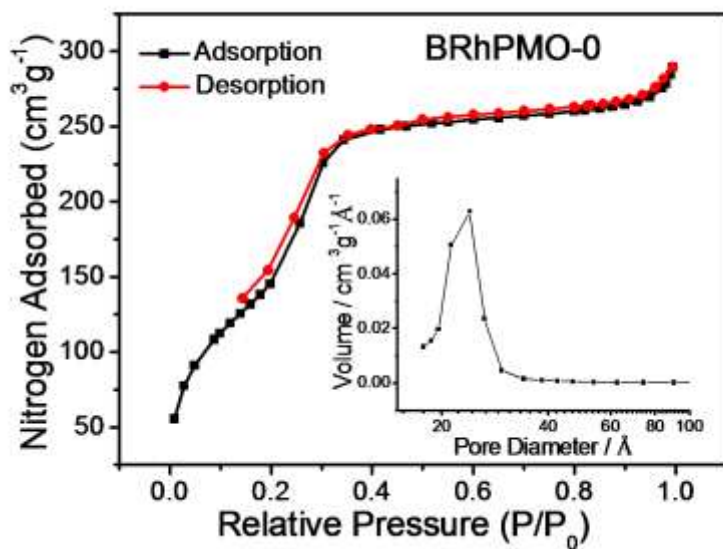
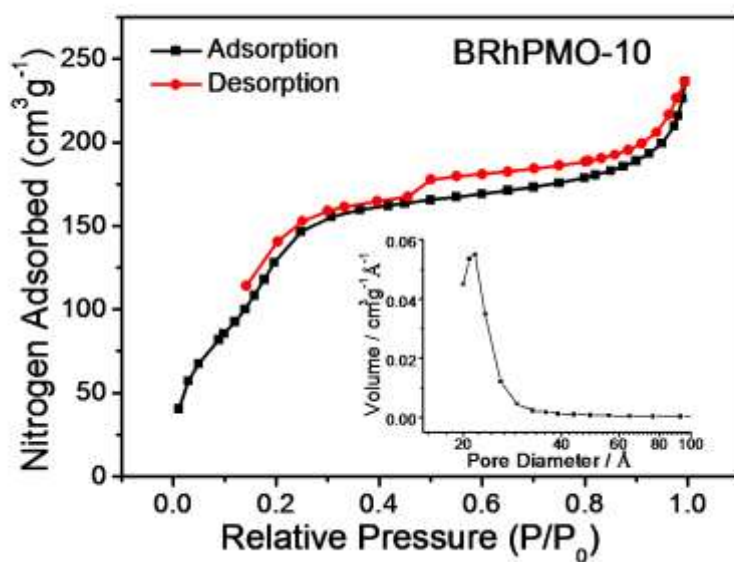
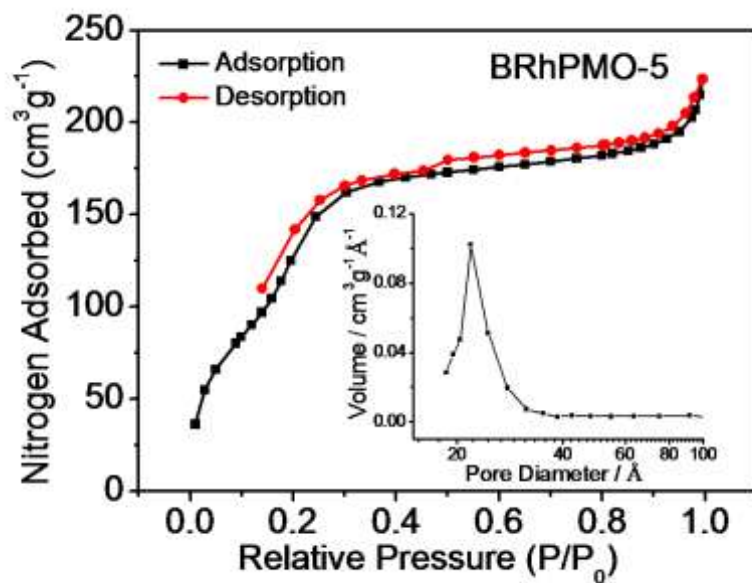


Figure S3. Small angle X-ray scattering (SAXS) patterns for solvent-extracted BRhPMO-10 and BRhPMO-15.





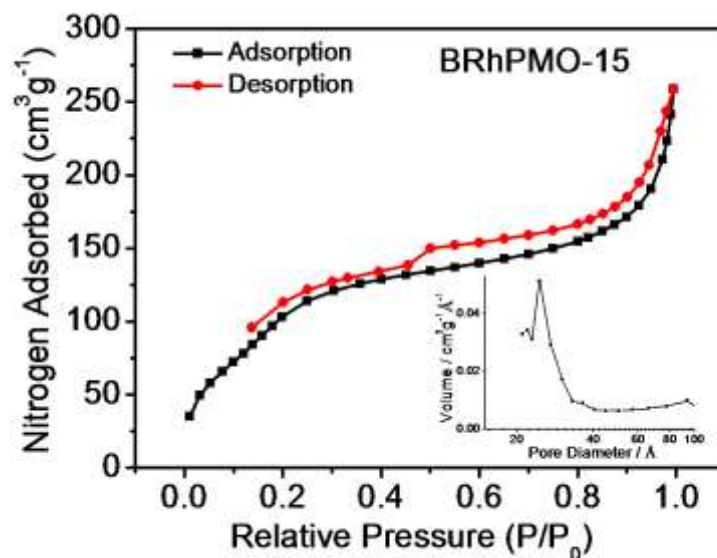


Figure S4. Nitrogen adsorption/desorption isotherms and pore size distribution of solvent-extracted BRhPMOs.

The BET surface areas, pore volume, and BJH pore diameter for BRhPMO-1 were calculated to be $643 \text{ m}^2 \text{ g}^{-1}$, $0.45 \text{ cm}^3 \text{ g}^{-1}$, and 2.78 nm , respectively. For BRhPMO-5, these values were $579 \text{ m}^2 \text{ g}^{-1}$, $0.41 \text{ cm}^3 \text{ g}^{-1}$, and 2.75 nm , while for BRhPMO-15, these values were $413 \text{ m}^2 \text{ g}^{-1}$, $0.39 \text{ cm}^3 \text{ g}^{-1}$, and 4.41 nm respectively.

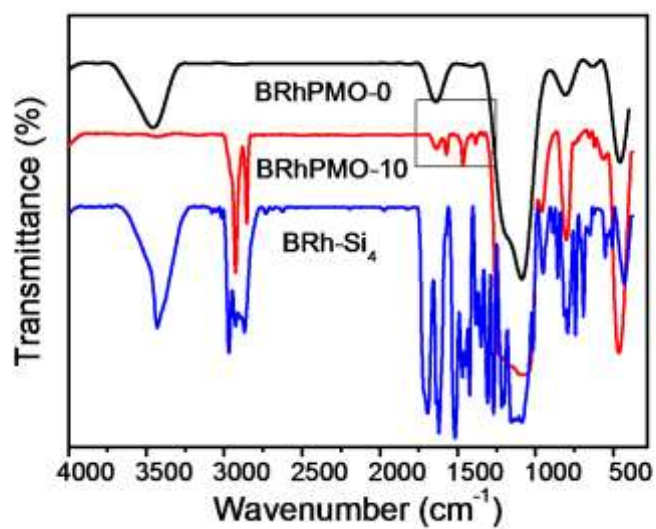


Figure S5. FT-IR spectra of BRh-Si₄, solvent-extracted BRhPMO-0 and BRhPMO-10.

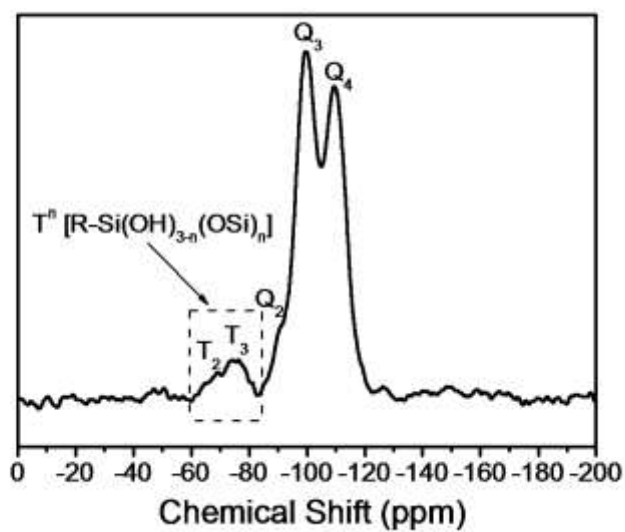


Figure S6. ²⁹Si MAS NMR spectrum of solvent-extracted BRhPMO-10.

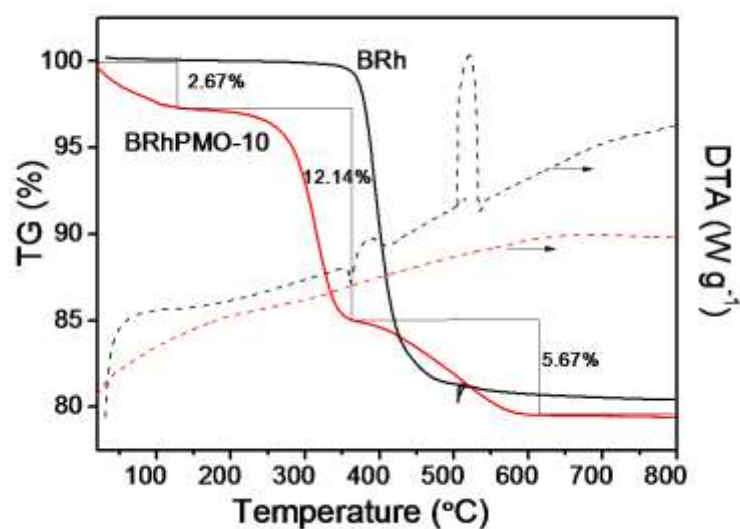


Figure S7. Thermal analysis for BRh and solvent-extracted BRhPMO-10: TG curves (solid line) and DTA curves (dash line).

3. Optical Characterization of BRhPMOs.

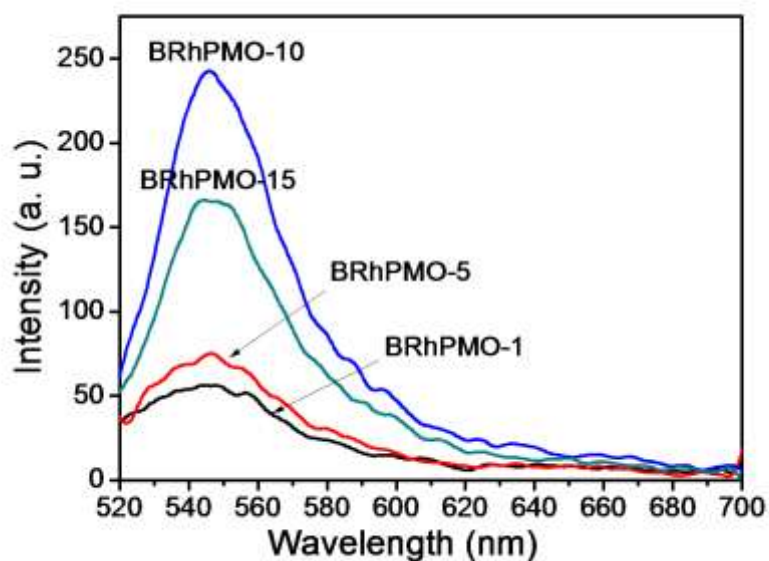


Figure S8. Fluorescence response of BRhPMOs with different BRh-Si₄/TEOS molar ratios upon the addition of Cu²⁺ (10⁻⁴ M) in C₂H₅OH/HEPES (8:2 v/v, pH 6.8).

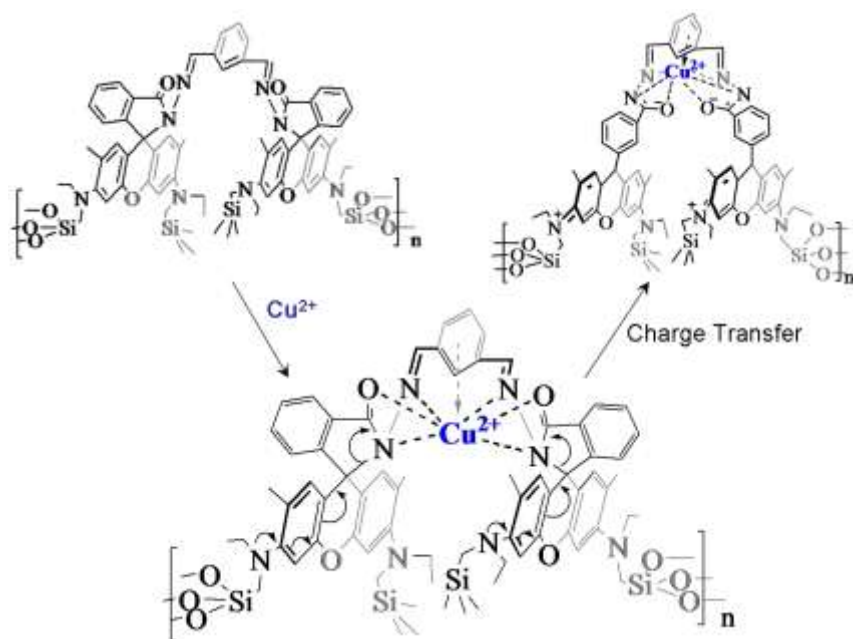


Figure S9. The mechanism for Cu²⁺-induced ring-opening of BRh units in BRhPMOs.

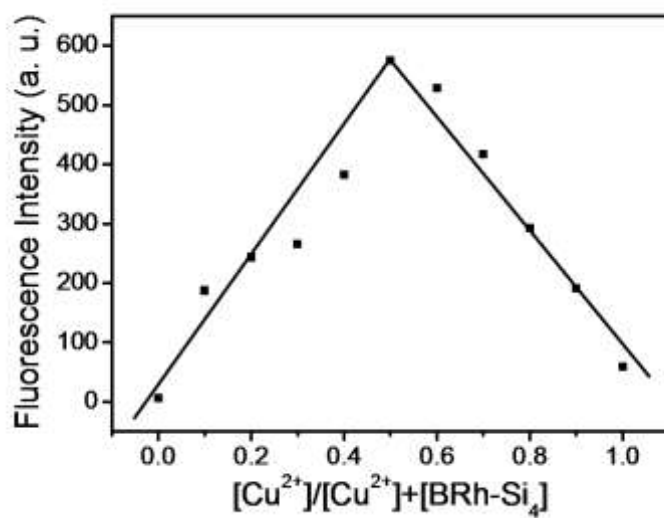


Figure S10. Job's plot for BRh-Si₄ and Cu²⁺ in THF. The total concentration of BRh-Si₄ and copper ion was 1.0×10⁻⁴ M.

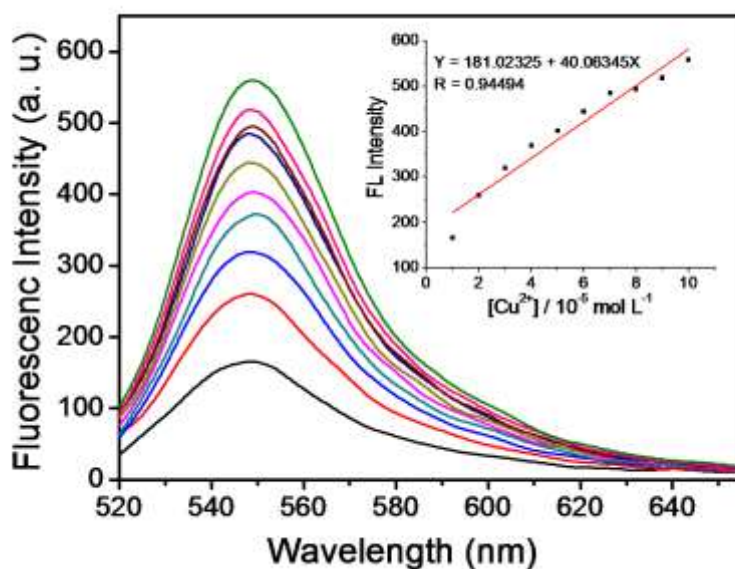


Figure S11. Fluorescence response of BRhPMOs (0.1 mg mL^{-1}) upon the addition of Cu^{2+} in $\text{C}_2\text{H}_5\text{OH/HEPES}$ (8:2 v/v, pH 6.8). Inset: emission intensity at 548 nm of BRhPMOs (0.1 mg mL^{-1}) as a function of Cu^{2+} concentration in 10^{-5} M range (1.0×10^{-5} to $10 \times 10^{-5} \text{ M}$). Excitation at 500 nm.