

## **Immobilized bis-layered ionic liquids/peroxotungstates as an efficient catalyst for selective oxidation of alcohols in neat water**

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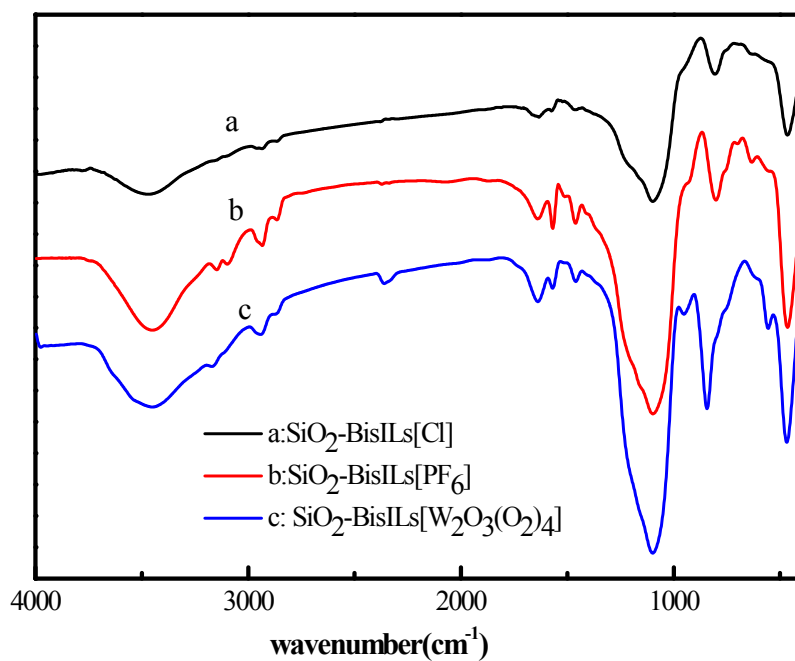
**Fig. S1** IR spectra of the catalyst and its precursors.

**Fig. S2** The TGA curves of SiO<sub>2</sub>-BisILs[Cl] (a), SiO<sub>2</sub>-BisILs[PF<sub>6</sub>] (b), and SiO<sub>2</sub>-BisILs[W<sub>2</sub>O<sub>3</sub>(O<sub>2</sub>)<sub>4</sub>] (c).

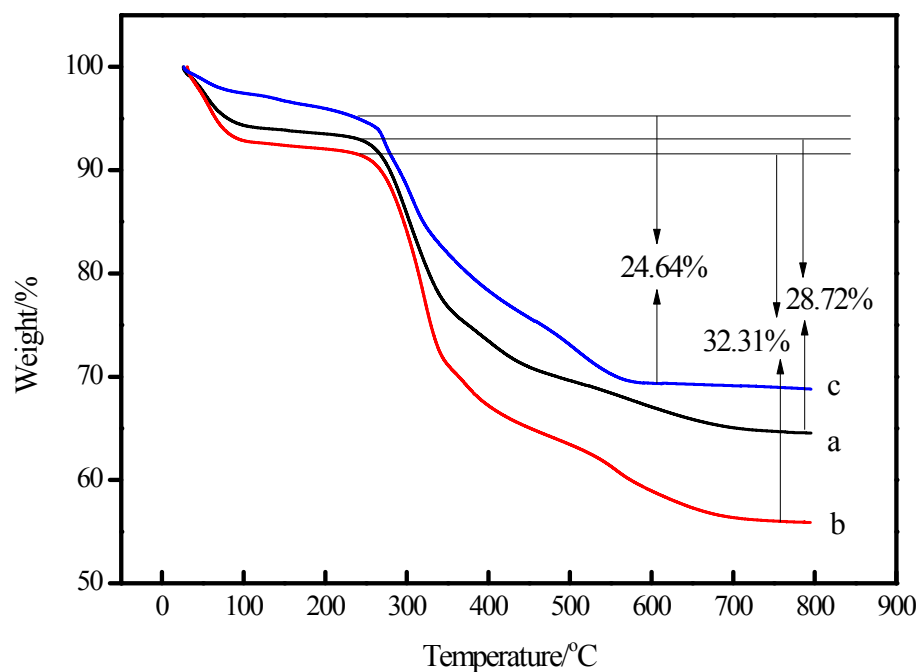
**Fig. S3** SEM image and EDAX results of the SiO<sub>2</sub>-BisILs[PF<sub>6</sub>].

**Fig. 4S** SEM image and EDAX results of the SiO<sub>2</sub>-BisILs[W<sub>2</sub>O<sub>3</sub>(O<sub>2</sub>)<sub>4</sub>].

**Fig. 5S** IR spectra of the fresh and used SiO<sub>2</sub>-BisILs[W<sub>2</sub>O<sub>3</sub>(O<sub>2</sub>)<sub>4</sub>].



**Fig. S1** IR spectra of the catalyst and its precursors.



**Fig. S2** The TGA curves of SiO<sub>2</sub>-BisILs[Cl] (a), SiO<sub>2</sub>-BisILs[PF<sub>6</sub>] (b), and SiO<sub>2</sub>-BisILs[W<sub>2</sub>O<sub>3</sub>(O<sub>2</sub>)<sub>4</sub>] (c).

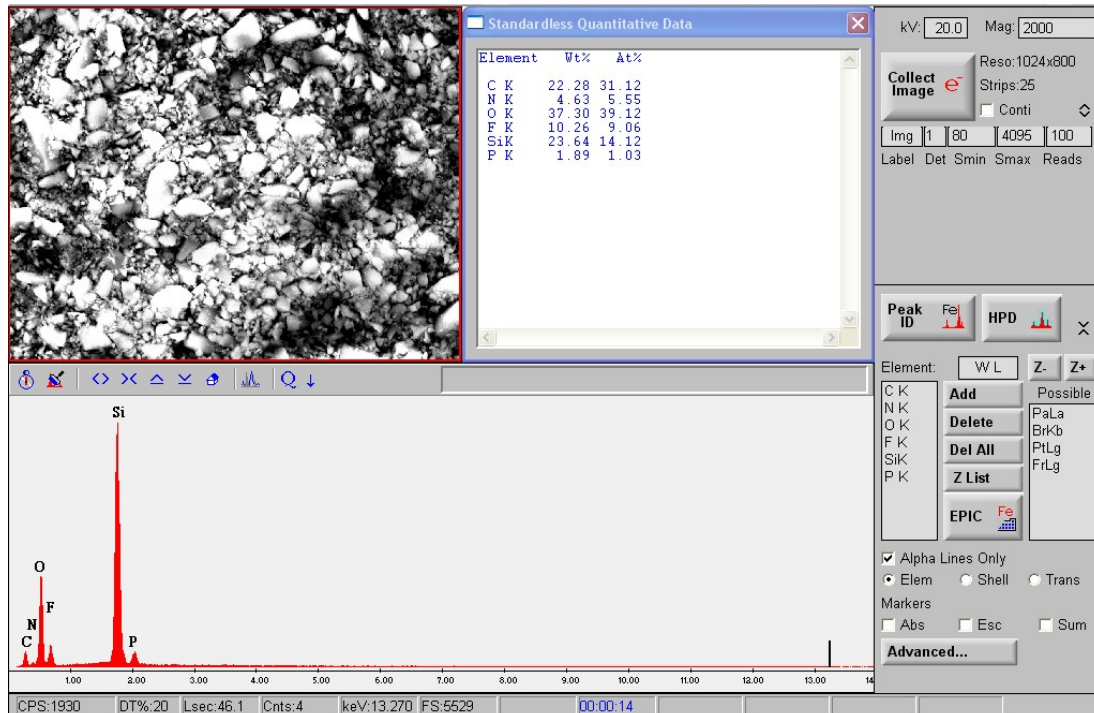


Fig. S3 SEM image and EDAX results of the SiO<sub>2</sub>-BisILs[PF<sub>6</sub>].

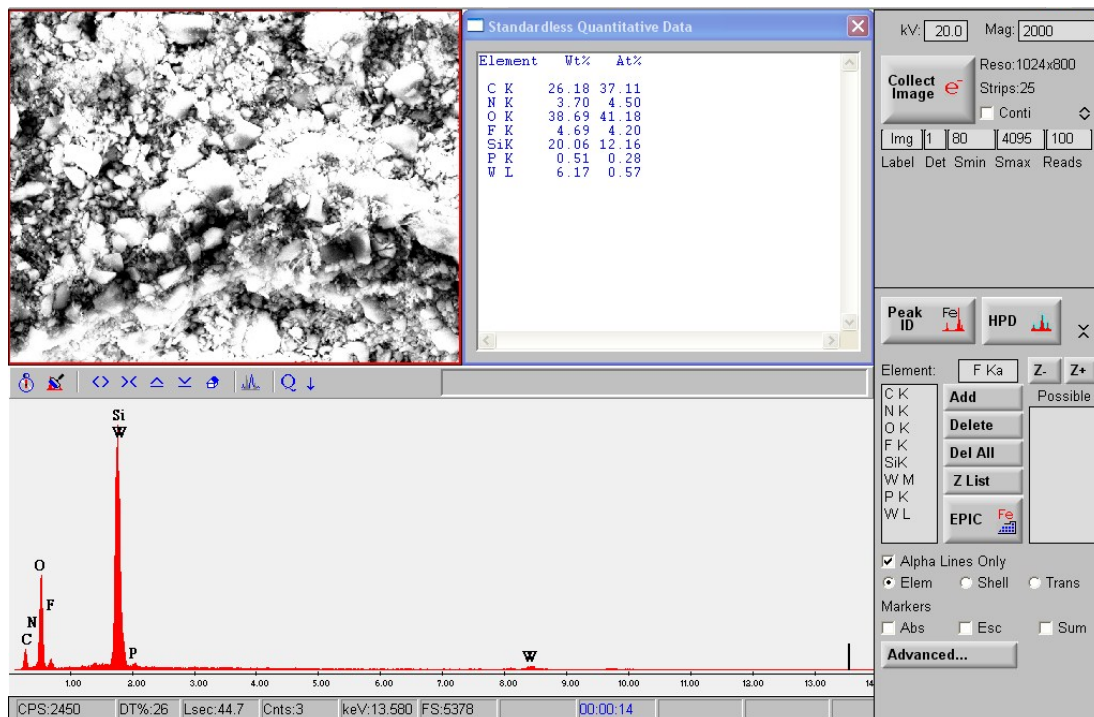
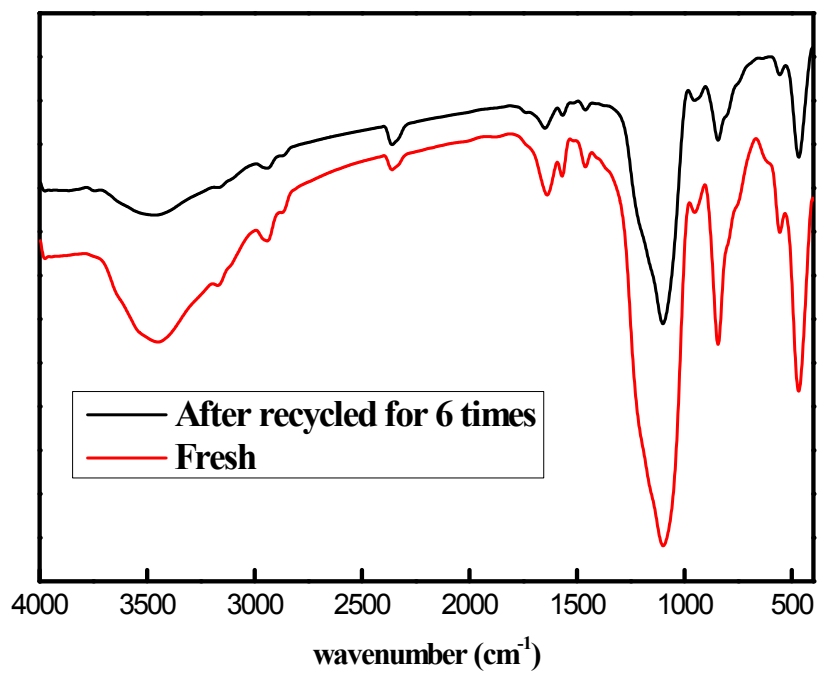


Fig. 4S SEM image and EDAX results of the SiO<sub>2</sub>-BisILs[W<sub>2</sub>O<sub>3</sub>(O<sub>2</sub>)<sub>4</sub>].



**Fig. 5S** IR spectra of the fresh and used SiO<sub>2</sub>-BisILs[W<sub>2</sub>O<sub>3</sub>(O<sub>2</sub>)<sub>4</sub>].