

## Electronic Supplementary Information

### ***In situ* modification of cellulose paper with amino groups for catalytic applications**

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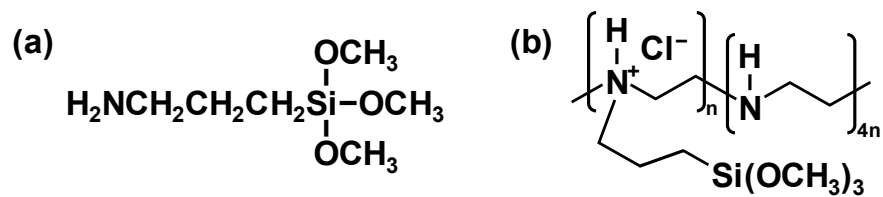
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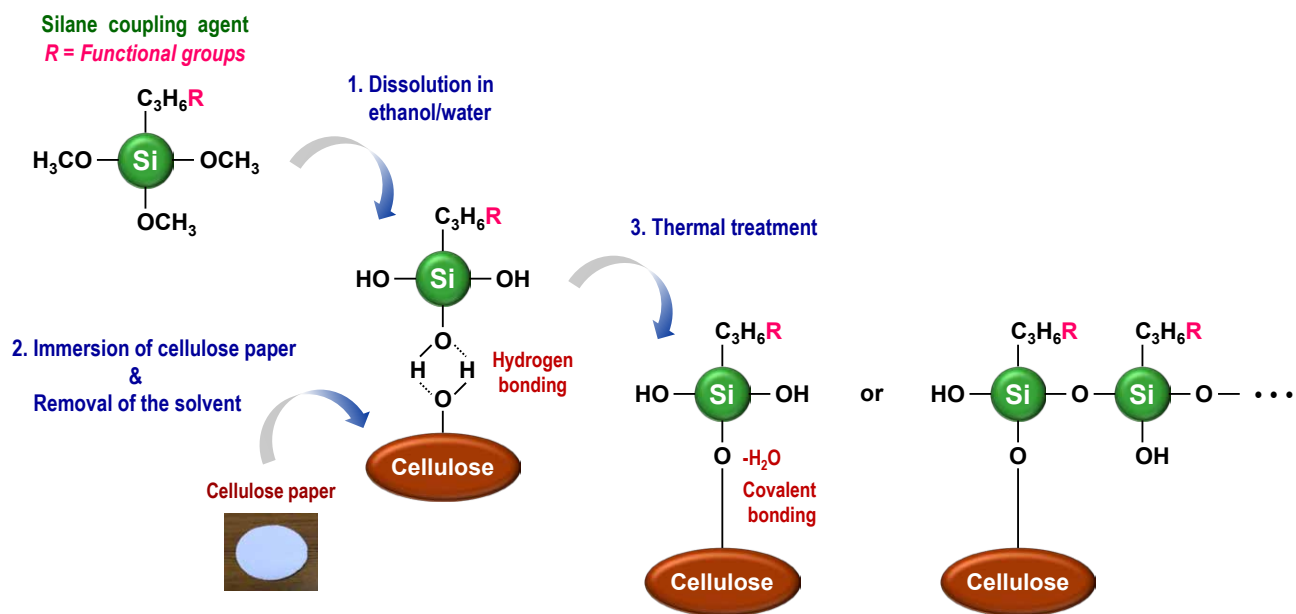
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## Experimental

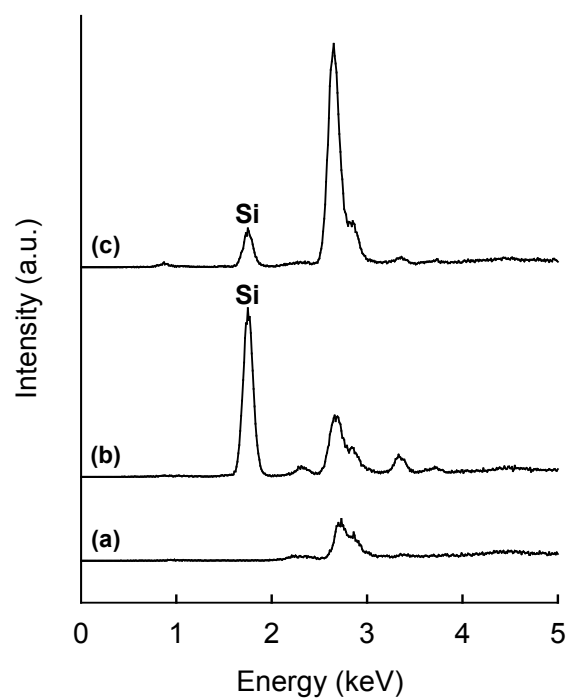
**Preparation of cellulose paper modified with imidazolium-based ionic liquid.** Imidazolium-based ionic liquid, 1-methyl-3-(3-trimethoxysilylpropyl)-imidazolium chloride, was prepared according to a previous report<sup>1</sup>. 1-Methyl-3-(3-trimethoxysilylpropyl)-imidazolium chloride (100 mg) was dissolved in a mixture of 80/20 (v/v) ethanol/water (10 ml). Then a piece of cellulose paper (*ca.* 90 mg, 33 mm in diameter) was immersed in the resulting solution for 2 h. Subsequently, the solvent was evaporated at 40 °C for 3 h under reduced pressure. The obtained paper was thermally treated at 110 °C for 3 h, followed by thorough washing with ethanol and drying at room temperature. The resistance of the as-prepared ionic liquid-modified paper was measured using a tester (Agilent U1253A OLED Handled Digital Multimeter, Agilent Technologies, Inc.) at 23°C and at a relative humidity of *ca.* 50%. The measurement spacing was set at 10 mm.



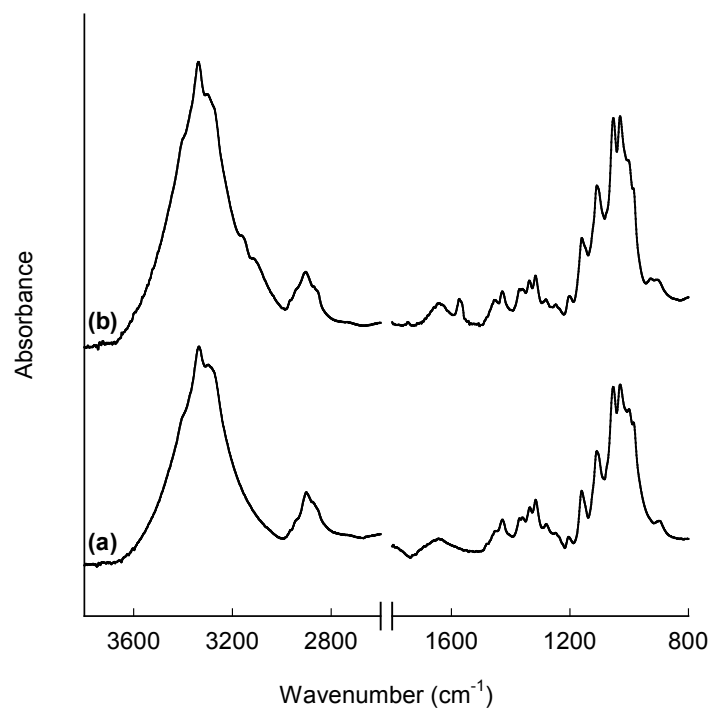
**Fig. S1** Chemical structure of (a) 3-aminopropyltrimethoxysilane and (b) trimethoxysilylpropyl-modified polyethylenimine.



**Fig. S2** Putative scheme of the silane coupling process on the cellulosic substrate.



**Fig. S3** XRF spectra of (a) untreated cellulose paper, cellulose paper treated with (b) 3-aminopropyltrimethoxysilane and (c) trimethoxysilylpropyl-modified PEI.



**Fig. S4** FT-IR spectra of (a) untreated cellulose paper, (b) cellulose paper treated with imidazolium-based ionic liquid, 1-methyl-3-(3-trimethoxysilylpropyl)-imidazolium chloride. The absorption peak around *ca.* 1560 cm<sup>-1</sup> shown in Fig. S2b, which is ascribed to the ring stretching of the imidazolium molecule<sup>2</sup>, clearly indicated the introduction of imidazolium-based ionic liquid to cellulose paper. While the original paper had no conductivity, the as-prepared ionic liquid-modified paper exhibited a resistance value of *ca.* 10 MΩ, indicating potential for electronic applications.

## References

- 1 T. Sasaki, M. Tada, C. Zhong, T. Kume and Y. Iwasawa, *J. Mol. Catal. A*, 2008, **279**, 200–209.
- 2 L. Han, S.-W. Park and D.-W. Park, *Energy Environ. Sci.*, 2009, **2**, 1286–1292.