

Supporting information

**SO<sub>2</sub> capture by 2-pyridineethanol through the formation of a  
zwitterionic liquid**

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## **Experimental Sections**

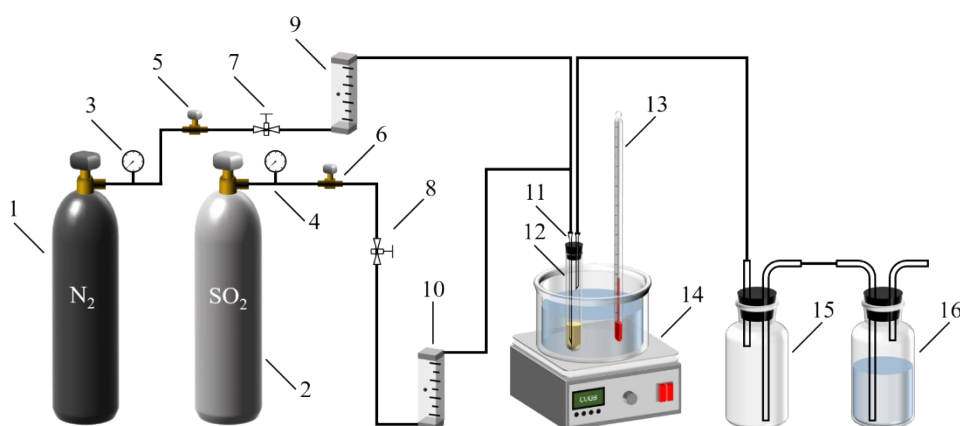
### **Materials and Characterizations**

2-PyEtOH (99%) was supplied by Alfa Aesar and it was dried by 4Å molecular sieve before use. SO<sub>2</sub> (≥ 99.9%) and N<sub>2</sub> (≥99.99%) were provided by Beijing ZG Special Gases Sci. and Tech. Co. Ltd. A Perkin-Elmer Frontier spectrometer with an attenuated total reflection (ATR) accessory was used to record the FTIR spectra. <sup>1</sup>H NMR (600 MHz) and <sup>13</sup>C NMR (151 MHz) spectra were recorded on a Bruker spectrometer using CDCl<sub>3</sub> as the internal solvent, and the chemical shifts values were referenced to TMS.

### **Absorption and desorption of SO<sub>2</sub>**

2-PyEtOH (~1.0 g) was added into a glass tube with a diameter of 10 mm, which was sealed with a rubber lid equipped with two needles. One needle was SO<sub>2</sub> outlet, and the other one was SO<sub>2</sub> inlet. The tube was partially immersed in a water bath at 20 °C. Then, SO<sub>2</sub> was bubbled into 2-PyEtOH in the tube at a flow rate of ~50 mL/min, which was controlled by a flowmeter. The weight of the tube was determined at regular time by an electronic balance with an accuracy of ±0.1 mg. The weight difference of the tube before and after SO<sub>2</sub> uptake was considered as the mass of SO<sub>2</sub> captured by the absorbent. In the low SO<sub>2</sub> partial pressure experiments, the pressure of SO<sub>2</sub> was obtained by tuning the flow rates of SO<sub>2</sub> and N<sub>2</sub>.

In the desorption process, the tube was placed in a water bath at 50 °C, and N<sub>2</sub> was bubbled through the solution at a flow rate of ~60 mL/min.



**Fig. S1** The schematic diagram of SO<sub>2</sub> absorption and desorption process by 2-PyEtOH. 1, 2 - Gas cylinders; 3, 4 - Pressure gauges; 5, 6 - Pressure reducing valves; 7, 8 - Needle valves; 9, 10 - Gas flowmeters; 11 - Needles; 12 - Tube; 13 - Thermometers; 14 - Water bath; 15 – Safety bottle; 16 - NaOH aqueous solution

**Table S1.** Comparison of 2-PyEtOH with DESs and ILs in SO<sub>2</sub> capacity and desorption temperature.

Solvents	SO <sub>2</sub> capacity (g SO <sub>2</sub> /g solvent)		Desorption temperature /°C	References
	T /°C	1.0 atm		
2-PyEtOH	20	1.16	50	This work
BmimCl	50	0.75	140	1
[Emim][Cl][SCN] (1:1)	20	1.22	120	2
[P <sub>66614</sub> ][4-CNC <sub>6</sub> H <sub>4</sub> COO]	20	0.40	120	3
[P <sub>66614</sub> ][4-Br-PhCOO]	20	0.39	120	4
[P <sub>66614</sub> ][4-Cl-PhCOO]	20	0.39	120	4
EmimCl-TEG (2:1)	20	1.06	100	5
Bet-EG (1:3)	40	0.366	90	6
BmimCl-Im (2:1)	20	1.32	80	7
BmimCl-EU (2:1)	20	1.18	80	8
EmimCl-EG (2:1)	20	1.15	80	9
EmimCl-SN (1:1)	20	1.13	80	10
[Emim][SCN]	20	1.13	80	11
[Et <sub>2</sub> NEmim][Tetz]	20	1.10	80	12
[E <sub>3</sub> mim][Tetz]	20	0.95	80	13
EmimCl-TEG (1:1)	20	0.91	80	5
[C <sub>10</sub> mim][Tetz]	20	0.74	80	13
[P <sub>66614</sub> ][Tetz]	20	0.43	80	14
[Na(TX-10)][SCN]	20	0.422	80	15
PPZBr-Gly (1:6)	20	0.35	80	16

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