

## Supporting Information

# Absorption Mechanism and Polarity-induced Viscosity Model for CO<sub>2</sub> Capture Using Hydroxypyridine-based Ionic Liquids

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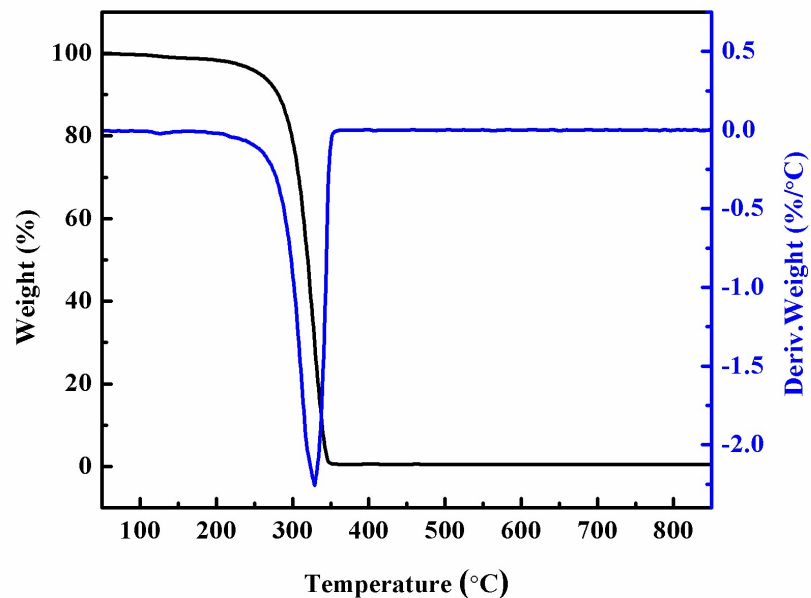
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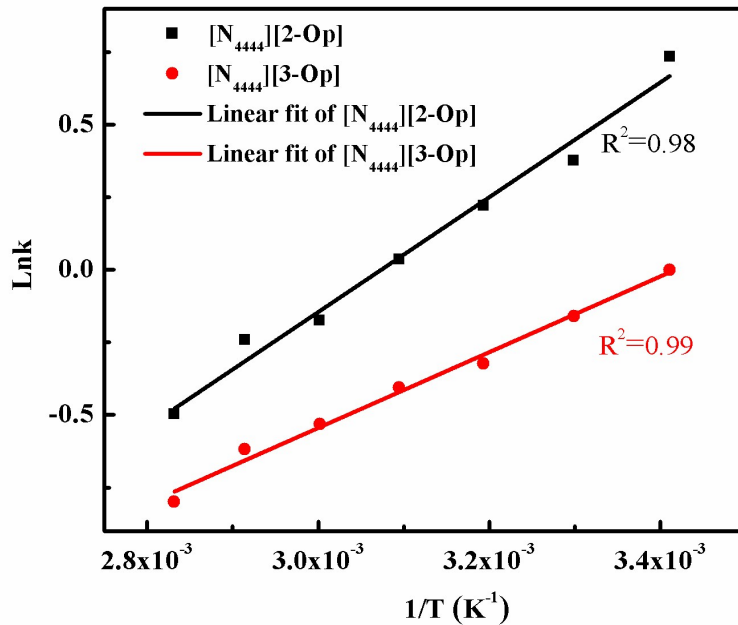
Matsubara, Aomori 030-0813, Japan

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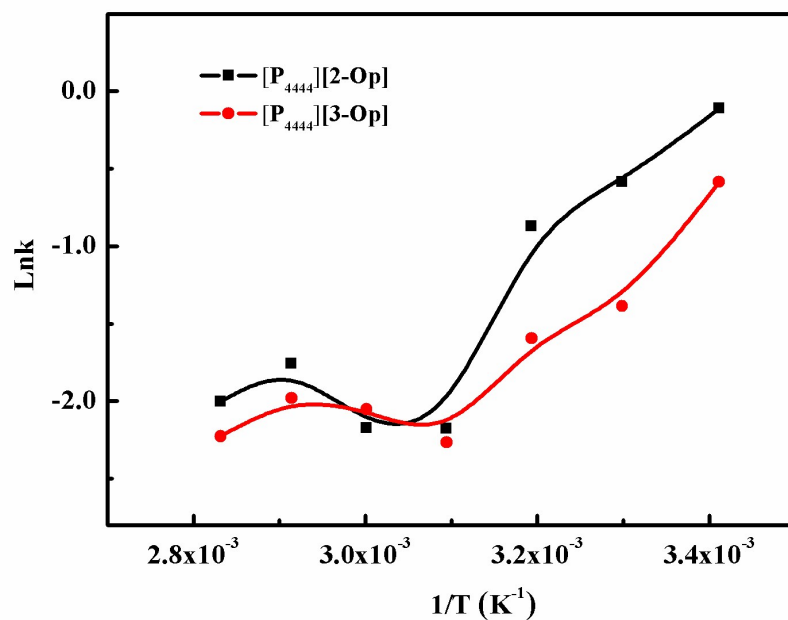
University of Science and Technology, Shanghai, 200237, P. R. China



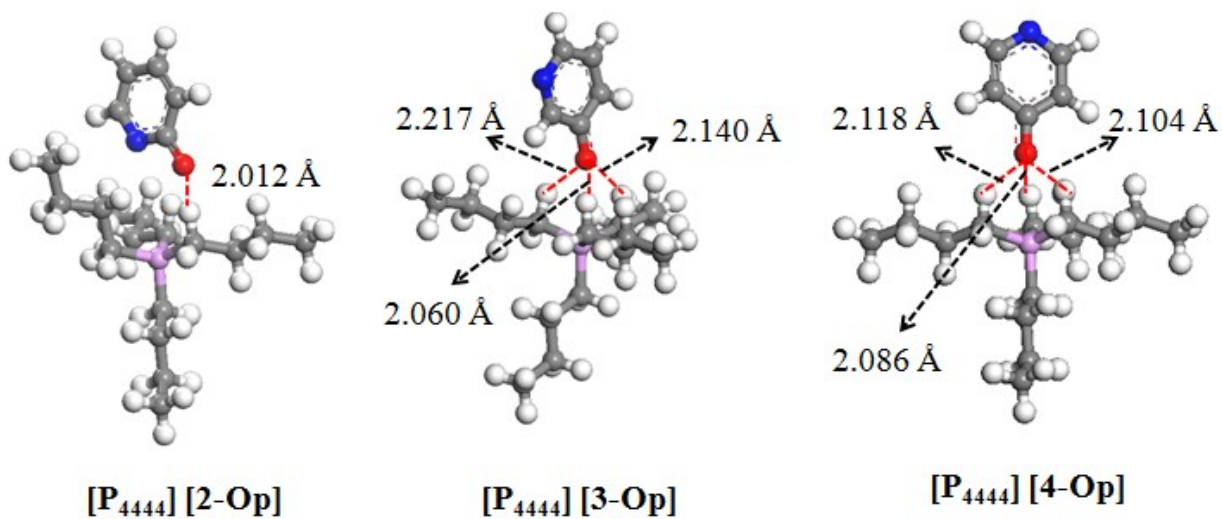
**Fig. S1** TG and DTG plot of [P<sub>4444</sub>][2-Op] with a heating rate of 10 °C/min.



**Fig. S2** Van't Hoff plots of fitted equilibrium constants for CO<sub>2</sub> with [N<sub>4444</sub>][2-Op] and [N<sub>4444</sub>][3-Op].



**Fig. S3** Van't Hoff plots of fitted equilibrium constants for CO<sub>2</sub> with [P<sub>4444</sub>][2-Op] and [P<sub>4444</sub>][3-Op]. The lines are drawn to guide the eye.



**Fig. S4** Optimized structures of [P<sub>4444</sub>][2-Op], [P<sub>4444</sub>][3-Op] and [P<sub>4444</sub>][4-Op] at the B3LYP/6-311++G\*\* level of theory.

## **NMR Data**

### **[P<sup>4444</sup>][2-Op]**

<sup>31</sup>P NMR (500 MHz, DMSO-d<sub>6</sub>): δ 46.00, 37.66, 33.80

### **[P<sup>4444</sup>][2-Op]+CO<sub>2</sub>**

<sup>31</sup>P NMR (500 MHz, DMSO-d<sub>6</sub>): δ 46.00, 37.65, 33.78, 31.48