

## Supplementary Information

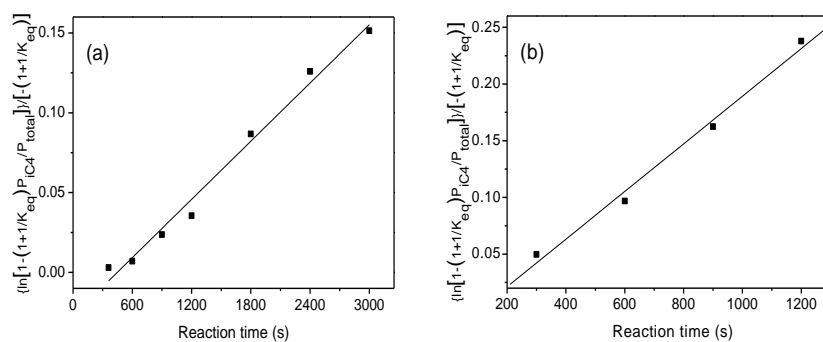


Figure S1 The plots of rate constants for 1-<sup>13</sup>C-n-butane isomerization reaction obtained from eq. (2) over CsPW (a) and Al<sub>0.1</sub>CsPW (b).

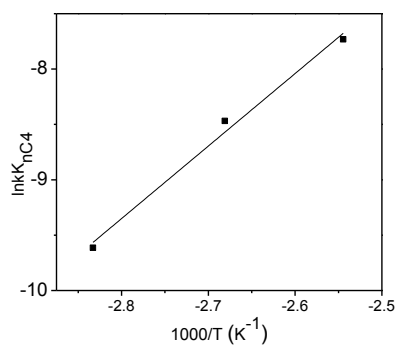


Figure S2 Arrhenius plot for 1-<sup>13</sup>C-n-butane isomerization over Al<sub>0.1</sub>CsPW.

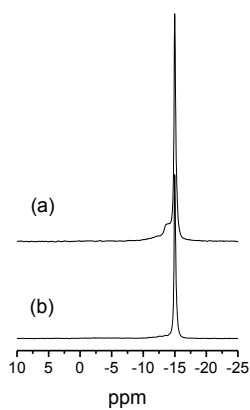


Figure S3 <sup>1</sup>H-decoupling <sup>31</sup>P MAS NMR spectra of (a) Al<sub>0.1</sub>CsPW and (b) CsPW after the adsorption of 2-<sup>13</sup>C-acetone.