

# Supporting Information

## NH<sub>3</sub> Mediated or Ion Migration Reaction —The Case Study on Halide-Amide System

Hujun Cao<sup>abc</sup>, Jianhui Wang<sup>a</sup>, Yongshen Chua<sup>a</sup>, Han Wang<sup>ac</sup>, Guotao Wu<sup>a</sup>,

Zhitao Xiong<sup>a</sup>, Jieshan Qiu<sup>b</sup>, Ping Chen<sup>a\*</sup>

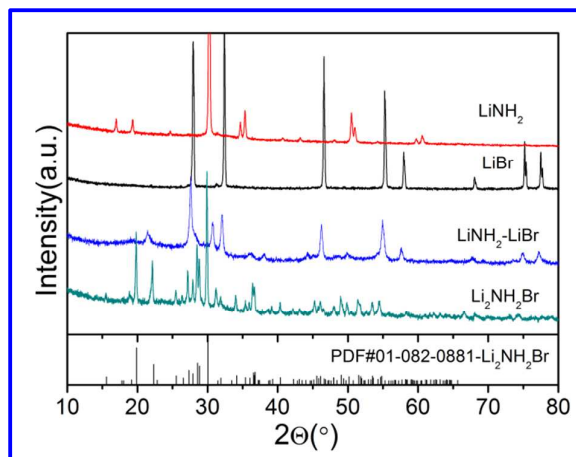
<sup>a</sup> Dalian National Laboratory for Clean Energy, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian 116023, P R China.

<sup>b</sup> Carbon Research Laboratory, Liaoning Key Lab for Energy Materials and Chemical Engineering, State Key Lab of Fine Chemicals, Dalian University of Technology, Dalian 116024, P R China.

<sup>c</sup> University of Chinese Academy of Sciences, Beijing 100049, P R China.

\* E-mail: [pchen@dicp.ac.cn](mailto:pchen@dicp.ac.cn).

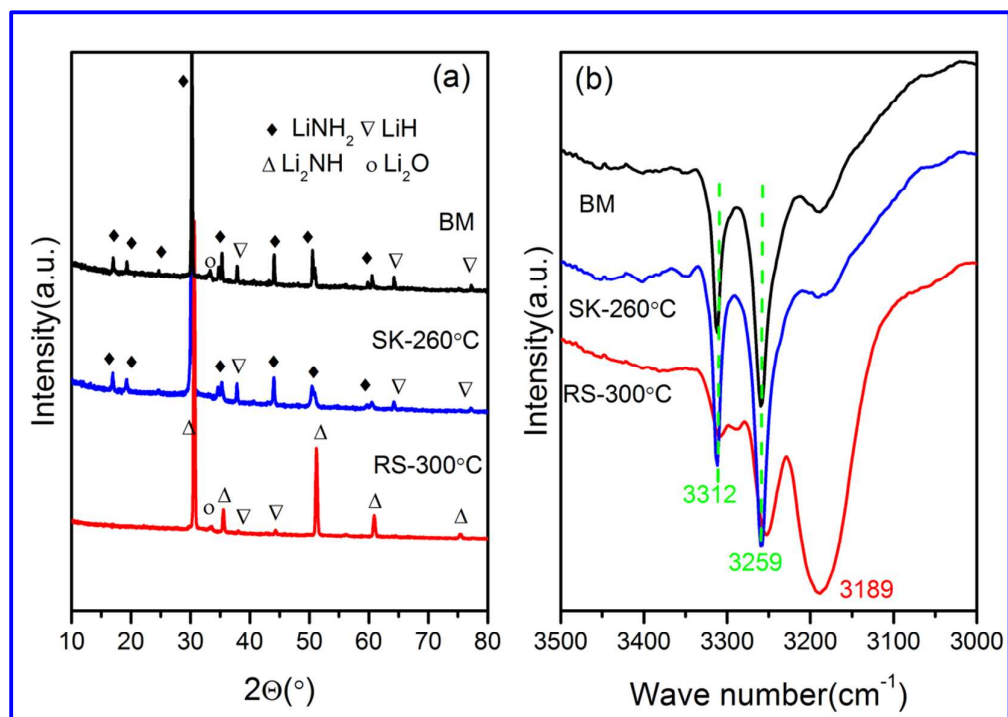
Tel: +86-411-84379905, Fax: +86-411-84685940.



**Figure S1.** XRD patterns of  $\text{LiBr}$ ,  $\text{LiNH}_2$ , and  $\text{Li}_2\text{NH}_2\text{Br}$  samples.



**Figure S2.** The digital photographs for  $\text{Li}_2\text{NH}_2\text{Br}$  before and after calcined at 250 °C.



**Figure S3.** XRD patterns (a) and FTIR spectra (b) of  $\text{LiNH}_2\text{-2LiH}$  system at different states: release (RS) at 300 °C, soak (SK) at 260 °C and after ball milling (BM).