

## Catalytic Ionic Hydrogenation by Intra-zeolite Frustrated Lewis Pairs

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Ionic hydrogenation (IH) is an addition of proton and hydride to unsaturated substrates. Typical materials containing both proton and hydride source are transition metal dihydride complexes<sup>1)</sup>. Frustrated Lewis pair (FLP) is a set of Lewis acid and base within the materials. Most of FLP compounds reported to date are zwitter-ionic organic molecules such as  $(C_6F_5)_2BH-HPR_2$  (R=Mes or tBu)<sup>2)</sup>. These are homogeneous catalysts which require separation step after the reaction.

Recently we have reported a formation of intra-zeolite FLP catalysts having hydridic sites as well as protic sites<sup>3)</sup>. Catalytic ionic hydrogenation of unsaturated organic compounds possessing C=O, C≡N and C=C have been demonstrated. Especially, the reaction coordinate of aceton hydrogenation deduced from in situ experiments has been confirmed by a DFT calculation. Detailed results and discussion will be presented.

1) R. M. Bullock, *Chem. Eur. J.*, 2004, 10, 2366-2374.

2) D. W. Stephan and G. Erker, *Angew. Chem. Int. Ed.*, 2015, 54, 2-44.

3) H. Lee and Y. N. Choi et al. *Angew. Chem. Int. Ed.*, 2015, 54, 13080-13084.