Electronic Supplementary Material (ESI) for Sustainable Energy & Fuels.

Supporting Information

Esterification of 1-Hexene and acetic acid catalyzed by the modified resin with Lewis acid

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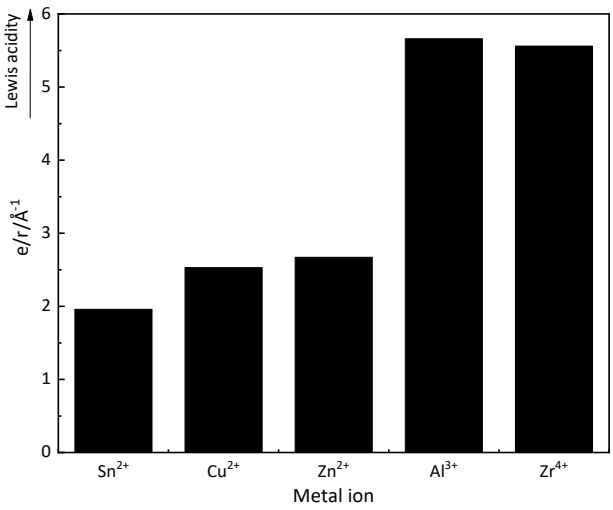


Fig. S1 The Lewis acidity of different metal ions.

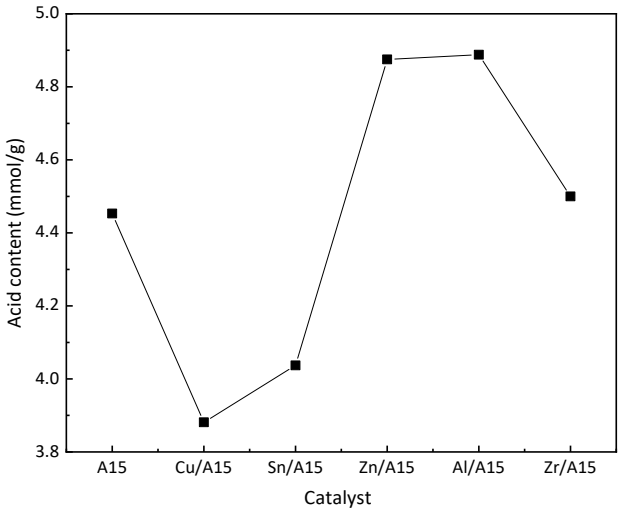


Fig. S2 Acid content of different catalysts.

Note: The acid content of different catalysts were measured according to N-butylamine titration.[1]

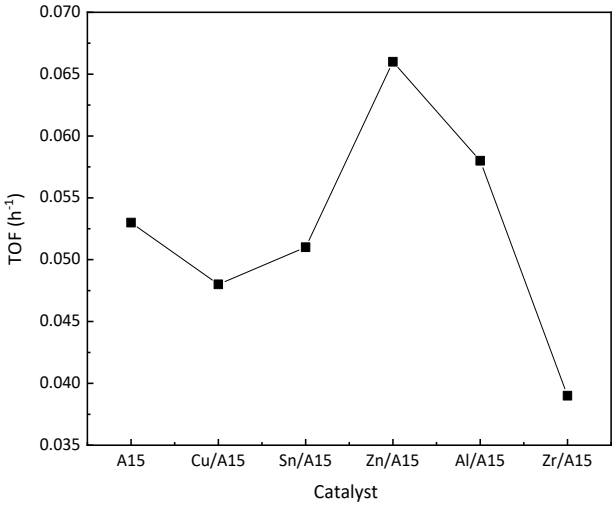


Fig. S3 Effect of different catalysts on TOF for esterification.

Note: was calculated as (mmol of 1-methylbutyl acetate)/(mmol of acid sites in added catalyst)/(reaction time, h).[2,3]

Combining the results of Fig. S3, Fig. 6, and Fig. S2, it can be indicated that the catalyst activity of catalysts in the esterification is different from the order of acid content, which is consist with the study of Shi et al.[2]

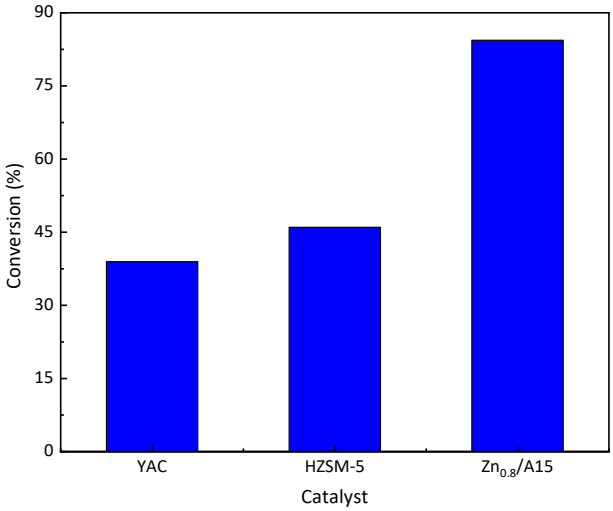


Fig. S4 Catalytic performance of different homogeneous catalysts. Reaction conditions: 90 °C, 12 h, n(acetic acid) / n(1-hexene) =1, Catalyst mass = 1.2 g.

Note: The preparation process of YAC is based on the study of Xue et al.[4] About HZSM-5, the molar ratio of SiO_2 to Al_2O_3 is 25.

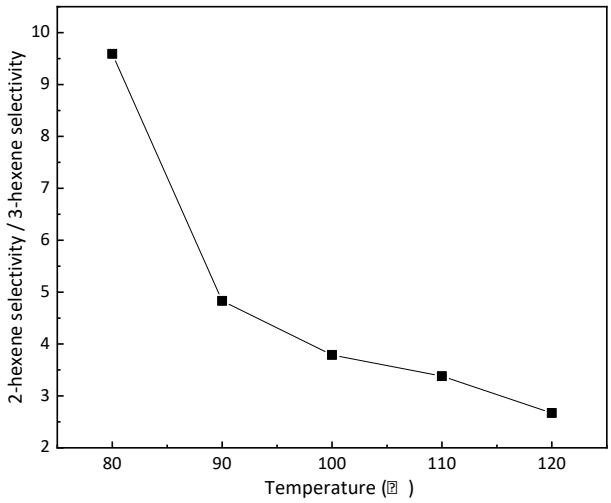


Fig. S5 Effect of temperature on 2-hexene selectivity/3-hexene selectivity.

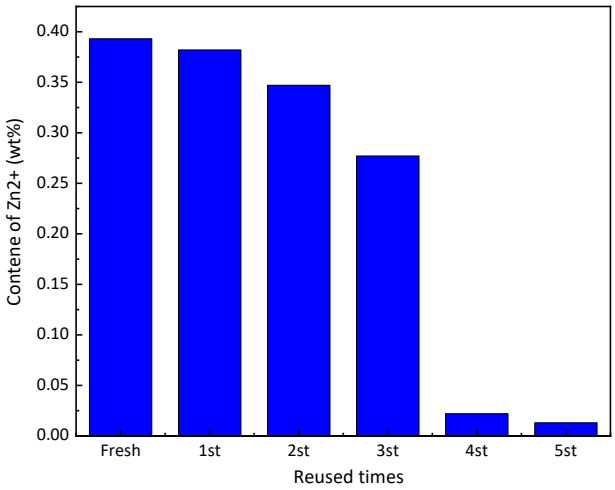
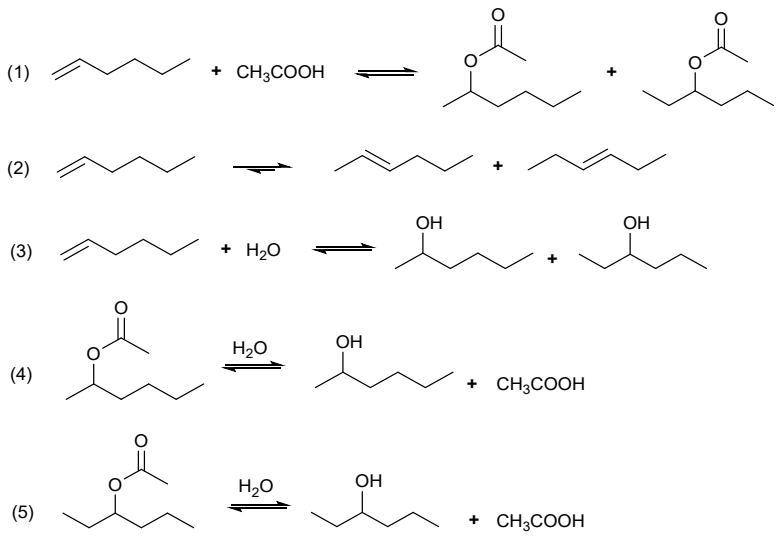


Fig. S6 The content of Zn^{2+} after reused different times.



Scheme S1 Reaction route of different products.

Referennce

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3 W. Shi, J. Zhao, X. Yuan, S. Wang, X. Wang and M. Huo, *Chem. Eng. Technol*., 2012, **35**, 347-352.

4 W. Xue, H. Zhao, J. Yao, F. Li and Y. Wang, *Chin. J. Catal*., 2016, **37**, 769-777.