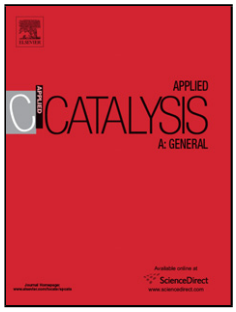

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Hydrodeoxygenation activity of W modified Ni/H-ZSM-5 catalyst for single step conversion of levulinic acid to pentanoic acid: An insight on the reaction mechanism and structure activity relationship

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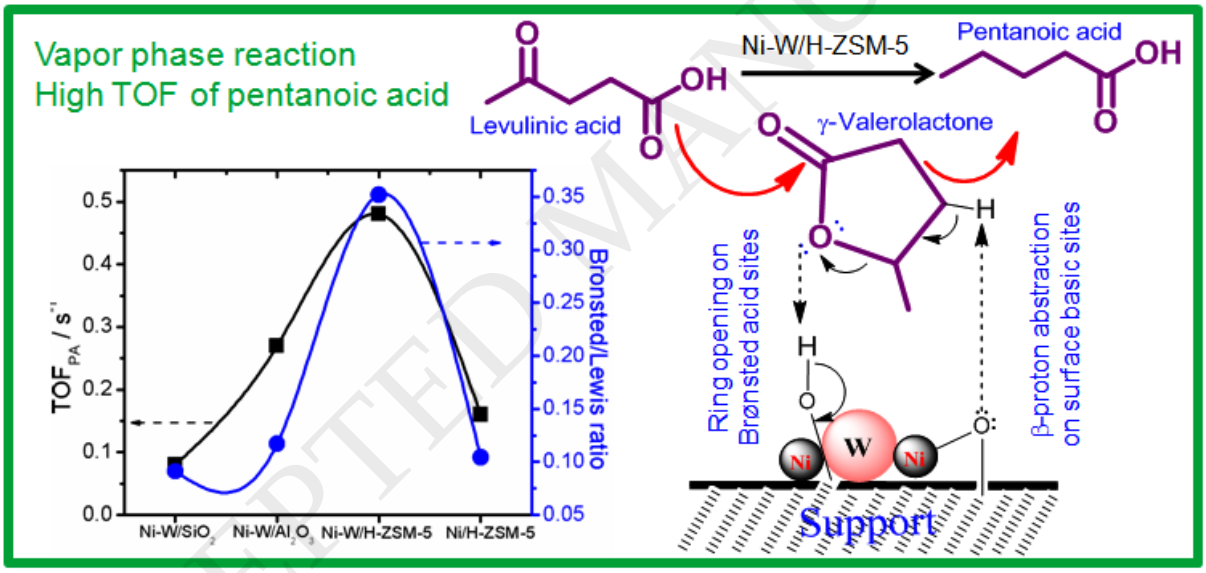
Graphical Abstract



Highlights

- Levulinic acid to pentanoic acid in a single step at 270 °C and ambient H_2 pressure
- High TOF of pentanoic acid obtained over W modified Ni/H-ZSM-5 catalyst
- Pyridine IR showed ring opening of γ-valerolactone occurred on Brønsted acid sites
- HCOOH adsorbed DRIFTS indicated β-proton abstraction on surface basic sites

Abstract

Direct conversion of levulinic acid (LA) to pentanoic acid (PA) was achieved over the W modified Ni supported on SiO_2, Al_2O_3 and H-ZSM-5 catalysts at 270 °C and ambient H_2