

Accepted Manuscript

Title: Novel aqueous-phase hydrogenation reaction of the key biorefinery platform chemical levulinic acid into γ -valerolactone employing highly active, selective and stable water-soluble ruthenium catalysts modified with nitrogen-containing ligands



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PII: S0926-3373(18)30617-9
DOI: <https://doi.org/10.1016/j.apcatb.2018.07.009>
Reference: APCATB 16831

To appear in: *Applied Catalysis B: Environmental*

Received date: 21-3-2018
Revised date: 26-6-2018
Accepted date: 2-7-2018

Please cite this article as: Moustani C, Anagnostopoulou E, Krommyda K, Panopoulou C, Koukoulakis KG, Bakeas EB, Papadogianakis G, Novel aqueous-phase hydrogenation reaction of the key biorefinery platform chemical levulinic acid into γ -valerolactone employing highly active, selective and stable water-soluble ruthenium catalysts modified with nitrogen-containing ligands, *Applied Catalysis B: Environmental* (2018), <https://doi.org/10.1016/j.apcatb.2018.07.009>

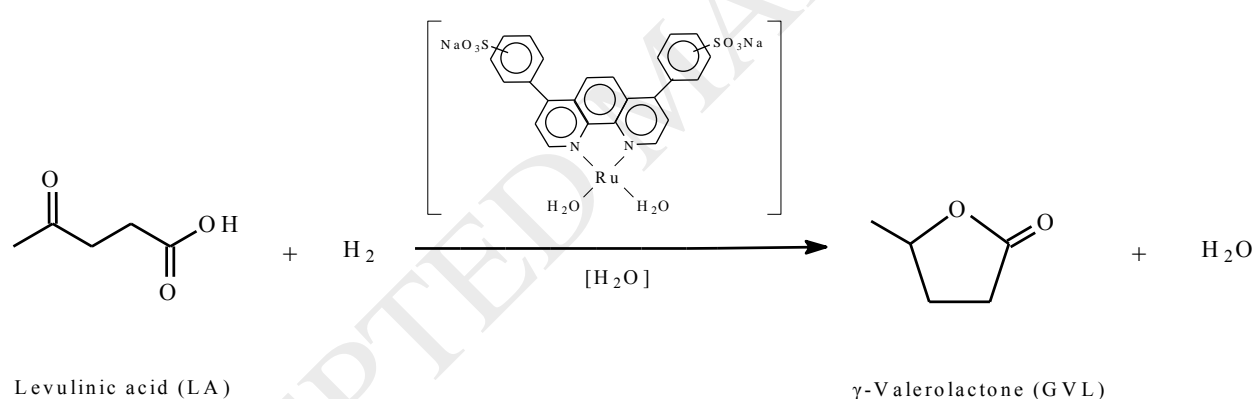
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Novel aqueous-phase hydrogenation reaction of the key biorefinery platform chemical levulinic acid into γ -valerolactone employing highly active, selective and stable water-soluble ruthenium catalysts modified with nitrogen-containing ligands

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Graphical Abstract



Highlights

- Novel hydrogenation of the key biorefinery platform chemical levulinic acid to γ -valerolactone in aqueous media
- High activities of novel water-soluble ruthenium catalysts modified by nitrogen-containing ligands (TOF = 3000 h⁻¹)
- Stable and recyclable Ruthenium/bathophenanthrolinedisulfonic acid disodium salt catalysts
- Superior activity over water-soluble Ru/TPPTS benchmark catalyst
- Essentially quantitative selectivity of 99.9 mol% to γ -valerolactone

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