

Accepted Manuscript

Title: A bio-inspired heterogeneous catalyst for the transformation of limonene from orange peel waste biomass into value-added products

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PII: S0920-5861(17)30496-0
DOI: <http://dx.doi.org/doi:10.1016/j.cattod.2017.07.012>
Reference: CATTOD 10926

To appear in: *Catalysis Today*

Received date: 29-11-2016
Revised date: 19-6-2017
Accepted date: 8-7-2017

Please cite this article as: Jaime-Andrés Becerra, Lina-María González, Aída-Luz Villa, A bio-inspired heterogeneous catalyst for the transformation of limonene from orange peel waste biomass into value-added products, *Catalysis Today* <http://dx.doi.org/10.1016/j.cattod.2017.07.012>

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A bio-inspired heterogeneous catalyst for the transformation of limonene from orange peel waste biomass into value-added products

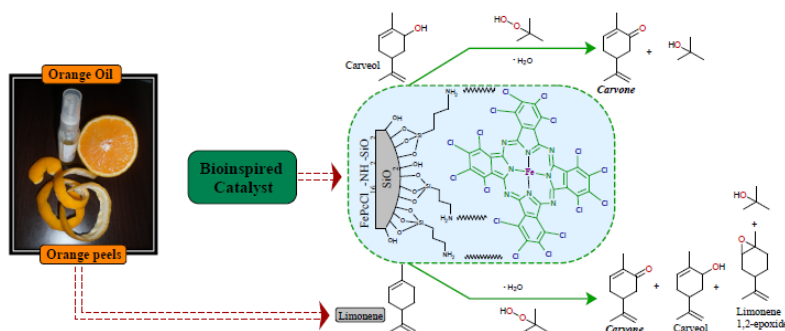
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Graphical abstract



Highlights

- Carvone was obtained from limonene, carveol and orange oil
- The bio-inspired catalyst FePcCl₁₆-NH₂-SiO₂ is active in limonene oxidation
- The effect of free radicals on the kinetic of limonene oxidation was studied
- Experimental limonene and carveol reaction rate fitted LHHW-based kinetic equations
- FePcCl₁₆-NH₂-SiO₂ catalyst did not deactivate at the reaction conditions

Abstract

The kinetic study of limonene oxidation using an iron hexadecachlorinated phthalocyanine immobilized on modified silica catalyst (FePcCl₁₆-NH₂-SiO₂) with the oxidizing agent *t*-butyl hydroperoxide (TBHP) is developed. Experimental reaction rates from a batch reactor were fitted with the kinetic expression based on Langmuir-Hinshelwood-Hougen-Watson (LHHW) mechanisms with the adsorption of both reactants and the main reaction products (carvone, limonene 1,2-epoxide and carveol) on the surface of the

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