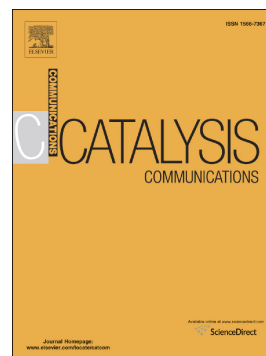


Accepted Manuscript

Role of the Fe oxidation states on the catalytic oxy-dehydrogenation of ethylbenzene using CO₂ as a soft oxidant over FeO_x/carbon-alumina

Venkata Ramesh Babu Gurram, Siva Sankar Enumula, Kumara Swamy Koppadi, Raji Reddy Chada, David Raju Burri, Seetha Rama Rao Kamaraju



PII: S1566-7367(18)30449-7
DOI: doi:[10.1016/j.catcom.2018.09.001](https://doi.org/10.1016/j.catcom.2018.09.001)
Reference: CATCOM 5492
To appear in: *Catalysis Communications*
Received date: 12 May 2018
Revised date: 31 August 2018
Accepted date: 8 September 2018

Please cite this article as: Venkata Ramesh Babu Gurram, Siva Sankar Enumula, Kumara Swamy Koppadi, Raji Reddy Chada, David Raju Burri, Seetha Rama Rao Kamaraju , Role of the Fe oxidation states on the catalytic oxy-dehydrogenation of ethylbenzene using CO₂ as a soft oxidant over FeO_x/carbon-alumina. *Catcom* (2018), doi:[10.1016/j.catcom.2018.09.001](https://doi.org/10.1016/j.catcom.2018.09.001)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Role of the Fe oxidation states on the catalytic oxy-dehydrogenation of ethylbenzene using CO₂ as a soft oxidant over FeO_x/carbon-alumina

Venkata Ramesh Babu Gurram,^{a, b, *} Siva Sankar Enumula,^b Kumara Swamy Koppadi,^b Raji Reddy Chada,^b David Raju Burri,^{a, b} Seetha Rama Rao Kamaraju^{a, b, *}

^aCSIR-Academy of Scientific and Innovative Research (CSIR-AcSIR), New Delhi, India

^bCatalysis & Fine Chemicals Division, CSIR-Indian Institute of Chemical Technology, Hyderabad - 500007, India.

* Corresponding Author; Phone: +91-40-27191711.

Email: SRRK: ksramaraoiict@gmail.com, VRBG: gvrchem@gmail.com

Abstract

Iron oxide (FeO_x) supported on 1:3 carbon-alumina (ICA) was prepared by wet impregnation method. Oxidized and reduced forms of Fe in ICA catalyst were achieved by diluted H₂O₂ and hydrazine hydrate treatments, respectively. Three different oxidation states of Fe present in magnetite (Fe²⁺ and Fe³⁺), hematite (Fe³⁺) and wüstite (Fe²⁺) were confirmed by XPS, powder-XRD, H₂-TPR, TGA, NH₃-TPD and N₂-physisorption analysis. Among the synthesized catalysts, in comparison with hematite and wüstite phases, magnetite phase offered high catalytic activity in ethylbenzene dehydrogenation reaction. The presence of CO₂ in the reaction mixture was found to leave intact the activated carbon support structure.

Keywords: Carbon dioxide; Ethylbenzene dehydrogenation; Fe₂O₃; Fe₃O₄; FeO; Styrene.

Download English Version:

<https://daneshyari.com/en/article/10224911>

Download Persian Version:

<https://daneshyari.com/article/10224911>

[Daneshyari.com](https://daneshyari.com)