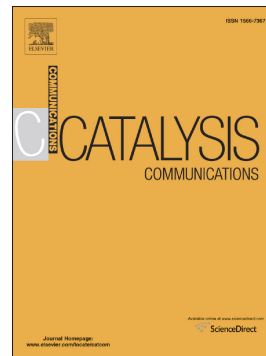


Accepted Manuscript

New insights into the promotional effects of Cu and Fe over V₂O₅-WO₃/TiO₂ NH₃-SCR catalysts towards oxidation of Hg⁰

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PII: S1566-7367(17)30273-X

DOI: doi: [10.1016/j.catcom.2017.06.036](https://doi.org/10.1016/j.catcom.2017.06.036)

Reference: CATCOM 5102

To appear in: *Catalysis Communications*

Received date: 13 April 2017

Revised date: 20 June 2017

Accepted date: 21 June 2017

Please cite this article as: Hongyan Wang, Baodong Wang, Qi Sun, Yonglong Li, Wayne Qiang Xu, Junhua Li, New insights into the promotional effects of Cu and Fe over V₂O₅-WO₃/TiO₂ NH₃-SCR catalysts towards oxidation of Hg⁰. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Catcom(2017), doi: [10.1016/j.catcom.2017.06.036](https://doi.org/10.1016/j.catcom.2017.06.036)

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New insights into the promotional effects of Cu and Fe over V₂O₅-WO₃/TiO₂**NH₃-SCR catalysts towards oxidation of Hg⁰**Hongyan Wang ^{a,b}, Baodong Wang ^{a*}, Qi Sun ^a, Yonglong Li ^a, Wayne Qiang Xu ^a, Junhua Li ^b^a National Institute of Clean-and-Low-Carbon Energy (NICE), Beijing 102209, China^b School of Environment, Tsinghua University, Beijing 100084, China

*Corresponding author. Tel.: +86-010-57339633

Fax: +86-010-57339649

E-mail address: wangbaodong@nicenergy.com

Abstract

The promotional effects of Cu and Fe over the V₂O₅-WO₃/TiO₂ NH₃-SCR catalyst for the oxidation of Hg⁰ and the selective catalytic reduction of NO by NH₃ were investigated in the temperature range of 280-360 °C. Cu or Fe addition, especially Cu, improved the catalytic performance of V₂O₅-WO₃/TiO₂. The results show that Cu²⁺ was the main Cu species in the Cu-containing catalyst, whereas FeVO₄ was formed in the Fe-containing catalyst. Well-dispersed active species, good redox properties and abundant chemisorbed surface oxygen species on the catalyst surface were responsible for the high catalytic performances. Hg⁰ oxidation over the V-based catalysts may follow a Mars-Maessen mechanism.

Keywords: Cu, Fe, V₂O₅-WO₃/TiO₂, Hg⁰, NO**1. Introduction**

Mercury pollution is a growing concern globally because of its volatility, persistence and bioaccumulation (as methyl mercury) in the environment, which can pose a variety of risks to human health [1]. The major anthropogenic source of Hg

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