

Accepted Manuscript

Title: Experimental and modeling study of visible light responsive photocatalytic oxidation (PCO) materials for toluene degradation

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PII: S0926-3373(17)30464-2
DOI: <http://dx.doi.org/doi:10.1016/j.apcatb.2017.05.047>
Reference: APCATB 15689

To appear in: *Applied Catalysis B: Environmental*

Received date: 22-3-2017
Revised date: 15-5-2017
Accepted date: 17-5-2017

Please cite this article as: Lexuan Zhong, James J. Brancho, Stuart Batterman, Bart M. Bartlett, Christopher Godwin, Experimental and modeling study of visible light responsive photocatalytic oxidation (PCO) materials for toluene degradation, *Applied Catalysis B, Environmental* <http://dx.doi.org/10.1016/j.apcatb.2017.05.047>

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Highlights

1. Morphology, structure and band-gap energy of TiNbON demonstrate its ability to be driven by visible light.
2. Toluene removal by TiNbON strongly depends on humidity, concentration and irradiance.
3. A Langmuir–Hinshelwood kinetic model considering one active site with competition best fitted results.
4. TiNbON advantages for VOC removal include low sensitive to RH, less formaldehyde formation, and durability.

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