



# Stony Brook University

## TAEJIN KIM

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## RESEARCH INTERESTS

- Synthesis and characterization of catalysts for various industrial and environmental applications
- Understanding the fundamental relationships between the catalysts structure and composition of heterogeneous catalysts and their catalytic activity
- Investigating reaction mechanisms, kinetics, and surface chemistry
- In-situ and Operando Spectroscopy: improve and understand catalytic processes
- Combination of Experimental and Computational Methods: Thermodynamic Properties, Molecular Structure

## CURRENT EMPLOYMENT

**Stony Brook University** Stony Brook, NY  
*Assistant professor, Materials Science and Chemical Engineering Department.* 2013-Present

## EDUCATIONS and PAST EXPERIENCES

**Argonne National Laboratory** Argonne, IL  
*Postdoctoral researcher, Chemical Sciences and Engineering* 2010-2012  
Project Title: *Breakdown of furfuryl alcohol*  
Advisor: Dr. Christopher Marshall and Professor Peter Stair

**University of California at Berkeley** Berkeley, CA  
*Postdoctoral researcher, Chemical Engineering* 2007-2010  
Project Title: *Novel Vapor-Phase Formaldehyde and DMM carbonylation over Acid Zeolite*  
Advisor: Professor A.T. Bell

**Lehigh University** Bethlehem, PA  
*Ph.D, Chemical Engineering,* 2002-2007  
Title of Dissertation: *Fundamental Structure-Activity Relationships for Supported Metal Oxide Catalysts*  
Advisor: Professor I.E. Wachs

## PUBLICATIONS (> 30 publications)

### Selected Papers

1. J.Q. Zhong, M. Wang, N. Akter, J.D. Kestell, A.M. Boscoboinik, **T. Kim**, D.J. Stacchiola, D. Lu, J.A. Boscoboinik, "Single atoms in nano-cages: Immobilization of Ar atoms in two-dimensional zeolite models" *Nature Communication*, 2017, accepted.
2. X. Chan, T. Pu, X. Chen, A. James, J. Lee, J.B. Parise, D.H. Kim, **T. Kim**, "Effect of Niobium Oxide Phase on the Furfuryl Alcohol Dehydration" *Catal. Commun.*, 2017, 97, 65-69.

3. X. Chan, P. Yang, C. Ooi, J. Cen, A. Orlov, and **T. Kim**, "Separation and Purification of Furfuryl Alcohol Monomer and Oligomers Using a Two-Phase Extracting Process" ACS Sustainable Chem. Eng., 2016, 4 (8), pp 4084–4088. (Cover Story)
4. X. Chan, W. Nan, D. Mahajan, **T. Kim** "Comprehensive investigation of the biomass derived furfuryl alcohol oligomer formation over tungsten oxide catalysts" Catal. Commun, 72 (2015) 11-15.
5. **Taejin Kim**, R.S. Assary, C.L. Marshall, D.J. Gosztola, L.A. Curtiss, P.C. Stair, "Acid-Catalyzed Furfuryl Alcohol Polymerization: Characterizations of Molecular Structure and Thermodynamic Properties", ChemCatChem, 3 (2011) 1451-1458 (Cover Story)
6. **Taejin Kim**, R.S. Assary, C.L. Marshall, L.A. Curtiss, P.C. Stair, "Vibrational properties of levulinic acid and furan derivatives: Raman spectroscopy and theoretical calculations", J. Raman Spectrosc. 42 (2011) 2069-2076.
7. **Taejin Kim**, F.E. Celik, D.G. Hanna, S. Shylesh, S. Werner, A.T. Bell, "Gas-Phase Hydroformylation of Propene over Silica-Supported PPh<sub>3</sub>-Modified Rhodium Catalysts", Topics in Catalysis, 54 (2011) 299-307.
8. F.E. Celik, **Taejin Kim**, A.T. Bell "Novel Vapor-Phase Carbonylation of Dimethoxymethane over H-ZSM-5" Angew. Chem. Int. Ed. 48 (2009) 4813- 4815
9. **Taejin Kim**, Israel .E. Wachs "CH<sub>3</sub>OH Oxidation over Well-Defined Supported V<sub>2</sub>O<sub>5</sub>/Al<sub>2</sub>O<sub>3</sub> Catalysts: Influence of Vanadium Oxide Loading and Surface Vanadium-Oxygen Functionalities" Journal of Catalysis, 255 (2008) 197-205
10. **Taejin Kim**, Andrew Burrows, Chris Kiely and Israel .E. Wachs "Molecular/electronic Structure-Surface Acidity Relationships of Model Supported Tungsten Oxide Catalysts" Journal of Catalysis, 246 (2007) 370-381

## **BOOK CHAPTER**

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Taejin Kim, I.E. Wachs "Oxidation Reactions over Supported Metal Oxide Catalysts: Molecular/Electronic Structure-Activity/Selectivity Relationships" Metal Oxide Catalysis, WILEY-VCH, vol.2, (2009) 487-498

## **PATENT**

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F.E. Celik, Taejin Kim, A.T. Bell "Process for the production of alkyl alkoxyacetates" (2010, Patent No. US 7,772,423, B2)

## **SYNERGISTIC ACTIVITIES**

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### **Member of Chemical Engineering, Chemistry and Catalysis Society:**

North American Catalysis Society (NACS) New York Chapter (Director-membership), 2003-present, Philadelphia Chapter, 2003-2007, American Chemical Society (ACS), 2004-present; American Institute of Chemical Engineers (AIChE), 2013-present, Catalysis Club of Chicago, 2010-2013, Korean-American Scientists and Engineers Association (KSEA), 2002-present. International Conference on Advances in Functional Materials (AFM), 2015-present.

### **Journal Reviewer and Editor:**

Editor: Korean Journal of Chemical Engineering, Annals of Materials Science and Engineering, Journal of Nanotechnology and Smart materials

Reviewer: Applied Catalysis B, Applied Polymer Science, Nature protocol, ACS Sustainable Chemistry and Engineering, J. of Renewable and Sustainable Energy, Energy Conversion and Management, Catalysis Today. Proceedings of the National Academy of Sciences. Journal of CO Utilization. ChemElectroChem, ChemSusChem, ChemPhysChem, Energy and Fuels