
Curriculum Vitae
Sheima Jatib Khatib Ph.D.

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Education

- 2003 – 2007 **PhD in Chemistry**
Institute of Catalysis and Petrochemistry (CSIC)/Autonomous University of Madrid (UAM)
Synthesis, characterization and catalytic activity of supported transition metal oxides (Mo, V, Cr) in the oxidative dehydrogenation (ODH) of propane
Advisor: Professor Miguel Ángel Bañares Gonzalez
- 2001-2002 **Master Thesis in Chemical Engineering**
University of Málaga (UMA)
Photocycloaddition of Cyclic Dienes to the Phthalimide Anion
Advisor: Dr. Rafael García Segura
- 1996-2001 **Bachelor's Degree in Chemical Engineering** (maxima cum laude)
University of Málaga (UMA)

Professional Experience

- 2015 – present **Assistant Professor**
Department of Chemical Engineering – Texas Tech University, Lubbock, TX, USA
- 2010 – 2014 **Research Associate**
Department of Chemical Engineering – Virginia Tech, Blacksburg, VA, USA
- 2008 – 2010 **Postdoctoral Researcher**
Institute of Chemical Physics “Rocasolano”, CSIC (Spanish National Research Council), Madrid, Spain
- 2006 **Visiting Researcher**
Operando Molecular Spectroscopy and Catalysis Laboratory, Lehigh University, Bethlehem, PA (USA)
- 2005 **Visiting Researcher**
Technische Universiteit Delft, Faculty of Applied Sciences, Reactor and Catalysis Engineering, Delft (The Netherlands)

Awards

- Outstanding Poster Presentation Award of the 2018 Catalysis Gordon Conference
- AIChE Student Chapter Best Professor 2018 Award
- 2018 Mortar Board and Omicron Delta Kappa's Faculty Recognition Award
- 2017 George T. and Gladys Abell-Hanger Faculty Award

- 2017 TLPDC Faculty Spotlight Award (for involvement with the Teaching, Learning and Professional Development Center and for effort to creatively enhance student learning and engagement in the classroom)
- AIChE Student Chapter Best Professor 2017 Award
- 2017 Department of Energy Visiting Faculty Program
- 2016 Department of Energy Visiting Faculty Program

Society Memberships

- The American Chemical Society (ACS)
- American Institute of Chemical Engineers (AIChE)
- Southwest Catalysis Society (SWCS)

Publications

ORCID ID: 0000-0002-3788-1628 <https://orcid.org/0000-0002-3788-1628>

- 22)** Sridhar, A., Rahman, M., Infantes-Molina, A., Khatib*, S.J., Optimizing the Reactivity and Stability of Mo-Co/ZSM-5 and Mo-Ni/ZSM-5 Catalysts for Methane Dehydroaromatization, *ChemCatChem* (submitted).
- 21)** Rahman, M., Infantes-Molina, A., Sridhar, A., Khatib*, S.J., Increasing the Catalytic Stability by Optimizing the Formation of Zeolite-Supported Mo Carbide Species *ex situ* for Methane Dehydroaromatization, *ChemSusChem* (submitted).
- 20)** Vovchok, D., Tata, J., Orozco, I., Zhang, F., Palomino, R. M., Xu, W., Harper, L., Khatib, S.J., Rodriguez, J.A., Senanayake*, S.D., Location and chemical speciation of Cu in ZSM-5 during water-gas shift reaction, *Catalysis Today*, **323**, 216-224 (2019).
- 19)** Sridhar, A., Rahman, M., Khatib*, S.J., Enhancement of Mo/ZSM-5 catalysts in methane aromatization by addition of Fe promoters and by reduction/carburization pretreatment, *ChemCatChem*, **10** (12), 2571-2583 (2018). (Cover feature)
- 18)** Rahman, M., Sridhar, A., Khatib*, S.J., Impact of the presence of Mo carbide species prepared *ex situ* in Mo/HZSM-5 on the catalytic properties in methane aromatization, *Applied Catalysis A: General*, **558**, 67-80 (2018).
- 17)** Sánchez-Gil, V., Noya, E., Sanz, A., S. J. Khatib, Guil, J. M., Lomba, E., Marguta, R., Valencia, S., Experimental and Simulation Studies of the Stepped Adsorption of Toluene on Pure-Silica MEL Zeolite, *Journal of Physical Chemistry:C*, **120**, 16, 8640-8652 (2016).
- 16)** Khatib*, S. J., Oyama*, S. T., Direct oxidation of propylene to propylene oxide with molecular oxygen: a review, *Catalysis Reviews*, **57**, 3, 306-344 (2015).
- 15)** Gallardo, A., Guil, J.M., Lomba, E., Almarza, N. G., Khatib, S.J., Cabrillo, C., Sanz, A., Pires, J., Adsorption of probe molecules in pillared interlayered clays: experiment and computer simulations, *Journal of Chemical Physics*, **140**, 22, 224701 (2014).
- 14)** Khatib, S. J., Yun, S., Oyama, S. T., Sulfur Resistance by Phosphidation of Pd and Pd alloy membranes, *Journal of Membrane Science*, **455**, 283-293 (2014).

- 13) Khatib*, S. J., Oyama, S. T., Silica membranes for hydrogen separation prepared by chemical vapor deposition (CVD), *Separation and Purification Technology*, **111**, 20-42 (2013).
- 12) Wang, Z., Achenie, L. E. K., Khatib, S. J., Oyama, S. T. Mixed mechanism model for permeation of gases in hybrid inorganic-organic membranes, *Industrial and Engineering Chemistry Research*, **52**, 9, 3258-3265 (2013).
- 11) Wang, Z., Achenie, L. E. K., Khatib, S. J., Oyama, S. T., Simulation study of permeation of CO₂ and CH₄ in hybrid inorganic-organic membrane, *Journal of Membrane Science*, **387-388**, 30-39 (2012).
- 10) Gu, Y., Vaezian, B., Khatib, S. J., Oyama, S. T., Wang, Z., Achenie, L., Hybrid H₂-selective silica membranes prepared by chemical vapour deposition, *Separation Science and Technology*, **47**, 1698-1708 (2012).
- 9) Khatib, S. J., Oyama, S. T., de Souza, K. R., Noronha, F. B., Review of Silica Membranes for Hydrogen Separation Prepared by Chemical Vapor Deposition, *Membrane Science and Technology*, **14**, 25-60 (2011).
- 8) Marguta, R., Khatib, S. J., Guil, J. M., Lomba, E., Noya, E. G., Perdigón-Melón, J.A., Valencia, S., Molecular simulation and adsorption studies of n-hexane in ZSM-11 zeolites, *Microporous & Mesoporous Materials*, **142**, 258-267 (2011).
- 7) Khatib, S. J., Fierro, J. L. G., Bañares, M. A., Effect of phosphorous additive on the surface chromium oxide species on alumina for propane oxidation to propylene, *Topics in Catalysis*, **52**, 1459-1469 (2009).
- 6) Yuan, L., Gulians, V. V., Bañares, M. A., Khatib, S. J., Mesoporous Niobium-Based Mixed Metal Oxides Containing Mo, V and Te for Propane Oxidative Dehydrogenation, *Topics in Catalysis*, **49**, 268-280 (2008).
- 5) Khatib, S. J., Guil-López, R., Peña, M.A., Fierro, J.L.G., Bañares, M. A., Alumina-supported V-Mo-O mixed oxide catalysts, the formation of phases involving aluminum: AlVMoO₇, *Catalysis Today*, **118**, 353-359 (2006).
- 4) Garcia, M.A., Ruiz Gonzalez, M.L., Quesada, A., Costa-Kramer, J.L., Fernandez, J.F., Khatib, S.J., Wennberg, A., Caballero, A.C., Martin-Gonzalez, M.S., Villegas, M., Briones, F., Gonzalez-Calbet, J.M., Hernando, A., Interface double-exchange ferromagnetism in the Mn-Zn-O system: New class of biphasic magnetism, *Physical Review Letters*, **94** (21) Art. No. 217206, (2006).
- 3) Fernández, J. F., Caballero, A. C., Villegas, M., Khatib, S. J., Bañares, M. A., Fierro, J.L.G., Costa- Kramer, E. López-Once, M. S. Martin-González, F. Briones, A. Quesada, M. García, A. Hernando, J. L., Structure and magnetism in the Zn-Mn-O system: A candidate for room temperature ferromagnetic semiconductor, *Journal of the European Ceramic Society*, **26**, 3017-3025 (2006).
- 2) Bañares, M. A., Khatib, S. J., Structure-activity relationships in alumina-supported molybdena-vanadia catalysts for propane oxidative dehydrogenation, *Catalysis Today*, **96**, 251 (2004).
- 1) Mul, G., Bañares, M. A., Garcia Cortéz, G., van der Linden, B., Khatib, S. J., Moulijn, J. A., MultiTRACK and Operando Raman-GC study of oxidative dehydrogenation of propane over alumina-supported vanadium oxide catalyst, *Physical Chemistry Chemical Physics*, **5**, 4378 – 4383 (2003).

* Indicates corresponding authorship

Presentations

Invited Presentations

5) Catalytic Aromatization of Methane: Strategies for improving active chemistry, mitigation of coke formation and sustaining selectivity to benzene

S.J. Khatib, M. Rahman, A. Sridhar, L. Harper, J. Tata

2017 ACS Fall Meeting, Washington D.C., USA, 2017

4) Synthesis, Characterization and the Fundamental Interrogation of Novel Catalytic Materials for Industrial and Energy Applications

S. J. Khatib

DOE-Visiting Faculty Program, Brookhaven National Lab, Upton, NY, USA, 2017.

3) Synthesis, activity, and characterization of Copper loaded ZSM-5 catalysts for the water-gas shift reaction

J.Tata, D.Vovchok, **S.J. Khatib**, S.D. Senanayake, J.Rodriguez

DOE-Visiting Faculty Program, Brookhaven National Lab, Upton, NY, USA, 2017

2) ZSM-5 Supported Molybdenum Carbide and Oxide Catalysts for Methane Dehydroaromatization: Elucidation of Active Sites and Deactivation Pathways

L.Harper, S.D.Senanayake, S.J.Khatib

DOE-Visiting Faculty Program, Brookhaven National Lab, Upton, NY, USA, 2017

1) Ultrathin Pd and Pd alloy membranes with phosphorus additive and enhanced sulfur resistance applied in membrane reactors for ethanol steam reforming

S.J. Khatib, S. Yun. S. T. Oyama

247th ACS National Meeting & Exposition, Dallas, TX, USA, 2014

Contributed Presentations

32) Catalytic Aromatization of Methane: Strategies for Improving Active Chemistry and Sustaining Selectivity to Benzene

S.J. Khatib, M. Rahman, A. Sridhar

2018 AIChE Annual Meeting, Pittsburg, PA, USA, 2018

31) Enhancement of Mo/ZSM-5 catalysts in methane aromatization by addition of Fe promoters and reduction/carburization pretreatment

A. Sridhar, M. Rahman **S.J. Khatib** (Poster)

2018 AIChE Annual Meeting, Pittsburg, PA, USA, 2018

30) Enhancement of Mo/ZSM-5 catalysts in methane aromatization by addition of Fe promoters and reduction/carburization pretreatment

A. Sridhar, M. Rahman **S.J. Khatib** (Poster)

2018 Catalysis Gordon Conference, New London, NH, USA, 2018

29) Enhancement of Mo/ZSM-5 catalysts in methane aromatization by addition of Fe promoters and reduction/carburization pretreatment

A. Sridhar, M. Rahman **S.J. Khatib** (Poster)

2018 Southwest Catalysts Society Spring Symposium, Houston, TX, USA, 2018

28) Strategies for improving active chemistry, mitigation of coke formation and sustaining selectivity to benzene in the catalytic aromatization of methane

S.J. Khatib, M. Rahman, A. Sridhar, J. Tata, L. Harper, E. Osoro (Poster)

2017 AIChE Annual Meeting, Minneapolis, MN, USA, 2017

27) STEM Teaching Engagement and Pedagogy (STEP) Program: Implementation of Evidence-Based Instructional Practices

S.J. Khatib, K.Griffith, S.Tapp (Poster)

ASEE Chemical Engineering Summer School, Raleigh, NC, USA, 2017.

26) Synthesis and Physico-Chemical Properties of ZSM5-supported Molybdenum Carbide Catalysts

M. Rahman, **S.J. Khatib** (Poster)

Southwest Catalysis Society Spring Symposium, Houston, TX, USA, 2017

25) Promotional effects of Fe on Mo-HZSM-5 in Non-Oxidative Methane Aromatization

A. Sridhar, **S.J. Khatib** (Poster)

Southwest Catalysis Society Spring Symposium, Houston, TX, USA, 2017

24) Synthesis, Characterization and the Fundamental Interrogation of Novel Catalytic Materials for Industrial and Energy Applications

S. J. Khatib, M. Rahman, A. Sridhar, T. Harvey

DOE-Visiting Faculty Program, Brookhaven National Lab, Upton, NY, USA, 2016

23) Ultrathin Pd and Pd Alloy Membranes with Enhanced Sulfur Resistance Using Phosphorus Additive and Their Application in Membrane Reactors for Ethanol Steam Reforming

S.J. Khatib, S. Yun. S. T. Oyama

2015 AIChE Annual Meeting, Salt Lake City, UT, USA, 2015

22) Ultrathin Pd and Pd-Cu membranes prepared by electric field assisted activation and their application in membrane reactors for ethanol steam reforming

S.J. Khatib, S. Yun. S. T. Oyama

11th Annual Symposium of the Southeastern Catalysis Society, Asheville, NC, USA, 2012

- 21)** Differences in hydrocarbon adsorption on PILCs of similar Zr (pillars) composition
J.M. Guil, S. Jatib Khatib, N.G. Almarza, A. Gallardo, J. Pires (Poster)
5th International FEZA conference, Valencia, Spain, 2011
- 20)** Diferencias en la adsorción de hidrocarburos en PILCs con similar composición de Zr (pilares)
J.M. Guil, **S. Jatib Khatib**, N.G. Almarza, A. Gallardo, J. Pires (Poster)
XXXV RIA. Reunião Ibérica de Adsorção, Lisbon, Portugal, 2010
- 19)** Efectos estructurales de P en la estabilización de especies superficiales de óxido de cromo soportados en alúmina durante la deshidrogenación oxidativa de propano
S. J. Khatib, M. A. Bañares
XXVI Bienal Meeting of the Royal Spanish Society of Chemistry, Toledo, Spain, 2007
- 18)** Mesoporous and Nanostructured Multicomponent Mo-V-Te-Nb-O Catalysts for Propane Ammoxidation to Acrylonitrile
Vadim V. Guliants, Li Yuan, Lingyan Song, Pavel A. Korovchenko, Miguel A. Bañares and **Sheima J. Khatib**
AIChE Annual Meeting, San Francisco, USA, 2006
- 17)** Study of Propane and Propene Interactions with K- Promoted Vanadia Alumina Catalysts by TAP and Operando Raman Spectroscopy
G.Mul, B. Van der Linden, J.A. Moulijn, G.G. Cortez, **S.J. Khatib**, M.A. Bañares
Operando-II Second International Congress on Operando Spectroscopy, Toledo, Spain, 2006
- 16)** Structural Effects of P on the stabilization of surface Cr oxide species on alumina during propane oxidative dehydrogenation
Khatib, S.J., Bañares, M.A
Operando-II Second International Congress on Operando Spectroscopy, Toledo, Spain, 2006
- 15)** Nature of the Catalyst, of the Carbonaceous Species and of the Active Oxygen Species on Supported Oxide Catalysts during Alkane Oxidative and Non-Oxidative Dehydrogenation
M.A. Bañares, G. Garcia-Cortez, M.O. Guerrero-Pérez, **S.J. Khatib**, R. Guil-López, B.M. Weckhuysen, D. Keller and S. Tinnemans, O. Krause, S. Airaksinen, J. Kanervo, R. Puurunen, S. Korhonen, J.A. Moulijn, G. Mul, B. van der Linden, Wie Wie, R. Schoonheydt, Marijke Grootheart
COST D15 “Interfacial Chemistry and Catalysis” Final Workshop, Maribor, Slovenia, 2005
- 14)** MultiTRACK and Operando Studies of Oxidative and Non-Oxidative Dehydrogenation of Propane over Supported Oxide Catalysts
M.A. Bañares, G. Garcia-Cortez, M.O. Guerrero-Pérez, **S.J. Khatib**, R. Guil-López, B.M. Weckhuysen, D. Keller and S. Tinnemans, O. Krause, S. Airaksinen, J. Kanervo, R. Puurunen,

S. Korhonen, J.A. Moulijn, G. Mul, B. van der Linden, Wie Wie, R. Schoonheydt, Marijke Grootheart

COST D15 “Interfacial Chemistry and Catalysis” Final Workshop, Maribor, Slovenia, 2005

13) Nature and reactivity in methanol temperature-programmed surface reaction (TPSR) of supported mixed V-Mo oxide catalysts

M.A. Bañares, G. Garcia-Cortez, M.O. Guerrero-Pérez, **S.J. Khatib**, R. Guil-López, B.M. Weckhuysen, D. Keller and S. Tinnemans, O. Krause, S. Airaksinen, J. Kanervo, R. Puurunen, S. Korhonen, J.A. Moulijn, G. Mul, B. van der Linden, Wie Wie, R. Schoonheydt, Marijke Grootheart.

COST D15 “Interfacial Chemistry and Catalysis” Final Workshop, Maribor, Slovenia, 2005

12) Semiconductores Magnéticos a temperatura ambiente basados en ZnO

J. F. Fernández, A.C. Caballero, M. Villegas, E. López-Ponce, J. L. Costa-Kramer, F. Briones, **S. J. Khatib**, M.A. Bañares, J. L. García-Fierro, M. García, A. Quesada, A. Hernando
Electrocerámica 2005, VII National Meeting, Teruel, Spain, 2005

11) Catalizadores de óxidos Mixtos de V-Mo Soportados: Caracterización y Reactividad en TPSR de Metanol

R. Guil-López, **S.J. Khatib**, M.A. Peña, M.A. Bañares

Meeting of the Spanish Catalysis Society, SECAT05, Móstoles, Madrid, Spain, 2005.

10) Estudio de los centros superficiales ácidos, básicos y redox por reacción a temperatura programada (TPSR) de la molécula sonda metanol en catalizadores basados en VO_x/Al_2O_3

Miguel A. Bañares, G. García Cortez, **S. J. Khatib**, and R. Guil-López

XXIX Renião Ibérica de Adsorção, Oporto, Portugal

9) Propane (O)DH over K-promoted V/Al_2O_3 catalysts: the analysis of carbonaceous deposits using Multi-track and Operando Raman

Miguel A. Bañares, **S. J. Khatib**

13th International Congress on Catalysis, Paris, France, 2004

8) La metodología Operando Raman en el estudio de la relación estructura-actividad de catalizadores de oxidación

Miguel A. Bañares, M.O. Guerrero-Pérez, **S. J. Khatib**

XIX Simposio Iberoamericano de Catálisis. Mérida, Yucatán, Mexico, 2004

7) MultiTRACK and operando Raman-GC study of oxidative dehydrogenation of propane over alumina-supported vanadium oxide catalysts

G. Mul, M.A. Bañares, G. Garcia Cortez, B. van der Linden, **S. J. Khatib**, J.A. Moulijn (Poster)

COST D15 “Interfacial Chemistry and Catalysis” 4th Workshop of all Working groups and 10th MC Meeting, La Colle sur Loup, France, 20-23, October, 2004.

6) Role of additives on the structure and surface properties and reactivity for propane oxidation of alumina-supported vanadia

Miguel A. Bañares, **Sheima J. Khatib**, Rut Guil-López (Poster)

COST D15 “Interfacial Chemistry and Catalysis” 4th Workshop of all Working groups and 10th MC Meeting, La Colle sur Loup, France, 20-23, October, 2004

5) Catalysis by Metal Oxides: Comparison between Bulk Mixed Oxides, Supported Oxides, Oxide Clusters, Organometallic Oxides and Oxide Single Crystals

G. Mul , **S. J. Khatib**, B. van der Linden, M. A. Bañares, J. A. Moulijn

228th ACS National Meeting, Philadelphia, USA, 22-26 August, 2004

4) Supported mixed V-Mo oxide catalysts for propane oxidation reactions

M. A. Bañares , **S. J. Khatib**, R. Guil

228th ACS National Meeting, Philadelphia, USA, 22-26 August, 2004

3) Highly reactive oxygen species on vanadia alumina catalysts as determined by Multi-Track: Relevance for steady state activity and role of Fe-contamination in alumina

G. Mul, **S. J. Khatib**, B. van der Linden, M. A. Bañares, J. A. Moulijn

228th ACS National Meeting, Philadelphia, USA, 22-26 August, 2004

2) Structure-activity relationships in alumina-supported transition metal oxides

S. J. Khatib, M. A. Bañares

226th ACS National Meeting, New York, USA, September 7-11, 2003

1) Estudio De La Relación Estructura-Actividad En Catalizadores Soportados En Alúmina De Óxidos De Elementos De Transición

S.J. Khatib, M.A. Bañares (Poster)

Meeting of the Spanish Catalysis Society, SECAT03, Malaga, Spain, June 22-26, 2003

Active Proposals

Date	Title of Current Research or Grant	Granting Agency	Amount \$	Chief Investigators & Faculty Members in order	Status
2018	Harnessing Metal-Carbon Interactions to Obtain Enhanced Yield in Aromatics and Improved Coking Resistance in Methane Aromatization	US Department of Energy	\$450,000	Khatib, S. (Principal)	Funded

Workshops and seminars attended

- *ASEE 2017 Summer School for Chemical Engineering*
American Society of Engineering Education
July 29- August 3, 2017, Raleigh, NC, USA.
- *National Effective Teaching Institute-II*
American Society of Engineering Education
June 1-2, 2016, Washington DC, USA.
- *National Effective Teaching Institute*
American Society of Engineering Education
June 11-13, 2015, Seattle, WA, USA.
- *NSF Engineering Career Development: From Senior Undergraduates to Navigating Assistant Professorships*
National Science Foundation
June 4-5, 2015, Houston, TX, USA.
- *NSF Day at TTU*
National Science Foundation
May 20, 2015, Texas Tech University, Lubbock, TX, USA.
- *Introduction to the Characterization of Adsorbents and Catalysts*
Institute of Chemical Physics "Rocasolano" (CSIC)/ University of Extremadura
June 2008, Jarandilla de la Vera (Caceres), Spain
- *4th EFCATS School on Catalysis; Catalyst Design from Molecular to Industrial Level*
European Federation of Catalysis Societies
September 2006, Saint Petersburg, Russia
- *Science and Technology Management, 8th Edition*
Carlos III University of Madrid
March – April 2006, Madrid, Spain
- *Managing Gases in Laboratories*
Institute of Catalysis and Petrochemistry (CSIC)
April 2003, Madrid, Spain
- *Physical-Chemical Characterization of Solids*
Institute of Carbon (CSIC)
April 2003, Oviedo, Spain
- *Organic Photochemistry*
- *Doctorate Courses, University of Malaga (UAM)*
2001, Malaga, Spain
- *Structural Determination of Organic Molecules*
University of Malaga (UAM)
2001, Malaga, Spain

