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Research Summary:

- Physical and chemical properties of supported size-selected metal clusters and nanoparticles and cluster-based nanomaterials
- Study of the size/shape/composition & function relationship at the sub-nanometer and nanometer scale
- Nanocatalysis & nanophotocatalysis
- Synchrotron X-ray characterization of nanoparticles
- Combined synchrotron X-ray and mass-spectroscopy studies of nanocatalysts under realistic reaction conditions
- Surface composition and morphology effects on nanoparticle properties
- Controlled assembly of nanoparticles into nanostructures
- Optical properties of clusters and nanostructures

Selected Recent Publications:

“Selective Propene Epoxidation on Immobilized Au₆₋₁₀ Clusters: The Effect of Hydrogen and Water on Selectivity and Activity”, S. Lee, L. M. Molina, M. L. María J. López, J. A. Alonso, B. Hammer, B. Lee, S. Seifert, R. E. Winans, J. W. Elam, M. J. Pellin, and S. Vajda, *Angew. Chemie. Int. Ed.*, *in Press*

“Optical Properties of Au Nanoparticles Produced by the Assembly of Size-Selected Cluster Deposition: Covering the full Visible Wavelength Range in the Smallest Particle Size Regime” S. Vajda, G. Wiederrecht, A. Bouhelier, B. Lee, S. Seifert, G.Y. Tikhonov, N. Tomczyk, and R.E. Winans, *Collect. Czech. Chem. Commun.*, **72**, 121, (2007), *invited contribution*

“Charge Transfer Initiated Nitroxyl Chemistry on Free Silver Clusters Ag₂₋₅-: Size Effects and Magic Complexes”, J. Hagen, L. D. Socaciu-Siebert, J. Le Roux, D. Popolan, S. Vajda, T. M. Bernhardt, and L. Wöste, *Intl. J. Mass. Spectr.* **261**, *Chava Lifshitz Memorial Issue*, 152 (2007)

“Supported Gold Clusters and Cluster-Based Nanomaterials: Characterization, Stability and Growth Studies by In Situ GISAXS under Vacuum Conditions and in the Presence of Hydrogen”, S. Vajda, R.E. Winans, J.W. Elam, B. Lee, M.J. Pellin, S. Seifert, G.Y. Tikhonov and N. A. Tomczyk, *Top. Catal., Special Issue „Nanotechnology in Catalysis”* **39**, 161 (2006)

“Reactivity of Supported Platinum Nanoclusters Studied by In Situ GISAXS: Clusters Stability under Hydrogen”, R.E. Winans, S. Vajda, G.E. Ballentine, J.W. Elam, B. Lee, M.J. Pellin, S. Seifert, G.Y. Tikhonov and N. A. Tomczyk, *Top. Catal., Special Issue, Nanotechnology in Catalysis”* **39**, 145 (2006)

Book Chapters:

“Catalysis by Size-Selected Clusters“, R. Meyer, Yu Lei, S. Lee and S. Vajda , In *Model Systems in Catalysis: From Single Crystals and Size Selected Clusters to Supported Enzyme Mimics*, Springer, 2008, *in Press*

“Smallest Size Regime: Control of Ultrafast Dynamics”, S. Vajda, and L. Wöste in *The Dekker Encyclopedia of Nanoscience and Nanotechnology Second Edition*, Editors: J. A. Schwartz, C. Cotescu, and K. Putyera, Marcel Dekker, Inc., New York, 2008, ISBN-13 for hardcover: 978-0-8493-9639-7; online ISBN-13 is 978-0-8493-9638-0; Web: www.informaworld.com, *Invited review article, in Press*

“Supported Size-Selected Clusters as Model Nanocatalysts for Highly Selective and Efficient Oxidation Reactions“, S. Vajda, G. E. Ballentine, S. Lee, S. Mucherie , C. L. Marshall, J. W. Elam, M. J. Pellin, B. Lee, C. Lo, S. Seifert, R. E. Winans, A. Kleibert, K. Sell, V. von Oyenhausen and K.-H. Meiwes-Broer , *Proceedings of the XII ISMB Conference in Freiburg*, 2007, pp. 88-91