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Area of Specialization: Solid State Chemistry, Nuclear Materials, Ceramic Waste Form, Materials under Extreme Conditions, Thermodynamics

Education and Training

2015-2017 Seaborg Postdoctoral Fellow, Los Alamos National Laboratory, Los Alamos, NM
Advisor: Hongwu Xu, Jeremy N. Mitchell

2010-2014 Ph.D. Chemical Physics, University of California, Davis, CA
Advisor: Alexandra Navrotsky

2006-2010 B.S. Physics, Sun Yat-sen University, Guangzhou, China
Advisor: Xue-hua Wang

Research and Professional Experience

2018-present Assistant Professor of Chemistry, Washington State University, Pullman, WA

2017 Adjunct Assistant Professor of Chemistry, Washington State University, Pullman, WA

Publications

Peer Reviewed

Guo, X., Tavakoli, A.H., Qi, L., Sutton, S.R., Kukkadapu, R.K., Lanzirotti, A., Newville, M., Asta, M., Navrotsky, A., Cerium Substitution in Yttrium Iron Garnet: Valence State, Structure, and Energetics, *Chem. Mater.*, 26(2), 1133-1143, 2014

Guo, X., Rak, Z., Tavakoli, A.H., Becker, U., Ewing, R.C., Navrotsky, A., Thermodynamics of Thorium Substitution in Yttrium Iron Garnet: Comparison of Experimental and Theoretical Results, *J. Mater. Chem. A* 2, 16945-16954, 2014

Wang, Y., Xie, X., Qi, J., Wang, J., Wu, D., Guo, X., Wei, N., Lu, T., Two-step preparation of AlON transparent ceramics with powder synthesized by aluminothermic reduction and nitridation method, *J. Mater. Res.*, 29(19), 2325-2331, 2014

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Mielewczyk-Gryn, A., Wachowski, S., Lilova, K.I., Guo, X., Gazda, M., Navrotsky, A., Influence of Antimony Substitution on Spontaneous Strain and Thermodynamics Stability of Lanthanum Orthoniobate, *Ceram. Int.*, 41(2), 2128-2133, 2015

- Sun, H., Wu, D., Guo, X., Navrotsky, A., Energetics and Structural Evolution of Na - Ca Exchanged Zeolite A during Heating, *Phys. Chem. Chem. Phys.*, 17(14), 9241-9247, 2015
- Sun, H., Wu, D., Guo, X., Shen, J., Navrotsky, A., Energetics of Sodium-Calcium Exchanged Zeolites A, *Phys. Chem. Chem. Phys.*, 17(17), 11198-11203, 2015
- Qi, J., Guo, X., Mielewczyk-Gryn, A., Navrotsky, A., Formation Enthalpy of LaLnO₃ (Ln = Ho, Er, Tm and Yb) Interlanthanide Perovskite Compounds, *J. Solid State Chem.*, 227, 150-154, 2015
- Guo, X., Kukkadapu, R.K., Lanzirrotti, A., Newville, M., Sutton, S.R., Navrotsky, A., Charge-coupled substituted Garnets (Y_{3-x}Ca_{0.5x}M_{0.5x})Fe₅O₁₂ (M = Ce, Th): Structure and Stability as Crystalline Waste Forms, *Inorg. Chem.*, 54(8), 4156-4166, 2015
- Guo, X., Szenknect, S., Mesbah, A., Labs, S., Clavier, N., Poinssot, C., Ushakov, S.V., Curtius, H., Bosbach, D., Ewing, R.C., Burns, P.C., Dacheux, N., Navrotsky, A., Thermodynamics of Formation of Coffinite, USiO₄, *Proc. Natl. Acad. Sci. USA.* 112(21), 6551-6555, 2015
- Wu, D., Guo, X., Sun, H., Navrotsky, A., Thermodynamics of Methane Adsorption on Copper HKUST-1 at Low Pressure, *J. Phys. Chem. Lett.*, 6(13), 2439-2443, 2015
- Wu, D., Guo, X., Sun, H., Navrotsky, A., Energy Landscape of Water and Ethanol on Silica Surfaces", *J. Phys. Chem. C*, 119(27), 15428-15433, 2015
- Guo, X., Tiferet, T., Liang, Q., Solomon, J., Lanzirrotti, A., Newville, M., Engelhard, M.H., Kukkadapu, R.K., Wu, D., Eugene, I.S., Sutton, S.R., Asta, M., Navrotsky, A., U(V) in metal uranates: a combined experimental and theoretical study of MgUO₄, CrUO₄, and FeUO₄, *Dalton Trans.* 45, 4622-4632, 2016
- Guo, X., Lipp, C., Tiferet, T., Lanzirrotti, A., Newville, M., Engelhard, M.H., Wu, D., Eugene, I.S., Sutton, S.R., H. Xu, Burns, P.C., Navrotsky, A., Structure and stability of UTa₃O₁₀, a U(V) -bearing compound, *Dalton Trans.* 45, 18892-18899, 2016
- Long, G.J., Grandjean, F., Guo, X., Navrotsky, A., Kukkadapu, R.K., Mössbauer Spectral Properties of Yttrium Iron Garnet, Y₃Fe₅O₁₂, and its Isovalent and Non-isovalent Yttrium Substituted Solid Solutions, *Inorg. Chem.*, 55(7), 3413-3418, 2016
- Wu, D., Guo, X., Sun, H., Navrotsky, A., Interplay of Confinement and Surface Energetics in the Interaction of Water with Metal-Organic Frameworks, *J. Phys. Chem.*, 120(14), 7562-7567, 2016
- Guo, X., Wu, D., Xu, H. Burns, P.C., Navrotsky, A., Thermodynamic Studies of Studtite Thermal Decomposition Pathways via Amorphous Intermediates, UO₃, U₂O₇, and UO₄, *J. Nucl. Mater.* 478, 158-163, 2016
- Sun, H., Wu, D., Liu, K., Guo, X., Navrotsky, A., Energetics of Alkali and Alkaline Earth Ion-Exchanged Zeolite A, *J. Phys. Chem.*, 120(28), 15251-15256, 2016
- Sun, H., Shen, B., Wu, D., Guo, X., Li, D., Supported Al-Ti Bimetallic Catalysts for 1-decene Oligomerization: Activity, Stability and Deactivation Mechanism, *J. Catal.*, 339, 84-92, 2016

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Lü, X., Wang, Y., Stoumpos, C.C., Hu, Q., Guo, X., Chen, H., Yang, L., Smith, J.S., Yang, W., Zhao, Y., Xu, H., Kanatzidis, M.G., Jia, Q., Enhanced Structural Stability and Photo Responsiveness of $\text{CH}_3\text{NH}_3\text{SnI}_3$ Perovskite via Pressure-induced Amorphization and Recrystallization, *Adv. Mater.*, 28, 8663-8668, 2016

Liu, N., Guo, X., Shi, L., Wu, D., Navrotsky, A., Thermodynamic Complexity of Sulfated Zirconia Catalysts, *J. Catal.*, 342, 158-163, 2016

Xu, H., Guo, X., Thermal behavior of polyhalite: A high-temperature synchrotron XRD study, *Phys. Chem. Mineral.* 44(2), 125-135, 2017

Guo, X., Xu, H., Enthalpies of Formation of Polyhalite: A Mineral Relevant to Salt Repository, *J. Chem. Thermo.*, 114, 44-47, 2017

Shan, C., Yen, H.J., Wu, K., Lin, Q., Zhou, M., Guo, X., Wu, D., Zhang, H., Wu, G., Wang, H.L., Functionalized Fullerenes for Highly Efficient Lithium Ion Storage: Structure-property-performance Correlation with Energy Implications, *Nano energy.*, 40, 327-335, 2017

Li, G., Sun, H., Xu, H., Guo, X., Wu, D., Probing the Energetics of Molecule – Material Interactions at Interfaces and in Nanopores, *J. Phys. Chem. C*, 121(47), 16141-16154, 2017

Tang, Z., Huang, Z., Qi, J., Guo, X., Han, W., Zhou, M., Peng, S., and Lu, T., “Synthesis and Characterization of $\text{Gd}_2\text{Zr}_2\text{O}_7$ Defect-fluorite Oxide Nanoparticles via a Homogeneous Precipitation-solvothermal Method”, *RSC Adv.*, 7, 54980-54985, 2017

Migdisov, A.A., Guo, X., Xu, H., Williams-Jones, A.E., Sun, C.J., Vasyukova, O., Sugiyama, I., Fuchs, S., Pearce, K., Roback, R., Hydrocarbons as Ore Fluids, *Geochem. Prospect. Lett.*, 5, 47-52, 2017

Book Chapter

Navrotsky, A., Shvareva, T., Guo, X., Thermodynamics of uranium minerals and related materials, in “Uranium –Cradle to Grave”, Burns, P.C. and Sigmon, G.E. Eds., *Mineralogical Association of Canada, Short Course Volume*, 147-164, 2013

Meeting talks

Guo, X.* Tiferet, E., Liang, Q., Lanzirrotti, A., Newville, M., Engelhard, M.H., Kukkadapu, R.K., Solomon, J., Wu, D., Sutton, S.R., Asta, M., Navrotsky, A., Monouranates $\text{MgU}^{6+}\text{O}_4$, $\text{CrU}^{5+}\text{O}_4$, and $\text{FeU}^{5+}\text{O}_4$: Structure and Thermodynamic Stability, **Energy Frontier Research Centers (EFRC) Annual meeting**, South Bend, Indiana, United States, Nov. 16-17, 2015

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Wu, D. *, Sun, H., Guo, X., Navrotsky, A., Confinement of organic molecules in nanoporous minerals, **Goldschmidt Conference**, Sacramento, California, United States, Jun. 8-13, 2014

Guo, X., Szenknect, S., Mesbah, A., Labs, S., Clavier, N., Poinssot, C., Ushakov, S.V., Curtius, H., Bosbach, D., Ewing, R.C., Burns, P.C., Dacheux, N., Navrotsky, A. *, Thermodynamics of Formation of Coffinite, $USiO_4$, **Materials Science & Technology Technical Meeting and Exhibition**, Columbus, Ohio, United States, Oct. 4-8, 2015

Guo, X.*, Navrotsky, A., Kukkadapu, R.K., Engelhard, M.H., Lanzirrotti, A., Newville, M., Sutton, S.R., Xu, H., Structure and Stability of Uranium Containing Iron Garnets, **Geological Society of America Annual Meeting**, Baltimore, Maryland, United States, Nov. 1-4, 2015

Guo, X.*, Xu, H., Migliori, A., Mitchell, J.N., Freibert, F., Navrotsky, A., LANL AlexSys Calorimeter and its Applications to Actinide Research, **EFRC Annual meeting**, South Bend, Indiana, United States, Nov. 16-17, 2015

Wu, D. *, Gassensmith, J.J., McDonald, T., Guo, X., Quan, Z., Ushakov, S.V., Zhang, P., Long, J.R., Navrotsky, A., Thermodynamics Complexity of CO_2 Capture in Metal-Organic Framework Sorbents, **252th American Chemical Society National Meeting & Exposition**, Philadelphia, Pennsylvania, United States, Aug. 21-25, 2016