

Dr. Paul A. Maggard

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○ Current Research Interests

Hydrothermal synthesis; Molten-salt flux synthesis
Metal-oxides; Metal-oxide/organic hybrids
Photon-driven catalysis; Magnetism

○ Professional Appointments and Educational Preparation

Associate Professor of Chemistry (8/08 – present): North Carolina State University
Assistant Professor of Chemistry (6/02 – 8/08): North Carolina State University
Postdoctoral Associate (10/00 – 5/02): Northwestern University with Professor Kenneth R. Poeppelmeier
Ph.D., Inorganic Chemistry (9/95 – 8/00): Iowa State University with Distinguished Professor John D. Corbett
B.A., Chemistry (9/91 – 6/95): William Jewell College
Summer Research Assistant (5/94 – 7/94): University of Arkansas

○ Scholarly and Professional Awards and Honors

Scialog Award, Research Corporation for Science Advancement
CAREER Award, National Science Foundation
Beckman Young Investigator Award, Beckman Foundation
Ralph E. Powe Junior Faculty Award, Oak Ridge Associated Universities
Sigma Xi Scientific Honor Society

○ Selected Professional Activities

Departmental Committees: Faculty Search Committee (Chair; 2009), Operations, Space, and Facilities Committee, X-ray Users Committee (Chair)
Co-director (with Prof. Lin He) of NSF-funded Summer Research Experience for Undergraduates Program in the Department of Chemistry (2005-2008); emphasis in materials and life sciences
Co-organizer (with Prof. Hanno zur Loye) of the Solid-State Symposium during the 2007 SERMACS in Greenville, SC (October 2007)
Invited Co-organizer (one of three selected from USA) of International Symposium “2006 Transatlantic Frontiers of Chemistry” in Durham, NH (August 2006)
Invited participant of NSF workshop “The Status of Solid-State Chemistry and its Impact in the Physical Sciences” at Northwestern University (May 2006)
Co-organizer (with Prof. Jim Martin and Prof. Mike Whangbo) of the Solid-State Symposium during the 2004 SERMACS in Durham, NC (October 2004)
External article referee for journals: *Advanced Materials*, *Inorganic Chemistry*, *Journal of the American Chemical Society*, *Chemistry of Materials*, *Journal of Alloys and Compounds*, *Journal of Photochemistry and Photobiology A: Chemistry*, *Journal of Solid-State Chemistry*, *Journal of Physics and Chemistry of Solids*, *Crystal Growth & Design*, *Chemistry – A European Journal*, *Journal of Physical Chemistry C*, *Journal of Physical Chemistry Letters*

External proposal referee for funding agencies: National Science Foundation, Department of Energy, American Chemical Society Petroleum Research Fund, National Sciences, and Engineering Council of Canada

Invited Research Presentations: 2009 – Indiana University; 2008 – University of Nebraska, University of Iowa, University of California at Santa Cruz; 2007 – North Carolina State University, Iowa State University, University of California at Los Angeles, University of California at Santa Barbara, Colorado State University, University of Wyoming, Purdue University, University of Notre Dame, University of North Carolina at Chapel Hill; 2006 – Texas A&M University, Arizona State University, University of California at Davis, Rutgers University, State University of New York at Binghamton, Clemson University, University of South Carolina; 2005 – University of North Carolina at Pembroke, Norfolk State University; 2004 – Austin Peay State University; 2003 – Western Carolina University, Appalachian State University; 2002 – Georgia Southern University, Northwestern University.

Conference research presentations: Zing Solar Fuels / Photochemistry Conference (2010); Solid-State Gordon Research Conference (2010, 2008, 2006, 2004, 2002, 2000, 1998); National and Regional Meetings of the ACS (2010, 2008, 2005, 2004, 2003, 2001), Midwestern High-Temperature and Solid-State Chemistry Conference (2009, 2005, 2001, 1999, 1997)

Professional Memberships: American Chemical Society, Sigma Xi, American Association for the Advancement of Science, Materials Research Society

○ List of Publications

- 48.† *Efficacy of C-N Coupling Reactions for a Multinuclear Copper Complex and its Dissociation into Mononuclear Species.* Zou, Y.; Lin, H.; Maggard, P.A.; Deiters, A. **2011**, under revision.
- 47.† *Effect of Particle Surface Areas and Microstructures on Photocatalytic H₂ and O₂ Production Over PbTiO₃.* Arney, D.; Watkins, T.; Maggard, P.A. *J. Am. Ceram. Soc.* **2011**, in press.
- 46.† *Site-Differentiated Solid Solution in (Na_{1-x}Cu_x)₂Ta₄O₁₁ and its Electronic Structure and Optical Properties.* Palasyuk, O.; Palasyuk, A.; Maggard, P.A. *Inorg. Chem.* **2010**, 49(22), 10571-10578.
- 45.† *Semiconducting Oxides to Facilitate the Conversion of Solar Energy to Chemical Fuels.* Joshi, U.A.; Palasyuk, A.; Arney, D.; Maggard, P.A. *J. Phys. Chem. Lett.* **2010**, 1(18), 2719-2726.
- 44.† *A Bismuth-Stabilized Metal-Rich Telluride Lu₉Bi_{-1.0}Te_{-1.0} – Synthesis and Characterization.* Gupta, S.; Maggard, P.A.; Corbett, J.D. *Eur. J. Inorg. Chem.* **2010**, 18, 2620-2625.
- 43.† *Flux Synthesis of AgNbO₃: Effect of Particle Surfaces and Sizes on Photocatalytic Activity.* Arney, D.; Hardy, C.; Greve, B.; Maggard, P.A. *J. Photochem. Photobio. A: Chem.* **2010**, 214, 54-60.
- 42.† *Microporosity, Optical Bandgap Sizes, and Photocatalytic Activity of M(I)-Nb(V) (M = Cu, Ag) Oxyfluoride Hybrids.* Lin, H.; Maggard, P.A. *Cryst. Grow. Des.* **2010**, 10, 1323-1331.
- 41.† *Syntheses, Optical Properties and Electronic Structures of Copper(I) Tantalates: Cu₃Ta₇O₁₉ and Cu₅Ta₁₁O₃₀.* Palasyuk, O.; Palasyuk, A.; Maggard, P.A. *J. Solid St. Chem.* **2010**, 183, 814-822.
- 40.† *Single Crystal Growth and Structure of La₄Cu₃MoO₁₂.* Enterkin, J.A.; Maggard, P.A.; Ishiwata, S.; Marks, L.D.; Poeppelmeier, K.R.; Azuma, M.; Takano, M. *J. Solid St. Chem.* **2010**, 183, 551-556.

- 39.† *Structural Modification and Optical Reflectivity of New Gold-Indide Intermetallic Compounds.* Palasyuk, A.; Maggard, P.A. *J. Alloys Compds.* **2009**, 491, 81-84.
- 38.† *Ligand-Based Modification of the Structures and Optical Properties of New Silver(I)-Rhenate(VII) Oxide/Organic Hybrid Solids.* Lin, H.; Maggard, P.A. *Inorg. Chem.* **2009**, 48, 11265-11276.
- 37.† *Ligand-Mediated Interconversion of Multiply-Interpenetrating Frameworks in Cu^I/Re^{VII}-Oxide Hybrids.* Lin, H.; Maggard, P.A. *Inorg. Chem.* **2009**, 48, 8940-8946.
- 36.† *Syntheses and Structures of a New Series of Silver-Vanadate Hybrid Solids and Their Optical and Photocatalytic Properties.* Lin, H.; Maggard, P.A. *Inorg. Chem.* **2008**, 47, 8044-8052.
- 35.† *New Molten-Salt Synthesis and Photocatalytic Properties of La₂Ti₂O₇ Particles.* Arney, D.; Greve, B.; Porter, B.; Greve, B.; Maggard, P.A. *J. Photochem. Photobio. A: Chem.* **2008**, 199, 230-235.
- 34.† *Effect of Spin Ladder Topology on 2D Charge Ordering: Toward New Spin-Antiferroelectric Transitions.* Yan, B.; Maggard P.A. *J. Am. Chem. Soc.*, **2007**, 129, 12646-12647.
- 33.† *M(bipyridine)V₄O₁₀ (M = Cu, Ag): Hybrid Analogues of Low-Dimensional Reduced Vanadates.* Yan, B.; Maggard, P.A. *Inorg. Chem.* **2007**, 46(16), 6640-6646.
- 32.† *A Rapid Flux-Assisted Synthetic Approach Towards The Bandgap Engineering of Layered Perovskites.* Porob, D.G.; Maggard, P.A. *Chem. Mater.* **2007**, 19, 970-972.
- 31.† *Layered copper-rhenate hybrids: Syntheses, structures and optical properties.* Lin, H.; Maggard, P.A. *Inorg. Chem.* **2007**, 46, 1283-1290.
- 30.† *Synthesis of photocatalytically-active hydrated forms of amorphous titania, TiO₂·nH₂O.* Zhang, Z.; Maggard, P.A. *J. Photochem. Photobio. A: Chem.* **2007**, 186, 8-13.
- 29.† *Hydrothermal synthesis and photocatalytic activities of SrTiO₃-coated Fe₂O₃ and BiFeO₃.* Luo, J.; Maggard, P.A. *Adv. Mater.* **2006**, 18, 514-517.
- 28.† *Flux syntheses of La-doped NaTaO₃ and its photocatalytic activity.* Porob, D.; Maggard, P.A. *J. Solid St. Chem.* **2006**, 179, 1727-1732.
- 27.† *Polar symmetry and intercalation of new multilayered hybrid molybdates: [M₂(pzc)₂(H₂O)_x][Mo₅O₁₆] (M = Co, Ni).* Yan, B.; Maggard, P.A. *Inorg. Chem.* **2006**, 45, 4721-4727.
- 26.† *Spin gap formation and thermal structural studies in reduced hybrid layered vanadates.* Yan, B.; Luo, J.; Dube, P.; Sefat, A.S.; Greedan, J.E.; Maggard, P.A. *Inorg. Chem.* **2006**, 45, 5109-5118.
- 25.† *Synthesis of textured Bi₅Ti₃FeO₁₅ and LaBi₄Ti₃FeO₁₅ ferroelectric layered Aurivillius phases by molten-salt flux methods.* Porob, D.; Maggard, P.A. *Mat. Res. Bull.* **2006**, 41, 1513-1519.
- 24.† *Synthesis and properties of pyrazine-pillared Ag₃Mo₂O₄F₇ and AgReO₄ layered phases.* Lin, H.; Yan, B.; Boyle, P.D.; Maggard, P.A. *J. Solid St. Chem.* **2006**, 179, 39-47.
- 23.† *Layered perrhenate and vanadate hybrid solids: On the utility of structural relationships.* Yan, B.; Maggard, P.A. *Inorganic Chemistry in Focus III* (eds. G. Meyer, D. Naumann, L. Wesemann) Wiley-VCH, **2006**.
- 22.† *Pillared hybrid solids with access to coordinatively unsaturated metal sites: An alternative strategy.* Maggard, P.A.; Yan, B.; Luo, J. *Angew. Chem. Int. Ed.* **2005**, 44, 2553-2556.
- 21.† *Structural origin of chirality and properties of a remarkable helically-pillared solid.* Yan, B.; Capracotta,

- M.D.; Maggard, P.A. *Inorg Chem.* **2005**, *44*, 6509-6511.
20. Poly[nickel(II)-di- μ -4,4'-bipyridyl-k₄N:N'- μ -dichromato-k₂O:O'] and Poly[copper(II)-di- μ -4,4'-bipyridyl-k₄N:N'- μ -dichromato-k₂O:O']. Kopf, A.; Maggard, P.A.; Stern, C.L.; Poeppelmeier, K.R. *Acta Cryst. C* **2005**, *C61*, m165-m168.
 - 19.† *Synthesis and characterization of ReO₄-containing microporous and open framework structures.* Luo, J.; Alexander, B.; Wagner, T.R.; Maggard, P.A. *Inorg. Chem.* **2004**, *43*, 5537-5542.
 - 18.† *Inorganic Chemistry* (in Vol. 2 in Chemistry: Foundations and Applications), Macmillan Reference USA: New York, **2004**.
 17. *Probing helix formation in chains of vertex-linked octahedra.* Maggard, P.A.; Kopf, A.L.; Stern, C.L.; Poeppelmeier, K.R. *Inorg. Chem.* **2004**, *43*, 5537-5542.
 16. *Two-dimensional metallic chain compounds Y₅M₂Te₂ (M = Fe, Co, Ni) that are related to Gd₃MnI₃. The hydride derivative Y₅Ni₂Te₂D_{0.4}.* Maggard, P.A.; Corbett, J.D. *Inorg. Chem.* **2004**, *43*, 2556-2563.
 - 15.† *Synthesis and properties of V₆O₁₆Cu(C₄H₄N₂)₂(H₂O)_{0.22(1)}: Charge density matching of a metal-segregated layer structure.* Maggard, P.A.; Boyle, P.D. *Inorg. Chem.* **2003**, *42*, 4250-4252.
 14. *Alignment of acentric MoO₃F₃³⁻ anions in a polar material: (Ag₃MoO₃F₃)(Ag₃MoO₄)Cl.* Maggard, P.A.; Nault, T.S.; Poeppelmeier, K.R. *J. Solid St. Chem.* **2003**, *175*, 27-33.
 13. *From linear inorganic chains to helices: Chirality in the M(py_z)(H₂O)₂MoO₂F₄ (M = Zn, Cd) Compounds.* Maggard, P.A.; Kopf, A.L.; Stern, C.L.; Poeppelmeier, K.R. *Inorg. Chem.* **2002**, *41*, 4852-4858.
 12. *(2,2'-Bipyridine-k₂N,N')(dichromato-kO)copper(II).* Maggard, P.A.; Kopf, A.L.; Stern, C.L.; Poeppelmeier, K.R. *Acta Cryst.* **2002**, *C58*, m207-m209.
 11. *Understanding the role of helical chains in the formation of noncentrosymmetric solids.* Maggard, P.A.; Stern, C.L.; Poeppelmeier, K.R. *J. Am. Chem. Soc.* **2001**, *123*, 7742-7743.
 10. *Substitutional chemistry in Mn₅Si₃-type scandium-main group compounds and the formation of quasibinary phases.* Maggard, P.A.; Knight, D.A.; Corbett, J.D. *J. Alloys Compd.* **2001**, *315*, 108-117.
 9. *Formation of gallium dimers in the intermetallic compounds R₅Ga₃ (R = Sc, Y, Ho, Er, Tm, Lu). Deformation of the Mn₅Si₃-type structure.* Maggard, P.A.; Corbett, J.D. *Inorg. Chem.* **2001**, *40*, 1352-1357.
 8. *Insights into metal framework constructions from the syntheses of new scandium- and yttrium-rich telluride compounds: Y₅Ni₂Te₂ and Sc₆PdTe₂.* Maggard, P.A.; Corbett, J.D. *J. Am. Chem. Soc.* **2000**, *122*, 10740-10741.
 7. *Sc₆MTe₂ (M = Mn, Fe, Co, Ni): Members of the flexible Zr₆CoAl₂-type family of compounds.* Maggard, P.A.; Corbett, J.D. *Inorg. Chem.* **2000**, *39*, 4143-4146.
 6. *Sc₉Te₂: A two-dimensional distortion wave in the scandium-richest telluride.* Maggard, P.A.; Corbett, J.D. *J. Am. Chem. Soc.* **2000**, *122*, 838-843.
 5. *Sc₅Ni₂Te₂: Synthesis, structure and bonding of a metal-metal-bonded chain phase, a relative of Gd₃MnI₃.* Maggard, P.A.; Corbett, J.D. *Inorg. Chem.* **1999**, *38*, 1945-1950.
 4. *The synthesis, structure, and bonding of Sc₈Te₃ and Y₈Te₃. Cooperative matrix and bonding effects in the solid state.* Maggard, P.A.; Corbett, J.D. *Inorg. Chem.* **1998**, *37*, 814-820.
 3. *Sc₂Te: A novel example of condensed metal polyhedra in a metal-rich but relatively electron-poor compound.* Maggard, P.A.; Corbett, J.D. *Angew. Chem., Int. Ed. Engl.* **1997**, *36*, 1974-1976.

2. *The novel encapsulation of transition metals in a bioctahedral rare earth metal cluster.* Lulei, M.; Maggard, P.A.; Corbett, J.D. *Angew. Chem., Int. Ed. Engl.* **1996**, 35, 1704-1706.
1. *Direct evaluation of equilibrium molecular geometries using real-time gas electron diffraction.*
 2. *Selenium hexafluoride* Maggard, P.A.; Lobastov, V.A.; Schaefer, L.; Ewbank, J.D. *J. Phys. Chem.* **1995**, 99, 13115-13117.