

## Dr. Paul A. Maggard, Jr.

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### ○ Current Research Interests

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

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### ○ Professional Appointments and Educational Preparation

Assistant Professor of Chemistry: North Carolina State University, 2002 – present  
Postdoctoral Associate (10/00 – 5/02): Northwestern University with Professor Kenneth R. Poepplmeier  
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

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### ○ Scholarly and Professional Awards and Honors

DOE Award, Basic Research for Solar Energy Utilization  
CAREER Award, National Science Foundation  
Beckman Young Investigator Award, Beckman Foundation  
Petroleum Research Fund Grant (Type G and AC)  
NCSU Faculty Research and Professional Development Award  
Ralph E. Powe Junior Faculty Award, Oak Ridge Associated Universities  
Sigma Xi Scientific Honor Society  
Outstanding Senior Academic Scholarship, William Jewell College  
Inducted Member (WJC): Mathematics Honor Society, National Academic Honor Society

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### ○ Selected Professional Activities

Co-director (with Prof. Lin He) of NSF-funded Summer Research Experience for Undergraduates (REU) Program in the Department of Chemistry, 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)  
Invited participant of “Inorganic Chemistry” Workshop at Lesburg, VA (June 2005)  
Co-organizer (with Prof. Jim Martin and Prof. Mike Whangbo) of the Solid-State Symposium during the 2004 SERMACS in Durham, NC (October 2004)  
Mentor scientist for K-8 Teacher Link program of the North Carolina Science, Mathematics, and Technology Education Center (2005 – present)  
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

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: 2007 – 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: Solid-State Gordon Research Conference (2006, 2004, 2002, 2000, 1998); National and Regional Meetings of the ACS (2005, 2004, 2003, 2001), Midwestern High-Temperature and Solid-State Chemistry Conference (2005, 2001, 1999, 1997)

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

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○ List of Publications

(† From research while at NCSU)

- 35.† *Effect of Spin Ladder Topology on 2D Charge Ordering: Toward New Spin-Antiferroelectric Transitions.* Yan, B.; Maggard P.A. Submitted, **2007**.
- 34.† *Rapid Molten-Salt Flux Syntheses Of  $\text{La}_2\text{Ti}_2\text{O}_7$  Particles with Enhanced Photocatalytic Rates of Hydrogen Production* Arney, D.; Maggard P.A., Submitted, **2007**.
- 33.† *M(bipyridine) $\text{V}_4\text{O}_{10}$  (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,  $\text{TiO}_2 \cdot n\text{H}_2\text{O}$ .* Zhang, Z.; Maggard, P.A. *J. Photochem. Photobio. A: Chem.* **2007**, 186, 8-13.
- 29.† *Hydrothermal synthesis and photocatalytic activities of  $\text{SrTiO}_3$ -coated  $\text{Fe}_2\text{O}_3$  and  $\text{BiFeO}_3$ .* Luo, J.; Maggard, P.A. *Adv. Mater.* **2006**, 18, 514-517.
- 28.† *Flux syntheses of La-doped  $\text{NaTaO}_3$  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:  $[\text{M}_2(\text{pzc})_2(\text{H}_2\text{O})_x][\text{Mo}_5\text{O}_{16}]$  (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  $\text{Bi}_5\text{Ti}_3\text{FeO}_{15}$  and  $\text{LaBi}_4\text{Ti}_3\text{FeO}_{15}$  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  $\text{Ag}_3\text{Mo}_2\text{O}_4\text{F}_7$  and  $\text{AgReO}_4$  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- $\mu$ -4,4'-bipyridyl- $k_4\text{N}:N'$ - $\mu$ -dichromato- $k_2\text{O}:O'$ ] and Poly[copper(II)-di- $\mu$ -4,4'-bipyridyl- $k_4\text{N}:N'$ - $\mu$ -dichromato- $k_2\text{O}:O'$ ]*. Kopf, A.; Maggard, P.A.; Stern, C.L.; Poeppelmeier, K.R. *Acta Cryst. C* **2005**, *C61*, m165-m168.
- 19.† *Synthesis and characterization of  $\text{ReO}_4$ -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  $\text{Y}_5\text{M}_2\text{Te}_2$  ( $M = \text{Fe}, \text{Co}, \text{Ni}$ ) that are related to  $\text{Gd}_3\text{MnI}_3$ . The hydride derivative  $\text{Y}_5\text{Ni}_2\text{Te}_2\text{D}_{0.4}$* . Maggard, P.A.; Corbett, J.D. *Inorg. Chem.* **2004**, *43*, 2556-2563.
- 15.† *Synthesis and properties of  $\text{V}_6\text{O}_{16}\text{Cu}(\text{C}_4\text{H}_4\text{N}_2)_2 \cdot (\text{H}_2\text{O})_{0.22(1)}$ : 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  $\text{MoO}_3\text{F}_3^{3-}$  anions in a polar material:  $(\text{Ag}_3\text{MoO}_3\text{F}_3)(\text{Ag}_3\text{MoO}_4)\text{Cl}$* . 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  $M(\text{pyz})(\text{H}_2\text{O})_2\text{MoO}_2\text{F}_4$  ( $M = \text{Zn}, \text{Cd}$ ) Compounds*. Maggard, P.A.; Kopf, A.L.; Stern, C.L.; Poeppelmeier, K.R. *Inorg. Chem.* **2002**, *41*, 4852-4858.
12. *(2,2'-Bipyridine- $k_2\text{N}, N'$ )(dichromato- $k\text{O}$ )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  $\text{Mn}_5\text{Si}_3$ -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  $\text{R}_5\text{Ga}_3$  ( $R = \text{Sc}, \text{Y}, \text{Ho}, \text{Er}, \text{Tm}, \text{Lu}$ ). Deformation of the  $\text{Mn}_5\text{Si}_3$ -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:  $\text{Y}_5\text{Ni}_2\text{Te}_2$  and  $\text{Sc}_6\text{PdTe}_2$* . Maggard, P.A.; Corbett, J.D. *J. Am. Chem. Soc.* **2000**, *122*, 10740-10741.
7.  *$\text{Sc}_6\text{MTe}_2$  ( $M = \text{Mn}, \text{Fe}, \text{Co}, \text{Ni}$ ): Members of the flexible  $\text{Zr}_6\text{CoAl}_2$ -type family of compounds*. Maggard,

- P.A.; Corbett, J.D. *Inorg. Chem.* **2000**, 39, 4143-4146.
6.  $Sc_9Te_2$ : 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.  $Sc_5Ni_2Te_2$ : Synthesis, structure and bonding of a metal-metal-bonded chain phase, a relative of  $Gd_3MnI_3$ . Maggard, P.A.; Corbett, J.D. *Inorg. Chem.* **1999**, 38, 1945-1950.
  4. The synthesis, structure, and bonding of  $Sc_8Te_3$  and  $Y_8Te_3$ . Cooperative matrix and bonding effects in the solid state. Maggard, P.A.; Corbett, J.D. *Inorg. Chem.* **1998**, 37, 814-820.
  3.  $Sc_2Te$ : 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.