

CURRICULUM VITAE
Christopher L. Cahill

Department of Chemistry
The George Washington University
725 21st Street, N.W.
Washington, DC 20052
Phone:(202)994-6959 Fax: (202)994-5873
cahill@gwu.edu

1859 Wilson Blvd., #372
Arlington, VA. 22201
703-527-1801

POSITIONS HELD

George Washington University
Department of Chemistry
Associate Professor: 2006- present
Assistant Professor: 2000 to 2006.

Carnegie Institution of Washington, Geophysical Laboratory
Visiting Investigator, July 2000 to present.

University of Notre Dame: Post-Doctoral Research Associate in the Environmental Mineralogy and Crystallography Group within the Department of Civil Engineering and Geological Sciences. June 1999 to July 2000. Advisor: Peter C. Burns.

State University of New York
University at Stony Brook- Departments of Chemistry and Geosciences
Research Assistant, 1994-1999
Teaching Assistant, 1997

Arizona State University
Teaching Assistantship, 1993-1994.

EDUCATION

State University of New York
University at Stony Brook
Ph.D. Chemistry, May 1999; Dissertation Title: *Synthesis and Time-Resolved Structural Characterization of Framework and Mineral Sulfides*.
Advisor: John B. Parise

Arizona State University
Department of Chemistry
Tempe, Arizona 1993-1994.

State University of New York
College at Fredonia
B.S. (cum laude) Chemistry and Geochemistry, 1993.

CURRENT/RECENT FUNDING

External:

DOE-BES-Energy Frontier Research Center. 8/1/09-7/31/14. Cahill is a subawardee on the Notre Dame based Actinide Materials Science EFRC. This is an \$18 million award where Cahill's portion is 1,284,577.

DOE-BES 9/1/05-9/30/2009 'Hydrothermal chemistry of UO_2^{n+} Phases: Formation and Stabilization of Pentavalent Uranium Compounds.' \$282,000.
Renewed for 10/1/09- 9/30/12: \$299,842.

NSF-CAREER Award DMR-0348982 2/15/2004-7/31/2009: 'Design of organic-inorganic hybrid lanthanide and actinide materials.' \$569,996.

NSF-MRI- 0419754 8/1/04-7/31/05. 'Acquisition of an imaging plate equipped X-ray diffractometer for use in a materials chemistry research and education program.' Total: \$283,000 (includes \$84,900 from GWU in cost sharing). Co-PIs: Xu and Wagner (GWU).

NSF-EAR- 0409422 7/1/04-6/30/07: 'Collaborative Research: Crystal chemistry of U,Th and other radionuclides in apatite: environmental and geochemical implications. Co-PI with J. Rakovan and J. Hughes, Miami University, Oxford, OH. \$308,219; \$46,766 to Cahill.

Synthesis of Ferrite Nanoparticles Using Reverse Micelles. Office of Naval Research. \$121,906; 6/1/01-5/31/04.

Internal (GWU, excluding start-up; competitive):

University Facilitating Fund: Synthesis of Uranium Oxide Materials from Spent Nuclear Fuel Analogs. \$12,637; 7/01-7/02.

University Facilitating Fund: Synthesis and structural characterization of heteronuclear metal-organic framework materials. \$6,674; 7/03-7/04.

Columbian College of Arts and Sciences Junior Scholar Incentive Award: \$7500; 7/03.

SCHOLARSHIPS AND AWARDS

AS FACULTY

- NSF-CAREER Award (2004).
- Junior Scholar Incentive Award (2003). Columbian College of Arts and Sciences, GWU.
- Bender Teaching Award, GWU (2005)
- Fulbright Scholarship (2008).

PROFESSIONAL AFFILIATIONS

- Sigma Xi (President, GWU Chapter)
- Mineralogical Society of America
- American Crystallographic Association (Member- Continuing Education Committee)
- American Chemical Society
- Geological Society of Washington
- United States National Committee for Crystallography

PUBLICATIONS (PEER REVIEWED)

65. K. E. Knope and C.L. Cahill (2009) "Homometallic uranium (VI) phosphonoacetates containing interlayer dipyridines." *Inorganic Chemistry*, In Press.
64. D. T. de Lill, A. M. Tareila, and C. L. Cahill (2009) "Synthesis, structure, and luminescence of a two-dimensional lanthanide(III)-suberate coordination polymer resulting from dimeric secondary building units." *Inorganic Chemistry Communications*, **12**(2), 191-194.
63. N. P. Deifel, K. Travis Holman and C. L. Cahill (2008) "PF₆⁻ Hydrolysis as a Route to Unique Uranium Phosphate Materials." *ChemComm.*, 6037-6038.
62. N. Belai, M. Frisch, E. S. Ilton, B. Ravel, and C. L. Cahill (2008) "Pentavalent Uranium Oxide via Reduction of [UO₂]²⁺ Under Hydrothermal Reaction Conditions." *Inorganic Chemistry*, **47**(21), 10135-10140.
61. R. E. Wilson, S. Skanthakumar, K. E. Knope, C. L. Cahill and L. Soderholm (2008) "A thorium sulfate hydrate with 11.5 Å channels." *Inorganic Chemistry*, **47**(20), 9321-9326.
60. K.E. Knope and C.L. Cahill (2008) "Structural variation within homometallic uranium(VI) carboxyphosphonates: in-situ ligand synthesis, directed assembly, metal-ligand coordination, and hydrogen bonding." *Inorganic Chemistry*, **47**, 7660-7672.
59. M. Frisch and C.L. Cahill (2008) "Thorium (IV) coordination polymers in the pyridine- and pyrazinedicarboxylic acid systems." *Crystal Growth and Design*, **8**, 2921-2928.
58. N.E. Dean, R. D. Hancock, C.L. Cahill and M. Frisch (2008) "Affinity of the Highly Preorganized Ligand PDA (1,10-Phenanthroline-2,9-dicarboxylic acid) for Large Metal Ions of Higher Charge. A Crystallographic and Thermodynamic Study of PDA Complexes of Thorium(IV) and the Uranyl(VI) ion." *Inorganic Chemistry*, **47**, 2000-2010.
57. K. L. Ziegelgruber, K. E. Knope, M. Frisch and C. L. Cahill (2008) "Hydrothermal chemistry of Th(IV) with aromatic dicarboxylates: New framework compounds and in situ ligand syntheses." *Journal of Solid State Chemistry*, **181**, 373-381.
56. D.T. de Lill and C.L. Cahill (2007) "The synthesis and characterization of a praseodymium-adipate framework templated with 1,2-bis(4-pyridyl)ethane : Host-guest interactions and structural survey." *Crystal Growth and Design*, **7**, 2390-2393.
55. M Frisch and C. L. Cahill (2007) "In Situ Ligand Synthesis with the UO₂²⁺ Cation under Hydrothermal Conditions." *Journal of Solid State Chemistry*, **180**, 2597-2602.
54. K. E. Knope and C. L. Cahill, (2007) "Hydrothermal Synthesis of a Novel Uranium Oxalate/Glycolate via In-Situ Ligand Formation." *Inorganic Chemistry*, **46**, 6607-6612.
53. K.E. Knope and C.L. Cahill (2007) "1,4-diazabicyclo[2.2.2]octane dinitrate" *Acta Crystallographica*, Section E: Structure Reports Online. E63, o2955.
52. D.T. de Lill, A. de Bettencourt-Dias and C.L. Cahill (2007) "Exploring Lanthanide Luminescence in Metal-Organic Frameworks: Synthesis, structure, and guest sensitized luminescence of a mixed

europium/terbium-adipate framework and a terbium-adipate framework.” *Inorganic Chemistry*, 46, 3960-3965.

51. C.L. Cahill, D. T. de Lill, and M. Frisch (2007) “Homo- and heterometallic coordination polymers from the f elements.” *CrystEngComm*, 9, 15-26. **Invited ‘Highlight’ and Cover Article.**

50. X. Song, N. Koranteng, L. Borkowski, C. Cahill and G. Eng (2007) "Crystal structure of dicyclohexylammonium thiolactatotriphenylstannate." *Main Group Metal Chemistry*, 29, 263-266.

49. D.T. de Lill and C.L. Cahill (2006) “An Unusually High Thermal Stability within a Novel Lanthanide 1,3,5-Cyclohexanetricarboxylate Framework: Synthesis, Structure, and Thermal Data.” *Chemical Communications*, 4946-4948.

48. M. Frisch and C.L. Cahill (2006) “Synthesis, structure and fluorescent studies of novel uranium coordination polymers in the pyridinedicarboxylic acid system.” *Dalton Transactions*, 4679-4690.

47. L.A. Borkowski and C.L. Cahill (2006) “Crystal Engineering with the Uranyl Cation I. Aliphatic Carboxylate Coordination Polymers: Synthesis, Crystal Structures, and Fluorescent Properties.” *Crystal Growth and Design*, 6(10), 2241-2247.

46. L. A. Borkowski and C.L. Cahill (2006) “Crystal Engineering with the Uranyl Cation II. Mixed Aliphatic Carboxylate/Aromatic Pyridyl Coordination Polymers: Synthesis, Crystal Structures, and Sensitized Luminescence.” *Crystal Growth and Design*, 6(10), 2248-2259.

45. S. A. Morrison, C.L. Cahill, E.E. Carpenter and V.G. Harris (2006) “Production scale-up of reverse micelle synthesis.” *Industrial and Engineering Chemistry Research*, 45, 1217-1220.

44. A.B. Wiles, D. Bozzuto, C.L. Cahill and R.D. Pike (2006) “Cu (I) and (II) complexes of melamine.” *Polyhedron*, 25, 776-782.

43. N.S. Gunning and C.L. Cahill (2005) “Novel coordination polymers and structural systematics in the hydrothermal M,M’ trans-3(-3-pyridyl)acrylic acid system.” *Dalton Transactions*, 2788-2792.

42. D.T. de Lill, W.W. Brennessel, L.A. Borkowski, N.S. Gunning and C.L. Cahill (2005) “Poly[(13-n-hexane-1,6-dicarboxylato)dysprosium(III)].” *Acta Crystallographica*, Section E: Structure Reports Online, E61, 1343-1345.

41. D.T. de Lill, D.J. Bozzuto and C.L. Cahill (2005) “Templated Metal-Organic Frameworks: Synthesis, Structures, Thermal Properties and Solid-State Transformation of Two Novel Calcium-Adipate Frameworks.” *Dalton Transactions*, 2111 - 2115.

40. Morrison, S.A., Cahill, C.L., Carpenter, E.E., Calvin, S. and Harris, V.G. (2005) “Atomic engineering of mixed ferrite and core shell nanoparticles.” *J. Nanoscience and Nanotechnology*, 5, 1323-1344. **(Invited contribution).**

39. Borkowski, L.A. and Cahill, C.L (2005) “A novel uranium-containing coordination polymer: poly[dioxouranium(VI)-14-npentane-1,5-dicarboxylato]” *Acta Crystallographica*, Section E: Structure Reports Online, E61, m816-m817.

38. Frisch, M. and Cahill, C.L. (2005) “Syntheses, Structures and Fluorescent Properties of Two Novel Coordination Polymers in the U-Cu-H₃pdc System.” *Dalton Transactions*, 1518 - 1523.

37. Ilton, E. S.; Haiduc, A.; Cahill, C. L.; Felmy, A. R. (2005) "Mica surfaces stabilize pentavalent uranium" *Inorganic Chemistry*, 44, 2896-2898. **Cover Article.**
36. Krivovichev, S. V.; Cahill, C. L.; Nazarchuck, E. V.; Burns, P.C.; Armbruster, T.; Depmeier, W. (2005) "Chiral open-framework uranyl molybdates. 1. Topological diversity: synthesis and crystal structure of $[(C_2H_5)NH_2]_2[(UO_2)_2(MoO_4)_5(H_2O)]H_2O$ " *Microporous Mesoporous Mat.*, 78, 209-215.
35. D.T. de Lill, N.S. Gunning, and C.L. Cahill (2005) "Toward Templated Metal-Organic Frameworks: Synthesis, Structures, Thermal Properties and Luminescence of Three Novel Lanthanide-Adipate Frameworks." *Inorganic Chemistry*, 44, 258-266.
34. Morrison, S. A.; Cahill, C. L.; Carpenter, E. E.; Calvin, S.; Swaminathan, R.; McHenry, M. E.; Harris, V. G. (2004) "Magnetic and Structural Properties of Nickel Zinc Ferrite Nanoparticles Synthesized at Room Temperature" *Journal of Applied Physics*, 95(11, Pt. 1), 6392-6395.
33. L.A. Borkowski and C.L. Cahill (2004) Two Novel Three Dimensional Nd-adipates: Influence of Hydrothermal Reaction Temperature on Framework Topology. *Inorganic Chemistry Communications*, 7/6, 725-728.
32. P.R. Bartholemew, F. Mancini, C.L. Cahill and G.E. Harlow (2005) Zoltaiite, $Ba_{1.05}V_{11.75}Ti_{1.31}Fe_{0.49}Cr_{0.34}Mg_{0.03}Al_{0.02}Si_{2.06}O_{27}$, A New Barium-Vanadium Orthosilicate Mineral from British Columbia: Description and Crystal structure. *American Mineralogist*. 90, 1655-1660.
31. L.A. Borkowski and C.L. Cahill (2004) Poly[[aquaneodymium(III)]- μ_3 -decane-1,10-dicarboxylato- μ_3 -9-carboxynonecarboxylato] Acta Crystallographica, Section C: Crystal Structure Reports, C60, m159-m161.
30. L.A. Borkowski and C.L. Cahill (2004) A novel uranium-containing coordination polymer: poly[[aqua(benzene-1,3,5-tricarboxylato)dioxouranium(VI)] monohydrate]. Acta Crystallographica, Section E: Structure Reports Online, E60, m198-m200.
29. L.A. Borkowski and C.L. Cahill(2003) Poly[di-aquabis(3-pyridyl)propionato]copper(II)]. Acta Crystallographica, Section E: Structure Reports Online, 59(12), m1127-m1128.
28. L.A. Borkowski and C.L. Cahill (2003) Topological evolution in U-dicarboxylates: Synthesis and structures of $UO_2(C_6H_8O_4) \cdot 2H_2O$ and $UO_2(C_6H_8O_4)$. *Inorganic Chemistry*, 42, 7041-7045.
27. S. A. Morrison, C.L. Cahill, E.E. Carpenter, S. Calvin and V.G. Harris (2003) Preparation and characterization of MnZn-ferrite nanoparticles using reverse micelles. *J. Applied Physics*, 93, 7489-7491.
26. X. Song, C. Cahill and G. Eng (2003)Triorganotin 2-(p-chlorophenyl)-3-methylbutyrates. *Applied Organometallic Chemistry*, 17, 743-744.
25. S.V. Krivovichev, C.L. Cahill and P.C. Burns (2003) A Novel Open Framework Uranyl Molybdate: Synthesis and Structure of $(NH_4)_4[(UO_2)_5(MoO_4)_7](H_2O)_5$. *Inorganic Chemistry*, 42, 2459-2464.
24. J. E. Post, P. J. Heaney, C. L. Cahill and L. W. Finger (2003) Woodruffite: A New Mn Oxide Structure with Very Large Tunnels. *American Mineralogist*, 88, 1697-1702.
23. X. Song, C.L. Cahill, G. Eng (2002) The Crystal Structure tricyclohexyltin

4-hydroxybenzoate. *Main Group Metal Chemistry*, 25, 703-704.

22. R. E. Glatz, Y. Li, K. A. Hughes, C.L. Cahill and P.C. Burns (2002) Synthesis and structure of a new Ca uranyl oxide hydrate, $\text{Ca}[(\text{UO}_2)_4\text{O}_3(\text{OH})_4](\text{H}_2\text{O})_2$, and its relationship to becquerelite. *Can. Mineral.*, 40, 217-224.

21. F. Mancini, G.E. Harlow and C.L. Cahill (2002) The crystal structure and cation ordering of Phase-X- $(\text{K}_{1-x})_2(\text{Mg}_{1-n}[\text{Al},\text{Cr}]_n)_2\text{Si}_2\text{O}_7\text{H}_{2(x-n)}$: A potential K- and H- bearing phase in the mantle. *American Mineralogist*, 87(2-3), 302-306.

20. X. Song, C.L. Cahill, G. Eng (2002) Crystal Structure of Triphenyltin 4-methoxybenzoate. *Main Group Metal Chemistry*, 25, 177-178.

19. Krivovichev, S.V., Cahill, C.L., and Burns, P.C. (2002) Syntheses and crystal structures of two topologically related modifications of $\text{Cs}_2[(\text{UO}_2)_2(\text{MoO}_4)_3]$. *Inorganic Chemistry*, 41, 34-39.

18. X. Song, C.L. Cahill, G. Eng (2002) The crystal structure of tricyclohexyltin N-N-butyl dithiocarbamate. *Main Group Metal Chemistry*, 25, 13-14.

17. F. Mancini, G.E. Harlow and C.L. Cahill (2001) Crystal structure of potassium magnesio-disilicate hydroxide, $(\text{K}_{0.65})_2(\text{Mg}_{0.95}\text{Al}_{0.03}\text{Cr}_{0.02})_2\text{Si}_2\text{O}_{6.40}(\text{OH})_{0.60}$. *Zeitsch. fur Krist.*, NCS 216, 189-190.

16. Cahill, C.L. and Burns, P.C. (2001) Building Unit and Topological Evolution in the Hydrothermal DABCO-U-F system. *Inorganic Chemistry*, 40, 1347-1351.

15. Li, Y., Cahill, C. L. and Burns, P.C. (2001) Synthesis and Structural Characterization and Topological Re-arrangement of a Novel Open Framework U-O Material: $(\text{NH}_4)_3(\text{H}_2\text{O})_2\{[(\text{UO}_2)_{10}\text{O}_{10}(\text{OH})][(\text{UO}_4)(\text{H}_2\text{O})_2]\}$. *Chemistry of Materials*, 13, 4026-4031.

14. Cahill, C.L., Krivovichev, S.V., Burns, P.C., Bekenova, G.K. and Shabanova, T.A. (2001) the crystal structure of mitryaevaite, $\text{Al}_5(\text{PO}_4)_2[(\text{P},\text{S})\text{O}_3(\text{OH},\text{O})]_2\text{F}_2(\text{OH})_2(\text{H}_2\text{O})_8 \cdot 6.48\text{H}_2\text{O}$, determined from a microcrystal using synchrotron radiation. *Canadian Mineralogist*, 39, 179-186.

13. Ghosh, S., Lei, X., Cahill, C.L. and Fehlner, T. P. (2000) Symmetrical Scission of the Coordinated Tetraborane in $[(\text{Cp}^*\text{ReH}_2)_2\text{B}_4\text{H}_4]$ on CO Addition and Reassociation of the Coordinated Diboranes on H_2 Loss. *Angew. Chem. Int. Ed.*, 39, 2900-2902.

12. Cahill, C.L. and Burns, P.C. (2000) The structure of agrinierite: a Sr-containing uranyl oxide hydrate mineral. *American Mineralogist*, 85, 1294-1297.

11. Parise, J.B., Cahill, C.L., and Lee, Y. (2000) Dynamic crystallography at synchrotron sources. Invited contribution to *Canadian Mineralogist*, 38, No. 4, 777-800.

10. Cahill, C.L., Benning, L.G., Parise, J.B. and Barnes, H.L. (2000) In situ, time-resolved X-ray diffraction of iron sulfides during hydrothermal pyrite growth. **Invited contribution** to *Chemical Geology* for the Special Issue on Direct Observation and Measurement of Hydrothermal Reactions, 167, 53-63.

9. Cahill, C.L. and Parise, J.B. (2000) On the formation of framework indium sulfides. *Journal of the Chemical Society, Dalton Transactions*, 9, 1475-1482.

8. Tripathi, A.; Young, V. J.; Johnson, G. M.; Cahill, C.L.; and Parise, J.B. (1999) $[\text{N}(\text{CH}_3)_4]_4\text{Ge}_9\text{O}_{26}\text{H}_{12} \cdot 14\text{H}_2\text{O}$; *Acta Cryst.*, C55, 496-499.

7. Cahill, C.L.; Gugliotta, B.; and Parise, J.B. (1998) A novel layered indium-sulfide material consisting of corner and edge shared InS_4 tetrahedra: synthesis and structural characterization of DPA- InS-SB3 , *J. Chem. Soc., Chem. Commun.*, 16, 1715-1716.
6. Cahill, C.L.; Ko, Y.; Hanson, J.C.; Tan, K.; and Parise, J.B. Structure of microporous QUI-MnGS-1 and in situ studies of its formation using time-resolved synchrotron X-ray powder diffraction, *Chem. Mater.*, 1998, 10, 1453-1458.
5. Norby, P; Cahill, C.L.; Koleda, C., and Parise, J. B., A reaction cell for in situ studies of hydrothermal titration, *J. Appl. Cryst.*, 1998, 31, 481-483.
4. Cahill, C.L.; Ko, Y.; and Parise, J.B. A novel 3-dimensional open framework sulfide based on the $[\text{In}_{10}\text{S}_{20}]^{10-}$ Supertetrahedron, *Chem. Mater.*, 1998, 10, 19-21.
3. Cahill, C. L.; Parise, J.B. The synthesis and structure of $\text{MnGe}_4\text{S}_{10} \cdot (\text{C}_6\text{H}_{14}\text{N}_2) \cdot 3\text{H}_2\text{O}$: A novel sulfide framework analogous to zeolite-ABW, *Chem. Mater.*, 1997, 9, 807-811.
2. Cahill, C. L.; Tan, K.; Novoseller, R.; Parise, J.B. Synthesis and structural characterization of $[\text{Ni}_{12}(\text{S}_2)_6\text{S}_8]^{3-}$: a novel Ni-S cluster with a distorted cuboctahedral core. *J. Chem. Soc., Chem. Commun.* 1996, 1667.
1. Ko, Y.; Cahill, C.; Parise, J. B. Novel Layered Sulfides of Tin: Synthesis and Structural Characterization of $\text{Cs}_4\text{Sn}_5\text{S}_{12} \cdot 2\text{H}_2\text{O}$ and $\text{Sn}_5\text{S}_{12}(\text{N}_2\text{C}_4\text{H}_{11})_2(\text{N}_4\text{C}_{10}\text{H}_{24})$. *J. Chem. Soc., Chem. Commun.* 1994, 69-71.

PUBLICATIONS (NOT PEER REVIEWED)

Wolf, A., Rakovan, J. and Cahill, C.L. (2003) Ferroaxinite from Lime Crest Quarry, Sparta, New Jersey. *Rocks and Minerals*. 78, 252-256.

BOOK CHAPTERS AND REVIEW ARTICLES

Cahill, C. L.; Borkowski, L. A. "U(VI)-containing metal-organic frameworks and coordination polymers," In *Structural Chemistry of Inorganic Actinide Compounds*; Krivovichev, S. V., Burns, P. C., Tananaev, I. G., Eds.; Elsevier: Amsterdam, 2007.

de Lill, D.T. and Cahill, C.L. (2007) "Coordination Polymers of the Lanthanide Elements: A Structural Survey" In *Progress in Inorganic Chemistry*, 55, 143-203.

BOOK AND SOFTWARE REVIEWS

An Introduction to Materials Science by Wenceslao Gonzalez-Vinas and Hector L. Mancini, Princeton Univ. Press- Princeton, NJ. Appears in *Physics Today*, July 2005, pgs. 66-67.

The Physics and Chemistry of Materials by Joel I. Gersten & Frederick W. Smith, Wiley-Interscience, New York. Appears in *J. Chem. Ed.*, 80, April 2003.

Descriptive Inorganic Chemistry by James E. House & Kathleen A. House, Brooks Cole, San Diego. Appears in *J. Chem. Ed.*, 81, May 2004.

CrystalMaker V6.3.5, CD-Rom [for MAC OS X and OS 7.1-9.2] by David Palmer. Appears in *J. Chem. Ed.*, 81, November 2004.