

Edward G. Gillan (updated October 2021)

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Education

1994 Ph.D. in Chemistry (Inorganic); University of California, Los Angeles
1989 B.S. in Chemistry; University of California, Berkeley

Professional Experience

2003 - present Associate Professor, Department of Chemistry, University of Iowa
1997 - 2003 Assistant Professor, Department of Chemistry, University of Iowa
1994 - 1997 *Postdoctoral Research Associate* Advisor: Prof. Andrew R. Barron
Harvard University and Rice University
1990 - 1994 *Graduate Research Assistant* Advisor: Prof. Richard B. Kaner
Department of Chemistry, University of California, Los Angeles
Thesis: The rapid synthesis of refractory ceramics and intermetallic
compounds via solid-state metathesis routes
1989 - 1992 *Graduate Teaching Assistant*, University of California, Los Angeles
1988 - 1989 *Undergraduate Research Assistant* Advisor: Prof. Neil Bartlett
Department of Chemistry, University of California, Berkeley
1987 *Research Assistant* with Dr. J. Sarma, Cardiology, City of Hope, Duarte, California

Awards and Recognition

2020 Innovation in Laboratory Safety Award (University of Iowa, Office of Vice President
for Research). Excellence in Safety Certificate (UI Environmental Health & Safety)
2019 - current Editorial Board member for *Catalysts* (Catalytic Materials section, MDPI)
2018 - current Editorial Board member for *Frontiers in Chemistry* (Electrochemistry Review Editor)
2016-17 University of Iowa Faculty Senate Secretary (elected position)
2005 American Chemical Society's Division of Inorganic Chemistry: Elected and served
as Chair of the Solid State and Materials Chemistry subdivision
1998 Research Innovation Award, Research Corporation
1997 New Faculty Award, Camille and Henry Dreyfus Foundation
1992 Award for Excellence in Research, UCLA Chemistry Department
1990 Award for Distinguished Teaching, UCLA Chemistry Department
1989 - 1993 Solid State Fellowship from the UCLA Solid State Science Center

Affiliations

American Chemical Society (ACS) member since 1990
Materials Research Society (MRS) member since 1992
University of Iowa Optical Science and Technology Center (OSTC) member since 1999
University of Iowa Nanoscience and Nanotechnology Institute (NNI) member since 2007
Royal Chemical Society (RSC) affiliate member since 2021

Teaching and Student Mentoring at the University of Iowa

UI Teaching Summary (past 5 years out of 24 years): Courses for primarily undergraduates (1xxx or 3xxx) and graduates (5xxx). Student ACE (Assessing the Classroom Environment) scores for each course are on a scale of 0 (strongly disagree) to 6 (strongly agree). Gillan has taught seven different Chemistry department courses since 1997.

Semester	Advisees ¹ UG/Grad	Chemistry Course Number and Title (lecture team instructors noted after title)	Students Enrolled	ACE scores (responses) ²
Spring 2021	0/3	1110 - Principles of Chem I (w/ Becker, Sinnwell)	628	5.43 (112)
Fall 2020	0/5	1110 - Principles of Chem I (w/ Forbes, Mason, Small)	1025	5.22 (171)
Spring 2020	0/5	1110 - Principles of Chem I (w/ Cole, Geng)	726	5.53 (79)
Fall 2019	0/7	5206 - Solid State and Materials Chemistry	18	5.67 (12)
		1000 - First-Year Seminar: Making Stuff: Stronger, Smaller, Cleaner, Smarter	16	5.70 (14)
Fall 2018	0/10	3530 - Inorganic Chemistry Laboratory	17	5.76 (8)
Spring 2018	1/6	1110 - Principles of Chem I (Lead, w/ Mason, Alexeeva)	711	5.32 (282)
Fall 2017	0/5	3530 - Inorganic Chemistry Laboratory	23	5.18 (15)
Spring 2017	0/4	5206 - Solid State and Materials Chemistry	17	5.38 (15)
Fall 2016	0/4	3530 - Inorganic Chemistry Laboratory	22	5.65 (9)

Students and Research Associates Supervised

a. Ph.D. candidates	Years in group	Outcomes or next position after leaving UI
Ishanka Liyanage	Dec. 2018 - current	Post-comp status
Janaka Abeysinghe	Dec. 2017 - current	Post-comp status
Matthew Lovander	Dec. 2012 - current	2019 M.S., post-comp, co-advised with Prof. Johna Leddy, currently instructor at Sioux Falls community college
Nathan Black	Jan. 2015 - Aug. 2020	2019 Ph.D., NRC Fellow (2017-18), F19 UI Ballard Fellow, current safety staff member at LBL in California
Suparno Nandi	Oct. 2018 - Dec. 2020	2020 Ph.D., co-advisor Prof. Mishtu Dey, Emory postdoc
Mortezaali Razzaghi	Oct. 2018 - March. 2020	2020 Ph.D., co-advisor Prof. Mishtu Dey, UI postdoc
Ashley Flores	Dec. 2015- April 2020	2018 M.S., 2019 UI adjunct instructor, lab manager at UCSB
Majid Nada	Jan. 2017 – July 2019	2019 Ph.D., co-advised with Prof. Sarah Larsen, 2019-20 UI visiting professor, staff scientist UI Hygienics Lab
Ashley Schneider	Dec. 2018 – Aug. 2019	joined the new Williams research group
Anthony Montoya	Dec. 2011 – Jan. 2019	2018 Ph.D., GAANN Fellow (2016-18), 2019 postdoc Argonne Nat. Lab
Nathaniel Coleman Jr.	Dec. 2008 - Jan. 2016	2015 Ph.D. & postdoc, GAANN Fellow (2008-10), 2016 KSU postdoc, 2017 community college instructor, 2018-19 University of Toledo lecturer and lab coordinator
Andrew Zimmerman	Aug. 2007 - Dec. 2012	2012 M.S., chemist/consultant
Allen Wu	June 2010 - June 2011	co-advisor Grassian, PhD. student at Univ. S. Dakota
Brian Barry	Dec. 2004 - Jan. 2010	2010 Ph.D.; postdoc: Univ. New Mexico/Sandia, St. Mary's (Canada); 2014 Asst. Prof. of Chemistry at UW - Platteville
James Holst	Dec. 2003 - May 2009	2009 Ph.D., postdoc - Univ. of Liverpool, employed at Aldrich Co. and now Donaldson

Sujith Perera	May 2002 - May 2007	2007 Ph.D., postdoc at Univ. of Akron, now at Lubrizol Inc.
Jonglak Choi	Dec. 2000 - May 2007	2006 Ph.D., 2007 postdoc, postdoc at Univ. New Orleans and NCSU, employed at Cree and Natural Fiber Welding
Dale Miller	Dec. 1999 - May 2006	2004 Ph.D., 04-06 postdoc; postdoc NRL in Washington, DC then at RedX Defense in DC, now a patent examiner
Scott Cullison	Dec. 1997 - May 2000	2000 M.S., high school chemistry teacher in VA
b. Postdoctoral associates and visiting scientists		
Dr. Jianjun Wang	2000 - 2002	Employed by Intel Corp.(Chandler, AZ)
Dr. Luke Grocholl	2000 - 2002	Employed by Aldrich Co. (Milwaukee, WI)
Prof. Dean Katahira	Fall 2000	Returned to Ripon College chemistry faculty
c. Undergraduates (2016 – 2021, out of 21 total)		
Hannah Barmore	summer 2021 - present	UI NSF-REU student from UI Chemical Engineering, continuing as a research assistant
Anna Kolln	summer 2019	UI NSF-REU student (from Dartmouth College)
Tristan Freese	Jan 2019 – May 2019	UI undergrad
Matt Mohacey	summer 2018	UI NSF-REU student (from University of Pittsburgh)
Colin Slattery	Jan. - May 2018	UI undergrad
David Ciota	summer 2017	UI NSF-REU student (from Drake University), Ph.D. program at Arizona State University
Dan Waterhouse	Jan. 2016 – May 2016	2016 B.S. in Chemistry

Scholarship - Publications, Presentations, and Research Funding

Publications - Peer Reviewed from University of Iowa work (* = undergrad) - 37 out of 50 total

- 50) Petronek, M. S.; St. Aubin, J. J.; Lee, C. Y.; Spitzl, D. R., Gillan, E. G.; Allen, B. G.; Magnotta, V. A., Quantum chemical insight into the effects of the local electron environment on T2*-based MRI,” *submitted* (collaboration with UI Radiology and Radiation Oncology).
- 49) “Rapid and energetic solid-state metathesis reactions for iron, cobalt, and nickel boride formation and their application as bifunctional water splitting electrocatalysts,” Abeyasinghe, J. P.; Kölln, A. F.*; Gillan, E. G., *ACS Materials Au*, submitted August 2021 (under revision).
- 48) “Linking solid state reduction mechanisms to size-dependent reactivity of metal oxide oxygen carriers for chemical looping combustion,” Alalwan, H. A.; Augustine, L. J.; Hudson, B. G.; Abeyasinghe, J. P.; Gillan, E. G.; Mason, S. E.; Grassian, V. H.; Cwiertny, D. M., *ACS Appl. Energy Mater.* **2021**, 4, 2, 1163–1172. <https://doi.org/10.1021/acsaem.0c02029>.
- 47) “Mechanochemically-assisted solvent-free and template-free synthesis of zeolites ZSM-5 and mordenite,” Nada, M. H.; Larsen, S. C.; Gillan, E. G., *Nanoscale Adv. (RSC)*, **2019**, 1, 3918-3928. <http://dx.doi.org/10.1039/C9NA00399A>
- 46) “Solvent-free synthesis of crystalline ZSM-5 zeolite: Investigation of mechanochemical pre-reaction impact on growth of thermally stable zeolite structures,” Nada, M. H.; Larsen, S. C.; Gillan, E. G., *Solid State Sci.* **2019**, 94, 15-22. <https://doi.org/10.1016/j.solidstatesciences.2019.05.009>
- 45) “Phosphorus-rich metal phosphides: Direct and tin-flux assisted synthesis and evaluation as hydrogen evolution electrocatalysts,” Coleman Jr., N.; Lovander, M. D.; Leddy, J.; Gillan, E. G., *Inorg. Chem.* **2019**, 58 (8), 5013-5024. <http://dx.doi.org/10.1021/acs.inorgchem.9b00032>

- 44) "Photocatalytic carbon nitride materials with nanoscale features synthesized from the rapid and low-temperature decomposition of trichloromelamine," Montoya, A. T.; Gillan, E. G., *ACS Appl. Nano Mater.* **2018**, *1*, 5944-5956. <http://dx.doi.org/10.1021/acsanm.8b01670>
- 43) "Mechanochemical reaction pathways in solvent-free synthesis of ZSM-5," Nada, M. H.; Gillan, E. G.; Larsen, S. C., *Microporous Mesoporous Mater.* **2019**, *276*, 23-28 (online Sept. 2018). <http://dx.doi.org/10.1016/j.micromeso.2018.09.009>
- 42) "Botanically templated monolithic macrostructured zinc oxide materials for photocatalysis," Black, N. M.; Ciota, D. S.; Gillan, E. G., *Inorganics* **2018**, *6*, 103 (16 pages). <http://dx.doi.org/10.3390/inorganics6040103>
- 41) "Enhanced photocatalytic hydrogen evolution from transition-metal surface-modified TiO₂," Montoya, A. T.; Gillan, E. G., *ACS Omega* **2018**, *3*, 2947-2955. <http://dx.doi.org/10.1021/acsomega.7b02021>
- 40) "Rapid solid-state metathesis route to transition-metal doped titanias," Coleman Jr., N; Perera, S.; Gillan, E. G., *J. Solid. State Chem.* **2015**, *232*, 241-248. <http://dx.doi.org/10.1016/j.jssc.2015.09.028>
- 39) "Titania and silica materials derived from chemically dehydrated porous botanical templates," Zimmerman, A. B.; Nelson, A. M.*; Gillan, E. G. *Chem. Mater.* **2012**, *24*, 4301-4310. <http://dx.doi.org/10.1021/cm3016534>
- 38) "Sulfur dioxide adsorption on ZnO nanoparticles and nanorods," Wu, C.-M.; Baltrusaitis, J.; Gillan, E. G.; Grassian, V. H. *J. Phys. Chem. C* **2011**, *115*, 10164-10172. <http://dx.doi.org/10.1021/jp201986j>
- 37) "A general and flexible synthesis of transition-metal polyphosphides via PCl₃ elimination," Barry, B. M.; Gillan, E. G. *Chem. Mater.* **2009**, *21*, 4454-4461. <http://dx.doi.org/10.1021/cm901066j>
- 36) "Solvothermal metal azide decomposition routes to nanocrystalline metastable nickel, iron, and manganese nitrides," Choi, J.; Gillan, E. G. *Inorg. Chem.* **2009**, *48*, 4470-4477. <http://dx.doi.org/10.1021/ic900260u>
- 35) "From triazines to heptazines: Deciphering the local structure of amorphous nitrogen-rich carbon nitride materials," Holst, J. R.; Gillan, E. G. *J. Am. Chem. Soc.* **2008**, *130*, 7373-7379. <http://dx.doi.org/10.1021/ja709992s>
- 34) "Low-temperature solvothermal synthesis of phosphorus-rich transition-metal phosphides," Barry, B. M.; Gillan, E. G. *Chem. Mater.* **2008**, *20*, 2618-2620. <http://dx.doi.org/10.1021/cm703095z>
- 33) "A facile solvothermal route to photocatalytically active nanocrystalline anatase TiO₂ from peroxide precursors," Perera, S.; Gillan, E. G. *Solid State Sci.* **2008**, *10*, 864-872. <http://dx.doi.org/10.1016/j.solidstatesciences.2007.10.032>
- 32) "Rapid and exothermic solid-state synthesis of metal oxyhalides and their solid solutions via energetic metathesis reactions," Perera, S.; Zelenski, N. A.*; Pho, R. E.*; Gillan, E. G. *J. Solid State Chem.* **2007**, *180*, 2916 - 2925. <http://dx.doi.org/10.1016/j.jssc.2007.08.005>
- 31) "Nitrogen-rich carbon nitride network materials via the thermal decomposition of 2,5,8-triazido-s-heptazine," Miller, D. R.; Holst, J. R; Gillan, E. G., *Inorg. Chem.* **2007**, *46*, 2767 - 2774. <http://dx.doi.org/10.1021/ic061296y>
- 30) "Low-temperature solvothermal synthesis of nanocrystalline indium nitride and Ga-In-N composites from the decomposition of metal azides," Choi, J.; Gillan, E. G. *J. Mater. Chem.* **2006**, *16*, 3774 - 3784. <http://dx.doi.org/10.1039/b608204>
- 29) "Synthesis of nanocrystalline TiO₂ and reduced titanium oxides via rapid and exothermic metathesis reactions," Perera, S.; Zelenski, N.*; Gillan, E. G. *Chem. Mater.* **2006**, *18*, 2381 - 2388. <http://dx.doi.org/10.1021/cm0528328>

- 28) "High-temperature stabilized anatase TiO₂ from an aluminum-doped TiCl₃ precursor," Perera, S.; Gillan, E. G. *Chem. Commun.* **2005**, 5988 - 5990. <http://dx.doi.org/10.1039/b512148e>
- 27) "Structure of nanocrystalline GaN from X-ray diffraction, Rietveld and atomic pair distribution function analyses," Petkov, V.; Gateshki, M.; Choi, J.; Gillan, E. G.; Ren, Y. *J. Mater. Chem.* **2005**, *15*, 4654 - 4659. <http://dx.doi.org/10.1039/b509577h>
- 26) "Solvothermal synthesis of nanocrystalline copper nitride from an energetically unstable copper azide precursor," Choi, J.; Gillan, E. G. *Inorg. Chem.* **2005**, *44*, 7385 - 7393. <http://dx.doi.org/10.1021/ic050497j>
- 25) "Synthesis and structure of 2,5,8-triazido-s-heptazine: An energetic and luminescent precursor to nitrogen-rich carbon nitrides," Miller, D. R.; Gillan, E. G. *J. Am. Chem. Soc.* **2004**, *126*, 5372 - 5373. <http://dx.doi.org/10.1021/ja048939y>
 Profiled in an article in *Chemical and Engineering News*, May 31, 2004, pp. 34 - 35.
- 24) "Rapid solid-state synthesis of titanium aluminides," Blair, R. G.; Gillan, E. G.; Nguyen, N. K. B.; Daurio, D.; Kaner, R. B. *Chem. Mater.* **2003**, *15*, 3286 - 3293. <http://dx.doi.org/10.1021/cm021829a>
- 23) "Deposition of carbon nitride films from single-source s-triazine precursors," Wang, J.; Miller, D. R.; Gillan, E. G. *Carbon* **2003**, *41*, 2031 - 2037. [http://dx.doi.org/10.1016/S0008-6223\(03\)00213-6](http://dx.doi.org/10.1016/S0008-6223(03)00213-6)
- 22) "Synthesis of sub-micron silver and silver sulfide particles via solvothermal silver azide decomposition," Grocholl, L.; Wang, J.; Gillan, E. G. *Mater. Res. Bull.* **2003**, *38*, 213 - 220. [http://dx.doi.org/10.1016/S0025-5408\(02\)01028-0](http://dx.doi.org/10.1016/S0025-5408(02)01028-0)
- 21) "Low-temperature deposition of carbon nitride films from a molecular azide, (C₃N₃)(N₃)₃," Wang, J.; Gillan, E. G. *Thin Solid Films* **2002**, *42*, 62 - 68. [http://dx.doi.org/10.1016/S0040-6090\(02\)00982-3](http://dx.doi.org/10.1016/S0040-6090(02)00982-3)
- 20) "Photoluminescent carbon nitride films grown by vapor transport of carbon nitride powders," Wang, J.; Miller, D. R.; Gillan, E. G. *Chem. Commun.* **2002**, 2258 - 2259. <http://dx.doi.org/10.1039/b207041c>
- 19) "Facile azidothermal metathesis route to gallium nitride nanoparticles," Wang, J.; Grocholl, L.; Gillan, E. G. *Nano Lett.* **2002**, *2*, 899 - 902. <http://dx.doi.org/10.1021/nl0256356>
- 18) "Rapid, facile synthesis of nitrogen-rich carbon nitride powders," Miller, D. R.; Wang, J.; Gillan, E. G. *J. Mater. Chem.* **2002**, *12*, 2463 - 2469. <http://dx.doi.org/10.1039/b109700h>
- 17) "Synthesis and characterization of an air-stable gallium hydride, [t-Bu(H)Ga(μ-NEt₂)]₂, and related chloride derivatives," Grocholl, L.; Cullison, S. A.; Wang, J.; Swenson, D. C.; Gillan, E. G. *Inorg. Chem.* **2002**, *41*, 2920 - 2926. <http://dx.doi.org/10.1021/ic011278a>
- 16) "Solvothermal azide decomposition route to GaN nanoparticles, nanorods, and faceted crystallites," Grocholl, L.; Wang, J.; Gillan, E. G. *Chem. Mater.* **2001**, *13*, 4290 - 4296. <http://dx.doi.org/10.1021/cm010342j>
- 15) "Rapid, energetic metathesis routes to crystalline metastable phases of zirconium and hafnium dioxide," Gillan, E. G.; Kaner, R. B. *J. Mater. Chem.* **2001**, *11*, 1951 - 1956. <http://dx.doi.org/10.1039/b102234m>
- 14) "Synthesis of nitrogen-rich carbon nitride networks from an energetic molecular azide precursor," Gillan, E. G. *Chem. Mater.* **2000**, *12*, 3906 - 3912. <http://dx.doi.org/10.1021/cm000570y>

Gillan's Publications Prior to University of Iowa: 13 peer-reviewed publications

- 13) "Chemical vapor deposition of hexagonal gallium selenide and telluride films from cubane precursors: Understanding the envelope of molecular control," Gillan, E. G.; Barron, A. R. *Chem. Mater.* **1997**, *9*, 3037 - 3048. <http://dx.doi.org/10.1021/cm9703886>

- 12) "Volatility studies on gallium chalcogenide cubanes: Thermal analysis and determination of sublimation enthalpies," Gillan, E. G.; Bott, S. G.; Barron, A. R. *Chem. Mater.* **1997**, *9*, 796 - 806. <http://dx.doi.org/10.1021/cm960485j>
- 11) "*tert*-Amyl compounds of aluminum and gallium: Halides, hydroxides, and chalcogenides," Harlan, C. J.; Gillan, E. G.; Bott, S. G.; Barron, A. R. *Organometallics* **1996**, *15*, 5479 - 5488. <http://dx.doi.org/10.1021/om9605185>
- 10) "Synthesis of gallium chalcogenide cubanes and their use as CVD precursors for Ga₂E₃ (E = S, Se)," Schulz, S.; Gillan, E. G.; Ross, J. L.; Rogers, L. M.; Rogers, R. D.; Barron, A. R. *Organometallics* **1996**, *15*, 4880 - 4883. <http://dx.doi.org/10.1021/om960480w>
- 9) "Chemical vapor deposition of gallium selenide and indium selenide nanoparticles," Stoll, S. L.; Gillan, E. G.; Barron, A. R. *Chem. Vap. Deposition* **1996**, *2*, 182 - 184. <https://doi.org/10.1002/cvde.19960020506>
- 8) "Synthesis of refractory ceramics via rapid metathesis reactions between solid-state precursors," Gillan, E. G.; Kaner, R. B. *Chem. Mater.* **1996**, *8*, 333 - 343. <http://dx.doi.org/10.1021/cm950232a>
- 7) "Rapid synthesis of transition metal borides by solid-state metathesis," Rao, L.; Gillan, E. G.; Kaner, R. B. *J. Mater. Res.* **1995**, *10*, 353 - 361. <https://doi.org/10.1557/JMR.1995.0353>
- 6) "Materials synthesis via solid-state metathesis reactions," Treece, R. E.; Gillan, E. G.; Kaner, R. B. *Comments Inorg. Chem.* **1995**, *16*, 313 - 337. <https://doi.org/10.1080/02603599508035775>
- 5) "Rapid solid-state synthesis of refractory nitrides," Gillan, E. G.; Kaner, R. B. *Inorg. Chem.* **1994**, *33*, 5693 - 5700. <http://dx.doi.org/10.1021/ic00103a015>
- 4) "Rapid solid state metathesis reactions for the synthesis of copper oxide and other metal oxides," Wiley, J. B.; Gillan, E. G.; Kaner, R. B. *Mat. Res. Bull.* **1993**, *28*, 893 - 900. [https://doi.org/10.1016/0025-5408\(93\)90035-C](https://doi.org/10.1016/0025-5408(93)90035-C)
- 3) "Collisional probes and possible structures of La₂C₈₀," Yeretizian, C.; Hansen, K.; Alvarez, M. M.; Min, K. S.; Gillan, E. G.; Holczer, K.; Kaner, R. B.; Whetten, R. L. *Chem. Phys. Lett.* **1992**, *196*, 337 - 342. [https://doi.org/10.1016/0009-2614\(92\)85978-J](https://doi.org/10.1016/0009-2614(92)85978-J)
- 2) "Endohedral rare-earth fullerene complexes," Gillan, E. G.; Yeretizian, C.; Min, K. S.; Alvarez, M. M.; Whetten, R. L.; Kaner, R. B. *J. Phys. Chem.* **1992**, *96*, 6869 - 6871. <http://dx.doi.org/10.1021/j100196a006>
- 1) "La₂C₈₀: A soluble dimetallofullerene," Alvarez, M. M.; Gillan, E. G.; Holczer, K.; Kaner, R. B.; Min, K. S.; Whetten, R. L. *J. Phys. Chem.* **1991**, *95*, 10561 - 10563. <http://dx.doi.org/10.1021/j100179a014>

Gillan's Symposium Proceedings Publications: 2 from UIowa work and 3 prior to Iowa

- 5) "Facile botanical templating strategies for the growth of porous metal oxides in artificial leaf-like macroscale structures for potential use in energy related catalysis," Gillan, E. G. in **From Molecules to Materials – Pathways to Artificial Photosynthesis**, *MRS Online Proc. Lib.* **2013**, vol. 1539. <https://doi.org/10.1557/opl.2013.1054>
- 4) "Low-temperature solvothermal route to gallium nitride nanoparticles," Wang, J.; Grocholl, L.; Gillan, E. G. in **Synthesis, Functional Properties, and Applications of Nanostructures**, *Mater. Res. Soc. (MRS) Symp. Proc.* **2001**, vol. 676. <https://doi.org/10.1557/PROC-676-Y8.15>
- 3) "Group 13-16 precursors: What controls their volatility?," Gillan, E. G.; Bott, S. G.; Barron, A. R. in **Metal-Organic Chemical Vapor Deposition of Electronic Ceramics II**, *MRS Symp. Proc.* **1996**, *415*, 87 - 92. <https://doi.org/10.1557/PROC-415-87>

2) “From ceramics to superconductors: Rapid materials synthesis by solid-state metathesis reactions,” Treece, R. E.; Gillan, E. G.; Jacubinas, R. M.; Wiley, J. B.; Kaner, R. B. in **Better Ceramics Through Chemistry V**, *MRS Symp. Proc.* **1992**, 271, 169 - 174.

1) “Solid state metathesis routes to layered transition metal dichalcogenides and refractory materials,” Wiley, J. B.; Bonneau, P. R.; Treece, R. E.; Jarvis, R. F.; Gillan, E. G.; Rao, L.; Kaner, R. B. in **Supramolecular Architecture: Synthetic Control in Thin Films and Solids**, *ACS Symp. Ser.* **1991**, 499, 369 - 383.

Invited Book Chapters and Magazine Articles

Abeyasinghe, J. P.; Gillan, E. G., “Thermochemical Reaction Strategies for the Rapid Formation of Inorganic Solid-State Materials,” in *Dynamic Processes in Solids*, J. House Ed., Oxford: Elsevier, submitted **April 2021**. <https://www.elsevier.com/books/kinetics-of-processes-in-the-solid-state/house/978-0-12-818876-7>

Rebuilding “Iowa Nice” in Shared Governance: From Sanction to Collaboration, Sandra Daack-Hirsch, Frank Durham, Russell Ganim, Edward Gillan, and Justine Kolker, published online in *Academe*, American Association of University Professors (AAUP), **June 2019**
<https://www.aaup.org/article/rebuilding-“iowa-nice”-shared-governance-sanction-collaboration#.XWRUqsR7m71>

Nada, M.; Jayalath, S.; Gillan, E.; Grassian, V. H.; Larsen, S. C., “Zeolites and Mesoporous Silica: From Greener Synthesis to Surface Chemistry of Environmental and Biological Interactions,” In: A. Douhal and M. Anpo, Eds., *Chemistry of Silica- and Zeolite-based Materials Synthesis, Characterization, and Applications* (Chp. 20), Oxford: Elsevier; **2019**, ISBN: 9780128178133, pp. 375-398.
<https://www.elsevier.com/books/chemistry-of-silica-and-zeolite-based-materials/douhal/978-0-12-817813-3>

Gillan E.G., “Precursor Chemistry - Group 13 Nitrides and Phosphides (Al, Ga, and In),” In: J. Reedijk and K. Poeppelmeier, Eds., *Comprehensive Inorganic Chemistry II*, Vol 1 (Chp. 32), Oxford: Elsevier; **2013**, pp. 969-1000. <https://doi.org/10.1016/B978-0-08-097774-4.00132-7>

Book Review

“Nanocharacterisation,” Hutchinson, J.; Kirkland, A. (eds), RSC Publishing, Cambridge UK, 2007. E. G. Gillan’s review appeared in *Chemistry World* January **2008**, 5(1), 66.

Patents

“Methods for production of metals on carbon nitride powders and composites and their use as catalysts in fuel cell electrochemistry,” E. G. Gillan, D. R. Miller, D. C. Dunwoody, J. Leddy (provisional patent filed Jan. 2006, patent application Jan. 2007 (US 11/654,768, revisions filed in 2010-2015, abandoned).

“Rapid solid state synthesis of refractory materials,” R. B. Kaner, P. R. Bonneau, E. G. Gillan, J. B. Wiley, R. F. Jarvis, Jr., and R. E. Treece, U.S. Patent 5,110,768, May 5, 1992.
<https://patents.google.com/patent/US5110768A/en>

Gillan's Invited and Contributed Presentations for past 6 years (17 of 64 total, 54 from UI)

- 64) (invited) "Solvent-Free Synthesis and Electrocatalytic Water Splitting Activity of Phosphorus-Rich 3d Metal Phosphides," 15th International conference on Materials Chemistry (MC15) - Materials for Energy, Royal Chemical Society, July 13, 2021.
- 63) "Synthesis, Properties and Electrocatalytic Activity of Phosphorus-Rich 3d Metal Phosphides," E. G. Gillan, Materials Research Society National Meeting (virtual), April 23, 2021.
- 62) (invited) "Precursor Routes to Inorganic Materials for Energy Relevant Photocatalysis and Electrocatalysis," **E. G. Gillan**, University of Wisconsin La Crosse, Feb. 14, 2020.
- 61) (invited) "Precursor Routes to Inorganic Materials for Energy Relevant Photocatalysis and Electrocatalysis," **E. G. Gillan**, Grinnell College, Grinnell, Iowa, Nov. 14, 2019.
- 60) (invited) "Precursor Routes to Inorganic Materials for Energy Relevant Photocatalysis and Electrocatalysis," **E. G. Gillan**, Bradley University, Peoria, Illinois, Nov. 7, 2019.
- 59) "Comparison of structure, properties, and electrocatalytic activity of phosphorus-rich metal phosphides," **E. G. Gillan**, A. Flores, M. D. Lovander, American Chemical Society National Meeting, Orlando, FL, April 2019. Session on: Structure-Property Correlations in Functional Inorganic Materials.
- 58) "Comparison of structure, properties, and photocatalytic activity of polymeric carbon nitrides synthesized from a reactive trichloromelamine precursor," **E. G. Gillan**, A. T. Montoya, American Chemical Society National Meeting, Orlando, FL, April 2019. Session on: Chemistry of Materials - Materials for Energy & Catalytic Applications.
- 57) "Synthesis and catalytic reactions with 3d and 4d phosphorus-rich metal phosphides," **E. G. Gillan**, American Chemical Society National Meeting, San Francisco, CA, April 2017.
- 56) (*Invited*) "Precursor routes to unusual structures of phosphides, nitrides, and oxides for photocatalysis and electrocatalysis," **E. G. Gillan**, University of Northern Iowa, Department of Chemistry, Cedar Falls, Iowa, November 2016.
- 55) (*Invited*) "Thermochemical synthesis of earth-abundant phosphorus-rich metal phosphides and metal thiophosphates for catalytic water splitting applications," **E. G. Gillan**, American Chemical Society National Meeting, San Diego, CA, March 2016.
- 54) (*Invited*) "Precursor routes to unusual phases and structures of phosphides, nitrides, and oxides for photocatalysis or electrocatalysis," **E. G. Gillan**, International Materials Research Congress (Mater. Res. Soc. and Sociedad Mexicana de Materiales), Cancun, Mexico, August 2015.

Gillan Group External Presentations – 40 external presentations over the past 23 years

Current Grant Support

National Science Foundation – Chemistry Division (Chemical Catalysis): \$448,709 (7/20 - 6/23), "Investigation of earth-abundant metal phosphides with polyphosphide anions as catalysts in hydrogen evolution reactions."

National Science Foundation – REU Site: Undergraduate Research in Nanoscience and Nanotechnology (3/2018 - 2/2021, extension to 2022 due to global pandemic). In August 2020, I became co-PI with Allan Guymon in Chem. Eng. because the current PI (Amanda Haes) became an NSF rotator in fall 2020.

Total Grant Support since 1997 ~\$1.4 million in external and internal research funding (including from Office of Naval Research, Army Research Office, ACS-PRF, and NSF) and ~\$760K in department or university major equipment funding.

Service

Selected Recent Service to the Department of Chemistry

Department of Chemistry Executive Committee (2007-13, fall 2020 - current)
Departmental External Review and Strategic Planning Committee (2019-20)
Safety Committee and Building Emergency Team (Member: 2005-2021, Chair 2005-12, 2014-16, Fall 2017, Fall 2020) – presented Departmental Safety Seminars (2007-20) and annual safety seminar to new graduate students (2010-12, 2014-20) and summer NSF-REU students (2013-19)
Graduate Education Committee (2017-20, 2021 - current)
Faculty Hiring Plan Committee (2005-07, 2013-14, 2016-20)
Promotion and Tenure Committee (2003-current, Convener: 2012, 2019, Recorder: 2003, 2015, 2020)
Probationary Faculty Review Committees (2004-07, 2008-11, 2012-17)
Environmental Health and Safety (EHS) – Departmental Health and Safety Coordinator (2016-2021)

Selected Service to the University of Iowa

Elected Member of Faculty Senate representing CLAS Group III (2013-19, 2020-23)
Faculty Senate Policies and Compensation Committee (Member: 2009-15, 2016-22, Chair: 2010-12, 2017-21) - Wrote and revised many faculty-centered promotion, review, and community policies.
Faculty Senate Judicial Commission (Member: 2007-13, 2016-22)
Ad hoc Committee to Remove AAUP Sanction (member, 2016-18) met regularly with Board of Regents members, co-wrote best practices document that successfully removed national AAUP sanction.
Elected Faculty Senate Secretary (2016-17): monthly meetings with UI Provost and President, biweekly meetings with Presidential staff, twice semester meetings with other UI vice-presidents.
Elected Member of Faculty Council - Executive Committee of Faculty Senate (2013-16)
OVPR Research Council (Member: 2010-16, Chair: 2014-16) - Served on publications waiver, centers and institutes, and authorship subcommittees, VPR candidate interviews in 2012.

Service Outside the University of Iowa- Profession and Community

NSF Review Panel member (8 panels from 2006-20)
ACS Symposium organizer or session chair (10 times since 1998)
ExxonMobil Solid State Faculty Fellowship Award Committee member (2004-07)
Solid State and Materials Chemistry Subdivision Chair - ACS Division of Inorganic Chem. (2005)
Exhibits Chair for Midwest Regional ACS Meeting in Iowa City in Oct. 2009 (2008-09)
External tenure review of chemistry faculty at a primarily undergraduate institution (2008, 2019) and at international academic institutions (2020, 2021)
Journal article peer review: more than 656 article reviews since 1997 in 67 different publications
Eastern Iowa Science and Engineering Fair (EISEF) finalist judge (2012, 2013, 2014, 2017-19, 2021)