# KATHLEEN CARRADO GREGAR

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## PROFESSIONAL EXPERIENCE

2006-Present
**Manager, User & Outreach Programs**
Responsible for the development of strategic alliances and collaborative partnerships with academia, industry, and the user community at large; managing user facility programs administration; media and outreach efforts including workshops and meetings coordination and promotion of staff and user science developments; present overviews and defend programs to sponsors.
*Center for Nanoscale Materials, Argonne National Laboratory, Argonne, Illinois*

2005-2006
**Group Leader, Catalyst Design Group**
Clay-polymer nanocomposite polyelectrolytes in batteries and membranes in fuel cells; managed group budgets and personnel.
*Chemistry Division, Argonne National Laboratory, Argonne, Illinois*

1989-2006
**Scientist:** Researched new catalysts based on layered materials; silicate sol-gel materials chemistry; deposition of metals, metal sulfides, metal oxides; characterization by diffraction, microscopy, NMR, neutron scattering, and synchrotron x-ray radiation techniques. Clay synthesis, surface science and chemistry.
*Chemistry Division, Argonne National Laboratory, Argonne, Illinois*

1987-1989
**Postdoctoral Associate:** Clay catalysis in coal formation; reactivity of lignin models probed by mass spectrometry and NMR.
*Chemistry Division, Argonne National Laboratory, Argonne, Illinois*

1982-1986
**Graduate Research, Thesis Title:** "Aluminosilicates as Controlled Molecular Environments for Selective Photochemical and Catalytic Reactions"
Research Advisor: Prof. Steven L. Suib
*Departments of Chemistry and Chemical Engineering*
*University of Connecticut, Storrs, Connecticut*

Summer 1984
**Graduate Research Appointment:** Zinc sulfide phosphors.
*Rogers Corporation, Connecticut*

1982-1984
**Graduate Teaching Assistant:** Department of Chemistry
*University of Connecticut, Storrs, Connecticut*

Spring 1982
**Undergraduate Teaching Assistant:** Department of Chemistry
*State University College at Fredonia, New York*

1981-1982
**Undergraduate Research:** polymer, analytical, & photochemistry
*Department of Chemistry, SUC at Fredonia, New York*

1981
**Richard & Camille Dreyfus Summer Scholar Research Program**
*Department of Chemistry, University of Chicago, Chicago, Illinois*

## EDUCATION

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| 1986 | **Doctorate of Philosophy**, Inorganic Chemistry<br>*The University of Connecticut, Storrs, Connecticut* |
| 1982 | **Bachelor of Science**, Chemistry (magna cum laude)<br>*State University College at Fredonia, New York* |

## PROFESSIONAL RECORD

- 60+ peer-reviewed publications, 5 patents, 8 book chapters, 3 books
- invited speaker at international conferences (Spain; France; Belgium)
- numerous presentations to Dept. of Energy, University of Chicago, and ANL sponsors
- site panelist on proposal funding review boards for DOE-EPSCoR and NSF
- several ANL LDRD (lab-directed R&D) proposals
- journal editorial board member; associate journal editor
- supervisory experience: 20 undergraduates, 1 graduate student, 6 post-docs, technician & admin staff
- reviewer for numerous technical journals and funding agencies (NSF, DOE, ACS-PRF, CRDF)

## HONORS AND AWARDS

- Fellow, American Chemical Society, 2012
- Argonne/Fermi Strategic Laboratory Leadership Program, University of Chicago Booth School of Business, 2009
- American Chemical Society Fuel Chemistry Division *Distinguished Service* Award, 2007
- DOE Office of Science Undergraduate Research Programs *Outstanding Mentor* Award, 2006
- Obtained DOE-BES and EOARD grants for international CMS workshop in France, June 2006
- Research program highlight in *Chemical & Engineering News* article, March 29, 1999
- State of Connecticut High Technology Scholarship Award, 1986 (one of five awarded)

## PROFESSIONAL SOCIETY MEMBERSHIPS

*American Chemical Society (ACS)* since 1982
Division of Energy & Fuels
*Clay Minerals Society* 1986 – 2008

## PROFESSIONAL ACTIVITIES

***American Chemical Society (ACS)***

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| *Member* | Divisional Activities Committee of ACS Council, 2005-2009 |
| *Councilor* | National, for the Fuel Chemistry Division, 2004-2006, 2007-2009 |
| *Director* | Fuel Chemistry Division, 2001-2004 |
| *Co-Organizer* | FUEL Symposium on "Catalysis in Fuel Chemistry", San Diego, March 2005 |
| *Member* | Chicago Section Nominations Committee, 2004 |
| *Member* | Chicago Section Women Chemists Committee 2004-present |
| *Organizer* | FUEL Symposium on "X-ray and Neutron Methods", San Francisco, 2000 |
| *Past Chair* | Fuel Chemistry Division, 2000 |
| *Chair* | Fuel Chemistry Division, 1999 |
| *Chair-Elect* | Fuel Chemistry Division, 1998 |
| *Program Chair* | Fuel Chemistry Division National Meetings, 1997 (on committee 1994-1997) |

**PROFESSIONAL ACTIVITIES, continued**

***Editorial Boards & Review Panels***

ACS Journal Editorial Board Member, *Chemistry of Materials*, 2005-2010*;* Elsevier Journal Editorial Board Member, *Microporous & Mesoporous Materials*, 2004-2008*;* DOE Workshop on "Opportunities for Catalysis Science in the 21st Century", Gaithersburg, MD, May 2002*;* NSF Panelist for NIRT proposals on "Nanoscale Structures, Novel Phenomena, and Quantum Control", Arlington, VA, Feb. 2003*;* DOE Panelist for *Carbon Management* proposals, Gaithersburg, MD, May 1999*;* DOE EPSCoR Catalysis Programs at Univ. Puerto Rico (postal reviewer), Feb 1999*;* DOE EPSCoR Catalysis Programs, site visit, University of Puerto Rico, June 1998

***Gordon Research Conferences***

Advisory Committee, GRC on *Hydrocarbon Resources*, 2005-2007; *Discussion Leader* "Catalysis for Hydrocarbons", *Hydrocarbon Resources*, January 2007 and "Layered Materials", *Zeolitic & Layered Materials*, June 2002

***Clay Minerals Society (CMS)***

Program Committee, 2008; Organized Annual CMS Meeting Workshop on "Polymer-Clay Nanocomposites", France, 2006; on *Advisory Board,* Joint CMS and French Clay Group Meeting, France, 2006; Clay Minerals Society, 2001-2003, 2008-2010*;* Continuing Education Committee, 2001-2003*;* Associate Editor, *Clays and Clay Minerals* (journal of the CMS), 1996-1998

***Argonne National Laboratory (ANL)***

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| *Chair* | University of Chicago Argonne National Laboratory Outstanding Service Award Committee, 2012-2014; member 2008-2014 |
| *Chair* | Administrative chair of annual CNM Users Meetings since 2007 |
| *Member* | Search Committee for Advanced Photon Source User Programs Manager, 2012 |
| *Member* | CNM Search Committees for Deputy Division Director, X-ray Microscopy Group Leader (2011) |
| *Member* | CNM Search Committees for EMMD Group Leader (2010) and ESH Officer (2008) |
| *Member* | ANL Postdoctoral Programs Committee, 2006-2009 |
| *Member* | Director's Award Committee representing Associate Lab Directorate, 2002-present |
| *Chair* | Chemistry Division Assistant Scientist Promotion Committee, 2003 – 2006 |
| *Co-Chair* | Argonne Combined Appeal Committee representing ALD-ship, 2005-2007 |
| *Co-Organizer* | APS User's Meeting Workshop on "In Situ Chemical Processes Studied by Synchrotron X-Rays", May 2003; *Synchrotron Radiation News*, 2003, 16, 29 |
| *Member* | Pacesetter Award Committee for Physical Sciences, 2001-2003 |
| *Co-Organizer* | Argonne & Midwest Workshop on "*Selectivity in Catalysis*", December 3, 2002 |
| *Member* | Chemistry Division Seminar Committee, 2000-2002 |
| *Member* | Physical Research Senior Advisory Group, 1994 |
| *Member* | Chemistry Division Maria Goeppert-Mayer Award Nomination Committee, 1991-2003; Chair 1993, 1997-1999 |

## REVIEWED PUBLICATIONS

1. Template Synthesis of Nanostructured Carbonaceous Materials for Application in Electrochemical Devices, R. Fernandez-Saavedra, P. Aranda, K. A. Carrado, G. Sandi, S. Seifert, E. Ruiz-Hitzky, *Current Nanoscience*, **2009**, *5*, 506-513.
2. Acid Activation of Bentonites and Polymer-Clay Nanocomposites, Kathleen A. Carrado and Peter Komadel, *Elements,* May **2009**, 5, 111-116.
3. HDS & Deep HDS Activity of Co/Mo/S-Mesostructured Synthetic Layered Silicates, K. A. Carrado, C. Song, J. H. Kim, N. Castagnola, R. Fernandez-Saavedra, C. L. Marshall, M. M. Schwartz, *Catalysis Today* (invited to special issue), **2006**, 116, 478-484.
4. Platinum Nanoclusters Immobilized on Polymer-Clay Nanocomposite Films, K. A. Carrado, G. Sandi, R. Kizilel, S. Seifert, N. Castagnola, **2005**, *Applied Clay Science*, 30, 94-102.
5. Effect of the Silica Precursor on the Conductivity of Hectorite-Derived Polymer Nanocomposites. G. Sandí, R. Kizilel, K. A. Carrado, R. Fernández-Saavedra, N. Castagnola. *Electrochimica Acta*, **2005**, 50, 3891-3896.
6. The Effects of Surface Functionalization and Organo-Tailoring of Synthetic Layer Silicates on Immobilization of Cytochrome *c* , K. A. Carrado, S. M. Macha, D. M. Tiede, *Chemistry of Materials*, **2004**, *16*, 2559-2566.
7. Determination of the Hydrogen Storage Capacity of Novel Sepiolite-Derived Carbonaceous Materials, G. Sandi, H. Yang, H. Joachin, K. A. Carrado, R. E. Winans, J. Prakash, *Journal of New Materials for Electrochemical Systems*, **2003**, *6*, 169-173.
8. Characterization of Polymer Clay Nanocomposite Electrolyte Motions via Combined NMR and Neutron Scattering Studies, L. J. Smith, J.-M. Zanotti, G. Sandí , K. A. Carrado, P. Porion, A. Delville, D. L. Price, M. L. Saboungi, *Solid-State Ionics—2002,* Eds: P. Knauth, J-M. Tarascon, E. Traversa, H.L. Tuller (MRS Symp. Proc., Vol. 756), **2003**, 339.
9. Catalytic Decomposition of Alcohols, Including Ethanol, for in situ Hydrogen Generation in a Fuel Stream Using a Layered Double Hydroxide-Derived Catalyst, S. R. Segal, K. A. Carrado, C. L. Marshall, K. B. Anderson, *Applied Catalysis A: General*, **2003**, *248*, 33-45.
10. Polymer Nanocomposites for Lithium Battery Applications, G. Sandi, K. A. Carrado, H. Joachin, W. Lu, J. Prakash, *Journal of Power Sources*, **2003**, 119-121C, 492-496.
11. In Situ SAXS Studies of the Structural Changes of Polymer Nanocomposites Used in Battery Applications, G. Sandi, H. Joachin, R. Kizilel, S. Seifert, K. A. Carrado, *Chemistry of Materials*, **2003**, *15*, 838-843.
12. Crystallization and Textural Porosity of Synthetic Clay Minerals, K. A. Carrado, R. Csencsits, P. Thiyagarajan, S. Seifert, S. M. Macha, J. S. Harwood, *Journal of Materials Chemistry*, **2002**, *12*, 3228-3237.
13. Low Temperature Steam Reforming of Methanol over Layered Double Hydroxide-Derived Catalysts, S. R. Segal, K. B. Anderson, K. A. Carrado, C. L. Marshall, *Applied Catalysis A: General*, **2002**, *231*, 215-226.
14. In Situ SAXS Stuidies of the Structural Changes of Sepiolite Clay and Sepiolite-Carbon Composites with Temperature, G. Sandi, R. E. Winans, S. Seifert, K. A. Carrado, *Chemistry of Materials,* **2002**, *14*, 739-742.
15. Intermolecular Dimerization Within Pillared Layered Clay Templates, G. P. Wiederrecht, G. Sandi, K. A. Carrado, S. Seifert, *Chemistry of Materials* **2001**, *13*, 4233-4238.
16. The Use of Organo- and Alkoxysilanes in the Synthesis of Grafted and Pristine Clays, K. A. Carrado, L. Xu, R. Csencsits, J. V. Muntean, *Chemistry of Materials* **2001**, *13*, 3766-3773 (special issue on "Organic-Inorganic Nanocomposite Materials").
17. Electrochemical Performance of Sepiolite-Derived Carbon with Lithium Transition Metal Oxide Positive Electrodes, G. Sandi, C. S. Johnson, R. E. Gerald, R. Klingler, K. A. Carrado, R. E. Winans, in *Electrochemistry of Carbon Materials*, K. Zaghib, D. Belanger, M. T. McDermott, Eds., PV 2000-34. The Electrochemical Society Proceedings Series: Pennington, NJ, **2000**, p. 18-23.
18. The Crystallization of a Layered Silicate Clay as Monitored by Small Angle X-ray Scattering and NMR**,** K. A. Carrado, L. Xu, D. Gregory, K. Song, S. Seifert, R. E. Botto, *Chemistry of Materials* **2000**, *12*, 3052-3059.
19. Mesoporous Synthetic Clays: Synthesis, Characterization, and Use as HDS Catalyst Supports, K. A. Carrado, L. Xu, C. L. Marshall, D. Wei, S. Seifert, C. A. A. Bloomquist, *Nanoporous Materials II* (Stud. Surf. Sci. Catal.), A. Sayari, M. Jaroniec, T. J. Pinnavaia (Eds), Elsevier: Amsterdam, **2000**, vol. 129, 417-424.
20. Synthetic Organo- and Polymer-Clays: Preparation, Characterization, and Materials Applications, K. A. Carrado, *Applied Clay Science* **2000**, *17*, 1-23 (invited review).
21. Carbons for Lithium Batteries Applications Prepared Using Sepiolite as an Inorganic Template. G. Sandi, K. A. Carrado, R. E. Winans, C. S. Johnson, R. Csencsits, *Journal of the Electrochemical Society* **1999**, *146*, 3644-3648.
22. Small Angle Neutron Scattering Characterization of the Porous Structure of Carbons Prepared Using Inorganic Templates, G. Sandi, P. Thiyagarajan, K. A. Carrado, R. E. Winans, *Chemistry of Materials* **1999**, *11*, 235-240.
23. Materials with Controlled Mesoporosity Derived from Synthetic Polyvinyl Pyrrolidone-Clay Composites, K. A. Carrado and L. Xu, *Microporous and Mesoporous Materials* **1999**, *27*, 87-94.
24. Carbons for Lithium Ion Cells Prepared Using Sepiolite as an Inorganic Template, G. Sandi, K. A. Carrado, R. E. Winans, C. S. Johnson, K. D. Kepler, in *Lithium Batteries*, S. Surampudi, R. A. Marsh, Eds, PV 98-16, The Electrochemical Society Proc. Series: Pennington, NJ, **1999**, p. 11-18.

25. Studies of Electrolyte Penetration in Carbon Anodes by NMR Techniques, G. Sandi, R. E. Gerald, R. J. Klingler, J. W. Rathke, K. A. Carrado, R. E. Winans, in *Lithium Batteries*, S. Surampudi and R. A. Marsh, Eds, PV 98-16, The Electrochemical Society Proc. Series: Pennington, NJ, **1999**, p. 400-407.
26. In Situ Synthesis Of Polymer-Clay Nanocomposites From Silicate Gels, K. A. Carrado and L. Xu, *Chemistry of Materials* **1998**, *10*, 1440-1445.
27. A NEXAFS Determination of the Electronic Structure of Carbons Prepared Using Inorganic Templates and Used as Anodes in Lithium Ion Cells, G. Sandi, K. Song, K. A. Carrado, R. E. Winans, *Carbon* **1998**, *36*, 1755-1758.
28. Electrochemical and Spectroscopic Studies of Novel Carbonaceous Materials Used in Lithium Ion Cells, G. Sandi, R. E. Winans, K. A. Carrado, C. S. Johnson, P. Thiyagarajan, *Journal of New Materials for Electrochemical Systems* **1998**, *1*, 83-88 (invited).
29. Anomalous Small Angle X-Ray Scattering Studies of Interlayer Heavy Metal Ions in Clay Minerals, K. A. Carrado, P. Thiyagarajan, K. Song, R. E. Winans, *Chemistry of Materials* **1998**, *10*, 1130-1134.
30. Computational, Electrochemical and $^{7}$Li NMR Studies of Lithiated Disordered Carbon Electrodes in Lithium Ion Cells, G. Sandi, R. E. Gerald, L. G. Scanlon, K. A. Carrado, R. E. Winans, *Materials for Electrochemical Energy Storage and Conversion II: Batteries, Capacitors and Fuel Cells* (MRS Symp. Proc.) , Ginley et al., Eds., **1998**, *496*, 95-100.
31. Computational, Electrochemical and $^{7}$Li NMR Studies of Lithiated Disordered Carbon Electrodes in Lithium Ion Cells, G. Sandi, R. E. Gerald, L. G. Scanlon, K. A. Carrado, R. E. Winans, *Materials for Electrochemical Energy Storage and Conversion II: Batteries, Capacitors and Fuel Cells* (MRS Symp. Proc.) , Ginley et al., Eds., **1998**, *496*, 95-100
32. Investigation Of The Microporous Structure Of Clays And Pillared Clays By $^{129}$Xe Nmr, C. Tsiao, K. A. Carrado, R. E. Botto, *Microporous and Mesoporous Materials* **1998**, *21*(1-3), 45-52.
33. Materials Derived From Synthetic Organo-Clay Complexes as Novel Hydrodesulfurization Catalyst Supports, K. A. Carrado, C. L. Marshall, J. R. Brenner, K. Song, *Microporous and Mesoporous Materials* **1998**, *20*(1-3), 17-26.
34. Crystal Growth of Organo-Hectorite Clay as Revealed by Atomic Force Microscopy, K. A. Carrado, G. W. Zajac, K. Song, J. R. Brenner, *Langmuir* **1997**, *13*, 2895-2902.
35. A Study of Organo-Hectorite Clay Crystallization, K. A. Carrado, P. Thiyagarajan, K. Song, *Clay Minerals* **1997**, *32*, 29-40 (invited).
36. Porous Networks Derived from Synthetic Polymer-Clay Complexes, K. A. Carrado, P. Thiyagarajan, D. L. Elder, *Synthesis of Porous Materials: Zeolites, Clays, and Nanostructures*, Marcel Dekker: NY, M. L. Occelli and H. Kessler, Eds., **1997**, pp. 551-565.
37. Designer Carbons Templated by Pillared Clays: Lithium Secondary Battery Anodes, G. Sandi, K. A. Carrado, R. E. Winans, J. R. Brenner, G. W. Zajac, *Materials for Electrochemical Energy Storage and Conversion: Batteries, Capacitors and Fuel Cells* (MRS Symp. Proc.) **1996**, *431*, 39-44.
38. *Ab Initio* Molecular Orbital Study Of The Acidity Of Hydrated Lithium Hydroxide, C. L. Marshall, J. B. Nicholas, H. Brand, K. A. Carrado, R. E. Winans, *Journal of Physical Chemistry*, **1996**, *100*, 15748-15752.
39. Polyvinyl Alcohol-Clay Complexes Formed by Direct Synthesis, K. A. Carrado, P. Thiyagarajan, D. L. Elder, *Clays and Clay Minerals* **1996**, *44*, 506-514.
40. Anomalous Small Angle Scattering Study of Layered Silicate Clays Containing Ni(II) and Er(III), P. Thiyagarajan, K. A. Carrado, S. R. Wasserman, K. Song, R. E. Winans, *Review of Scientific Instruments* **1996**, *67*(9), 3364 (SRI '95 CD suppl.)
41. A One-Step Method for the Synthesis of a Vinyl-Containing Silsesquioxane and Other Organolithic Macromolecular Precursors, S. E. Yuchs and K. A. Carrado, *Inorganic Chemistry* **1996**, *35*, 261-262.
42. New Carbon Electrodes for Secondary Lithium Batteries, G. Sandi, R. E. Winans, K. A. Carrado, *Journal of the Electrochemical Society* **1996**, *143*, L95-98.
43. Stability of Cu(II)- and Fe(III)-Porphyrins on Montmorillonite Clay: An X-Ray Absorption Study, K. A. Carrado and S. R. Wasserman, *Chemistry of Materials* **1996**, *8*, 219-225.
44. Direct Synthesis of Organic- and Organometallic-Containing Clays, K. A. Carrado and P. Thiyagarajan, *EUROCLAY '95* European Clay Groups Association; A. Elsen et al., Eds.; **1995**, 10-11 (**invited keynote address**).
45. Novel Forms of Carbon as Potential Anodes for Lithium Batteries, R. E. Winans and K. A. Carrado, *Journal of Power Sources* **1995**, *54*, 11-15.
46. The Structure of New Synthetic Manganese Oxide Octahedral Molecular Sieves, S. R. Wasserman, K. A. Carrado, S. E. Yuchs, Y. F. Shen, H. Cao, S. L. Suib, *Physica B* **1995**, *208&209*, 674-676.
47. Molecular Modeling of the Enthalpies of Adsorption of Hydrocarbons on Smectite Clay, G. L. Keldsen, J. B. Nicholas, K. A. Carrado, R. E. Winans, *Journal of Physical Chemistry* **1994**, *98*, 279-284.
48. Incorporation of Phthalocyanines by Cationic and Anionic Clays via Ion-Exchange and Direct Synthesis, K. A. Carrado, J. E. Forman, R. E. Botto, R. E. Winans, *Chemistry of Materials* **1993**, *5*, 472-478.
49. An X-Ray Absorption Study of the Solvated Cu(II) Ion: Transition from a Solvated Solid to the Dissolved State, S. R. Wasserman and K. A. Carrado, *Journal of the American Chemical Society* **1993**, *115*, 3394-3395.
50. Presenting the Fun Side of the Periodic Table, K. A. Carrado, *Journal of Chemical Education* **1993**, *70*, 658-659.

51. Preparation of Hectorite Clays Utilizing Organic and Organometallic Complexes During Hydrothermal Crystallization, K. A. Carrado, *Industrial and Engineering Chemistry Research* **1992**, *31*, 1654-1659.
52. Thermal Analysis of Porphyrin-Clay Complexes, K. A. Carrado, K. B. Anderson, P. S. Grutkoski, *Supramolecular Architecture: Synthetic Control in Thin Films and Solids*, (ACS Symp. Ser.) **409**, T. Bein, Ed.; **1992**, 155-165.
53. Hydrothermal Crystallization of Porphyrin-Containing Layer Silicates, K. A. Carrado, P. Thiyagarajan, R. E. Winans, R. E. Botto, *Inorganic Chemistry* **1991**, *30*, 794-799.
54. Interactions of Water-Soluble Porphyrins and Metalloporphyrins with Smectite Clay Surfaces, K. A. Carrado and R. E. Winans, *Chemistry of Materials* **1990**, *2*, 328-335.
55. Reactivity of Anisoles on Clay and Pillared Clay Surfaces, K. A. Carrado, R. Hayatsu, R. E. Botto, R. E. Winans, *Clays and Clay Minerals* **1990**, *38*, 250-256.
56. Electrochemical Surface Analysis of Nonconducting Solids: Ferricyanide and Phenol as Electrochemical Probes of the Surfaces of Layered Double Hydroxide Anion Exchanging Clays, B. R. Shaw, Y. Deng, F. E. Strillacci, K. A. Carrado, M. G. Fessehaie, *J. Electrochem. Soc.* **1990**, *137*, 3136-3143.
57. Structural Studies of Pillared Clays and Modified Clays, K. A. Carrado, A. R. Thompson, R. E. Winans, R. E. Botto, *Microstructure and Properties of Catalysts* (MRS Symp. Proc., Vol. 111) **1988**, 277-282.
58. Layered Double Hydroxides (LDH's), K. A. Carrado, A. Kostapapas, S. L. Suib, *Solid State Ionics* **1988**, *26*, 77-86.
59. Catalytic Performance of Iron(III) and Chromium(III) Exchanged Pillared Clays, N. D. Skoularikis, R. W. Coughlin, A. Kostapapas, K. Carrado, S. L. Suib, *Applied Catalysis* **1988**, *39*, 61-76.
60. Cr(III)-Doped Pillared Clays (PILC's), K. A. Carrado, S. L. Suib, N. D. Skoularikis, R. W. Coughlin, *Inorganic Chemistry* **1986**, *25*, 4217-4221
61. Physical and Chemical Stabilities of Pillared Clays Containing Transition Metal Ions, K. A. Carrado, A. Kostapapas, S. L. Suib, R. W. Coughlin, *Solid State Ionics* **1986**, *22*, 117-125
62. Uranyl Clay Photocatalysts, S. L. Suib, K. A. Carrado, *Inorganic Chemistry* **1985**, *24*, 863-867.
63. Zeolite Photochemistry: Energy Transfer Between Rare Earth and Actinide Ions in Zeolites, S. L. Suib, K. A. Carrado, *Inorganic Chemistry* **1985**, *24*, 200-202.

**PATENTS**

1. ORGANIC OR ORGANOMETALLIC TEMPLATE MEDIATED CLAY SYNTHESIS, Kathleen Carrado Gregar, Randall E. Winans, and Robert E. Botto, U.S. Patent #5,308,808. Awarded May 3, **1994**.
2. CARBONS FOR LITHIUM BATTERIES PREPARED USING SEPIOLITE AS AN INORGANIC TEMPLATE, Giselle Sandi, Randall E. Winans, Kathleen Carrado Gregar, U.S. Patent #6,110,621. Awarded August 29, **2000**.
3. PROCESS FOR IN SITU PRODUCTION OF HYDROGEN ($H_2$) BY ALCOHOL DECOMPOSITION FOR EMISSION REDUCTION FROM INTERNAL COMBUSTION ENGINES, Ken B. Anderson, Kathleen Carrado Gregar, Christopher L. Marshall, Scott R. Segal, U.S. Patent #6,668,763. Awarded December 30, **2003**.
4. POLYMER NANOCOMPOSITES FOR LITHIUM BATTERY APPLICATIONS, Giselle Sandí and Kathleen Carrado Gregar, U.S. Patent #7,077,983. Awarded July 18, **2006**.
5. CATALYTIC MEMBRANES FOR CO OXIDATION IN FUEL CELLS, Giselle Sandi, Kathleen Carrado Gregar, Riza Kizelel, U. S. Patent #7,732,080. Awarded June 8, **2010**.

## BOOK CHAPTERS

1. NEW DEVELOPMENTS IN PRIMARY AND SECONDARY BATTERIES, G. Sandi and K. A. Carrado, in *Recent Research Developments in Electroanalytical Chemistry II*, S. G. Pandalai (Ed.), Transworld Research Network, India, **1999**, 159-181.
2. POLYMER-CLAY NANOCOMPOSITES DERIVED FROM POLYMER-SILICATE GELS, K. A. Carrado, L. Xu, S. Seifert, R. Csencsits, C. Bloomquist, in *Polymer-Clay Nanocomposites*, G. Beall & T. J. Pinnavaia, Eds., Wiley & Sons: UK, **2000**, 47-63.
3. POLYMER-CLAY NANOCOMPOSITES, K. A. Carrado, in *Advanced Polymeric Materials: Structure Property Relationships*, S. G. Advani, G. O. Shonaike, Eds.; CRC Press LLC, Boca Raton, FL, **2003**, pp. 349-396.
4. INTRODUCTION: CLAY STRUCTURE, SURFACE ACIDITY AND CATALYSIS, K. A. Carrado, in *Handbook of Layered Materials*, S. M. Auerbach, K. A. Carrado, P. K. Dutta, Eds.; Marcel-Dekker: NY, **2004**, pp. 1-38.
5. SYNTHETIC CLAY MINERALS AND PURIFICATION OF NATURAL CLAYS, K. A. Carrado, S. Petit, F. Bergaya, G. Lagaly, in *Handbook of Clay Science*, F. Bergaya, B.K.G. Theng, G. Lagaly, Eds., Elsevier, **2006**.
6. METAL NANOCLUSTERS ON POLYMER-CLAY NANOCOMPOSITE FILMS, K. A. Carrado and G. Sandi, *Polymer-Clay Nanocomposite Research* (CMS Workshop Lectures, vol. 15), K. A. Carrado, F. Bergaya, Eds.; Clay Minerals Society: Aurora, CO**, 2007**.
7. TEMPLATED CARBON FROM PYROLYSIS OF PYRENE IN PILLARED CLAY MATRICES. IN MATERIALS SYNTHESES, A PRACTICAL GUIDE. G. Sandí, K. A. Carrado, and R. E. Winans. U. Schubert, N. Hüsing, and R. Laine (editors). SpringerWien, New York, **2008**, p. 71-76.
8. FIBROUS CARBON FROM SEPIOLITE CLAY AND PROPYLENE. IN MATERIALS SYNTHESES, A PRACTICAL GUIDE. G. Sandí, K. A. Carrado, and R. E. Winans. U. Schubert, N. Hüsing, R. Laine (editors). SpringerWien, New York, **2008**, p. 77-82.

## BOOKS

1. HANDBOOK OF ZEOLITE SCIENCE AND TECHNOLOGY, S. M. Auerbach, K. A. Carrado, P. K. Dutta, Eds.; Marcel-Dekker: NY, **2003**, (1184 pages).
2. HANDBOOK OF LAYERED MATERIALS, S. M. Auerbach, K. A. Carrado, P. K. Dutta, Eds.; Marcel-Dekker: NY, **2004**, (650 pages).
3. CLAY-BASED POLYMER NANOCOMPOSITES (CPN), K. A. Carrado, F. Bergaya, Eds.; CMS Workshop Lectures, vol. 15; Clay Minerals Society: Aurora, CO, **2007** (278 pages).

## SELECTED INVITED PRESENTATIONS

**Invited,** "Overview of Argonne's Center for Nanoscale Materials – A U. S. Dept. of Energy Nanoscale Science Research Center", Argonne User Facilities Workshop, Northern Illinois University, April 2014

**Invited,** "Diversifying Your Career Path", National Postdoctoral Association Meeting, panelist, St. Louis, April 2014

**Invited,** "Working at CNM: Nuts & Bolts," User Facilities for Industry 101 Workshop, APS/CNM/EMC Users Meeting, Argonne National Laboratory, May 2013

**Invited,** "Snapshots of Nanoscience & Nanotechnology at Argonne National Laboratory", American Industrial Hygiene Association, Argonne National Laboratory, November 2012

**Invited,** "The Center for Nanoscale Materials: a case study for careers in nanotechnology", NANOConnect, Wheeling High School, Illinois, October 2012

**Invited,** "Overview of Argonne's Center for Nanoscale Materials – A U. S. Dept. of Energy Nanoscale Science Research Center", MRSEC Management Workshop, Northwestern University, November 2011

**Invited,** "Overview of Argonne's Center for Nanoscale Materials – A U. S. Dept. of Energy Nanoscale Science Research Center", Partnership Council, Argonne National Laboratory, March 2011

**Invited,** "Overview of Argonne's Center for Nanoscale Materials – A U. S. Dept. of Energy Nanoscale Science Research Center", International School & Symposium on Multifunctional Molecule-based Materials, Argonne National Laboratory, March 2011

**Invited,** "Overview of the Center for Nanoscale Materials – A U. S. Dept. of Energy User Facility", Savannah River National Laboratory, July 2010

**Invited keynote address,** "Materials Research at the Center for Nanoscale Materials – A U.S. Dept. of Energy Nanoscale Science Research Center," CMS Workshop on "Materials and Clay Minerals" for the 2010 Trilateral Meeting on Clays – The Spanish Clay Society (SEA), The Clays Science Society of Japan (CSJ) and The Clay Minerals Society (CMS); Madrid, Spain, June 2010

**Invited**, "DOE Nanoscale Science Research Centers: User Facilities for the Broad Scientific Community", National EPSCoR Meeting, Oak Ridge National Laboratory, TN, July 2008

**Invited**, "Scientific Research Programs at the Center for Nanoscale Materials", Postdoctoral Seminar Series of Division of Educational Programs, Argonne National Laboratory, November 2007

**Invited**, "The Diversity of Synthetic Nanoparticles", ASA-CSSA-SSSA Meeting, New Orleans, November 2007

**"**Overview of the Center for Nanoscale Materials", Argonne National Laboratory Delegation for the North Central States Nanoscience Consortium and EPSCoR, South Dakota School of Mines, February 2007

**Invited**, "A Career in Clay: A Research Journey from Grad Lab to National Lab", University of Connecticut 125th Anniversary Symposium "Celebrating the Elements of Connecticut Chemistry", September 2006

**Invited**, "Silicate-Based Catalysts & Nanocomposites for Energy Applications", Northwestern University, Center for Catalysis & Surface Science, August 2006

**Invited**, "Metal Nanoparticles on Polymer-Clay Nanocomposite Films", Clay Minerals Society Workshop & Joint Clay Minerals Society and French Clay Group Meeting, Poitiers & Ile d'Oleron, France, June 2006

**Invited,** "In Situ SAXS and GISAXS Studies of Polymer Nanocomposite Membranes for Energy Applications", G. Sandi, K. A. Carrado*, 229th ACS National Meeting, San Diego, CA, March 2005

**Invited,** "HDS & Deep HDS Activity of CoMoS-Mesostructured Synthetic Clays", 229th ACS National Meeting, San Diego, CA, March 200

**Invited**, "Crystallization and Textural Porosity of Synthetic Clays", in the "Porous Materials and Molecular Intercalation" Forum, Royal Chemistry Society Materials Chemistry MD5 Meeting, Madrid, Spain, September 2002

**Invited**, "Synthesis of Organo-Hectorites from Sol-Gels for Catalytic and Materials Applications", Southern Clay Products, Inc., Gonzales, TX, Jaunary 2001