# Carlo Uberto Segre

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Google Scholar~~~Publons

## Education

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|---|---|
| 1981 | Ph.D., Physics, University of California, San Diego |
| 1977 | M.S., Physics, University of California, San Diego |
| 1976 | B.S. *cum laude*, Physics, University of Illinois, Urbana-Champaign<br>B.S. *cum laude*, Chemistry, University of Illinois, Urbana-Champaign |

## Appointments

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| 2021- | Director, Materials Research Collaborative Access Team (MRCAT) |
| 2014- | Chief Technology Officer & Chief Financial Officer, Influit Energy, LLC |
| 2012- | Director, Center for Synchrotron Radiation Research and Instrumentation, Illinois Institute of Technology |
| 2011- | Duchossois Leadership Professor, Illinois Institute of Technology |
| 2001- | Professor of Physics, Illinois Institute of Technology |
| 2016-2019 | Interim Chair, Department of Chemistry, Illinois Institute of Technology |
| 2012-2020 | Deputy Director, Biophysics Collaborative Access Team |
| 2009-2011 | Associate Dean for Graduate Admissions, Graduate College, Illinois Institute of Technology |
| 2003-2009 | Associate Dean for Special Projects, Graduate College, Illinois Institute of Technology |
| 2002-2003 | Associate Dean for Research, Armour College of Engineering and Science, Illinois Institute of Technology |
| 1995-1999 | Associate Chair, Department of Biological, Chemical and Physical Sciences, Illinois Institute of Technology |
| 1994-2021 | Deputy Director, Materials Research Collaborative Access Team (MRCAT) |
| 1993-1995 | Executive Chair for Chemistry, Department of Chemical and Biological Sciences, Illinois Institute of Technology |

1993-1995 Joint Appointment as Associate Professor of Chemistry, Illinois Institute of Technology

1989-2001 Associate Professor of Physics, Illinois Institute of Technology

1990-1993 Staff Associate, International Centre for Science and High Technology, Trieste, Italy

1989-1990 Visiting Senior Scientist, International Centre for Theoretical Physics, Trieste, Italy

1983-1989 Assistant Professor of Physics, Illinois Institute of Technology

1981-1983 Postdoctoral Research Fellow, Department of Physics, Rutgers, the State University of New Jersey
Advisor: M.C. Croft

**Awards and Recognition**

- Fellow, American Association for the Advancement of Science (2013)
- Fellow of the International Centre for Diffraction Data (2006)
- IIT Sigma Xi Research Award, Senior Faculty Division (2014)
- IIT Faculty Research Fellowship 1985-1986
- Lewis College Junior Faculty Teaching Award 1985-1986
- NATO Postdoctoral Fellowship, 1983 (declined)
- Lyman Award, Department of Physics, University of Illinois, Urbana 1976
- Phi Beta Kappa
- Phi Kappa Phi

**Society Memberships & Service**

- American Physical Society
- American Association for the Advancement of Science
- American Chemical Society
- International X-ray Absorption Society
- Electrochemical Society
- Materials Research Society
- American Vacuum Society
- Sigma Xi
  - President IIT Chapter (2005-2016)
  - Director, North Central Region (2016-2022)
  - Executive Committee (2017-2019)
- International Center for Diffraction Data

  - Chair Education Subcommittee (2005-2020)
  - Director At-Large (2020-2024)
- Advanced Photon Source
  - Member of the Advanced Photon Source Beamtime Allocation Committee (2007-)
  - Member, Steering Committee, APS User Organization (2018-2021)
  - Vice Chair, Steering Committee, APS User Organization (2018-2019)
  - Chair, Steering Committee, APS User Organization (2019-2020)
- Member Stanford Synchrotron Radiation Laboratory Triennial Review Committee (2014, 2017)
- Debian GNU/Linux Developer (2005-)
- Proposal reviewer for NSF, DOE, ARO, NIH, CRDF, Research Corporation, SSRL, CLS
- Reviewer for *Physical Review, Journal of Crystal Growth & Design*, *ACS Nano*, *Nanoscience & Nanotechnology Letters, Ionics, Journal of Physical Chemistry, Powder Diffraction, Journal of Alloys & Compounds, Journal of Synchrotron Radiation, Journal of Physics: Condensed Matter, Superconductor Science and Technology, Physical Chemistry Chemical Physics, Journal of Chemical Physics, Nano Energy, ACS Catalysis, Applied Catalysis, Applied Crystallography, Nuclear Instruments & Methods, Materials Research Express*

**Teaching and Outreach Activities**

Over the course of my career at IIT, I have had the opportunity to teach undergraduate courses at all levels and graduate courses specific to my research expertise. These include, Introduction to the Professions, General Physics I, II & III, Computational Physics, Instrumentation Laboratory, Solid State Physics, Modern Optics, Fundamentals of Quantum Theory I & II, Physical Chemistry I & III, Electronics for Analytical Chemists (graduate), Introduction to Synchrotron Radiation (graduate, also offered over Internet to students outside the United States). I have also been involved in several revisions of the physics curriculum to meet the needs of our majors and engineering students who take our general physics courses.

I have also been an instructor for the APS/IIT EXAFS Summer School since 2009 and I have twice been invited to be an instructor for the NSLS EXAFS Workshop (2006 & 2010). I annually offer an informal short course for IIT graduate students on EXAFS Theory and practice and I have offered the same short course to researchers at the Indian Institute of Science (Bangalore, India) and Wright Patterson Air Force Base (Dayton, Ohio).

I have served as academic advisor to several hundred undergraduate students, including physics majors (undergraduates as well as professional Masters and first year M.S. and Ph.D. students), and undecided students in their first 2 years. More recently, I have become a mentor for the Duchossois Leadership Scholars program. This includes not only advising current scholars but also recruiting new scholars for the program.

Over my time at IIT, I have been able to successfully establish a number of new degree programs, including Professional Masters programs in Radiation Health Physics, where I served as co-Director and Interim Director at various times; Bachelor of Science programs in Physics Education and Applied Physics; and a Master of Science program in Applied Physics.

Outside the classroom, I have been faculty advisor to the Society of Physics Students, the IIT students responsible for the Chicago Area Undergraduate Research Symposium and the IIT Undergraduate Research Journal. For the past 20 years I have been webmaster, chair, and member of the International Bridge Building Committee, a competition for high school students.

In my role as a Debian GNU/Linux Developer, I have packaged scientific software for the Debian Linux and Ubuntu operating systems. Making these programs for scientific data analysis freely available to the broader scientific community.

**Administrative Accomplishments**

I have served as Associate Chair of the combined Biological, Chemical and Physical Sciences Department (6 years) and as Associate Dean for nearly 10 years in various positions. My major accomplishment as Associate Dean for Special Projects was the development of a framework and agreement for IIT/FermiLab joint faculty appointments at the Assistant Professor level. These were novel appointment agreements at the time but have proven to be successful and now are used as templates for joint positions with Argonne National Laboratory.

As Associate Dean for Graduate Admissions, I reorganized the Graduate Admissions Office and spearheaded the development of a fully electronic graduate application, evaluation, admission, and award system which integrates with the Banner academic computing system used by IIT and which is as advanced as any in the country.

In addition to developing and recruiting for the Duchossois Leadership Scholars program, I have also put together a framework for the Tang Fellowship program which recruits outstanding Chinese students and fully supports their Ph.D. studies at IIT.

**Research Activities**

I have been working in the field of materials science for over 30 years and have gained a broad experience in the preparation and characterization of bulk and thin film samples of complex superconducting, magnetic and mixed valence materials. My expertise spans the experimental techniques of x-ray diffraction, neutron diffraction and x-ray absorption spectroscopy as well as the structural analysis tools of total pattern fitting and Rietveld refinement of structural data. I also have experience in electron microscopy, resistivity, magnetic and Mössbauer effect measurements. There are three patent disclosures related to materials I have studied.

Beginning in 1989, I have devoted more of my effort to building IIT's presence in the Synchrotron Radiation community. These activities have resulted in a shift in my scientific interests which is now beginning to be reflected in my publication record.

- I am a founding member of IIT's Center for Synchrotron Radiation Research and Instrumentation (CSRRI);
- I have been on the Local Organizing Committee of the *1$^{st}$ International Conference on Synchrotron Radiation in Materials Science* (1996); the *10$^{th}$ International Conference on X-ray Absorption Fine Structure* (1998); and the *5$^{th}$International Conference on Synchrotron Radiation in Materials Science* (2006).
- Since 1994, I have served as the IIT representative to the MRCAT Executive Committee, as Deputy Director of MRCAT and as supervisor to all of the MRCAT staff.

One of my principal areas of interest has been sample preparation of bulk materials, from arc-melting of ternary silicide superconducting and magnetic compounds to the sintering of ceramic superconductors and ferroelectrics. This includes the determination of the optimal synthesis conditions and both ternary and solid solution phase diagram determination. This extended to thin film growth, particularly the determination of ideal growth conditions for highly oriented films of superconducting ceramic materials by pulsed laser deposition and the novel technique of electron spark deposition. An integral part of understanding the conditions for optimal synthesis is the structural characterization of the material. I have worked extensively on the solving of the crystallographic structure of complex oxides by powder neutron and x-ray diffraction using the technique of Rietveld refinement. I was involved in some of the original structural determinations of the high temperature superconducting compound $YBa_2Cu_3O_7$ and related materials.

More recently, I have been using synchrotron-related structural techniques such as X-ray Absorption Fine Structure (XAFS) and anomalous diffraction to get a better understanding of the local and medium range disorder which is usually an integral part of any ceramic superconductor or ferroelectric solid solution system. These techniques

are also being applied to the structural characterization of thin films. My ultimate goal is to develop new ways of combining traditional average structural refinement with local structural probes such as XAFS in order to develop more accurate structural models for disordered systems.

I have been heavily involved in developing instrumentation for use at synchrotron radiation facilities, including the MRCAT beamlines, a bent Laue analyzer for fluorescence XAFS, a beam cleaner for harmonic rejection, and *in-situ* and *operando* electrochemical cells for the study of catalysis, fuel cells and batteries.

My current research projects include *in situ* XAFS on solid state and flow batteries and working fuel cells, phosphors, dilute magnetic semiconductors, and multiferroics. I have also been applying high energy x-ray diffraction and tomography to study cultural heritage artifacts. A recent ARPA-e award has taken my research in the direction of developing a new format of battery, combining the advantages of solid state and flow batteries, for electric vehicles. This has resulted in founding a startup, Influit Energy, LLC to commercialize this new technology. To date, we have obtained ~$12M in funding for this activity.

**Recent Invited Presentations**

2004 "Structural studies of nanoparticle catalysts in a fully operating Direct Methanol Fuel Cell," Illinois State University, Physics Department.

2006 "Structural studies of nanoparticle catalysts in a fully operating Direct Methanol Fuel Cell," University of North Dakota, Physics Department

"Structural studies of nanoparticle catalysts in a fully operating Direct Methanol Fuel Cell," University of Iowa, Physics Department

"X-ray absorption spectroscopy as in-situ characterization of catalysts in operating fuel cells," XV International Materials Research Congress, Cancun, Mexico.

"Fuel cell catalyst structural characterization by in-situ x-ray absorption spectroscopy," American Chemical Society Meeting, San Francisco.

"In-situ XAFS studies of fuel cell catalysts," NSLS Workshop on XAFS studies of nanoparticles and chemical transformations.

2007 "In-situ Spectroscopic Studies of Pb Corrosion," GNEP Advanced Materials Workshop, Oak Ridge National Laboratory.

2009 "Using x-ray absorption spectroscopy to probe the local structure of nano-scale systems," Nanotechnology Colloquium, NanoMaterials Application Center, Texas State University.

"Removal of oxygen adsorbates on Pt/C and PtNi(1:1)/C alloy nanoparticle catalysts for the oxygen reduction reaction in PEMFCs," XAFS 14 Conference, Camerino, Italy.

2010 "Using experimental and computational x-ray absorption spectroscopy to understand fuel cell catalysts," University of Delaware, Physics Department

"Using experimental and computational x-ray absorption spectroscopy to understand fuel cell catalysts," Daresbury Laboratory, UK.

2011 "X-ray Absorption Spectroscopy and applications to fuel cell catalysts," Wichita State University, Physics Department.

"X-rays in the Neighborhood: IIT and the Advanced Photon Source," Illinois Institute of Technology University Lecture.

2012 "Using x-ray physics to study catalysis at the MRCAT Beam Line," University of Illinois, Urbana-Champaign, Physics Department.

"Using x-ray physics to study catalysis at the MRCAT Beam Line," Wright-Patterson Air Force Base.

2013 "Using x-ray physics to study catalysis at the MRCAT Beam Line," Università di Padova, Italy, Chemical Engineering Department.

"Using x-ray physics to study catalysis at the MRCAT Beam Line," Università di Trento, Italy, Chemical Engineering Department.

"Surface science using x-ray and neutron sources," BP Distributed Research Laboratory meeting on surface science, BP Naperville.

"In situ and operando XAFS studies of fuel cell catalysts," BP Distributed Research Laboratory meeting on surface science, BP Naperville.

"In situ and operando XAFS studies of fuel cell catalysts," Illinois Institute of Technology, Chemistry Department Colloquium.

2014 "Using synchrotron radiation to study catalysis," Villanova University, Chemistry Department Colloquium.

"Can EXAFS help solve local structural questions in NPD and XRPD?," International center for Diffraction Data, March 2014 Meeting.

"The challenges of making flow batteries with nanoelectrofuel," Wichita State University, Physics Department Colloquium.

"Making an nanoelectrofuel flow battery," Illinois Institute of Technology, Mechanical, Materials and Aerospace Engineering Department Colloquium.

2015 "X-ray absorption spectroscopy as a structural probe of dynamics in fuel cell and battery systems," University of Notre Dame, Physics Department Condensed Matter Seminar.

"Rechargeable nanoelectrofuel flow batteries \\ for EV systems," University of Illinois at Chicago, Invited leecture for LAS 493. *J. Phys. Chem. C*, (in press 2021).

2016 "High energy density Nanoelectrofuel flow batteries for transportation and renewables: Development, prospective and challenges," American Institute of Chemical Engineers, Midwest Research Conference, Keynote Address.

"Designing improved materials for electrochemical energy applications," Illinois Insitute of Technology, Chemistry Department Colloquium.

"The science and engineering of Nanoelectrofuel flow battery development," Illinois Insitute of Technology, Physics Department Colloquium.

"The science and engineering of nanoelectrofuel flow battery development," Illinois State University, Physics Department Colloquium.

"X-ray absorption spectroscopy as a structural probe of dynamics in fuel cell and battery systems," University of Illinois at Chicago, Chemical Engineering Department Colloquium.

"The science and engineering of Nanoelectrofuel flow battery development," VIllanova University, Chemistry Department Colloquium.

"How do we design improved materials for electrochemical energy applications?" NGenE 2016, University of Illinois at Chicago.

2017 "What's a physicist doing speaking at an analytical chemistry seminar?" University of Iowa, Chemistry Department Analytical Chemistry Seminar.

2018 "Nanoelectrofuel flow batteries for transportation: How to start a battery company," Southern Illinois University, Carbondale, Sigma Xi Lecture.

"In situ characterization of battery materials using x-ray absorption spectroscopy," American Physical Society March Meeting, Invited Talk.

"In situ characterization of battery materials using x-ray absorption spectroscopy," National Synchrotron Light Source II User Meeting, Invited Talk.

2019 "When can't crystallography be trusted? The case of hexagonal $YMO_3$-type chromophores," Illinois Institute of Technology, Chemistry Department Colloquium.

2021 " Enhancing cobalt-free lithium-ion cathode performance through doping, surface coating, and heat treatment," Illinois Institute of Technology, Chemistry Department Colloquium.

**Graduate Students Supervised**

**Ph.D.**

1987 K. Zhang - *Structure and Superconductivity of High Transition Temperature Copper Oxides.*

1991 K.J. Akujieze - *Structural and Electronic Studies of Pure and Lead-Doped Phases of the Single Cu-O layer Bi-Sr-Cu-O System.*

1991 D.T. Marx - *Structures and Superconductivity in Perovskite Bismuthate Systems.*

1992 P.G. Radaelli - *Oxygen Ordering and Superconductivity in Pure and Calcium-Substituted* $REBa_2Cu_3O_{6+x}$ *Systems*.

1994 Z. Wang - *Flux Dynamics in Type-II Superconductors*.

1995 R.K. Zasadzinski - *Studies of Superconductors Using a Low-Temperature Scanning Tunneling Microscope.*

1996 B. Ma - *Electrical Transport Properties and Defect Structure in the Sr-Fe-Co-O System*.

1999 A. Cansiz - *Force, Stiffness and Hysteresis Losses in High Temperature Superconducting Bearings*.

2003 N.E. Leyarovska - *X-ray Spectroscopy of Manganese-Based Single-Molecule Magnets.*

2007 S. Stoupin - *Manganese Incorporation into Ferroelectric Lead Titanate.*

2009 S. Liu - *X-ray Absorption Studies of Materials for Advanced Nuclear Reactors.*

2009 T. Brennan - *On the Variation of Sonoluminescence Flash Timing.*

2010 Q. Jia - *In situ XAFS Studies of the Oxygen Reduction Reaction on Carbon Supported Platinum and Platinum Nickel Nano-Scale Alloys as Cathode Catalysts in Fuel Cells.*

2012 H. Ganegoda - *Iron Incorporation into Ferroelectric Lead Titanate*

2013 M. Wojcik - *Fabrication and Characterization of High Aspect Ratio Hard X-ray Zone Plates with Ultrananocrystalline Diamond Molds*

2015 C. Pelliccione - *In Situ X-ray Absorption Spectroscopy Study of Sn and $SnO_2$ Anode Nanomaterials for Lithium-Ion Batteries*

2018 M. Sangroula - *Coupling Impedance Measurement and Analysis of Critical Vacuum Chamber Components for the Advanced Photon Source Upgrade*

2018 S. Aryal - *Structural Studies of Degradation Mechanism of Lithium Rich Manganese, Nickel, and Iron Based Cathodes*

2019 H. Saglam - *Spin Transport and Spin-Orbit Torques in Antiferromagnets*

2019 Y. Ding - *In Situ X-ray Absorption Spectroscopy Study of Tin-Based Graphite Composite Anodes for Lithium-Ion Batteries*

2020 E. Moazzen - *Nanomaterials for Advanced Battery Cathodes*

2021 K. Kucuk - *Investigation of structure and processing effects on the electrochemical performance of Lithium- and Manganese-rich, layered-oxide cathodes for LIBs*

**M.S.**

1989 M.S. Kleefisch - *The Thermal Decomposition of an Alternative Precursor to $YBa_2Cu_3O_7$.*

1997 T. Bolin - *The Dielectric Constant and Stability of Nafion-Ceramic Composite Thin Films.*

2010 L. Melo - *X-Ray Diffraction and Fluorescence Analysis of Ancient Axe Heads.*

2017 N. Goldring - *Finite Element Analysis of High Heat Load Deformation and Mechanical Bending Correction of a Beamline Mirror for the APS Upgrade.*

2017 N. Beaver - *In situ XAS of Molybdenum Dichalcogenides as Li-Ion Battery Anodes*

## Publications - Carlo U. Segre

### Archival Journal Articles

1. "Bound-state wave packets," C.U. Segre and J.D. Sullivan, *Am. J. Phys.* **44**, 729-732 (1976).

2. "Pressure enhanced superconductive and magnetic interactions in the system $(Er_{1-x}Ho_x)Rh_4B_4$," R.N. Shelton, C.U. Segre, and D.C. Johnston, *Solid State Commun.* **33**, 843-846 (1980).

3. "The superconductivity of $Sc_4T_5Si_{10}$ (T=Co,Rh,Ir) and isomorphous compounds," H.F. Braun and C.U. Segre, *Solid State Commun.* **35**, 735-738 (1980).

4. "Hydrostatic pressure effects on the superconducting properties of $Ag_{1-x}Sn_{1+x}Se_2$," R.N. Shelton, C.U. Segre, and D.C. Johnston, *Solid State Commun.* **39**, 797-800 (1981).

5. "Susceptibility and Mössbauer studies of magnetic rare earth-iron-silicides," H.F. Braun, C.U. Segre, F. Acker, M. Rosenberg, S. Dey, and P. Deppe, *J. Magn. Magn. Mat.* **25**, 117-123 (1981).

6. "Reentrant superconductivity in $Tm_2Fe_3Si_5$," C.U. Segre and H.F. Braun, *Physics Letters* **85A**, 372-374 (1981).

7. "Configurational crossover for Eu systems: a simple model," M. Croft, E. Kemly, and C.U. Segre, *Solid State Commun.* **44**, 1025-1029 (1982).

8. "Valence instability in $Eu(Pd_{1-x}Au_x)_2Si_2$: the global phase diagram," C.U. Segre, M. Croft, J.A. Hodges, V. Murgai, L.C. Gupta, and R.D. Parks, *Phys. Rev. Lett.* **49**, 1947-1950 (1982).

9. "Neutron-diffraction study of magnetically ordered $Er_2Fe_3Si_5$," A.R. Moodenbaugh, D.E. Cox, C.B. Vining, and C.U. Segre, *Phys. Rev. B* **29**, 271-277 (1984).

10. "Ce valence variation in intermetallic alloys: $L_{III}$ absorption spectroscopy results," R.A. Neifeld, M.C. Croft, C.U. Segre, and S. Raaen, *Phys. Rev. B* **30**, 4164-4169 (1984).

11. "Specific heat and critical field for some iron containing superconductors," G.R. Stewart, G.P. Meisner, and C.U. Segre, *J. Low Temp. Phys.* **59**, 237-240 (1985).

12. "Chemical environment and Ce valence: global trends in transition-metal compounds," R.A. Neifeld, M.C. Croft, B. Qi, J.B. Zhou, I. Perez, H. Jhans, T. Mihalisin, C.U. Segre, M. Madigan, M.S. Torikachvili, M.B. Maple, and L.E. DeLong, *Phys. Rev. B* **32**, 6928-6931 (1985).

13. "New superconducting phases in the Y-Os-Si system," L. Schellenberg, H.F. Braun, C.U. Segre, M. Gueramian, and J.Muller, *Jap. J. Appl. Phys.* **26**, 963-964 (1987).

14. "Magnetic properties of $Er_2Fe_{14}B$ and $Nd_2Fe_{14}B$ thin films," J.F. Zasadzinski, C.U. Segre, and E.D. Rippert, *J. Appl. Phys.* **61**, 4278-4280 (1987).

15. "Structure and crystal chemistry of the high $T_C$ superconductor $YBa_2Cu_3O_{7-\delta}$," W.I.F. David, W.T.A. Harrison, J.M.F. Gunn, O. Moze, A.K. Soper, P.Day, J.D. Jorgensen, M.A. Beno, D.W. Capone II, D.G. Hinks, I.K. Schuller, L. Soderholm, C.U. Segre, K. Zhang, and J.D. Grace, *Nature* **327**, 310-312 (1987).

16. "Phase diagram and superconductivity in the Y-Ba-Cu-O system," D.G. Hinks, L. Soderholm, D.W. Capone II, J.D. Jorgensen, I.K. Schuller, C.U. Segre, K. Zhang, and J.D. Grace, *Appl. Phys. Lett.* **50**, 1688-1690 (1987).

17. "Structure of the single phase high temperature superconductor $YBa_2Cu_3O_7$," M.A. Beno, L. Soderholm, D.W. Capone II, D.G. Hinks, J.D. Jorgensen, J.D. Grace, I.K. Schuller, C.U. Segre, and K. Zhang, *Appl. Phys. Lett.* **51**, 57-59 (1987).

18. "Electronic and magnetic properties of rare-earth ions in $REBa_2Cu_3O_{7-\delta}$ (RE=Dy,Ho,Er)," B.D. Dunlap, M. Slaski, D.G. Hinks, L. Soderholm, M. Beno, K. Zhang, C.U. Segre, G.W. Crabtree, W.K. Kwok, S.K. Malik, I.K. Schuller, J.D. Jorgensen, and Z. Sungaila, *J. Magn. Magn. Mat.* **68**, L139-L144 (1987).

19. "Structural phase transition in $YBa_2Cu_3O_{7-\delta}$: the role of dimensionality in high temperature superconductivity," I.K. Schuller, D.G. Hinks, M.A. Beno, D.W. Capone II, L. Soderholm, J.-P. Locquet, Y. Bruynseraede, C.U. Segre, and K. Zhang, *Solid State Commun.* **63**, 385-388 (1987).

20. "Incorporation of Pr in $YBa_2Cu_3O_{7-\delta}$: electronic effects on superconductivity," L. Soderholm, K. Zhang, D.G. Hinks, M.A. Beno, J.D. Jorgensen, C.U. Segre, and I.K. Schuller, *Nature* **328**, 604 (1987).

21. "Oxygen ordering and superconductivity in $La(Ba_{2-x}La_x)Cu_3O_{7+\delta}$," C.U. Segre, B. Dabrowski, D.G. Hinks, K. Zhang, J.D. Jorgensen, M.A. Beno, and I.K. Schuller, *Nature* **329**, 227-229 (1987).

22. "Oxygen ordering and the orthorhombic-to-tetragonal phase transition in $YBa_2Cu_3O_{7-\delta}$," J.D. Jorgensen, M.A. Beno, D. G. Hinks, L. Soderholm, K. Volin, R.L. Hitterman, J.D. Grace, I.K. Schuller, C.U. Segre, K. Zhang, and M.S. Kleefisch, *Phys. Rev. B* **36**, 3608-3616 (1987).

23. "Solubility and superconductivity in the $RE(Ba_{2-x}RE_x)Cu_3O_{7+\delta}$ (RE=Nd,Sm,Eu,Gd,Dy)," K. Zhang, C.U. Segre, B. Dabrowski, D.G. Hinks, I.K. Schuller, J.D. Jorgensen, and M. Slaski, *J. Phys. C* **20**, L935-L940 (1987).

24. "$La_{2-x}Sr_xCu_4$ and $YBa_2Cu_3O_{6.5}$: new high $T_C$ superconducting oxides," L. Soderholm, D.W. Capone II, D.G. Hinks, J.D. Jorgensen, I.K. Schuller, J. Grace, K. Zhang, and C.U. Segre, *Inorg. Chim. Acta* **140**, 167-168 (1987).

25. "Magnetic ordering of Gd and Cu in superconducting and non-superconducting $GdBa_2Cu_3O_{7-\delta}$," B.D. Dunlap, M. Slaski, D.G. Hinks, K. Zhang, C.U. Segre, S.K. Malik, and E.E. Alp, *Phys. Rev. B* **37**, 592-594 (1988).

26. "Is the isotope effect in $YBa_2Cu_3O_{7-\delta}$ absent?", M. Grimsditch, T.O. Brun, R. Bhadra, B. Dabrowski, D.G. Hinks, J.D. Jorgensen, M.A. Beno, J.Z. Liu, H.B. Schuttler, C.U. Segre, L. Soderholm, B.W. Veal, and I.K. Schuller, *Phys. Rev. Lett.* **60**, 752 (1988).

27. "Raman scattering from high $T_C$ superconductors," R. Bhadra, T.O. Brun, M.A. Beno, B. Dabrowski, D.G. Hinks, J.Z. Liu, J.D. Jorgensen, I.K. Schuller, C.U. Segre, L. Soderholm, B. Veal, J.M. Williams, K. Zhang, and M. Grimsditch, *Phys. Rev. B* **37**, 5142-5147 (1988).

28. "First order valence transition in $Eu(Pd_{0.9}Au_{0.1})_2Si_2$: an x-ray diffraction study," H. Jahns, M. Croft, E. Kemly, V. Murgai, B. Grier, and C.U. Segre, *Solid State Commun.* **66**, 1027-1030 (1988).

29. "Superconductivity in silicon-rich RE-Os-Si compounds," L. Schellenberg, H.F. Braun, C.U. Segre, M. Gueramian, B. Chabot, M. Decroux, D. Cattani, and J. Muller, *Physica C* **153-155**, 485486 (1988).

30. "Structural and magnetic properties of Fe impurities in $YBa_2Cu_3O_{7+\delta}$," B.D. Dunlap, J.D. Jorgensen, W.K. Kwok, C.W. Kimball, J.L. Matykiewicz, H. Lee,, and C.U. Segre, *Physica C* **153-155**, 1100-1104 (1988).

31. "Structural and superconducting properties of oxygen-deficient and doped $YBa_2Cu_3O_{7+\delta}$," J.D. Jorgensen, D.G. Hinks, H. Shaked, B. Dabrowski, B.W. Veal, A.P. Paulikas, L.J. Nowicki, G. Crabtree, W.K. Kwok, A. Umezawa, L.H. Nunez, B.D. Dunlap, C.U. Segre, and C.W. Kimball, *Physica B* **156**, 877879 (1990).

32. "Structural behavior and chemical order of Fe https://doi.org/10.1063/1.340225in $YBa_2(Cu_{1-x}Fe_x)_3O_{7+\delta}$," B.D. Dunlap, J.D. Jorgensen, C.U. Segre, A.E. Dwight, J.L. Matykiewicz, H. Lee, W. Peng, and C.W. Kimball, *Physica C* **158**, 397-405 (1989).

33. "Origin of enhanced growth of the 110 K superconducting phase by Pb doping in the Bi-Sr-Ca-Cu-O system," D. Shi, M.S. Boley, J.G. Shen, M. Xu, K. Vandervoort, Y.X. Liao, A. Zangvil, J. Akujieze, and C.U. Segre, *Appl. Phys. Lett.* **55**, 699-701 (1989).

34. "In-situ growth of Y-Ba-Cu-O films by laser deposition," G.G. Bentini, M. Bianconi, L. Correra, R. Fabbri, A. Lamagna, S. Nicoletti, R. Nipoti, J. Ramos-Arhuis, F.C. Matacotta, and C.U. Segre, *J. Less Common Metals* **164**, 315-320 (1990).

35. "High critical current density in grain-oriented bulk $YBa_2Cu_3O_x$ Processed by Partial Melt Growth," D. Shi, M.M. Fang, J. Akujieze, M. Xu, J.G. Chen, and C.U. Segre, *Appl. Phys. Lett.* **57**, 2606-2608 (1990).

36. "Superconductivity in $(Y_{1-x}Sr_x)(Ba_{1.5}Sr_{0.5})Cu_3O_{7-\delta}$ compounds," F.C. Matacotta, T. Moyo, J. Ramos-Arhuis, C.U. Segre, S.A. Siddiqi, and A. Migliori, *Bulletin of Materials Science* **14**, 279-285 (1991).

37. "Structure and superconductivity in the single Cu-O layered $(Bi_{2-x}Pb_x)(Sr_{2-y}La_y)CuO_{6+\delta}$ system," K. Zhang, G. Seidler, B.H. Ma, and C.U. Segre, *Physica C* **179**, 405-410 (1991).

38. "Superconductivity and charge transfer compensation by direct doping in the $La_{1+x}Ca_yBa_{2-x-y}Cu_3O_{7+\delta}$ system," T. Mertelj, P. Šťastný, F.C. Matacotta, P. Ganguly, C.U. Segre, and D. Mihailovic, *Physica C* **183**, 11-16 (1991).

39. "Defects, defect ordering, structural coherence and superconductivity in the 123 copper oxides," J.D. Jorgensen, D.G. Hinks, P.G. Radaelli, Shiyou Pei, P. Lightfoot, B. Dabrowski, C.U. Segre, and B.A. Hunter, *Physica C* **185-189**, 184-189 (1991).

40. "Microstructure and transport properties of $YBa_2Cu_3O_{7-\delta}$ films produced by laser ablation from a $BaF_2$/-$Y_2O_3$/CuO target," R.L. Burton, C.A. Bohn, S.W. Short, H.O. Marcy, D.C. DeGroot, C.R. Kannewurf, and C.U. Segre, *Physica C* **190**, 569-580 (1992).

41. "Structural inhomogeneities in oxygen-deficient $ErBa_2Cu_3O_{6+\delta}$ associated with the tetragonal–to–orthorhombic transition: evidence of first–order behavior," P.G. Radaelli, C.U. Segre, D.G. Hinks, and J.D. Jorgensen, *Phys. Rev. B* **45**, 4923-4949 (1992).

42. "The effect of reaction conditions on the $Bi_{1.6}Pb_{0.4}Sr_{2-x}Pr_xCuO_{6+\delta}$ system," N. Leyarovska, P. Šťastný, F.C. Matacotta, Q. Jiang, D. Pal, C.U. Segre, S. Bernik, and C. Schmid, *Physica C* **193**, 441-448 (1992).

43. "Low-energy spin fluctuations in $YBa_2Cu_3O_{6.1}$ and $ErBa_2Cu_3O_{6+\delta}$ a Cu(1) T(1) NQR study," S.G. Jang, C. Bucci, R. DeRenzi, G. Guidi, M. Varotto, C. Segre, and P. Radaelli, *Physica C* **226**, 301-310 (1994).

44. "Local configurations in $ErBa_2Cu_3O_{6+\delta}$ for $0.15 \leq x \leq 0.9$," M. Varotto, G. Amoretti, C. Bucci, R. DeRenzi, G. Guidi, S.G. Jang, P. Radaelli, and C. Segre, *Physica C* **235**-240, 1261-1262 (1994).

45. "Determination of chemical diffusion coefficient of $SrFeCo_{0.5}O_x$ by the conductivity relaxation method," B. Ma, U. Balachandran, J-H. Park, and C.U. Segre, *Sol. St. Ionics* **83**, 65-71 (1996).

46. "Electrical transport properties and defect structure of $SrFeCo_{0.5}O_x$," B. Ma, U. Balachandran, J-H. Park, and C.U. Segre, *J. Electrochem. Soc.* **143**, 1736-1744 (1996).

47. "Humidity sensing properties of Nafion and sol-gel derived $SiO_2$/Nafion composite thin films," C.D. Feng, S.L. Sun, H. Wang, C.U. Segre, and J.R. Stetter, *Sensors and Actuators B - Chemical* **40**, 217-222 (1997).

48. "Methanol oxidation on single phase Pt-Ru-Os ternary alloys," K.L. Ley, Renxuan Liu, Cong Pu, Qinbai Fan, N. Leyarovska, C.U. Segre, and E.S. Smotkin, *J. Electrochem. Soc.* **144**, 1543-1548 (1997).

49. "Comparison of conductometric humidity-sensing polymers," H. Wang, C.D. Feng, S.L. Sun, C.U. Segre, and J.R. Stetter, *Sensors and Actuators B - Chemical* **40**, 211-216 (1997).

50. "Diffraction Enhanced Imaging Applied to Materials Science and Medicine," D. Chapman, W. Thomlinson, Z. Zhong, R.E. Johnston, E. Pisano, D. Washburn, D. Sayers, and C.U. Segre, *Synchrotron Radiation News* **11**, 4-11 (1998).

51. "A bent Laue analyzer for fluorescence EXAFS detection," Z. Zhong, D. Chapman, B. Bunker, G. Bunker, R. Fischetti, C. Segre, *J. Synchrotron Rad.* **6**, 212-214 (1999).

52. "In-situ XANES study of carbon supported Pt-Ru anode electrocatalyst for reformate-air polymer electrolyte fuel cell," R. Viswanathan, G. Hou, R. Liu, S.R. Bare, F. Modica, G. Mickelson, C.U. Segre, N.E. Leyarovska, T. Chikyow, and E.S. Smotkin, *J. Phys. Chem. B* **106**, 3458-3465 (2002).

53. "Nondestructive analysis of phase evolution and microstructure development in Ag/$(Bi,Pb)_2Sr_2Ca_2Cu_3O_x$ composite superconductor by 25keV transmission x-ray diffraction," V.A. Maroni, K. Venkataraman, A.J. Kropf, C.U. Segre, Y. Huangc, G.N. Riley, Jr, *Physica C* **382**, 21-26 (2002).

54. "Bent silicon crystal in the Laue geometry to resolve x-ray fluorescence for x-ray absorption spectroscopy," J.A. Kropf, R.J. Finch, A.J. Fortner, S. Aase, C. Karanfil, C.U. Segre, J. Terry, G. Bunker, L.D. Chapman, *Rev. Sci. Inst.*, **74**, 4696-4702 (2003).

55. "Detection of interfacial strain and phase separation in $MBa_2Cu_3O_{7-x}$ thin films using Raman spectroscopy and x-ray diffraction space mapping," K. Venkataraman, A.J. Kropf, C.U. Segre, Q.X. Jia, A. Goyal, B.W. Kang, S. Chattopadhyay, H. You, and V.A. Maroni, *Physica C*, **402**, 1 (2004).

56. "Effect of Mn concentration on the structural, optical and magnetic properties of GaMnN," G. Thaler, R. Frazier, B. Gila, J. Stapleton, M. Davidson, C.R. Abernathy, S.J. Pearton, and C. U. Segre, *Appl. Phys. Lett.*, **84**, 1314-1316 (2004).

57. "Effect of nucleation layer on the magnetic properties of GaMnN," G. Thaler, R. Frazier, B. Gila, J. Stapleton, M. Davidson, C.R. Abernathy, and C. U. Segre, *Appl. Phys. Lett.*, **84**, 2578-2580 (2004).

58. "XRD and XPS analysis of as-prepared and conditioned DMFC array membrane electrode assemblies," R.R. Diaz-Morales, R. Liu, E. Fachini, G. Chen, C.U. Segre, A. Martinez, C. Cabrera, and E.S. Smotkin, *J. Electrochem. Soc.* **151**, A1314 (2004).

59. "A device for selecting and rejecting x-ray harmonics in synchrotron radiation beams," C. Karanfil, D. Chapman, C.U. Segre, G. Bunker, *J. Synchrotron Rad.* **11**, (5) September, 393-398 (2004).

60. "SAXS Study of the nucleation of glycine crystals from a supersaturated solution," S. Chattopadhyay, D. Erdemir, J.M.B. Evans, J. Ilavsky, H. Amenitsch, C.U. Segre, and A.S. Myerson, *Cryst. Growth & Design* **5**, 523-527 (2005).

61. "Pt and Ru x-ray absorption spectroscopy of PtRu anode catalysts in operating direct methanol fuel cells," S. Stoupin, E-H. Chung, S. Chattopadhyay, C.U. Segre, and E.S. Smotkin, *J. Phys. Chem. B* **110**, 9932-9938 (2006).

62. "Relationship between self-association of glycine molecules in supersaturated solutions and solid state outcome," D. Erdemir, S. Chattopadhyay, L. Guo, J. Ilavsky, H. Amenitsch, C.U. Segre, and A.S. Myerson, *Phys. Rev. Lett.* **99**, 115702 (2007).

63. "High concentration manganese doping of ferroelectric $PbTiO_3$," S. Stoupin, S. Chattopadhyay, T. Bolin, and C.U. Segre, *Solid State Commun.* **144**, 46-49 (2007).

64. "Niobium speciation at the metal/oxide interface of corroded niobium-doped zircaloys: an x-ray absorption near-edge structure study," A. Froideval, C. Degueldre, C.U. Segre, M.A. Pouchon, and D. Grolimund, *Corrosion Science* **50,** 1313-1320 (2008).

65. "Synchrotron radiation-based x-ray analysis of bronze artifacts from and Iron Age site in the Judean Hills," E.S. Friedman, A.J. Brody, M.L. Young, J.D. Almer, C.U. Segre, and S.M. Mini, *J. Archaeological Science* **35**, 1951-1960 (2008).

66. "Structural analysis of sonochemically prepared PtRu versus Johnson Matthey PtRu in operating direct methanol fuel cells," S. Stoupin, H. Rivera, Z. Li, C.U. Segre, C. Korzeniewski, D.J. Casadonte, H. Inoue, and E.S. Smotkin, *Phys. Chem. Chem. Phys.* **10**, 6430-6437 (2008).

67. "An x-ray absorption spectroscopy study of Mo oxidation in Pb at elevated temperatures," S. Liu, D. Olive, J. Terry, and C.U. Segre, *J. Nucl. Mat.* **392**, 259-263 (2009).

68. "Embedded cluster Δ-XANES modeling of adsorption processes on Pt," E.A. Lewis, C.U. Segre, and E.S. Smotkin, *Electrochim. Acta* **54**, 7181-7185 (2009).

69. "Local compositional environment of Er in $ZnS:ErF_3$ thin film electroluminescent phosphors", M.R. Davidson, S. Stoupin, D. DeVito, J. Collingwood, C.U. Segre, and P.H. Holloway, *J. Appl. Phys.* **109**, 054505 (2011).

70. "Operando x-ray absorption and infrared fuel cell spectroscopy," E.A. Lewis, I. Kendrick, C. Grice, C.U. Segre, and E.S. Smotkin, *Electrochim. Acta* **56**, 8827-8832 (2011).

71. "Photoemission studies of fluorine functionalized porous graphitic carbon," H. Ganegoda, D.S. Jensen, D. Olive, L Cheng, C.U. Segre, M.R. Linford, and J. Terry, *J. Appl. Phys.* **111**, 053705 (2012).

72. "Quantitative performance measurements of bent crystal Laue analyzers for X-ray fluorescence spectroscopy," C. Karanfil, G. Bunker, M. Newville, C.U. Segre, and L.D. Chapman, *J. Synchrotron Radiation* **19**, 375-380 (2012).

73. "Correlation between the piezo-Barkhausen effect and the fatigue limit of steel," T. Erber, S.A. Guralnick, C.U. Segre, and W. Tong, *J. Phys. D: Appl. Phys.* **45**, 465002 (2012).

74. "Structure-property-activity correlations of Pt-bimetallic nanoparticles: a theoretical study," Q. Jia, C.U. Segre, D. Ramaker, K. Caldwell, M. Trahan, S. Mukerjee, *Electrochimica Acta* **88**, 604–613 (2013).

75. "Temperature dependence of aliovalent-vanadium doping in $LiFePO_4$ Cathodes," K.L. Harrison, C.A. Bridges, M.P. Paranthaman, C.U. Segre , J. Katsoudas , V.A. Maroni , J.C. Idrobo, J.B. Goodenough, and A. Manthiram, *Chem. Mater.* **25** 768-781 (2013).

76. "In situ Ru K-edge x-ray absorption spectroscopy study of methanol oxidation mechanisms on model submonolayer Ru on Pt nanoparticle electrocatalyst," C.J. Pelliccione, E.V. Timofeeva, J.P. Katsoudas, and C.U. Segre, *J. Phys. Chem. C* **117**, 18904–18912 (2013).

77. "X-ray powder diffraction refinement of $PbTi_{1-x}Fe_xO_{3-\delta}$ solid solution series," H. Ganegoda, J.A. Kaduk, and C.U. Segre, *Powder Diffraction* **28** (3) (to be published, 2013; http://dx.doi.org/10.1017/S0885715613000511).

78. "Evidence for core–shell nanoclusters in oxygen dispersion strengthened steels measured using X-ray absorption spectroscopy," S. Liu, G.R. Odette, and C.U. Segre, *J. Nucl. Mater.* **445**, 50-56 (2014).

79. "Chemical and electrochemical lithiation of $LiVOPO_4$ cathodes for lithium-ion batteries," K.L. Harrison , C.A. Bridges , C.U. Segre , C.D. Varnado , D. Applestone , C.W. Bielawski , M.P. Paranthaman, and A. Manthiram, *Chem. Mater.* **26**, 3849-3861 (2014).

80. "X-ray absorption spectroscopy elucidates the impact of structural disorder on electron mobility in amorphous zinc-tin-oxide thin films," S.C. Siah, S.W. Lee, Y.S. Lee, J. Heo, T. Shibata, C.U. Segre, R.G. Gordon, and T. Buonassisi, *Appl. Phys. Lett.* **104**, 242113 (2014).

81. "Microscopic description of the evolution of the local structure and an evaluation of the chemical pressure concept in a solid solution," S. Mukherjee, A. Nag, V. Kocevski, P.K. Santra, M. Balasubramanian, S. Chattopadhyay, T. Shibata, F. Schaefers, J. Rusz, C. Gerard, O. Eriksson, C.U. Segre, and D.D. Sarma, *Phys. Rev. B* **89**, 224105 (2014).

82. "Structural and magnetic effects of mechanically grinding $Co_3(OH)_2(C_4O_4)_2{\cdot}3H_2O$," J.H. McNeely, K. Falaneh, H. Ganegoda, R. Clark, C.U. Segre, and B. Cage, *Polyhedron* **79**, 60-65 (2014).

83. "Note: Sample chamber for in situ x-ray absorption spectroscopy studies of battery materials," C.J. Pelliccione, E.V. Timofeeva, J.P. Katsoudas, and C.U. Segre, *Rev. Sci. Instrum.* **85**, 126108 (2014).

84. "In situ XAS study of the capacity fading mechanism in hybrid $Sn_3O_2(OH)_2$/graphite battery anode nanomaterials," C.J. Pelliccione, E.V. Timofeeva, and C.U. Segre, *Chem. Mater.* **27**, 574-580 (2015).

85. "Amorphous W–S–N thin films: the atomic structure behind ultra-low friction," L. Isaeva, J. Sundberg, S. Mukherjee, C.J. Pelliccione, A. Lindblad, C.U. Segre, U. Jansson, D.D. Sarma, O. Eriksson, and K. Kádas, *Acta Mater.*, **82**, 84-93 (2015).

86. "E-spun composite fibers of collagen and dragline silk protein: fiber mechanics, biocompatibility, and application in stem cell differentiation," B. Zhu, W. Li, R.V. Lewis, C.U. Segre, and R. Wang, *Biomacromol.*, to be published (2015).

87. "Efficient solid-state light-emitting CuCdS nanocrystals synthesized in air," A.H. Khan, A. Dalui, S. Mukherjee, C.U. Segre, D.D. Sarma, and S. Acharya, *Angew. Chem. Int. Ed.***127**, 2681-2686 (2015).

88. "Spectroscopic evidence of uranium immobilization in acidic wetlands by natural organic matter and plant roots", D. Li, D.I. Kaplan, H. Chang, J. Seaman, P.R. Jaffee, P. Koster, K.G. Scheckel, C.U. Segre, N. Chen, D.T. Jiang, M. Newville, and A. Lanzirotti, *Environ. Sci. Tech*ol. **49**, 2823–2832 (2015).

89. "Investigation of CaO-$CO_2$ reaction kinetics by in-situ XRD using synchrotron radiation," A. Biasin, C.U. Segre, G. Salviulo, F. Zorzi, and M. Strumendo, *Chem. Eng. Sci.* **127**, 13-24 (2015).

90. "The synthesis of ternary acetylides with tellurium: $Li_2TeC_2$ and $Na_2TeC_2$," K. Németh, A.K. Unni, C. Kanmals, C.U. Segre, J. Kaduk, I.D. Bloom, and V.A. Maroni, *RSC Adv.* **5** 55986-55993 (2015).

91. "In situ XAFS study of the capacity fading mechanisms in ZnO anodes for lithium-ion batteries," C.J. Pelliccione, Y. Ding, E.V. Timofeeva, and C.U. Segre, *J. Electrochem. Soc.* **162**, A1935-A1939 (2015).

92. "High-temperature, in situ x-ray absorption study of $Sr_2MgMoO_6$ solid-oxide fuel-cell anode materials," B.C. Eigenbrodt, A.M. Young, T.G. Howell, C.U. Segre, and T.L. Reitz, *ChemElectroChem*, **2**, 1568-1575 (2015)

93. "$CaCO_3$ crystallite evolution during CaO carbonation: Critical crystallite size and rate constant measurement by in-situ synchrotron radiation x-ray powder diffraction," A. Biasin, C.U. Segre, and M. Strumendo, *Cryst. Growth Des*. **15**, 5188–5201 (2015)k.

94. "Engineering nanofluid electrodes: controlling rheology and electrochemical activity of $\gamma$-$Fe_2O_3$ nanoparticles," S. Sen, E. Moazzen, S. Aryal, C.U. Segre, E.V. Timofeeva, *J. Nanoparticle Research* **17**:437 (2015).

95. "Dopant activation in Sn-doped $Ga_2O_3$ investigated by x-ray absorption spectroscopy," S.C. Siah, R.E. Brandt, K. Lim, L.T. Schelhas, R. Jaramillo, M.D. Heinemann, D. Chua, J. Wright, J.D. Perkins, C.U. Segre, R.G. Gordon, M.F. Toney, and T. Buonassisi, *Appl. Phys. Lett.*, **107** 252103 (2015).

96. "Structural analysis of $Tm^{3+}$ doped As-S-Ga glasses by Raman and EXAFS spectroscopy," A. Galstyan, S.H. Messaddeq, C.U. Segre, T. Galstian, and Y. Messaddeq, *J. Non-Cryst. Solids* **432**, 487-492 (2016).

97. "Potential-resolved in situ x-ray absorption spectroscopy study of Sn and $SnO_2$ nanomaterial anodes for lithium-ion batteries," C.J. Pelliccione, E.V. Timofeeva, and C.U. Segre, *J. Phys. Chem. C* **120** 5331-5339 (2016).

98. "Synthetic and spectroscopic study of the mechanism of atomic layer deposition of tin dioxide," M.S. Weimer, B. Hu, S.J. Kraft, R.G. Gordon, C.U. Segre, and A.S. Hock, *Organometallics* **35** 1202-1208 (2016).

99. "$Ba_3(Cr_{0.97(1)}Te_{0.03(1)})_2TeO_9$: in search of Jahn–Teller distorted Cr(II) oxide," M.R. Li, Z. Deng, S.H. Lapidus, P.W. Stephens, C.U. Segre, M. Croft, R. Paria Sena, J. Hadermann, D. Walker, and M. Greenblatt, *Inorg. Chem.* **55**, 10135-10142 (2016).

100. "Two dimensional hybrid organohalide perovskites from ultrathin PbS nanocrystals as template," J. Pradham, S. Mukherjee, A.H. Khan, A Dalui, B. Satapati, C.U. Segre, D.D. Sarma, and S. Acharya, *J. Phys. Chem. C* **121**, 6401-6408 (2017).

101. "Electroactive nanofluids with high solid loading and low viscosity for rechargeable redox flow batteries," S. Sen, C.-M. Chow, E. Moazzen, C.U. Segre, and E.V. Timofeeva, *J. Appl. Electrochem.* **47**, 593-605 (2017).

102. "Controlled synthesis of $MnO_2$ nanoparticles for aqueous battery cathodes: polymorphism-capacity correlation," E. Moazzen, E.V. Timofeeva, and C.U. Segre, *J. Mater. Sci.* **52**, 8107-8118 (2017).

103. "β-Nickel hydroxide cathode material for nano-suspension redox flow batteries," Y. Li, C. He, E.V. Timofeeva, Y. Ding, J. Parrondo, C.U. Segre, and V. Ramani, *Front. Energy* **11**, 401-409 (2017).

104. "Molecular beam epitaxy growth and structure of self-assembled $Bi_2Se_3/Bi_2MnSe_4$ multilayer heterostructures," J.A. Hagmann, X. Li, S. Chowdhury, S.-N. Dong, S. Rouvimov, S.J. Pookpanratana, K.M. Yu, T.A. Orlova, T.B. Bolin, C.U. Segre, D.G. Seiler, C.A. Richter, X. Liu, M. Dobrowolska, and J.K. Furdyna, *New J. Phys.* **19**, 085002 (2017).

105. "Structure-property relationships in $NO_x$ sensor materials composed of arrays of vanadium oxide nanoclusters," N.R. Putrevu, S.B. Darling, C.U. Segre, H. Ganegoda, and M.I. Khan, *Solid State Sci.*, in press (2017).

106. "Role of crystal lattice templating and galvanic coupling in enhanced reversible capacity of $Ni(OH)_2/Co(OH)_2$ core/shell battery cathode," E. Moazzen, E.V. Timofeeva, and C.U. Segre, *Electrochim. Acta,* in press (2017).

107. "In situ EXAFS-derived mechanism of highly reversible tin phosphide/graphite composite anode for Li-ion batteries," Y. Ding, Z. Li, E.V. Timofeeva, and C.U. Segre, *Adv. Energy Mater.* **8**,1702134 (2018).

108. "Structural studies of capacity activation and reduced voltage fading in Li-rich, Mn-Ni-Fe composite oxide cathode," S. Aryal, E.V. Timofeeva, and C.U. Segre, *J. Electrochem. Soc.* **165**, A1-A8 (2018).

109. "$YCrWO_6$: Polar and magnetic oxide with $CaTa_2O_6$-related structure," S.W. Kim, T.J. Emge, Z. Deng, R. Uppuluri, L. Collins, S.H. Lapidus, C.U. Segre, M. Croft, C. Jin, V. Gopalan, S.V. Kalinin, and M. Greenblatt, *Chem. Mater.* **30**, 1045-1054 (2018).

110. "Evolution of the local structure within chromophoric Mn-$O_5$ trigonal bipyramids in $YMn_{1-x}In_x$ with composition," S. Mukherjee, H. Ganegoda, A. Kumar, S. Pal, C.U. Segre, and D.D. Sarma, *Inorg. Chem.* **57**, 9012-9019 (2018).

111. "Synthesis and electrochemical properties of partially flourinated ether solvents for lithium–sodium battery electrolytes," Z. Yue, H. Dunya, S. Aryal, C.U. Segre, and B. Mandal, *J. Power Sources* **401**, 271-277 (2018).

112. "$MnFe_{0.5}Ru_{0.5}O_3$: an above-room-temperature antiferromagnetic semiconductor," X. Tan, E.E. McCabe, F. Orlandi, P. Manuel, M. Batuk, J. Hadermann, Z. Deng, C. Jin, I. Nowik, R. Herber, C.U. Segre, S. Liu, M. Croft, C.-J. Kang, S. Lapidus, C.E. Frank, H. Padmanabhan, V. Gopalan, M. Wu, M.-R. Li, G. Kotliar, D. Walker, and M. Greenblatt, *J. Mater. Chem. C* **7**, 509-522 (2019).

113. "Analysis of textural properties of CaO-based $CO_2$ sorbents by ex-situ USAXS," A. Benedetti, J. Ilavsky, C.U. Segre, and M. Strumendo, *Chem. Eng. J.* **355**, 760-776 (2019).

114. "Effect of sub-nanoparticle architecture on cycling performance of $MnO_2$ battery cathodes through thermal tuning of polymorph composition," E. Moazzen, E.V. Timofeeva, J.A. Kaduk, and C.U. Segre, *Cryst. Growth Des.* **19**, 1584-1591 (2019).

115. "Discovery of anion insertion electrochemistry in layered hydroxide nanomaterials," M.J. Young, T. Kiryutina, N.M. Bedford, and C.U. Segre, *Sci. Rep.* **9**, 2462 (2019).

116. "Charge disproportionate antiferromagnetism at the verge of the insulator-metal transition in doped $LaFeO_3$," S. Jana, S.K. Panda, D. Phuyal, B. Pal, S. Mukherjee, A. Dutta, P. Anil Kumar, D. Hedlund, J. Schött, P. Thunström, Y. Kvashnin, H. Rensmo, M. Venkata Kamalakar, C.U. Segre, P. Svedlindh, K. Gunnarsson, S. Biermann, O. Eriksson, O. Karis, and D. D. Sarma, *Phys. Rev. B* **99**, 075106 (2019).

117. "Long-term cycle behavior of nano-LiCoO and its post-mortem analysis," M. Ashuri, Q. He, Z. Shi, C. Chen, W. Yao, J.A. Kaduk, C.U. Segre, and L.L. Shaw, *J. Phys. Chem. C* **123**, 3299-3308 (2019).

118. "Tetragonal $Cs_{1.17}In_{0.81}Cl_3$: a charge-ordered indium halide perovskite derivative," X. Tan, P.W. Stephens, M. Hendrickx, J. Hadermann, C.U. Segre, M. Croft, C.-J. Kang, Z. Deng, S.H. Lapidus, S.W. Kim, C. Jin, G. Kotliar, and M. Greenblatt, *Chem. Mater.* **31**, 1981-1989 (2019).

119. "Quench-free enhanced emission in cluster-free Er-doped heavy metal oxide glasses," K. Lipinska, F. Cavallo, A.J. Ayitou, and C.U. Segre, *Optical Mater. Expr.* **9**, 1072-1084 (2019).

120. "High temperature x-ray absorption spectroscopy of the local electronic structure and oxide vacancy formation in the $Sr_2Fe_{1.5}Mo_{0.5}O_{6-\delta}$ solid oxide fuel cell anode catalyst," A.C. D'Orazio, T. Marshall, T. Sultana, J.K. Gerardi, C.U. Segre, J.P. Carlo, and B. Eigenbrodt, *ACS Appl. Energy Mater.* **2**, 3061-3070 (2019).

121. "$MnO_2$-coated sulfur-filled hollow carbon nanosphere-based cathode materials for enhancing electrochemical performance in Li-S cells," Z. Yue, H. Dunya, K. Kucuk, S. Aryal, Q. Ma, S. Antonov, M. Ashuri, B. Alabbad, Y. Lin, C.U. Segre, and B.K. Mandal, *J. Electrochem. Soc.* **166**, A1355 (2019).

122. "Identifying catalytic active sites of trimolybdenum phosphide ($Mo_3P$) for electrochemical hydrogen evolution," A. Kondori, M. Esmaeilirad, A. Baskin, B. Song, J. Wei, W. Chen, C.U. Segre, R. Shahbazian-Yassar, D. Prendergast, and M. Asadi, *Adv. Energy Mater.* 1900516, (2019).

123. "Coexistence of static and dynamic magnetism in the Kitaev spin liquid material $Cu_2IrO_3$," E.M. Kenny, C.U. Segre, W.L. Dit-Hauret, O.I. Lebedev, M. Abramchuk, A. Berlie, S.P. Cotrell, G. Simutis, F. Bahrami, N.E. Mordvinova, G. Fabbris, J.L. McChesney, D. Haskel, X. Rocquefelte, M.J. Graf, and F. Tafti, *Phys. Rev. B* **100**, 094418 (2019).

124. "Initial assessment of multilayer silicon detectors for hard x-ray imaging," X. Li, P. Chu, C.M. O'Shaughnessy, C. Morris, M. Demarteau, R. Wagner, J. Xia, L, Xia, R.-Y. Zhu, L. Zhang, C. Hu, B. Adams, J. Katsoudas, Y. Ding, C.U. Segre, T.A. Smith, and J. Shih, *Nucl. Instrum. Meth. A* **942**, 162414 (2019).

125. "Enhancement in electrochemical performance of lithium-sulfur cells through sulfur encapsulation in hollow carbon nanospheres coated with ultra-thin aluminum fluoride layer," M. Ashuri, H. Dunya, Z. Yue, D. Alramahi, X. Mei, K. Kucuk, S. Aryal, C.U. Segre, and B.K. Mandal, *Chem. Select*, **4**, 12622-12629 (2019).

126. "Influence of coordination environment of anchored single-site cobalt catalyst on $CO_2$ hydrogenation," J.D. Jimenez, C. Wen, M.M. Royko, A.J. Kropf, C.U. Segre, and J. Lauterbach, *ChemCatChem* **12**, 846-854 (2020).

127. "Nanoscale $MnO_2$ cathodes for Li-ion batteries: effect of thermal and mechanical processing," E. Moazzen, K. Kucuk, S. Aryal, E.V. Timofeeva, and C.U. Segre, *J. Power Sources* **448**, 227374 (2020).

128. "Oxygen functionalized copper nanoparticles for solar-driven conversion of carbon dioxide to methane," M. Esmaeilirad, A. Kondori, B. Song, A. Ruiz Belmonte, J. Wei, K. Kucuk, S.M. Khanvilkar, E. Efimoff, W. Chen, C.U. Segre, R. Shahbazian-Yassar, and M. Asadi, *ACS Nano* **14**, 2099-2108 (2020).

129. "A new graphitic carbon nitride-coated dual core-shell sulfur cathode for highly stable lithium-sulfur cells," H. Dunya, Z. Yue, M. Ashuri, X. Mei, Y. Li, K. Kucuk, S. Aryal, C.U. Segre, and B.K. Mandal, *Mat. Chem. Phys.* **246**, 122842 (2020).

130. "Origin of itinerant carriers in an antiferromagnetic $LaFe_{1-x}Mo_xO_3$ studied by x-ray spectroscopies," D. Phuyal, S. Mukherjee, S.K. Panda, S. Jana, C.U. Segre, L. Simonelli, S.B. Butorin, H. Rensmo, and O. Karis, *Phys. Rev. Mater.* **4**, 034405 (2020).

131. "$MnO_2$-coated dual core–shell spindle-like nanorods for improved capacity retention of lithium–sulfur batteries," H. Dunya, M. Ashuri, D. Alramahi, Z. Yue, K. Kucuk, C.U. Segre, and B.K. Mandal, *ChemEngineering* **4**, 42 (2020).

132. "Synthesis of a very high specific surface area active carbon and its electrical double-layer capacitor properties in organic electrolytes," Z. Yue, H. Dunya, M. Ashuri, K. Kucuk, S. Aryal, S. Antonov, B. Alabbad, C.U. Segre, and B.K. Mandal, *ChemEngineering* **4**, 43 (2020).

133. "Spontaneous redox continuum reveals sequestered technetium clusters and retarded mineral transformation of iron," D. Boglaienko, J.A. Soltis, R.K. Kukkadapu, Y. Du, L.E. Sweet, V.E. Holfeltz, G.B. Hall, E.C. Buck, C.U. Segre, H.P. Emerson, Y. Katsenovich, and T.G. Levitskaia, *Commun. Chem.* **3**, 87 (2020).

134. "Dual metal interbonding as the chemical facilitator for single-atom dispersions," Y. Zhou, E. Song, W. Chen, C.U. Segre, J. Zhou, Y.-C. Lin, C. Zhou, R. Ma, P. Liu, S. Chu, T. Thomas, J. Yang, Q. Liu, K. Suenaga, Z. Liu, J. Liu, and J. Wang, *Adv. Mater.* **32**, 2003484 (2020).

135. "Surface decoration accelerates the hydrogen evolution kinetics of a perovskite oxide in alkaline solution," C. Hu, J. Hong, J. Huang, W. Chen, C.U. Segre, K. Suenaga, W. Zhao, F. Huang, and J. Wang, *Energy Environ. Sci.* **13**, 4249-4257 (2020).

136. "Rational design of titanium oxide-coated dual core–shell sulfur nanocomposite cathode for highly stable lithium–sulfur batteries," H. Dunya, M. Ashuri, Z. Yue, K. Kucuk, Y. Lin, D. Alramahi, C.U. Segre, and B.K. Mandal, *J. Phys. Chem. Solids* **149**, 109791 (2020).

137. "Kinetically stable oxide overlayers on $Mo_3P$ nanoparticles enabling lithium-air batteries with low overpotentials and long cycle life," A. Kondori, M. Esmaeilirad, A. Baskin, B. Song, J. Wei, W. Chen, C.U. Segre, R. Shahbazian-Yassar, D. Prendergast, and M. Asadi, *Adv. Mater.* **32**, 2004028 (2020).

138. "Fundamental understanding of high-capacity lithium-excess cathodes with disordered rock salt structure," H. Lin, B. Moreno, K. Kucuk, S. Zhang, S. Aryal, Z. Li, C.U. Segre, J. Rodriguez, D. Puthusseri, L. Cai, X. Jiao, and V.G. Pol, *J. Mater. Sci. Technol.* **74**, 60-68 (2021).

139. "Roles of Mn and Ni in Li-rich Mn-Ni-Fe oxide cathodes," S. Aryal, K. Kucuk, E.V. Timofeeva, and C.U. Segre, *Mater. Today Commun.* **26**, 101693 (2021).

140. "High-pressure synthesis of double perovskite $Ba_2NiIrO_6$: In search of a ferromagnetic insulator," H.L Feng, Z. Deng, C.U. Segre, M. Croft, S.H. Lapidus, C.E. Frank, Y. Shi, C. Jin, D. Walker, and M. Greenblatt, *Inorg. Chem.* **60**, 1241-1247 (2021).

141. "In situ XAS study of the local structure of the nano-$Li_2FeSiO_4$/C cathode," K. Kucuk, S. Aryal, E. Moazzen, E.V. Timofeeva, and C.U. Segre, *J. Phys. Energy*, **3**, 034015 (2021).

142. "Role of Fe doping on local structure and electrical and magnetic properties of $PbTiO_3$," H. Ganegoda, S. Mukherjee, B. Ma, D.T. Olive, J.H. McNeely, J.A. Kaduk, J. Terry, H. Rensmo, and C.U. Segre, *J. Phys. Chem. C* **125**, 12342-12354 (2021).

143. "Antiferromagnetic order and spin-canting transition in the corrugated square net compound $Cu_3(TeO_4)(SO_4)\cdot H_2O$," Z.-C. Wang, K. Thanabalasingam, J.P. Scheifers, A. Streeter, G.T. McCandless, J. Gaudet, C.M. Brown, C.U. Segre, J.Y. Chan, and F. Tafti, *Inorg. Chem.* **60**, 10565-10571 (2021).

144. "Structure and electronic effects from Mn and Nb co-doping for low band gap $BaTiO_3$ ferroelectrics," S. Mukherjee, D. Phyyal, C.U. Segre, S. Das, O. Karis, T. Edvinsson, and H. Rensmo, *J. Phys. Chem. C* **125**, 14910-14923 (2021).

145. "Gold-like activity, copper-like selectivity of heteroatomic transition metal carbides for electrocatalytic carbon dioxide reduction reaction," M. Esmaeilirad, A. Baskin, A. Kondori, A.S. Matias, J. Qian, B. Song, M.T. Saray, K. Kucuk, A. Ruiz Belmonte, P. Navarro Munoz Delgado, J. Park, R. Azari, C.U. Segre, R. Shahbazian-Yassar, D. Prendergast, and M. Asadi, *Nat. Commun.* **12**, 5067 (2021).

146. "A new graphitic nitride and reduced graphene oxide-based sulfur cathode for high-capacity lithium-sulfur cells," A.M. Suzanowicz, Y. Lee, H. Lin, O.J.J. Marques, C.U. Segre, and B.K. Mandal, *Energies* **15**, 702 (2022).

147. "Synthesis and electrochemical properties of lignin-derived high surface area carbons," A.M. Suzanowicz, Y. Lee, O.J.J. Marques, H. Lin, C.U. Segre, and B.K. Mandal, *Surfaces* **5**, 265-279 (2022).

148. "Atomically-dispersed Mn-$(N\text{-}C_2)_2(O\text{-}C_2)_2$ sites on carbon for efficient oxygen reduction reaction," L. Zong, F. Lu, W. Zhang, K. Fan, X. Chen, B. Johannessen, D. Qi, N.M. Bedford, M. Warren, C.U. Segre, P. Liu, L. Wang, and H. Zhao, *Energy Storage Mater.* **49**, 209-218 (2022).

149. "Nickel hydroxide nanofluid cathodes with high solid loadings and low viscosity for energy storage applications," S. Sen, E. Moazzen, E. Draxler, C.U. Segre, and E.V. Timofeeva, *Energies* **15**, 4728 (2022).

150. "A novel SAXS model for multi-texture systems: application to $CaCO_3$ calcination using *in-situ* USAXS-SAXS-WAXS, M. Strumendo, C.U. Segre, J. Ilavsky, and I. Kuzmenko, *Appl. Mater. Today* **29**, 101568 (2022).

151. "Efficient electrocatalytic conversion of $CO_2$ to ethanol enabled by imidazolium- functionalized ionomer confined molybdenum phosphide," M. Esmaeilirad, A. Kondori, N. Shan, M.T. Saray, S. Sarkar, A.M. Harzandi, C.M. Megaridis, R. Shahbazian-Yassar, L.A. Curtiss, C.U. Segre, and M. Asadi, *Appl. Catal. B* 121681 (2022).

152. "Charge transfer-triggered $Bi^{+3}$ near-infrared emission in $Y_2Ti_2O_7$ for dual-mode temperature sensing," X. Wang, F. Jahanbazi, J. Wei, C.U. Segre, W. Chen, and Y. Mao, *Appl. Mater. Interfaces* **14**, 36834-36844 (2022).

153. "Excitation-dependent photoluminescence of $BaZrO_3$:$Eu^{+3}$ crystals," S.K. Gupta, H. Abdou, C.U. Segre, and Y. Mao, *Nanomaterials* **12**, 3028 (2022).

154. "Operando elucidation of electrocatalytic and redox mechanisms on a 2D metal organic framework catalyst for efficient electrosynthesis of hydrogen peroxide in neutral media," R.D. Ross, H. Sheng, Y. Ding, A.N. James, D. Feng, J.R. Schmidt, C.U. Segre, and S. Jin, *J. Am. Chem Soc.* **144**, 15845-15854 (2022).

**Refereed Conference Proceedings**

1. "Nonlinear pressure effects in superconducting rare earth-iron-silicides," C.U. Segre and H.F. Braun, in *Physics of Solids Under High Pressure*, Proceedings of the International Symposium, Bad Honnef, Germany, August 10-14, 1981, eds. J.S. Schilling and R.N. Shelton, (North-Holland, Amsterdam, 1981), p. 381-384.

2. "Properties of $Y_3Ru_4Ge_{13}$ and isotypic compounds," C.U. Segre, H.F. Braun, and K. Yvon, in *Ternary Superconductors*, Proceedings of the International Conference, Lake Geneva, WI, USA, September 24-26, 1980, eds. G.K. Shenoy, B.D. Dunlap, and F.Y. Fradin, (Elsevier North-Holland, New York, 1981), p. 243-246.

3. "Ternary superconductors of the $Sc_5Co_4Si_{10}$ type," H.F. Braun and C.U. Segre, in *Ternary Superconductors*, Proceedings of the International Conference, Lake Geneva, WI, USA, September 24-26, 1980, eds. G.K. Shenoy, B.D. Dunlap, and F.Y. Fradin, (Elsevier North-Holland, New York, 1981), p. 239-242.

4. "Effect of pressure on the superconducting and magnetic critical temperatures of bct ternary ruthenium borides," R.N. Shelton, C.U. Segre, and D.C. Johnston, in *Ternary Superconductors*, Proceedings of the International Conference, Lake Geneva, WI, USA, September 24-26, 1980, eds. G.K. Shenoy, B.D. Dunlap, and F.Y. Fradin, (Elsevier North-Holland, New York, 1981), p. 205-208.

5. "The phase diagram for a Eu compound undergoing configurational crossover: Mössbauer effect measurements," M.C. Croft, C.U. Segre, J.A. Hodges, A. Krishnan, V. Murgai, L.C. Gupta, and R.D. Parks, in *Valence Instabilities*, Proceedings of the International Conference, Zurich, Switzerland, April 13-16, 1982, eds. P. Wachter and H. Boppart, (North-Holland, Amsterdam, 1982), p. 121-128.

6. "Valence instabilities: model predictions for single impurity and cooperative behavior," M.C. Croft, E. Kemly, A.M. Zolandz, C.U. Segre, J. Gortych, in *High Pressure in Science and Technology: Part I - Collective Phenomena and Transport Properties*, Proceedings of the $9^{th}$ AIRAPT International High Pressure Conference, Albany, NY, USA, July 24-29, 1983, eds. C. Homan, R.K. MacCrone, and E. Whalley (Elsevier North-Holland, New York, 1984) p. 123-126.

7. "Mössbauer effect and $L_{III}$ absorption measurements on $EuPd_2Si_2$ and other Eu compounds," E. Kemly, M. Croft, C.U. Segre, V. Murgai, L.C. Gupta, C. Godart, and R.D. Parks, in Proceedings of the $4^{th}$ International Conference on Valence Fluctuations, Cologne, Germany, August 27-30, 1984, *J. Magn. Magn. Mat.* **47** 403-406 (1985).

8. "Sputtered thin films of $Er_2Fe_{14}B$ permanent magnets," C.U. Segre, J.F. Zasadzinski, and E.D. Rippert, in *Ternary and Multinary Compounds*, Proceedings of the $7^{th}$ International Conference, Snowmass, Colorado, September 10-12, 1986, eds. S.K. Deb, A. Zunger (Materials Research Society, Pittsburgh, 1987), p. 491-495.

9. "Thin film fabrication of $R_2Fe_{14}B$ compounds," J.F. Zasadzinski, C.U. Segre, E.D. Rippert, J. Chrzas, and P. Radusewicz, 1987 MRS Spring Meeting - Symposium F: Permanent Magnet Materials, Anaheim CA, USA, April 21-25, 1987, *MRS Symp. Proc.* **96**, 55-63 (1987).

10. "X-Ray diffraction and Mössbauer effect measurements near a valence transition," H. Jahns, M. Croft, E. Kemly, B. Grier, and C.U. Segre, in *Theoretical and Experimental Aspects of Valence Fluctuations*, Proceedings of the $5^{th}$ International Conference on Valence Fluctuations, Bangalore, India January 5-9, 1987 (Plenum, New York, 1987) p. 655-658.

11. "Copper oxidation states, vacancy ordering and their effect on high temperature superconductivity," I.K. Schuller, D.G. Hinks, J.D. Jorgensen, L. Soderholm, M.Beno, K. Zhang, C.U. Segre, Y. Bruynseraede, and J.-P. Locquet, in *Novel Superconductivity*, Proceedings of the International Workshop on Novel Mechanisms of Superconductivity, June 22-27, 1987, Berkeley, California, USA, eds. S.A. Wolf and V.Z. Kresin, (Plenum, New York, 1987), p. 647-652.

12. "Neutron diffraction studies of high $T_C$ superconductors," D.G. Hinks, B. Dabrowski, K. Zhang, C.U. Segre, J.D. Jorgensen, L. Soderholm, and M. Beno, in Proceedings of 1987 MRS Fall Meeting, Symposium AA - High Temperature Superconductivity, Boston, MA, November 30-December 5, 1987, *MRS Symp. Proc.* **99**, 9 (1987).

13. 'Oxygen order, stochiometry and magnetic behavior in $YBa_2(Cu_{1-x}Fe_x)_3O_{7+\delta}$," C.W. Kimball, J.L. Matykiewicz, J. Giapintzakis, H. Lee, B.D. Dunlap, M. Slaski, F.Y. Fradin, C.U. Segre, and J.D. Jorgensen, in Proceedings of 1987 MRS Fall Meeting, Symposium AA - High Temperature Superconductivity, Boston, MA, November 30-December 5, 1987, *MRS Symp. Proc.* **99**, 107 (1987).

14. "Local atomic structure of $La_{2-x}(Sr,Ba)_xCuO_4$ determined by pulsed neutron scattering," T. Egami, W. Dmowski, J.D. Jorgensen, D.G. Hinks, D.W. Capone, II, C.U. Segre, and K. Zhang, in High Temperature Superconductivity, Proceedings of the Drexel International Conference, Philadelphia, PA, USA, July 29-30, 1987, *Rev. Solid State Sci.* **1**, 247-257 (1988).

15. "'Microstructural investigation of $YBa_2Cu_3O_{7-\delta}$ films deposited by laser ablation from $BaF_2/Y_2O_3/CuO$ targets," R.L. Burton, C.U. Segre, H.O. Marcy, and C.R. Kannewurf, in *Technology of Thin Film Superconductors*, Proceedings of the International Conference, Colorado Springs, Colorado, November 14-18, 1988, eds. R.D. McConnell and S.A. Wolf (Plenum, New York, 1988) p. 61-70.

16. "Cation substitution studies in the $YBa_2Cu_3O_{7-\delta}$ structure," F.C. Matacotta, C.U. Segre, C. Infante, J. Ramos-Arhuis, B. Ma, and P. Ganguly, in *High Temperature Superconductivity: Proceedings of the 3rd National Meeting*, Genoa, Italy, February 1990, eds. C. Ferdeghini and A.S. Siri, (World Scientific, Singapore 1990) p. 75-82.

17. "Deposition of YBCO films on $SrTiO_3$ by laser ablation," M. Bianconi, L. Correra, R. Fabbri, A. Lamagna, S. Nicoletti, J. Ramos-Arhuis, F.C. Matacotta, C.U. Segre, and J. Siejka, *High Temperature Superconductivity: Proceedings of the 3rd National Meeting*, Genoa, Italy, February 1990, eds. C. Ferdeghini and A.S. Siri, (World Scientific, Singapore 1990) p. 409-414.

18. "Electronic/ionic conductivity and oxygen diffusion coefficient of the Sr-Fe-Co-O system," B. Ma, J-H. Park, C.U. Segre, and U. Balachandran, in Proceedings of 1995 MRS Fall Meeting: Symposium T - Electrically-Based Microstructural Characterization, Boston, MA, November 27-December 1, *MRS Symp. Proc.* **393**, 49-54 (1995).

19. "Electrical properties and defect structure in the Sr-Fe-Co-O system," B. Ma, J-H. Park, C.U. Segre, and U. Balachandran, in Proceedings of 1995 MRS Fall Meeting: Symposium T - Electrically-Based Microstructural Characterization, Boston, MA, November 27-December 1, *MRS Symp. Proc.* **411**, 163-168 (1996).

20. "A bent Laue analyzer detection system for dilute fluorescence XAS," C. Karanfil, Z. Zhong, L.D. Chapman, R. Fischetti, G.B. Bunker, C.U. Segre, and B.A. Bunker, in Proceedings of the $11^{th}$ National Conference on Synchrotron Radiation Instrumentation, Stanford, CA, October 13-15, *AIP Conf. Proc.* **521,** 178-182 (2000).

21. "A robust cryogenic crystal design in use at the APS," I. Ivanov, G. Rosenbaum, J. Chrzas, R. Fischetti, C.U. Segre, and L.D. Chapman, in Proceedings of the $11^{th}$ National Conference on Synchrotron Radiation Instrumentation, Stanford, CA, October 13-15, *AIP Conf. Proc.* **521**, 271-275 (2000).

22. "A 'beam cleaner' for harmonic selection/rejection," C. Karanfil, L.D. Chapman, G.B. Bunker, C.U. Segre, and N.E. Leyarovska, in Proceedings of the $11^{th}$ National Conference on Synchrotron Radiation Instrumentation, Stanford, CA, October 13-15, *AIP Conf. Proc.* **521**, 276-282 (2000).

23. "The MRCAT insertion device beamline at the Advanced Photon Source," C.U. Segre, N.E. Leyarovska, L.D. Chapman, W.M. Lavender, P.W. Plag, A.S. King, A.J. Kropf, B.A. Bunker, K.M. Kemner, P. Dutta, R.S. Duran, and J. Kaduk, in Proceedings of the $11^{th}$ National Conference on Synchrotron Radiation Instrumentation, Stanford, CA, October 13-15, *AIP Conf. Proc.* **521**, 419-422 (2000).

24. "Investigation of size effects in magnetoelectric $BiFeO_3$," S. Chattopadhyay, S.D. Kelly, V.R. Palkar, L. Fan, C.U. Segre, in Proceedings of the $12^{th}$ International Conference on X-ray Absorption Fine Structure, Malmö, Sweden, June 23-27, 2003, *Physica Scripta* ***T115***, 709-713 (2005).

25. "EXAFS studies of nanocrystals of $Zn_{1-x}Mn_xO$: A dilute magnetic semiconductor oxide system," S. Chattopadhyay, S.D. Kelly, T. Shibata, R. Viswanatha, M. Balasubramanian, S. Stoupin, C.U. Segre, and D.D. Sarma, in Proceedings of the $13^{th}$ International Conference on X-ray Absorption Fine Structure, Stanford, CA, USA, July 9-14, 2006, *AIP Conf. Proc.* **882**, pp. 809-811 (2007).

26. "XAFS studies on a modified Al-Si hypoeutectic alloy," V.S. Prakash Srirangam, S. Chattopadhyay, T. Shibata, J.A. Kaduk, J.T. Miller, C.U. Segre, and S. Shankar, in Proceedings of the $14^{th}$ International Conference on X-ray Absorption Fine Structure, Camerino, Italy, July 26-31, 2009, *J. Phys. Conf. Series* **190**, 012068 (2009).

27. "In situ XAFS studies of the oxygen reduction reaction on carbon supported Pt and PtNi(1:1) catalysts," Q. Jia, E.A. Lewis, E.S. Smotkin, and C.U. Segre, in Proceedings of the $14^{th}$ International Conference on X-ray Absorption Fine Structure, Camerino, Italy, July 26-31, 2009, *J. Phys. Conf. Series* **190**, 012157 (2009).

28. "Electrodeposition assisted x-ray lithography: single step approach," E.V. Timofeeva, J.P. Katsoudas, and C.U. Segre, in Proceedings of the $218^{th}$ ECS Meeting, Las Vegas, NV, October 10-15, 2010, *ECS Trans.* **33**, 319-326 (2010).

29. "The new MRCAT (Sector 10) bending magnet beamline at the Advanced Photon Source," A.J. Kropf, J. Katsoudas, S. Chattopadhyay, T. Shibata, E.A. Lang, V.N. Zyryanov, B. Ravel, K. McIvor, K.M. Kemner, K.G. Scheckel, S.R. Bare, J. Terry, S.D. Kelly, B.A. Bunker, and C.U. Segre, in Proceedings of the $10^{th}$ International Conference on Synchrotron Radiation Instrumentation, Melbourne, Australia, September 27-October 2, 2009, *AIP Conf. Proc.* **1234**, 299-302 (2010).

**Conference Proceedings**

1. "Structural relationships in high temperature superconductors," I.K. Schuller, C.U. Segre, D.G. Hinks, J.D. Jorgensen, L. Soderholm, M. Beno, and K. Zhang, in Proceedings of the Adriatico Research Conference on High Temperature Superconductivity, Trieste, Italy, July 5-8, 1987, *Int. J. Modern Phys. B* **1**, 821-828 (1987).

2. "Bifunctional Pt-Ru-Os ternary alloys: Improved Pt-based anodes for direct methanol fuel cells," R.X. Liu, K.L. Ley, C. Pu, Q.B. Fan, N. Leyarovska, C.U. Segre, E.S. Smotkin, in *Electrode Processes VI*, Proceedings of the $6^{th}$ International Symposium, Los Angeles, CA, May 5-10, 1996, ECS Proceedings Vol. 96-8 (Electrochemical Society, Pennington, NJ 1996) p. 341-355.

3. "Spectroscopic studies of Pb corrosion of reactor materials," S. Liu, D. Olive, J. Terry, and C.U. Segre, in Proceedings of the 2006 ANS Winter Meeting, Albuquerque, NM, November 12-16, 2006, *Trans. Am. Nuclear Soc.* **95**, 951 (2006).

4. "Characterization of oxide dispersion-strengthened steels by x-ray absorption spectroscopy," S. Liu, C.U. Segre, and G.R. Odette, in Proceedings of the 2008 ANS Annual Meeting, Minneapolis, MN, June 8-12, 2008, *Trans. Am. Nuclear Soc.* **98**, 1067-1068 (2008).

5. "In-situ spectroscopic studies of Pb corrosion of reactor material," S. Liu, D. Olive, J. Terry, and C.U. Segre, in Proceedings of the 2008 ANS Annual Meeting, Minneapolis, MN , June 8-12, 2008, *Trans. Am. Nuclear Soc.* **98**, 1073-1074 (2008).

6. "Atom-probe tomography, small angle neutron scattering, transmission electron microscopy, positron annihilation spectroscopy and x-ray absorption spectroscopy characterization of nano-scale features in nanostructured ferritic alloys," G.R. Odette, N.J. Cunningham, E.A. Marquis, S. Lozano-Perez, V. de Castro, P. Hosemann, E. Stergar, S. Liu, and C.U. Segre, in Proceedings of Microscopy and Microanalysis 2009, Richmond VA, July 26-30, 2009, *Microsc. Microanal.* **15**, S2 244-245 (2009).

7. "Design of in-situ electrochemical cells for XAS experiments," J.P. Katsoudas, E.V. Timofeeva, and C.U. Segre, *Nanotechnology 2013: Advanced Materials, CNTs, Particles, Films and Composites*, Proceedings of the 2013 NSTI Nanotechnology Conference and Expo Vol. 1 (CRC Press, Boca Raton, 2013) p. 13-15.

8. "Rechargeable nanofluid electrodes for high energy density flow battery," E.V. Timofeeva, J.P. Katsoudas, C.U. Segre, and D. Singh, *Nanotechnology 2013: Electronics, Devices, Fabrication, MEMS, Fluidics and Computational*, Proceedings of the 2013 NSTI Nanotechnology Conference and Expo Vol. 2 (CRC Press, Boca Raton, 2013) p. 679-682.

9. "Integration of flow batteries into electric vehicles: Feasibility and the future," J.P. Katsoudas, E.V. Timofeva, C.U. Segre, and D. Singh, *Nanotechnology 2014: Electronics, Manufacturing, Environment, Energy and Water*, Proceedings of the 2014 NSTI Nanotechnology Conference and Expo Vol. 3 (CRC Press, Boca Raton, 2014) p. 435-438.

10. "A study of unidirectionally aligned collagen-silk composite fibers and the application in hdpPSC neural differentiation," B. Zhu, W. Li, C.U. Segre, R. Lewis, R. Janota, N. Chi, and R. Wang, in Proceedings of Microscopy and Microanalysis 2014, Hartford, CT, August 3-7, 2014, *Microsc. Microanal.* **20** S3 1436-1437 (2014).

11. "Investigation of carbon nanostructure in copper covetics by x-ray nanotomography," B. Ma, R.P. Winarski, J. Wen, D.J. Miller, C.U. Segre, U. Balachandran, and D.R. Forrest, in *Proceedings of the 2nd International Conference on Tomography of Materials and Structures*, Québec City, CA, June 29-July 3, 2015, p.77-81.

12. "Studies of single crystal CVD diamonds for potential applications in x-ray crystal optics," S. Stoupin, S.P. Antipov, S.V. Baryshev, S. Baturin, Z. Liu, A.M. Khounsary, and C.U. Segre, *Advances in X-Ray/EUV Optics and Components XII, SPIE* **9963**, 50-59 (2016).

13. "Development of a multilayer monochromator system for the BioCAT beamline," A. Khounsary, A. Chandrashekarappa, A. Llodra, M. Antimonov, C.U. Segre, S.E. Nair, and T. Irving, *Advances in X-Ray/EUV Optics and Components XII, SPIE* **9963**, 125-133 (2016).

14. "A dual-bandwidth multilayer monochromator system," A. Khounsary, R. Conley, A. Macrander, R. Waswil, T. Irving, and C.U. Segre, *Advances in X-Ray/EUV Optics and Components XIII, SPIE* **10760**, 75-82 (2018).

15. "Focusing optics for a bending magnet beamline," Y. Ding, C.U. Segre, and A. Khounsary, *Advances in X-Ray/EUV Optics and Components XV, SPIE* **11491**, 50-58 (2020).

16. "Diaboloid mirror for a bending magnet beamline," Y. Ding, C.U. Segre, and A. Khounsary, *Advances in X-Ray/EUV Optics and Components XVI,SPIE* **11837**, 35-43 (2021).

**Monographs and Book Chapters**

1. "Chemical insights obtained by modelling the structure of high-temperature superconductors using $AX_3$ Close-Packing and Transferable Single Atom Parameters," P. Ganguly. F.C. Matacotta, and C.U. Segre, *Synthesis and Characterization of High-Temperature Superconductors* eds. J.J. Pouch, S.A. Alterovitz R.R. Romanofsky, and A.F. Hepp, *Materials Science Forum* **130-132**, 493-521 (Trans Tech, Brookfield VT, 1993).

2. "Exploring new routes for the development of functional nanomaterials using extreme pressure," K. Lipinska, P. Kalita, O. Hemmers, S. Sinogeikin, G. Mariotto, C. Segre, and Y. Ohki, *Processing and Properties of Advanced Ceramics and Composites II Book Series: Ceramic Transactions* **220**, 91-96 (2010).

3. "Operando x-ray absorption spectroscopy of polymer electrolyte fuel cells," E.S. Smotkin and C.U. Segre, *Fuel Cell Science: Theory, Fundamentals and Biocatalysis* eds. A. Wieckowski and J.K. Nörskov, pp 545-564 (John Wiley & Sons, Hoboken NJ, 2010).

4. "Battery entrepreneurship: Gameboard from lab to market," E.V. Timofeeva, J.P. katsoudas, C.U. Segre, A. Duchak, and T. Day, *Chemistry Entrepreneurship,* eds. J. García-Martínez and K. Li, pp 129-166 (Wiley-VCH, 2021).

**Patents**

1. "Rechargeable nanoelectrofuel electrodes and devices for high energy density flow batteries" US Patent 20,160,126,581, inventors E. Timofeeva, J. Katsoudas, D. Singh, and C.U. Segre (2016).