

# PROFESSIONAL CURRICULUM VITA

## Dr. Ken B. Anderson

### Professor of Geochemistry

Department of Geology SIU Carbondale

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### Educational Background.

Ph.D. Organic Chemistry, University of Melbourne, 1989

B.Sc. (Honors - 1st Class) Chemistry, University of Melbourne, 1984

### Professional Experience

<b>2012-Present</b>	<b>Founder and CTO, Thermaquatica LLC</b>
2010-2012	Founder and CEO Thermaquatica Inc
<b>2007- Present</b>	<b>Professor, SIU, Department of Geology</b>
2003- 2007	Associate Professor, SIU, Department of Geology
1994- 2003	Organic Geochemist, Argonne National Laboratory.
1991-1994	Research Scientist, Amoco Oil Company.
1989- 1991	Postdoctoral Research Fellow, Argonne National Laboratory.

**Research Interests - Organic Geochemistry.** Structural characterization and reactivity of coal. Novel coal utilization strategies. Investigation and characterization of ambers and related products derived from polyterpenoid resins. Application of geochemical techniques to the characterization of Archeological materials. Application of advanced analytical techniques to organic geochemical problems. Global energy resources and statistical modeling techniques for interpretation of resource production.

<b>Total Grants Received to date</b>	<b>\$ 4,697,500</b>
<b>Total External Grants Received 2003 to date (while at SIU)</b>	<b>\$ 4,326,500</b>

### Publications to Date

Books (as Editor)	1
Peer Reviewed articles	43 (including <i>Science</i> (1) and <i>PNAS</i> (2))
Conference Proceedings etc	6
Patents	5 Issued + 1 Pending
Abstracts and Oral Presentations	60+

### Service

**Editor in Chief, *Geochemical Transactions*** 2005-2011

**Chair,** American Chemical Society Geochemistry Division, 1997

**Governing Council Member,** American Chemical Society, 2000-2009

**Faculty Senate** (2010-present)

### Awards and Recognition.

DOE "Research Highlight", 1991.

R&D 100, 1999

**SIU Innovator of the Year, 2011**

**SIU Startup of the Year, 2012**

## Grants Received ( PI and Senior CoI).

Amber, Resinite and Fossil Resins. PRF Type SE # 29052. 1994	\$2,000
Catalytic Decomposition of Alcohol for in-situ H <sub>2</sub> Generation in Fuels. DOE LDRD CCST - 99-033R2 (WP 3326), 1999 - 2001	\$350,000
Ultratrace analytical spectroscopy of environmentally relevant organic compounds. ORDA. 2004-2005	\$19,000
History of Organic Geochemistry. ACS PRF 42710-SE, 2004	\$3,600
Characterization of volatile products generated from advanced brake materials during simulated braking and thermal loading in selected environments. NSF/Center for Advanced Friction Studies, 2004	\$27,400
Ultra -trace Analytical Spectroscopy of Organic Compounds ACS PRF 43597-AC2; 2005-2007	\$80,000
Planning meeting: Neogene climate-driven changes in the terrestrial and marine paleoenvironments of western South America. NSF, OISE; 2005	\$20,000
Proprietary analytical services. Honeywell Corporation, 2005	\$2,600
Oxidative Dissolution of Illinois Coal. ICCI, 2005	\$115,000
State of Illinois participation in Tri-State (IL-IN-KY) Coal Fuels Alliance. ICCI/DCEO, 2005-2006	\$150,000
Multi-functional Catalyst/Reactor Development for Product Defined Fischer-Tropsch Synthesis. ICCI, 2006	\$146,000
Oxidative Hydrothermal Dissolution of Illinois Coal. ICCI, 2006	\$113,000
Environmentally benign production of high value chemicals from Illinois Coal. ICCI, 2007	\$174,991
Application of Pulsewave Disintegration to Comminution, Drying and Cleaning of Illinois Coal. ICCI 2007	\$77,300
I-Lab: Coal to Liquid Fuels Research Facility. Illinois DCEO, 2007	\$1,976,000
Wet Scrubber For Carbon Dioxide Capture From Flue Gas. ICCI/IDCEO, 2008	\$30,000
Characterization of Product Streams from the OHD Coal Conversion Process ICCI/IDCEO, 2008	\$310,600
OHD Process Engineering Design and Pilot Plant Construction ICCI/DCEO 2011	\$950,000
Influence of Maceral And Mineral Composition on OHD Processing of Illinois Coal ICCI, 2012	\$150,000

In-situ investigation of maceral response to OHD, ICCI, 2014

\$163,000

## **PUBLICATIONS:**

### **Thesis.**

Chemical Characterization of Macerals Isolated From Australian Coals and Sediments  
Ken B. Anderson, Ph.D. Thesis, University of Melbourne, (1989)

### **Books.**

Amber Resinite and Fossil Resins ACS Symposium Series Volume No. 617, (1995)  
Ken B. Anderson and John C. Crelling (Eds)

### **Journal Articles.**

Oxidation Studies of Australian Coals - I. Aliphatic and Aromatic Hydrocarbon Centres of Oxidative Attack. Ken B. Anderson and R.B. Johns (1986), Org. Geochem., **9(5)** 219-224

A Review and Reinterpretation of Evidence Concerning the Environments of Deposition of Victorian Brown Coal. Ken B. Anderson and G. Mackay (1990), Int. J. Coal Geol. **16**, 327-347

Discussion of Recent Conclusions Concerning the Structure of Victorian Brown Coal Resinite: a Reply to the Comments of Wilson, et al. Ken B. Anderson, R.E. Botto, G.R. Dyrkacz, R. Hayatsu and R.E. Winans (1990), Fuel **69**, 934-935

The Nature and Fate of Natural Resins in the Geosphere. I. Evaluation of Pyrolysis-Gas Chromatography-Mass Spectrometry for the Analysis of Plant Resins and Resinites. Ken B. Anderson and R.E. Winans, (1991), Analytical Chemistry, **63**, 2901-2908

The Nature and Fate of Natural Resins in the Geosphere. II. Identification, Classification and Nomenclature of Resinites. Ken B. Anderson, R.E. Winans and R.E. Botto, (1992), Org. Geochem., **18(6)**, 829-841

The Nature and Fate of Natural Resins in the Geosphere. III. Re-evaluation of the Structure and Composition of *Highgate Copalite* and *Glessite*., Ken B. Anderson and R.E. Botto, (1993), Org. Geochem., **20(7)**, 1027-1038

<sup>1</sup>H CRAMPS NMR Derived Hydrogen Distributions in Various Coal Macerals. M.A. Wilson, J.V. Hanna, Ken B. Anderson and R.B. Botto. (1993), Org. Geochem., **20(7)**, 985-999

The Nature and Fate of Natural Resins in the Geosphere. IV. Middle and Upper Cretaceous Amber from the Taimyr Peninsula, Siberia - Evidence for a New Form of Polyabdanoid Resinite and Revision of the Classification of Class I Resinites. Ken B. Anderson (1994), Org. Geochem., **21(2)**, 209-212

Inter-laboratory Comparisons of Petrography of Liquefaction Residues from Three Argonne Premium Coals. J.C. Hower, Ken B. Anderson, G. Mackay, M.J. Lemos de Sousa, H. Pinheiro

January 28, 2014

and D. Flores. (1995), *Org. Geochem.*, **22(1)**, 27-32.

Temperature-dependant Structural Changes of Asphaltenes in 1-Methylnaphthalene. P. Thiyagarajan, Jerry E. Hunt, Randall E. Winans, Ken B. Anderson, and Jeffery T. Miller. (1995), *Energy and Fuels*, **9**, 829-833

The Nature and Fate of Natural Resins in the Geosphere. VII. A Radiocarbon (<sup>14</sup>C) Age Scale for Description of Immature Natural Resins. An Invitation to Scientific Debate. Ken B. Anderson, (1996), *Org. Geochem.*, **25(3/4)**, 251-253.

The Nature and Fate of Natural Resins in the Geosphere. VIII. NMR and Py-GC-MS Characterization of Soluble Labdanoid Polymers Isolated from Holocene Class I Resins. David J Clifford, Patrick G. Hatcher, Robert E Botto, John V. Muntean, Beverly Michels and Ken B. Anderson, (1997), *Org. Geochem.*, **27(7/8)**, 449-464.

Amber from 1000-year Old Prehispanic Tombs in Northern Peru. Izumi Shimada, Ken B. Anderson, Herbert Haas, Jean H. Langenheim (1997), *Mater. Res. Soc. Symp. Proc.*, **462** (Materials Issues in Art and Archaeology V), 3-18.

The Nature and Fate of Natural Resins in the Geosphere-IX. Structure and Maturation Similarities of Soluble and Insoluble Polylabdanoids Isolated from Tertiary Class I Resinites. David J. Clifford, Patrick G. Hatcher, Robert E. Botto, John V. Muntean and Ken B. Anderson, (1999), *Org. Geochem.*, **30(7)**, 635-650.

The Nature and Fate of Natural Resins in the Geosphere. X. Structural Characteristics of the Macromolecular Constituents of Modern Dammar Resin and Class II Ambers. Ken B. Anderson and John V. Muntean (2000), *Geochem. Trans.*, **1**.  
<http://www.rsc.org/ej/gt/2000/b000495m/index.html>

The Identity of Romanian Amber (Rumanite) with Baltic Amber (Succinite). Edith C. Stout, Curt W. Beck, and Ken B. Anderson (2000), *Physics and Chemistry of Minerals*, **27(9)**, 665-678

Distribution and Origin of Ethyl-branched Alkanes in a Cenomanian Transgressive Shale of the Western Interior Seaway (USA). Fabien Kenig, Dirk-Jan H. Simons and Ken B. Anderson, (2001), *Org. Geochem.*, **32(7)**, 949-954.

The Nature and Fate of Natural Resins in the Geosphere. XI. Ruthenium Tetraoxide Oxidation of a Mature Class Ib Amber Polymer. Ken B. Anderson, (2001), *Geochem. Trans.*, **3**  
<http://www.rsc.org/suppdata/gt/b1/b102650j/frames.htm> "Enhanced Version"  
<http://hotdog.rsc.org/ej/gt/2001/B102650J/> "Standard Version"

Low Temperature Steam Reforming of Methanol over Layered Double Hydroxide-Derived Catalysts. Segal, S. R., Anderson, K. B., Carrado, K. A. and Marshall, C. L., (2002), *Applied Catalysis A: General* **231**, 215-226

Catalytic Decomposition of Alcohols, Including Ethanol, for in-situ H<sub>2</sub> Generation in a Fuel

Stream using a Layered Double Hydroxide-Derived Catalyst. Scott R. Segal, Kathleen A. Carrado, Christopher L. Marshall, and Ken B. Anderson (2003), *Applied Catalysis A: General* Branched aliphatic alkanes with quaternary substituted carbon atoms in modern and ancient geologic samples. Fabien Kenig, Dirk-Jan H. Simons, David Crich, James P. Cowen, Gregory T. Ventura, Tatiana Rehbein-Khalily, Todd C. Brown, and Ken B. Anderson. (2003), *PNAS*, 22, 12554-12558.

Shock Tube Study of Thermal Rearrangement of 1,5-Hexadiyne over Wide Temperature and Pressure Regime. Weiyong Tang, Robert S. Tranter and Kenneth Brezinsky, Ken B. Anderson. (2004), *J. Phys Chem. A*, **108** (16), 3406 -3415.

Speciation of C<sub>6</sub>H<sub>6</sub> Isomers by GC-Matrix Isolation FTIR-MS. Ken B. Anderson, Robert S. Tranter, Weiyong Tang, Kenneth Brezinsky and Lawrence B. Harding. (2004), *J. Phys Chem. A*, (2004), **108(16)**, 3403 – 3405

The Amber of El Dorado. Class Ib Archaeological Ambers Associated with Laguna Guatavita. Ken B. Anderson and Warwick Bray, *Archaeometry*, (2006) 48(4), 633–640.

The Nature and Fate of Natural Resins in the Geosphere. XII. Investigation of C-Ring Aromatic Diterpenoids in Raritan Amber by Pyrolysis-GC-Matrix Isolation FTIR-MS. Ken B. Anderson, *Geochemical Transactions* (2006) **7**, 2

Characterization of 1,2,3,4-tetrabromocyclohexane isomers by GC-matrix isolation FTIR– MS. Daniel L. Vaughn and Ken B. Anderson, *New Journal of Chemistry* (2006) 30, 868-872

An Unusual Low-Fluorescence Algal Kerogen from the Canadian Arctic. Ken B. Anderson, John C. Crelling, Fabien Kenig and William W. Huggett. (2006) *International Journal of Coal Geology*. 69 (2007) 144–152

Comparison of Vitrified and Unvitrified Eocene Woody Tissues by TMAH Thermochemolysis – Implications for the Early Stages of the Formation of Vitrinite. Paul E. Kaelin, William W. Huggett and Ken B. Anderson, (2006), *Geochemical Transactions*, 7:9

Thermal Analysis of Bulk Carbon-Carbon Composite and Friction Products Derived from it During Simulated Aircraft Braking. Katarzyna Peszynska-Bialczyka, Ken B. Anderson, T. Szymanski, Milan Krkoska, Peter Filip (2007) *Carbon*. 45(3), 524-530

The Nature and Fate Of Natural Resins In The Geosphere XIII: A Probable Pinaceous Resin from the Early Cretaceous (Barremian), Isle Of Wight. P. Sargent Bray and Ken B. Anderson., (2008) *Geochemical Transactions*, 9:3

Chemical Signatures of Fossilized Resins and Recent Plant Exudates. (*Invited Review*) Joseph B. Lambert, Jorge A. Santiago-Blay, and Ken B. Anderson, (2008) *Angewandte Chemie* 47(50), 9608-9616.

**Bray, P. Sargent; Anderson, Ken B. (2009), Identification of Carboniferous (320 Million**

**Years Old) Class Ic Amber. *Science*, 326(5949), 132-134.**

Knight, Terrell K. Bingham, A, P. Sean A, Grimaldi, David A., Anderson, Ken B. C, Lewis Ronald D. A. and Savrda Charles E. (2010) A New Upper Cretaceous (Santonian) Amber Deposit From The Eutaw Formation Of Eastern Alabama, USA. *Cretaceous Research*, 31 85–93 (Available Online 8 October 2009)

Cretaceous African life captured in amber. Schmidt, A.R.; Perrichot, V; Svojtka, M; Anderson, Ken.B.; Belete, K.H.; Bussert, R.; Doerfelt, H; Jancke, S; Mohr, B; Mohrmann, E; et al. (2010) *Proceedings of the National Academy of Sciences of the United States of America* , 107(16), 7329-7334.

Biogeographic and evolutionary implications of a diverse paleobiota in amber from the early Eocene of India. Rust, J.; Singh, H.; Rana, R.S.; McCann, T.; Singh, L.; Anderson, Ken .B.; Sarkar, N.; Nascimbene, P.C.; Stebner, F.; Thomas, J.C.; et al (2010) *Proceedings of the National Academy of Sciences of the United States of America*, 107(43), 18360-18365

Discussion of Multicyclic Hubbert Modeling as a Method for Forecasting Future Petroleum Production. Ken B. Anderson.; Conder, James A. (2011) *Energy & Fuels*, 25(4), 1578-1584

### **Book Chapters (reviewed).**

The Direct Synthesis of Organic-containing Clays and Thermal Analysis of Porphyrin-clay Complexes. K.A. Carrado, Ken B. Anderson and P.S. Grutkoski, In ACS Symposium Series Vol. 499. "Supramolecular Architecture. Synthetic Control in thin films and solids. T. Bein (Ed), American Chemical Society, Washington D.C., (1992), pp 155-165

Amber, Resinite and Fossil Resins. Introduction. Ken B. Anderson and John C. Crelling In ACS Symposium Series Volume No. 617, (1995), Ken B. Anderson and John C. Crelling (Eds), ix-xvii.

The Nature and Fate of Natural Resins in the Geosphere. V. New Evidence Concerning the Structure, Composition and Maturation of Class I (Polylabdanoid) Resinites. Ken B. Anderson, In ACS Symposium Series Volume No. 617, (1995), Ken B. Anderson and John C. Crelling (Eds), p 105-129.

The Nature and Fate of Natural Resins in the Geosphere. VI. Analysis of Fossil Resins from Axel Heiberg Island, Canadian Arctic. Geochemical and Paleobotanical Implications. Ken B. Anderson and B.A. LePage, In ACS Symposium Series Volume No. 617, (1995), Ken B. Anderson and John C. Crelling (Eds), p 170-192.

Characterization of Organic Compounds in Phytoliths: Improving the Resolving Power of Phytolith  $\delta^{13}\text{C}$  as a Tool for Paleoecological Reconstruction of C3 and C4 Grasses. Francesca A. Smith and Ken B. Anderson, In, "The Phytoliths. Applications in Earth Science and

Human History", Meunier J.D., Colin, F. and Faure-Denard, L., Editors, Gordon and Breach Publishing Group. (2000)

Resins and Amber in Sediments. (*Invited Review*). Ken B. Anderson, In: Encyclopedia of Sediments and Sedimentary Rocks. G.V. Middleton (Ed). Kluwer Academic Publishers (2003).

Study of Adsorption/Desorption Phenomenon of Friction Debris on Aircraft Brakes  
K.Peszynska-Bialczyk, M.Krkoska, A.Pawliczek, P.Filip & Ken B. Anderson. In: Development in Advanced Ceramic and Composites, Eds; M. Brito, P. Filip, C. Lewinsohn, A. Sayir, M. Opeka, W. M. Mullins, (ISBN 1-57498-261-3), The American Ceramic Society (2005) , pp. 157-166

### **Oral Presentations, Posters and Preprints.**

An Infrared Study of Structural Changes Induced by Atmospheric Oxidation of an Australian Bituminous Coal. Ken B. Anderson and R.B. Johns Oral Presentation, Australian Organic Geochemistry Conference, Macquarie University, May 13-14, 1985.

Biological Marker and Other Organic Components of Victorian Brown Coal Pyrolysates as a Function of Maceral Group and Lithotype. Poster, 13<sup>th</sup> International meeting on Organic Geochemistry, Venice, September 1987.

Analysis and Comparison of Two Victorian Brown Coal Resinite Samples. Ken B. Anderson, R.E. Botto, G.R. Dyrkacz, R. Hayatsu and R.E. Winans Oral Presentation, and Preprint Miami Beach ACS national meeting, September 1989, Preprint, Div. Fuel Chem., Amer. Chem. Soc. (1989), **34(3)**, 752-758

Chemical Analyses of Four Diverse Alginite Samples by Spectroscopic and Pyrolytic Techniques, Ken B. Anderson, R.E. Winans, R.E. Botto and G.R. Dyrkacz. Oral Presentation 23<sup>rd</sup> Great Lakes Regional Meeting, ACS, May 1990

Structure and Structural Diversity in Resinites as Determined by Pyrolysis-Gas Chromatography-Mass Spectrometry. Ken B. Anderson and R.E. Winans. Oral Presentation, and Preprint Atlanta, ACS national meeting, April 1991, Preprint, Div. Fuel Chem., Amer. Chem. Soc. (1991) **36(2)**, 765-773

Evidence for a New Structural Sub-class of Resinite in Middle and Upper Cretaceous Amber from the Taimyr Peninsula, Siberia. Ken B. Anderson, Oral Presentation, Chicago, ACS national meeting, August 1993.

New Evidence Concerning the Structure, Composition and Maturation of Class I (Polylabdanoid) Resinites. Ken B. Anderson, Oral Presentation, Washington DC ACS national meeting, August 1994.

Analysis of Fossil Resins from Axel Heiberg Island, Canadian Arctic. Geochemical and

Paleobotanical Implications. Ken B. Anderson and Ben LePage, Oral Presentation, Washington DC ACS national meeting, August 1994.

Methylene Induced Line Broadening in Solid State NMR. David J. Clifford, Ken B. Anderson and Robert E. Botto (1995), *TAMU NMR Newsletter*.

The Structure and Behavior of Biopolymers in Coals and Sedimentary Systems. Ken B. Anderson, David J. Clifford and Nancy Tomczyk Oral Presentation, DOE Programmatic Review, November 1995

Status of the Argonne Premium Coal Sample Program. Oral Presentation, Ken B. Anderson, DOE Programmatic Review, November 1995

The Macromolecular Structure of Class I (Polylabdanoid) Resinites (Ambers). Ken B. Anderson, David J. Clifford, Patrick G. Hatcher, R.E. Botto, and John V. Muntean, Oral Presentation, Orlando ACS national meeting, March 1996

Amber: Towards Macromolecular Biomarkers? Ken B. Anderson, David J. Clifford and Patrick G. Hatcher. Oral Presentation and Poster Gordon research Conference on Organic Geochemistry, August 1996

Polyterpenoids: New Classes of Biological Markers with Potential Applications as Probes of Sedimentary Environments. Ken B. Anderson, and David Clifford, Oral Presentation, Sixth DOE Chemical Sciences Coal Chemistry Conference and Workshop, June 1997

The Argonne Premium Coal Sample Program: Status Report. Ken B. Anderson, Poster, Sixth DOE Chemical Sciences Coal Chemistry Conference and Workshop, June 1997

Biopolymers in Sedimentary Systems: NMR and related studies of Class I and Class II Ambers. Ken B. Anderson and David J. Clifford. Oral Presentation, DOE Programmatic Review, November 1998

Application of Multidimensional NMR to the Analysis of Polysesquiterpenoid Resins. Ken B. Anderson and John V. Muntean, Oral Presentation, New Orleans ACS national meeting, New Orleans, August 1999.

Low Temperature Steam Reforming of Methanol over Layered Double Hydroxides. Scott R. Segal, Ken B. Anderson, Kathleen A. Carrado, Christopher L. Marshall. ACS Div of Fuel Chemistry Preprints, (2001), **46(2)**, 654-655.

Distribution and Origin of Monoethylalkanes in Cenomanian Transgressive Shales. Fabien Kenig, Dirk-Jan H. Simons and Ken B. Anderson, Poster, 20<sup>th</sup> International Meeting on Organic Geochemistry, Nancy, France, September 2001

Catalytic Decomposition of Alcohol for in-situ H<sub>2</sub> Generation in Fuels. Ken B. Anderson, K.A. Carrado, C.L. Marshall, L. Xu, and S.C. Segal, Oral Presentation LDRD Symposium, Argonne



National Laboratory, September 2002.

The amber of *El Dorado*. Ken B. Anderson and Warwick Bray, 226<sup>th</sup> ACS National Meeting, New Orleans, LA, March 2003

Application of integrated GC-matrix isolation FTIR-MS for the analysis of organic geochemical samples. Ken B. Anderson and Dirk-Jan Simons, 226<sup>th</sup> ACS National Meeting, New Orleans, LA, March 2003

An Unusual Low-Fluorescence Algal Kerogen from the Canadian High Arctic. Ken B. Anderson, John C. Crelling and Fabien Kenig. International meeting of the Society for Organic Petrology, Sydney Australia, September 2004

A brief history of the ACS Division of Geochemistry. Ken B. Anderson, ACS National meeting San Diego CA, March 2005.

Use of GC-Matrix Isolation FTIR-MS to Elucidate Structural Characterization of Additive BFRs and Their Degradation Products. Daniel L. Vaughn and Ken B. Anderson, BFR 2005, NIST, Gathersberg, MD, June 2005

Investigation of Peckett Amber by GC-Matrix Isolation FTIR-MS. Y. Rosales and Ken B. Anderson. International Meeting of the Society for Organic Petrology, Lexington, KY, September 2005

Characterization of Vitrified and Unvitrified Eocene Woody Plant Tissues. P. Kaelin and Ken B. Anderson. International Meeting of the Society for Organic Petrology, Lexington, KY, September 2005

Chemistry and Combustion Properties of Pure Macerals: Preliminary Results. Crelling J.C, Ken B. Anderson, and Bill Huggett. International Meeting of the Society for Organic Petrology, Lexington, KY, September 2005

Geochemistry of amber from the lower Cretaceous (Wealden) of the Isle of Wight. Bray, P. Sargent and Ken B. Anderson. Abstracts of Papers, 234<sup>th</sup> ACS National Meeting, Boston, MA, United States, August 19-23, 2007

Thematic programming for Chicago: Energy overview. Ken B. Anderson. Abstracts of Papers, 233<sup>rd</sup> ACS National Meeting, Chicago, IL, United States, March 25-29, 2007

Geochemical Studies of the Early Stages of the Formation of Vitrinite. Paul E. Kaelin, John C. Crelling, William W Huggett and Ken B. Anderson. The Society for Organic Petrology, International meeting, Victoria, British Columbia, Canada, Aug. 19 - 25, 2007

The Ethiopian amber forest. Schmidt, A. R., Perrichot, V., Svojtka, M., Anderson, K. B., Belete, K. H., Bussert, R., Dörfelt, H., Jancke, S., Mohr, B., Mohrmann, E., Nascimbene, P.C., Nel, A.,

Nel, P., Ragazzi, E., Roghi, G., Saupe, E. E., Schmidt, K., Schneider, H., Selden, P. A. & Vávra, N. (2010). FossilsX3: Insects, Arthropods, Amber; Capital Normal University, Beijing, China; August 20-25, 2010, Abstracts, 166-167.

Oxidative Hydrothermal Dissolution (OHD): An efficient, environmentally friendly process for the dissolution of coal and biomass in aqueous media, for the production of fuels and chemicals Ken B. Anderson, John C. Crelling, William W. Huggett, Derek Perry, Tom Fullinghim, Patrick McGill and Paul Kaelin; Proceedings of the 36<sup>th</sup> International Technical Conference on Clean Coal and Fuel Systems, Sheraton Sand Key, Clearwater, Florida, USA, June 5-9, 2011, p51-59.

Oxidative Hydrothermal Dissolution (OHD) of Coal and Biomass. Ken B. Anderson, John C. Crelling, William W. Huggett, Derek Perry, Tom Fullinghim, Patrick McGill, Paul Kaelin. Abstract and Preprint, Fuel Chemistry Division, ACS National Meeting, Denver CO, August 2011.

Chemicals from Coal by Oxidative Hydrothermal Dissolution (OHD), John C. Crelling, Ken B. Anderson, and William W. Huggett, 2011, Ann. Meeting Geological Society of America Abstracts with Programs, Vol. 43, No. 5, p. 499

A Novel Process for Production of Chemicals from Coal by Oxidative Dissolution in Hydrothermal Water. Ken B. Anderson, John C. Crelling & Derek Perry. International Symposium on Clean Coal Technology, September 25, 2012. Taiyuan, China

Oxidative Hydrothermal Dissolution (OHD). Environmentally friendly production of fuels and chemicals from coals and biomass. Ken B. Anderson. Clearwater Coal Conference, Clearwater Florida, June 2-5, 2013.

### **Invited Oral Presentations.**

The Nature and Fate of Natural Resins in the Geosphere. University of Southern Illinois, Carbondale, Joint Departmental Seminar (Chemistry and Earth Sciences), April 1993

The Nature and Fate of Natural Resins in the Geosphere. Amber: A Chemist's Looking-Glass into the Geologic Past? Argonne National Laboratory August 1994

The Structure and Behavior of Fossil Resins in Sedimentary Systems. Argonne National Laboratory Chemistry Division Divisional Seminar May 1996

Forever Amber: Fossil Resins in Sedimentary Systems. Departments of Chemistry and Fuel Science, Penn State University, July 1996

Amber: Mythology, history and Science. Illinois State Microscopical Society, McCrone Research Institute August 1996

Chemistry of Amber. Invited Presentation to Korean Government Delegation, Argonne National

Laboratory September 1996

Argonne in the Arctic. Chemistry Division Seminar, August 1997

Forever Amber: The Nature and Behavior of Natural Resins in Coals and other Sedimentary Systems. University of Kentucky, Center for Advanced Energy Research, November 1997

Paleoenvironmental implications of Ambers from the Canadian Arctic. Earth Sciences Club of Northern Illinois, May 1998

Amber: Historic and Scientific Perspectives of an Extraordinary Natural Material. **Plenary Lecture**, Illinois State Microscopical Society *Intermicro '98*, August 1998

The Geochemistry of Amber. University of Illinois at Chicago, Department of Earth and Environmental Sciences Departmental Seminar, November 1998

Gas Chromatographic and Mass Spectrometric Studies of Arctic Ambers. Chicago Area Chromatography discussion group/Society for Analytical Spectroscopy/Madison-Chicago-Milwaukee Mass Spectrometry Discussion Group joint meeting April 1999

Amber: The Intersection of Myth, Mystery and Science. Iota Sigma Pi (Society of Women Chemists) April 1999

The Chemistry of Amber. Iota Sigma Pi (Society of Women Chemists) September 1999

Paleoenvironmental Chemistry. Invited Lecturer, Associated Colleges Chicago Area, October 1999

The Fossil Forests of Axel Heiberg Island. Des Plaines Valley Geological Society, Feb, 2001

The Chemistry of Amber. Department of Earth Sciences, Michigan State University, October 2001

The Geochemistry of Amber. Southern Illinois University Chemistry Department Seminar speaker, April 2004

The Chemistry of Amber. ACS Southern Illinois Local Section, Cape Girardau, September 2004

Ambers: What they are and what they can tell us about paleoenvironments? SIU Center for Ecology, September 2006

The Geochemistry of Amber, invited seminar speaker, University of Missouri, Rolla, November 5<sup>th</sup> 2007

Characterization of Product Streams from the OHD Coal Conversion Process, ICCI Program Committee Meeting. ICCI Program Review Committee annual meeting, Collinsville, IL, November 15 2011

*January 28, 2014*

Oxidative Hydrothermal Dissolution: An efficient, environmentally friendly process for the dissolution of coal and biomass in aqueous media for the production of fuels and chemicals  
North Western University, Potchefstroom, North West Province, South Africa, January 2012

Strengths and weaknesses of statistical forecasting of resource production as applied to coal and petroleum. Taiyuan University of Technology, September 26, 2012. Taiyuan, China

Oxidative Hydrothermal Dissolution (OHD) A breakthrough process for efficient and environmentally friendly production of fuels and chemicals from coal and biomass. National Institute for Clean-and-Low-Carbon Energy (NICE), September 28, 2012. Beijing, China.

“Green” routes to using coal. Making Chemical feedstocks from coal by dissolution in water. SIU Technology Expo. October 19, 2012

Oxidative Hydrothermal Dissolution (OHD): An efficient, environmentally friendly process for the production of fuels and chemicals from coal. Brown Coal Innovation Australia (BCIA), December 19, 2012.

Oxidative Hydrothermal Dissolution (OHD): An efficient, environmentally friendly process for the production of fuels and chemicals from coal and biomass. SIU Coal Research Center External review Panel, January 23, 2013.

Oil Water and the Valley of Death. Southern Illinois University Department of Chemistry. January 25<sup>th</sup> 2013.

Peeking at Peaking: The History and Science behind Resource Production Forecasting. , February 11, 2013

Green Routes to using Australian Coal. Production of Fuels and Chemicals by Oxidative Hydrothermal Dissolution. GreenPower Energy Shareholders meeting, Melbourne Australia, March 18, 2013

Environmentally friendly production of fuels and chemicals from coals and biomass. Clearwater Coal Conference, Clearwater, Florida, June 4, 2013

Environmentally Benign Production of Polyester Precursors from Victorian Brown Coal by Oxidative Hydrothermal Dissolution. GreenPower Energy/Australian Chemical Industry Representatives meeting, Melbourne Australia, December 5<sup>th</sup>, 2013.

Environmentally Friendly Production of Fuels and Chemicals from Victorian Brown Coal by Oxidative Hydrothermal Dissolution. Brown Coal Innovation Australia (BCIA) symposium, Melbourne Australia, December 6<sup>th</sup> 2013

*January 28, 2014*

## **Workshops.**

Workshop on Electronic Scientific Publishing. Presented at ACS National Meeting, Orlando, April 2002

Electronic Open Access Publishing in the Chemical Earth Sciences Presented ACS National meeting, San Francisco, September 2006

Coal in World Energy Markets: July 2012

## **Patents and Inventions.**

Process for Converting Oligimer-containing Waste Stream to Fuels.

Kenneth B. Anderson and J. Miller, 1995, US Patent No. 5,443,716

Method for Encapsulating and Isolating Hazardous Cations, Medium for Encapsulating and Isolating Hazardous Cations.

Stephen R. Wasserman, Kenneth B. Anderson, Kang Song, Steven E. Yuchs, and Christopher L. Marshall. 1996, US Patent No. 5,743,842

Gregar Extractor

Kenneth B. Anderson and Joseph Gregar. A novel continuous laboratory extractor. 1999, US Patent No. Des. 413,678

Process for In-situ Production of Hydrogen (H<sub>2</sub>) by Alcohol Decomposition for Emission Reduction from Internal Combustion Engines.

Kenneth B. Anderson, Kathleen A. Carrado, Christopher L. Marshall and Scott Segal  
US Patent 2003/0168023 A1

**Process for the dissolution of coal, biomass and other organic solids in superheated water.**

**Kenneth B. Anderson, John C. Crelling, William W. Huggett (2010) PCT Int. Appl. , WO 2010093785 A2 20100819. (Now filed in the following jurisdictions: Australia, Canada, China, European Union, India, Japan, Russia, South Africa, USA**

**Production of Organic Materials Using Oxidative Hydrothermal Dissolution Method**

**Kenneth B. Anderson, John C. Crelling, William W. Huggett, Derek M. Perry  
U.S. Prov. Pat. App. 61492910, 6-3-2011 PCT Filed June 2012**

## **Teaching Experience.**

### **Courses Taught**

Geology 221 – Historical Geology  
Geology 418 – Low Temperature Geochemistry  
Geology 421 – Organic Geochemistry  
Geology 420 – Petroleum Geology (20%)  
Geology 500 – Teaching for Graduate Teaching Assistants  
Geology 517 – Advanced Topics in Geochemistry  
Geology 588 – Global Energy Resources

## **Graduate Students.**

David J. Clifford. PhD Candidate, Penn. State. (1996-1997)\*  
Francesca A. Smith. PhD Candidate, University of Chicago. (1999)\*  
Daniel Vaugn, PhD Candidate SIU ERP (ABD)  
Paul Kaelin SIU Masters of Geology (2007)  
Yoanna Rosales, MA (Geology) (2007)  
P. Sargent Bray, SIU Masters of Geology (2007)  
Patrick McGill, Masters of Geology (2009)  
Layne Britton, Masters of Geology  
Christopher York, Masters of Geology (Co supervised with John C. Crelling) (2009)  
Tom Fullingim (MS Current, ABD)  
Margaret Sanders (Current)  
Jesse Sanders (PhD, start 2012)

\* While enrolled in degree-granting institutions, these students worked directly under my supervision, in my laboratory for all or part of their PhD studies.

## **University Service.**

### Department Committees

Speakers Committee (2003-present)  
Graduate Admissions Committee (2003-2008) Chair 2007-2008  
Faculty Search Committee (2005-2008)  
Space Allocation Committee (Chair) (2004-present)  
Undergraduate Advisor (2006-2012)  
Graduate Advisor (2007-2008)

### University Committees

Coal Fuels Alliance, technical steering committee (2005-2009)  
Masters Fellowship Committee (2005-2007)  
Professional Science Master (Advanced Energy Management) steering committee  
2007-Present  
Faculty Senate (2010-present)

- Executive Council (2012)
- Committee on Committees (2010-Present) (Chair 2012)
- Governance Committee (2010 – Present)

College of Science Tenure and Promotion Committee 2011

NTT Promotional Lines Committee 2012

SIU Representative IAI (IBHE) Gened - physical/life sciences panel

### **Professional Service.**

**American Chemical Society** - Councilor (2000 - 2009)

Division of Organic Chemistry

Geochemistry Division

- Program Chair (1997)

- Chair (1998)

- Membership Chair (2001)

Energy and Fuels Division

Division of the History of Chemistry

Division of Small Chemical Business

Division of History of Chemistry

Division of Industrial and Engineering Chemistry

### **Editorial Positions.**

Associate Editor, *Geochemical Transactions* 2000-2005

Chair, Editorial Board, *Geochemical Transactions* 2000-2005

**Co Editor in Chief, *Geochemical Transactions* 2005-2011**

### **Awards and Recognition.**

DOE "Research Highlight", 1991.

Outstanding Service Award, ACS Division of Geochemistry, 1999

1999 R&D 100 Award for development of the Gregar Extractor.

Federal Laboratory Consortium for Technology Transfer for commercialization of the Gregar Extractor, 2000

**SIU Innovator of the Year, 2011**

**SIU Startup of the Year 2012**

### **Other Professional Activities.**

Argonne National Laboratory Committee Responsibilities

Argonne National Laboratory Strategic Environmental Initiative -

Co Chair subcommittee on Scientific Challenges (2002)

Chemistry Division Chemical Hazards Committee (1999 - )

Chemistry Division Library Users Committee (Chair 2000 -2003 )

Chemistry Division Building 211 Safety Committee (1997 - 1999)

Illinois Basin Coal Sample Program Advisory and Steering Committee

ACS Division of Geochemistry Medal Committee 2004 - 2009

ACS Presidential Task Force on Support to Divisions and Local Sections (including Allocations and Representation) (2000)

*January 28, 2014*

ACS Presidential Task Force for revision of bylaws relating to allocations to Local Sections and Divisions (including Allocations and Representation) (2001)

Organizer and Co-Chair, ACS Symposium on “Amber, Resinite and Fossil Resins” 208th ACS National Meeting Washington D.C., August 1994

Organizer and Co-Chair, Symposium on “The History of Organic Geochemistry” 229th ACS National Meeting San Diego., March 2005

Editor, ACS Symposium Series Volume #617, “Amber Resinite and Fossil Resins”

Geochemistry Program Liaison for Pacifichem 2000 International Chemical Sciences Conference, held Dec 2000.

Program Consultant, Pacifichem 2005

International Program Committee (sub committee for Organic Geochemistry) Goldschmidt Conference 2005

Organizer, ACS Geochemistry Division Medal Award symposium, San Diego, April 2001

ACS Division Officer’s Caucus

Treasurer, 2000-2001

Chair, 2002-2004

ACS Council Committee on Constitution and Bylaws (2001-2006)

ACS National Program Coordinator, Energy Security and Sustainability, Chicago, 2007

ACS Council Committee on Committees, 2008

Nominee ACS Board of Directors 2011

### **Consultantships.**

Pulsewave LLC. Technical advisement related to implementation of proprietary technology related to coal and mineral processing.

Technical Consultant and delegate, Illinois Department of Commerce and Opportunity and Office of Trade and Investment, International Trade Mission to Europe and the UK, May 2008