

**CURRICULUM VITAE****Jost O.L. Wendt****POSITION**

Presidential Professor, University of Utah, Department of Chemical Engineering

**EDUCATION**

- 1968 Ph.D. Chemical Engineering, Johns Hopkins University.
- 1966 M.S. Chemical Engineering, Johns Hopkins University.
- 1963 B.Sc. First Class Honors in Chemical Engineering, University of Glasgow, Scotland.

**EMPLOYMENT**

- 2005- present Presidential Professor, University of Utah, Department of Chemical Engineering.
- 1998 - 2005 Head, Department of Chemical and Environmental Engineering, University Of Arizona, Tucson, AZ 85721
- 1979 - 2005 Professor, Department of Chemical Engineering, University of Arizona, Tucson, Arizona.
- 1974 - 1979 Associate Professor (with Tenure), Department of Chemical Engineering, University of Arizona, Tucson, Arizona.
- 1972 - 1974 Assistant Professor, Department of Chemical Engineering, University of Arizona, Tucson, Arizona.
- 1968 - 1972 Research Engineer, Department of Chemical Engineering Shell Development Company, Emeryville Research Center, Emeryville, California.

**APPOINTMENTS**

- 1984 - 1986 By National Research Council as National Academy of Sciences/National Academy of Engineering Senior Visiting Scientist at EPA.
- 1990 By the Governor of the State of Arizona to the Governor's Hazardous Waste Technical Advisory Committee, August through September, 1990.

**RESEARCH INTERESTS**

Combustion generated air pollution, environmental conservation, burner and furnace design, coal combustion, hazardous, municipal and medical waste incineration, transport phenomena and kinetics.

**PROFESSIONAL ACTIVITIES AND HONORS**

Lawrence K. Cecil Award, AIChE Environmental Division, 2004  
Fellow of the American Institute of Chemical Engineers (2002)  
Eminent Visitor to the Co-operative Research Center on Coal and Sustainable Development, University of Newcastle and CSIRO, Australia (2002)  
National Academy of Sciences/National Academy of Engineering Senior Visiting Scientist at EPA, 1984-1986.  
Governor's Hazardous Waste Technical Advisory Committee, State of Arizona, 8/1/90 - 10/1/90  
US Environmental Protection Agency Scientific and Technological Achievement Awards, 1988, 1993, and 1995.  
Invited Member, American Flame Research Committee, International Flame Research Foundation, Coalition for Responsible Waste Incineration.  
Member, Technical Advisory Board, Hazardous Waste Research Center, LSU, Baton Rouge, LA 1985-1988; North Eastern Hazardous Substance Research Center, MIT/NJIT/Tufts, 1989-  
.  
Invited Plenary Lecturer at Twenty-Fifth Symposium (International) on Combustion, The Combustion Institute, 1994.  
Keynote Lecturer at six other international meetings.  
Co-author of three patents.  
On editorial board of two journals.

## **MAJOR ACCOMPLISHMENTS**

Originated *REBURNING* as a new in-furnace NO<sub>x</sub> control technique (with C.V. Sternling and M.A. Matovich). This technology has subsequently been developed in Japan, Europe and the US, and has been applied to over one hundred boilers and combustion units worldwide.

Played major role in elucidation of *COAL NITROGEN MECHANISMS* and this led directly to development of combustion modifications for NO<sub>x</sub> control.

Contributed to understanding of critical phenomena for the safe *INCINERATION OF HAZARDOUS WASTES*. This involved developing methods for preventing transient puffs in rotary kilns and for managing toxic metal emissions through the use of sorbents. This work led to three patents.

Contributed to understanding of partitioning mechanisms for TOXIC METALS during pulverized coal combustion, and to MINIMIZING INHALATION HEALTH RISKS FROM FINE PARTICLES from combustion processes.

Served as *MENTOR TO EPA RESEARCHERS* at the National Risk Management Research Laboratory at North Carolina, to assist in upgrading EPA's in-house combustion research program. This led to a continuing fruitful collaboration, and to multiple, peer reviewed, publishable research contributions to combustion and incineration technology.

Served as research dissertation/thesis advisor and mentor to 20 PH.D. GRADUATES AND 27 M.S. GRADUATES in Chemical Engineering and also taught and advised numerous undergraduates.

## **RESEARCH GRANTS AND CONTRACTS**

"Sorption Mechanisms for Mercury Capture in Warm Post-Gasification Gas Clean Up Systems" DOE Co-operative Agreement DE-FC26-04NT42313 \$493,140 (with Paul Blowers) October 1, 2004- September 30 2007.

"Carbon Black Formation" Cabot Corporation \$105,000 June 1,2001- June 1, 2002

"Coal Particle Flow Patterns for O<sub>2</sub> Enriched Low NO<sub>x</sub> Burners", DOE Contract DE-FG26-00NT40816 to Purdue University, Co-Principal Investigator with Professor Jennifer L. Sinclair, Purdue University, \$ 200,000 (\$93,500 to UA), 10/1/00-9/30/03

“Fundamentals of Mercury Speciation Kinetics: A Theoretical and Experimental Study” US Environmental Protection Agency Grant Number R-82616801, Co-Principal Investigator with Assistant Professor Paul Blowers, \$225,148,.9/1/00 through 8/31/02.

“NO<sub>x</sub>, Fine Particles and Toxic Metal Emissions from the Combustion of Sewage Sludge/Coal Mixtures: A Comprehensive Assessment”, U.S. Department of Energy, 10/1/00 – 30/9/03, \$263,187.

“Oxygen Enhanced Combustion for NO<sub>x</sub> Control”, Praxair, Inc., 18 months, 6/1/00 – 12/1/02, \$ 105,000.

“Environmental Risk Management of Fine Particle Emissions from Combustion Sources” International Joint Research Grant from NEDO, Japan New Energy and Industrial Technology Development Organization, 8/30/98 – 8/30/01. Total amount ¥78,000,000 (with about \$300,000 to UA)

“Toxic Substances from Coal Combustion--A Comprehensive Assessment, Phase II” Subcontract from PSI, Continuation of DOE Contract DE-AC22-95PC95101, Task 6.2, 3/1/98- 6/31/00, UA Project Amount \$ 209,700.

“Research Collaboration with EPA on Optimization of In-Situ Capture by Sorbents in Combustion Processes”, EPA Co-operative Agreement, 2/1/98-1/31/01, (3 Yr Project Amount \$225,000.

“Optimization of Coal Particle Flow Patterns in Low NO<sub>x</sub> Burners”, Co-Principal Investigator with J. L. Sinclair, Purdue University, DOE, University Coal Research, 10/1/97 – 9/30/00, Project Amount \$200,000.

“Isolation of Metals from Liquid Wastes: Reactive Scavenging in Turbulent Thermal Reactors”, DOE, Office of Environmental Management, 10/1/97 – 9/30/00, Project Amount \$ 299,581.

"Tests for CDEM Sorbent" Mayr-Melnhoff, Netherlands, \$30,000 (assay account)

"Optimization of In-Situ Capture by Sorbents of Toxic Metals in Combustion Processes" Principal Investigator, EPA Grant Number R 825389-01-0, 10/1/96 - 9/30/99, Project Amount \$ 293,068.

"Toxic Substances from Coal Combustion--A Comprehensive Assessment Phase I" Subcontract from PSI, DOE Contract DE-AC22-95PC95101, Task 6.2, 10/1/95-9/30/97, \$30,000.

"Interactions Between Trace Metals, Sodium and Sorbents in Combustion" Principal Investigator, DOE Grant DE-FG22-94PC94203, 10/1/94-9/30/97, \$ 199,999.

"Fundamental Studies of NO<sub>x</sub> Destruction in Diffusion Flames" Principal Investigator, EPRI Grant # RP8005-16, 10/15/91 - 4/15/95, \$ 292,000.

"Synergistic Capture Mechanisms for Alkali and Sulfur Species from Combustion" Co-PI with Professors Shadman and Peterson. DOE Grant DE-FG22-90PC90285. 9/1/90 -8/31/93, \$199,977.

"Transient Gas Phase Mixing in Rotary Kilns" Principal Investigator, US EPA Cooperative Agreement CR-817497-01-0, 10/9/90- 10/08/93, \$90,000.

"NO<sub>x</sub> Destruction in Diffusion Flames", Principal Investigator, U.S. D.O.E. 10/1/88- 8/28/90, \$75,939.

"Prediction and Control of Heavy Metal Emissions from Combustion Processes" Co-Principal Investigator with T.W. Peterson, U.S.E.P.A. 4/1/88-8/31/89, \$70,000.

"Nitrogen Oxide Abatement by Distributed Fuel Addition", Principal Investigator, U.S. DOE 5/1/87 - 1/21/91  
\$194,368.

"Mechanisms of Surface Enrichment and Adhesion of Coal Combustion Particulates", Co-Principal Investigator with F. Shadman and T.W. Peterson. U.S. DOE 9/15/86 - 9/15/90  
\$174,970.

"Transformation of Mineral Matter in Coal", Co-Principal Investigator with T.W. Peterson, U.S. DOE, Subcontract through Physical Sciences Inc., 10/1/86 - 9/31/89  
\$300,995.  
Extension and addition through 9/31/91  
\$120,000.

"The Effect of Minerals Stratification on Aluminum Recovery from Coal Ash Particles", Co-Principal Investigator with F. Shadman and T.W. Peterson. Mining and Mineral Resources Research Institute, 7/1/86 - 6/30/87  
\$16,030.

"A Scanning Auger Microprobe for Particle Analysis", J.O.L. Wendt, Principal Investigator (with T.W. Peterson and F. Shadman), U.S. DOE University Instrumentation Grant, 9/1/84-8/31/85  
\$279,000.

"Advanced Research in Coal Combustion and Gasification Process Modification Technology" J.O.L. Wendt and T.W. Peterson, Principal Investigators  
U.S. DOE (Morgantown Energy Technology Center) 10/1/84-9/30/86  
\$149,366.

"Fuel Nitrogen Mechanisms in Pulverized Coal Combustion"  
J.O.L. Wendt, Principal Investigator  
U.S. DOE (Pittsburgh Energy Technology Center), 12/1/84-11/30/87  
\$150,000 (Subcontract): Prime Contractor is EER.

"Coal Pyrolysis in Flat, Opposed Jet Combustion Configurations"  
J.O.L. Wendt, Principal Investigator  
U.S. DOE/Shell Development, Funded 9/1/82-8/31/85  
\$190,794

"Fuel Nitrogen Mechanisms in Laminar Opposed Jet Diffusion Flame"  
J.O.L. Wendt, Principal Investigator  
U.S. EPA, Funded 7/31/79  
\$95,545  
Renewal under different auspices within EPA \$83,000  
U.S. EPA, Funded 8/5/82-2/4/84

"Advanced Staged Combustion of Pulverized Coal", J.O.L. Wendt, Principal Investigator  
U.S. DOE-Funded 9/30/79-1/31/83  
\$293,189

"Formation of NO<sub>x</sub> and Other Products from Chemically Bound Nitrogen in Coal Combustion", J.O.L. Wendt, Principal Investigator.  
Subcontract from Exxon Research and Engineering under NSF/RANN Contract  
AER 75-03964 W. Bartok, Project Manager.  
4/01/75-10/01/76 \$ 48,000 (Subcontract Only)

Continuation under DOE sponsorship  
10/01/77-11/30/79 \$ 88,000 (Subcontract Only)

Continuation

01/01/81-08/25/82 \$102,694 (Subcontract Only)

"Investigation of Pollutant Control Through Staged Combustion of Pulverized Coal", J.O.L. Wendt, Principal Investigator.

U.S. ERDA/DOE Contract E (49-18)-1817.

4/01/75-3/31/78 \$165,052.

"Effect of Fuel Sulfur on Nitrogen Oxide Formation in Combustion Processes",

J.O.L. Wendt, Principal Investigator.

U.S. EPA Grant R803715

6/01/75-07/31/76 \$76,355

6/01/76-07/31/77 \$60,000 (Continuation)

7/31/77-11/30/78 \$51,973 (Modification)

"Effect of Sulfur Dioxide on Nitrogen Oxide Formation in Premixed Flat Flames", J.O.L. Wendt, Principal Investigator.

U.S. EPA Grant R-802204

4/01/73-3/31/74 \$27,000

4/01/74-3/31/75 \$32,407 (Continuation)

"Pollutant Formation in Gas Solid Combustion Processes", J.O.L. Wendt, Principal Investigator. NSF-Engineering Research Initiation Grant GK-37459. 4/01/73-10/01/74 \$16,400

"A Kinetics Study of Sulfur Species in Smelter Emissions", J.O.L. Wendt, Faculty Advisor. NSF Student Originated Studies Grant GY-10801 4/01/73-4/01/74 \$17,100

### **GRADUATE STUDENTS SUPERVISED**

Aaron Hillshorst	M.S.	(Expected, 2004)
D. Chance Price	M.S.	May 2004
Jennifer Wilcox	Ph.D.	(Co-advised with P.Blowers; May, 2004, currently Asst. Prof., Chemical Engineering, Worcester Poly, MA)
Art Fernandez	Ph.D.	(Aug 2002)
John R. Schmidt	M.S, Ph.D.	(Aug 2000; December 2004)
Jonathan Amos	M.S.	(August, 1999, currently with CleanAir, MN)
Greg Ogden	Ph.D	(August 2002, Head of Dept at Pima College)
Thomas K. Gale	Ph.D	(Dec 2001, currently Southern Research Corp. Birmingham, AL)

Wayne S. Seames	Ph.D.	(Aug 2000, Assoc. Prof . Chemical Engineering, Univ. at N. Dakota)
Sheldon B. Davis	Ph.D.	(Dec., 1999, currently with Cabot Corp., MA)
William A. Johnson	M.S.	(Dec. 1995, independent consultant)
Julian Becker	M.S.	(Dec. 1995, at DFLVR, Cologne, Germany)
Nooshin Eftekhardzeh	M.S.	(December 1994)
Z. Fang	M.S.	(Aug. 1993, currently with Arizona Dept. of Env. Quality)
P. Mwabe	Ph.D.	(Dec. 1993, currently with Kenya Waste Management Institute, Nairobi, Kenya)
Neal B. Gallagher	Ph.D.	(June, 1992; co-advised with T.W. Peterson, currently Vice President of Eigenvector Technologies at Chelan, WA)
Mark A Scotto	Ph.D.	(December, 1992; co-advised with T.W. Peterson, currently at McDermott Ind., OH)
Lawrence E. Bool III	Ph.D.	(December, 1993, co-advised with T.W. Peterson currently with Praxair, Inc. NY)
H. Schenck	Ph.D.	(June 1994, currently at Shell Laboratory, Netherlands)
W.C. Lin	Ph.D.	(December 1994, currently teaching in Taiwan))
J. Mereb	Ph.D.	(Dec. 1991, currently with Consolidated Coal Research Laboratories, Pittsburgh, PA)
U. Ghani	Ph.D.	(Dec. 1990, currently at Air Liquide, Chicago)
E. A. Bassham	Ph.D.	(co-advised with T.W. Peterson, withdrew due to ill health)
A. Bose	Ph.D.	(May 1989, currently with U.S. Dept of Energy, National Energy Technology Center)
Sami Segbeaya	M.S.	(May 1986) Returned to Togo
U. Levin	M.S.	(May 1986, returned to Israel)
B. McCaslin	M.S.	(August 1985, currently with Shell Oil Company, Houston, Texas)
M. Masteller	M.S.	(August 1984, currently with Motorola, Inc.)
W. Anderson	M.S.	(December 1984, currently with Penn. State University)
B. Kram	M.S.	(August 1984, currently with Gore Corporation, Flagstaff, AZ)

K. Dannecker	M.S.	(December 1984, currently with CH2M, Inc. Wisconsin)
R. Borsheim	M.S.	(June 1982)
R. Montgomery	M.S.	(June 1982)
C. Jablonsky	M.S.	(June 1984)
G. Kyle	M.S.	(December 1982, currently with Rocketdyne)
C.F. Botsford	M.S.	(September 1982, currently with C.F. Braun and Co.)
D. Graves	M.S.	(May 1981, presently Professor University of California, Berkeley)
E.C. Wootan	M.S.	(December 1986, currently with IBM)
F.A. Pianki	M.S.	(June 1981, presently with Getty Oil Company, Bakersfield, California)
J.W. Glass	M.S.,Ph.D.	(December 1978, June 1981, presently with Phillips Petroleum, Tulsa,OK)
J. Lee	M.S.	(June 1979, presently with Accurex Corp. Pine Bluff, AR)
T.L. Corley	M.S.	(December 1976, presently with University of Arizona, Department of Hydrology and Water resources)
J.T. Morcomb	M.S.	(December 1977, presently with Cabot Corporation, LA)
R. Cortes	M.S.	(December 1976, presently with Kellogg Company, Houston, Texas)
W.A. Hahn	M.S.,Ph.D.	(May 1977, and Ph.D. November 1979, presently self employed, Houston, Texas)
D.W. Pershing	Ph.D.	(September 1976, presently Executive Vice President, University of Utah)
J.M. Ekmann	M.S.	(May 1975, presently Director, Coal Utilization Div. US Dept. of Energy, Pittsburgh, Pennsylvania)
O.E. Schulze	M.S.	(September 1974, presently with DOW Chemical Company, Freeport, Texas)

### **RESEARCH ASSOCIATES SUPERVISED**

Art Fernandez, Postdoctoral Research Associate	2002-2003
Gregory Ogden, Research Assistant Professor	2002-
Jerry Cabalo, Postdoctoral Research Associate	1999-2001
Sheldon B. Davis, Postdoctoral Research Associate	1999-2000

G. D'Arcy, Postdoctoral Researcher	1999-2000
Y Nagatake, Visiting Researcher	1998-1999
I. Naruse, Visiting Researcher	1996-1997
L. Y. Chen, Research Associate,	1984-1986
W.P. Linak, NAS/NAE Postdoctoral Fellow at EPA	1985-1986
W.A. Hahn, Visiting Assistant Professor	1979-1981
D.W. Pershing, Visiting Assistant Professor	1976-1977
D.G. Lilley, Visiting Associate Professor	1975-1976

### **INVITED LECTURES & SEMINARS**

California Institute of Technology, Department of Chemical Engineering, December 1975.  
Stanford University, Department of Chemical Engineering, December 1975.  
Shell Development Company, Westhollow Research Center, Houston, July 1976.  
Akademia Gorniczo-Hutnicza, Krakow, Poland, September 1977.  
Shell Laboratorium, Amsterdam, Netherlands, September 1977.  
Universities of Naples, Pisa and Technical University of Berlin, September 1977.  
California Institute of Technology, Pasadena, December 1978.  
University of California, Santa Barbara, November 1978.  
University of California at Los Angeles, January 1979.  
Washington State University, Pullman, Washington, April 1979.  
Gordon Conference on Fuel Science, Plymouth State College, July 1979.  
Brigham Young University, Provo, Utah, February 1980.  
Carnegie Mellon University, Pittsburgh, Pennsylvania, October 1979.  
General Electric Company, Schenectady, New York, July 1980.  
Wayne State University, Detroit, Michigan, November 1980.  
Shell Laboratorium, Amsterdam, June 1981.  
University of Pennsylvania, Philadelphia, Pennsylvania, October 1981.  
Morgantown Energy Technology Center, Department of Energy, West Virginia, Jan. 1982.  
Studsvik Energrteknik AB, Nykoping, Sweden, May 1983.  
University of Texas, Austin, Texas, September 1983.  
Coal Center, Ben Gurion University of the Negev, Israel, March 1984.  
Massachusetts Institute of Technology, Department of Chemical Engineering, December 1984.  
U.S. Environmental Protection Agency, Office of Exploratory Research, Washington, D.C.,  
April 1985.  
Combustion Research Branch, U.S. Environmental Protection Agency, North Carolina, January  
1985.  
University of Washington, Seattle, Department of Chemical Engineering, June 1985.  
University of Massachusetts, Amherst, Department of Chemical Engineering, Sep. 1985.  
Louisiana State University, Department of Mechanical Engineering, October 1985.

Industrial Laboratories at Ishikawajima Harima Heavy Industries, Tokyo; Mitsubishi Heavy Industries Nagasaki; Babcock Hitachi, Kure; Kobe Steel, Kobe, Japan, October 1985.  
University of California, San Diego, Department of Chemical Engineering, March 1987  
National Institute of Environmental Health Sciences at Conference on Health Effects of Combustion By-Products, October 23-24, 1990.  
Tampella Power, Tampere, Finland, April 19, 1991  
Helsinki University of Technology, Finland, April 15-16, 1991  
University of Arizona, Aerospace and Mechanical Engineering Department, October 31, 1991.  
Industrial Laboratories at Ishikawajima Harima Heavy Industries, Tokyo; Mitsubishi Heavy Industries Nagasaki, July, August 1992  
Toyohashi University of Technology, Energy Engineering Program, July 1992  
University of Tulsa, Chemical Engineering Department, January, 1994  
ACERC, University of Utah, March 1994  
Silesien Technical University, Katowice, Poland (Under US AID auspices), December, 1994  
Brigham Young University, Department of Chemical Engineering, October 1996.  
Advanced Combustion Engineering Research Center, Annual Technical Meeting, Provo, Utah, March 1998  
The Johns Hopkins University, Department of Chemical Engineering, Baltimore, MD, March 1999  
University of Newcastle, Australia, March 2002  
CSIRO, Sydney, Australia, March 2002  
Institute for the Study of Planet Earth, Spring 2002 ISPE Seminar Series: Air Quality, Climate, and Life, University of Arizona, Tucson AZ, April 2002  
National University of Singapore, February, 2003  
University of Utah, October, 2003

### **NEW COURSES**

- |         |   |
|---------|---|
| ChE 345 | Combustion Generated Air Pollution<br>"Pollutant formation in combustion processes and methods of control. Diffusion models for atmospheric dispersion including plume rise calculations", Cross-listed with AME 345. |
| ChE 245 | Principles of Fuels Processing<br>"Processing steps for obtaining clean fuels from coal, petroleum and natural gas, shale oil, tar sands and geothermal sources".   |

ChE 557

Applied Combustion

"Laminar, turbulent, premixed and diffusion flames; flammability limits. Fossil fuel combustion in furnaces; coal combustion and combustion diagnostics". Cross-listed with AME 557.

### **SABBATICALS**

Academic Year 1978-1979: California Institute of Technology, Pasadena, CA

Fall 1985: Combustion Research Branch, U.S. Environmental Protection Agency, and invited lectures in Japan and Europe

Fall 1992: International Flame Research Foundation, IJmuiden, Netherlands, Royal Institute of Technology, Stockholm, and invited lectures in Japan.

Calendar Year 2003: National University of Singapore, Singapore ; University of Utah; Invited lectures in Asia and Europe

### **SHORT COURSES**

Applied Combustion Technology. Problems and Solutions. Sponsored by University of Utah, Reaction Engineering International, Brigham Young University, March 15-17, 2004. Organizer and lecturer.

Applied Combustion Technology", Director. Course was offered through Center for Professional Advancement, in February, May, August, December, 1977, March, April, July, October, December 1978; February, May, July, August, December, 1980, and January, April, June (twice), October, November, 1981, January, February, May, August (twice), September 1982, and twice per year thereafter through 1998 at course locations in the U.S., Europe and the Middle East. Each offering has been well attended by registrants representing industries in the U.S., Canada, Mexico, Europe and the Middle East.

"Pulverized Coal Combustion-Principles and Practice", Director. Course offered December, 1982 in New Jersey and May 1983 in Copenhagen, Denmark. "Burner Aerodynamics Workshop", Director. Exxon Research and Engineering Company, August 1982.

"Flame Research Courses" 1 (1988, Netherlands), 2 (1989, Hong Kong), 3 (1990, Netherlands), 4 (1991, Prague), Lecturer, 5 (1992, Veldhoven, Netherlands), Sponsored by International Flame Research Foundation, Netherlands,.

**SERVICE**

Reviewer of articles for AIChE Journal, Industrial and Engineering Chemistry, Canadian Journal of Chemical Engineering, Chemical Engineering Science, Combustion Science and Technology, Combustion and Flame, Progress in Energy and Combustion Science, J. Energy and Fuels, Fuel, AIAA Journal, (1974-present).

Reviewer of research proposals for NSF, DOE, EPA, and the Petroleum Research Fund of the ACS (1974-present).

Chairman, College of Mines Research Committee. (1972-1973) Explored interdisciplinary research opportunities for College of Mines.

Member, College of Mines CO-OP Committee. (1972-1973; 1974-1975) Helped promote cooperative training program for Chemical Engineering Undergraduates.

Member, Arizona State Subcommittees on "Arizona's Airshed and their Assimilative Capacity to Absorb Air Pollution". (1973).

Chairman, Chemical Engineering Search Committee. (1975-1976) Responsible for coordination of preliminary phase of search for new Chemical Engineering faculty.

Chairman, Symposium on "Fundamentals of Direct Coal Combustion", 68th Annual Meeting, AIChE, Los Angeles, November 1975. Conceived, organized and reviewed research contributions for a technical session.

Chairman, Symposium on "Pulverized Coal Combustion Fundamentals", 70th Annual Meeting, AIChE, New York, November 1977.

Member, Energy Systems Engineering Committee  
Responsible for participation of Chemical Engineering Department in multi-department graduate program. (1974-1978) (1979-present).

Chairman, Colloquium on Coal Combustion, Session A3, Seventeenth International Symposium on Combustion, Leeds, England (August, 1978).

Member, Organizing Committee on EPA/Caltech Conference on Coal Combustion Technology and Emission Control, Pasadena, California, February 1979.

Member, Program Subcommittee, 18<sup>th</sup> through 27<sup>th</sup> Symposia on Combustion, The Combustion Institute, 1979-present.

Chairman, Colloquium on Advanced Combustion Techniques, Sixth Members' Conference, International Flame Research Foundation, Nordwijkerhout, Netherlands, May 19-21, 1980.

Co-chairman, Colloquium on Combustion Fundamentals at 73rd Annual Meeting of AIChE, Chicago, November 1980.

Member, Program Subcommittee First Specialists' Meeting of the Combustion Institute, Bordeaux, France, July 1981.

Chairman, Session on Deflagrations First Specialists' Meeting of the Combustion Institute, Bordeaux, France, July 1981.

Member, Chemical Engineering Department Head Search Committee (1980-1982).

Chairman, Chemical Engineering Graduate Study Committee (1981-1982; 1988-1990). Responsible for Coordination and Development of Graduate Program, and recruiting of graduate students.

Moderator, Afternoon session in International Conference on Stiff Computation, April 13, 1982, Park City, Utah.

Chairman, Session for Coal Combustion, Western States Combustion Institute Spring Meeting, April 1982, Salt Lake City, Utah.

Co-chairman, Session D-6 on Gaseous Pollutants, Nineteenth Symposium (International) on Combustion, Haifa, Israel, August 1982.

Executive Committee Member (at large), Western States Section, Combustion Institute 1981-1983, 1983-1985, 1985-1987, 1997-present.

Member, Scientific Advisory Panel, EPA Research Contract to EERC on In-Furnace NO<sub>x</sub> Reduction by Reburning (1983-1986).

Member, Peer Review Panel (Chairman, A.F. Sarofim, MIT), EPA LIMB (Limestone Injection/Multistage Burner) Research and Development Program. North Carolina, April 1983.

Member, Emissions Panel (Chairman, A.F. Sarofim, MIT), DOE Coal Combustion Kinetics Workshop, Pittsburgh Energy Technology Center, September 1983.

Member, Peer Review Panel, EPA Thermal Destruction Program (Hazardous Waste), February 1984.

Organizer, Fall 1986 Meeting of the Western States Section Combustion Institute, Tucson, Arizona

Member, Technical Advisory Board, Hazardous Waste Research Center, Louisiana State University, Baton Rouge, Louisiana 1985-1988.

Member, Dean's Search Committee, College of Engineering and Mines, 1987.

Organizer of Colloquium on Chemistry of NO<sub>x</sub> and SO<sub>x</sub> Abatement, 194th ACS National Meeting, New Orleans, 8/30/78 - 9/4/87

Member, Chemical Engineering Graduate Study Committee, 1987 - present, Chairman, 1988- 1990, 1994- 1997.

Member, Department of Chemical Engineering Faculty Status Committee, 1988-present, Chairman, 1988-1994.

Member, College of Engineering and Mines Promotion and Tenure Committee, 1988 - 1990, 1995-1997, Chairman, 1990.

Member, College of Engineering and Mines Graduate Study Committee, 1988-1990, 1995-1997.

Chairman, Department of Chemical Engineering Self Study Committee, 1988 -1989.

Member, NSF Panel on Incineration Research Needs, May 1988.

Member and Discussion Leader, EPRI Panel on Long Range and Innovative Combustion Research, October 1988.

Member, Steering Committee, EPA Core Combustion Research Needs, 1989 -1990.

Organizer, Spring 1990 Members' Meeting of the American Flame Research Committee, Tucson, Arizona, April 2-3, 1990.

Member, Governor's Hazardous Waste Technical Advisory Committee, July-September, 1990

Member, College Committee on Graduate Quality under Conditions of Declining Budgets, December 1991- January 1992.

Member, CRWI Metals Task Force (Chairperson: Dr. Joanne Hillary) 1991-1993

Discussion Leader, GRI Panel on Mathematical Models for Reburning Applications in Boilers, The Gas Research Institute, Chicago, May, 1996

Organizer and Chairman on Session on “Environmental Aspects of Combustion”. 1997 AIChE Meeting, Los Angeles, November 1997

Organizer and Chairman of Session on “Environmentally Benign Combustion Processes” 1998 AIChE Meeting, Miami, November 1998.

### **MISCELLANEOUS**

Member, Combustion Institute

Fellow, American Institute of Chemical Engineers.

Invited Independent Member, American Flame Research Committee, International Flame Foundation.

Invited Member, Coalition for Responsible Waste Incineration, Washington, D.C.

### **EDITORIAL BOARDS OF JOURNALS**

International Journal on Environmental Combustion Technologies

IFRF Industrial Combustion Journal

Annual Reviews in Hazardous Waste Treatment.

### **PATENTS**

U.S. Patent 5972301: Minimizing Emissions of Hexavalent Chromium from Combustion Sources (Issued 10/26/99)

U.S. Patent 5619937: Sorbent Melts for Capture of Metals from Combustion Gases (Issued 4/15/97)

U.S. Patent 5233933: Method of Reducing Transient Emissions from Rotary Kiln Incinerators and Container for Attaining Same (Issued 8/10/93)

### **PUBLICATIONS**

#### **a. Peer Reviewed Papers (94)**

94. Fernandez, A., Wendt, J.O.L., Witten, M.L., “Health Effects Engineering of Coal and Biomass Combustion Particulates: Influence of Zinc, Sulfur and Process Changes on Potential Lung Injury from Inhaled Ash” *Fuel*, 85, 1320-1327 (2005)

93. Gale, T. K. and Wendt, J.O.L. "In-Furnace Capture of Cadmium and Other Semi-Volatile Metals by Sorbents" *Proc. Comb Inst.* 30, 2999-3007 (2005)
92. Yoo, J.I, Shinagawa, T, Wood, J.P., Linak, W.P., Santoianni, D.A., King, C.J., Seo, Y.C., Wendt, J.O.L., "High Temperature Sorption of Cesium and Strontium on Kaolinite Powders in Combustors", *Environ. Sci. Technol.*, 39:5087-5094 (2005).
91. Linak, W.P., Miller, C.A., Santoianni, D.A., King, C.J., Shinagawa, T., Wendt, J.O.L., Yoo, J.I., Seo, Y.C. "High Temperature Interactions Between Residual Oil Ash and Dispersed Kaolinite Powders", *Aerosol Sci. and Technol.* 38:1-14(2004)
90. Gale, T.K., and Wendt, J.O.L., "Mechanisms and Models Describing Sodium and Lead Scavenging by a Kaolinite Aerosol at High Temperatures", *Aerosol Sci. Technol.*, 37:865-876 (2003).
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**b. Invited Keynote or Plenary Lectures at International Meetings. (18)**

““Managing the Health Risk from Incinerator Emissions: The Case for Health Effects Engineering” Invited plenary lecture, 3<sup>rd</sup> International Conference on Combustion, Incineration/Pyrolysis and Emission Control, Zhejiang University, Hangzhou, China, October 21-23, 2004

“Partitioning and Control of Trace Metals During Coal and Waste Combustion” Invited keynote lecture, Pittsburgh Coal Conference, Osaka, Japan, September 15, 2004.

“Managing Potential Lung Injury from Inhalation of Incinerator Emissions: The Case for health Effects Engineering” Invited plenary lecture, WASTE 2003 4<sup>th</sup> International Symposium on Waste Treatment Technologies, Sheffield, UK, June 30-July2, 2003

“Health Effects Engineering for Combustion Processes” Invited Plenary lecture 18<sup>th</sup> International Symposium on Combustion Processes, Ustron, Poland, September 2-5, 2003

“Health Effects Engineering of Combustion Generated Metal Particulates” Invited plenary lecture, Third Mediterranean Combustion Symposium, Marrakech, Morocco, June 8-13, 2003

“Combustion Process Modifications To Reduce Health Effects Of Particulate Emissions” Invited plenary lecture, CLEAN AIR 2003, 7<sup>th</sup> International Conference on Energy for a Clean Environment, Lisbon, Portugal, July 7-10, 2003

“Mechanisms Governing The Fate Of Trace Metals In Combustion”, Invited Lecture at 17th Symposium on Combustion Processes, Poznan, Poland, September 17-24, 2001

“Kinetic Mechanisms Governing Sorbent Control of Semi-Volatile Metal Emissions in Incinerators”, Invited Opening Plenary Lecture at 3<sup>rd</sup> International Symposium on Incineration and Flue Gas Treatment, Brussels, Belgium, July 2-4, 2001

“Pollutant Formation in Furnaces: NO<sub>x</sub> and Fine Particulates” Invited Keynote Paper presented at 5<sup>th</sup> European Conference on Industrial Furnaces and Boilers, Porto, Portugal April 11-14, 2000.

“Formation and Control of Toxic Metal Emissions in Combustion Systems” invited paper at Trace Element Workshop 2000, Yokohama, Japan, January 13-14, 2000.

“The Partitioning of Arsenic, Selenium, Cadmium, and Cesium during Pulverized Coal Combustion in a 17kW Downflow Combustor”, with W.S. Seames, Invited Keynote Paper at 4<sup>th</sup> International Symposium on Coal Combustion, August 18-21, 1999, Beijing, P.R. China.

“The Fate of Toxic Metals in High Temperature Combustion Systems”, Invited Topical Review, The Sixth International Congress on Toxic Combustion By-Products, June 27-30, 1999, University of Karlsruhe, Germany.

“Mechanisms Governing the Partitioning and Control of Toxic Metals during the Combustion of Waste Materials”, Invited Keynote Lecture delivered at Second International Symposium on Advanced Energy Conversion Systems and Related Technologies, RAN98, 1-3 December, 1988, Nagoya University, Nagoya, Japan.

“Toxic Metal Emissions and Abatement from Combustion Processes”, Invited Keynote lecture delivered at 1998 American Flame Research Committee Technical Meeting, April 1-3, 1998

“Mechanisms Governing the Partitioning of Semi-Volatile Alkali and Toxic Metals During Waste and Waste Fuel Combustion”, Keynote Lecture delivered at First International Symposium on Incineration and Flue Gas Treatment Technologies, Sheffield University, UK 7 – 8 July, 1997.

"Combustion Science for Incineration Technology". Invited Plenary Lecture delivered at the Twenty-Fifth International Symposium on Combustion, The Combustion Institute, 21 July - 5 August, 1994, Irvine, California, USA.

"Mechanisms Governing the Formation and Destruction of NO<sub>x</sub> and Other Nitrogenous Species in Coal Combustion Systems" Invited keynote lecture delivered at Second International Conference on Combustion Technologies for a Clean Environment, 19-22 July, 1994, Lisbon, Portugal.

"Simplified Coal Nitrogen Inter-conversion Mechanisms and Their Impact on Low NO<sub>x</sub> Burner Designs" Invited keynote lecture delivered at Coal Utilization and The Environment Conference, sponsored by the journal Fuel, 18-20 May, 1993, The Grosvenor Resort, Orlando, Florida, USA.

"Incineration Research, Processes, and Hearings- or The Good, The Bad, and The Ugly", Invited Luncheon Speech, 11th Annual Incineration Conference, May 11-15, 1992, Albuquerque, New Mexico.

c. **Contributed Presentations and Preprints: National and International Meetings.** (139, 31 AICHE)

Yoo, J.I., Shinagawa, T., Wood, J.P., Linak, W.P. (Presenter), Santoianni, D.A., King, C.J., Seo, Y.C., Wendt, J.O.L., "High Temperature Sorption of Cesium and Strontium on Kaolinite Powders in Combustors", Poster presented at 30<sup>th</sup> Symposium (International) on Combustion, University of Illinois at Chicago, July 26<sup>th</sup> –30<sup>th</sup>, 2004.

J. Wilcox (speaker), J.O.L. Wendt and P. Blowers, "On the Path to Elucidating the Speciation of Mercury in the Flue Gases of Coal Combustion", 7<sup>th</sup> Electrical Utilities Environmental Conference", Tucson, AZ, January 2004

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J. Wilcox (speaker), P. Blowers and J.O.L. Wendt, "Understanding the Kinetics of Mercury Oxidation in the Flue Gases of Coal Combustion: Experimental and Theoretical Results", AICHE Annual Meeting, San Francisco, CA, November 2003.

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