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**GENERAL BACKGROUND:**

Sept '02 - Present: **Institute of Paper Science & Technology**, Senior Associate Engineer.

Jan '98 – Sept'02: **Institute of Paper Science & Technology**, Associate Engineer. Leader of research program “Gasification and New Approaches in Chemical Recovery”. Oversee projects within program and budget. Conduct experiments with pilot-scale, high-pressure, high-temperature gasification reactor (which I assembled). Report results. Solicit new funding. Publish work in the open literature. Provide mill support to member companies.

'94-'97: **Sandia National Laboratories**, Combustion Research Facility, Visiting Researcher. Completed research portion of Ph.D., studying fireside fouling in combustion of spent pulping liquor. The focus is on obtaining rate data for deposition of sub-micron aerosols on heat transfer surfaces. Also developed diagnostic and experimental techniques that are used to study combustion properties of coal, biomass, black liquor, and energetic materials.

1996, July: University of Toronto, Chemical Engineering Dept. Engineering consultant on the design and construction of a new, 25-foot heated length, laminar entrained flow reactor.

1993, April-July: Sabbatical: studied aerosol science with the Aerosol Technology Group of the Valtion Teknillinen Tekniska (VTT) research center, Espoo Finland.

1992: OSU. Designed and constructed a laminar entrained flow reactor for black liquor research.

**PRIMARY SPECIALITIES:**

Combustion and gasification processes  
Aerosol deposition (i.e. ash fouling)  
Aqueous electrolyte modeling

**EDUCATION:**

B.S. Chemical Engineering, Oregon State University 1987  
M.S. Chemical Engineering, Oregon State University 1990  
Ph.D. Chemical Engineering, Oregon State University 1998

**PROFESSIONAL EXPERIENCE (see background synopsis):**

Grants and contracts in which I participated:

“Black Liquor Gasification with Direct Caustization Using Titanates”, in collaboration with Chalmers University, 1/01 – 10/01

“Black Liquor Gasification with Borate Autocaustization”, in collaboration with U.S. Borax, and University of Toronto, 5/01 – present

“Fundamental Study of Black Liquor gasification Kinetics”, DE-FC36-98GO10369, USDOE (subcontract through Air Products and Chemicals Corporation; 10/98 – 9/00)

“Fume Deposition in Recovery Boilers,” funded by a consortium of ABB/Combustion Engineers, Ahlstrom Machinery, Inc., Babcock & Wilcox Company, Kvaerner Pulping, Mitsubishi Heavy

Industries, Tampella Power Inc., Union Camp Corporation, and Weyerhaeuser Paper Company; under review by other industrial firms, 1992-96.

“Energy from Recycled Fiber Sludge,” James River Corp.

“Sulfate Reduction in an Entrained Flow Black Liquor Reactor,” Tampella Power, Inc.

“Non-Process Elements in Chemical Recovery,” Industry Consortium, 1986-1987

#### MAJOR PUBLICATIONS RELEVANT TO THIS WORK:

I. Nohlgren, V. Sricharoenchaikul, S. Sinquefield, W. Frederick, H. Theliander, “Black Liquor Gasification with Direct Causticization Using Titanates in a Pressurized Entrained-Flow Reactor’ Part 1: Kinetics of the Causticization Reaction”, (in press)

I. Nohlgren, V. Sricharoenchaikul, S. Sinquefield, W. Frederick, H. Theliander, “Black Liquor Gasification with Direct Causticization Using Titanates in a Pressurized Entrained-Flow Reactor’ Part 2: Carbon and Carbon Species Transitions”, (in press)

S. Sinquefield, V. Sricharoenchaikul, W.J. Frederick, D. Dayton, M. Ratcliff, R. French, D. Carpenter, J. Lewnard, “Black Liquor Gasification I: The Impact of Pressure on C-H-O-S Gas Speciation and Tar Components During Pyrolysis”, (Poster) 2001 International Chemical Recovery Conference, Whistler, B.C., June 11-14.

#### MAJOR PUBLICATIONS IN THE PAST 5 YEARS

S.A. Sinquefield, L.L. Baxter, and W.J. Frederick. ‘An Experimental Study of the Mechanisms of Fine Particle Deposition in Kraft Recovery Boilers’, Paper 9-2, 1998 International Chemical Recovery Conference, Tampa, FL, June 1-4

Bernath, P., S. A. Sinquefield, Baxter, L.L., al., "In-Situ Analysis of Ash Deposits From Black Liquor Combustion", Vibrational Spectroscopy 16(#2): 95-103. 1998

Frederick, W. J. Jr., G. L. Rorrer, A. W. Rudie, G. W. Schmidl, S. A. Sinquefield, M. L. Laver, W. Yantasee, D. Ming, “Control of the Accumulation of Non-Process Elements in Pulp Mills with Bleach Filtrate Reuse: A Chemical Equilibrium Approach to Predicting the Partitioning of Metals In Pulp Mill and Bleach Plant Streams.” Final Report, U.S. DOE Project Number: DE-FC07-96ID13441, October 2000.