

JOHN J. THOMAS

Department of Biological Sciences
Florida Institute of Technology
150 W. University Boulevard, Melbourne, FL 32901 USA

EDUCATION

- 1959 B.S., Chemistry, Boston College
1961 M.S., Organic Chemistry, Boston College
1966 Ph.D., Organic Chemistry, University of New Hampshire (Durham),
Doctoral Dissertation: Part 1: Sodium Borohydride Reduction of Pyrazinium Salts; Part 2:
Equivalence and Non-equivalence of Benzylic Protons in N-Benzyl Substitute Piperazines

CURRENT POSITION

Research Professor and Director
Bio-Energy and Technology Laboratory
Department of Biological Sciences
Florida Institute of Technology

POSITION DESCRIPTION

Dr. Thomas has over twenty years of Ph.D. level experience in medicinal, diagnostic, environmental, and biomass energy related sciences. This includes: industrial research, research supported by federal and state grants and contracts, teaching courses in environmental health, environmental toxicology, and biochemical toxicology, thesis direction of eight graduate students.

RECENT EXPERIENCE

Dr. Thomas has 12 years of experience in alternative fuels for transportation. He is widely known for the development of 2-methyltetrahydrofuran (MTHF) as an oxygenated fuel that is derived from waste paper. He has seven years of experience in developing scrubber systems for hypergolic fuels vented at NASA-KSC. He also has performed research in medical diagnostics and carcinogenesis. He is currently working on a project concerning a pilot plant for biomass to liquid fuels involving production of liquid fuels from biomass on a 10-liter scale from waste cellulose. The process is entirely chemical in nature and involves no fermentation (industrial sponsor).

SELECTED PUBLICATIONS

- Lucas, S., Loehn, D., Meyer, M., Thomas, J., and Gordon, E. October 18-21, 1993. "Exhaust Emissions and Field Trial Results of a New, Oxygenated, Non-Petroleum-Based, Waste-Derived Gasoline Blending Component: 2-Methyltetrahydrofuran. SAE Technical paper series 932675 Fuels and Lubricants." Meeting and Exposition, Philadelphia, PA.
- Thomas, J., Kim, J., and Mauro, D. 1992. "4-(4-Nitrobenzyl) Pyridine tests for Alkylating Agents Following Chemical Oxidative Activation." *Contam. Toxicol.*, 22, 219-227.
- Rudolph, T. and Thomas, J. 1988. "NO_x, NMHC, and CO Emissions from Biomass Derived Gasoline Extenders." *Biomass*, 16, 33-49.

Proposed CUAP Research Area: *Plants for Environmental Restoration.* Water hyacinths have been used successfully to remove nitrate, nitrite, and metals from water bodies in a NASA sponsored study several years ago. Although the usefulness of this technology would be limited the summer season in Hungary, the low cost and low-tech technology would seem to be an attractive option for Hungary at this time. There are other water plants, such ashydrilla, that accomplish the same tasks which have advantages and disadvantages compared to hyacinths. The usefulness of this approach cannot be discerned without first acquiring some knowledge concerning the major water pollution problems facing Hungary today.

Principal Investigator: Dr. John Thomas (Florida Tech); BUTE collaborator TBD.

First Year Activities: Develop and submit proposals for extramural support of this activity. This will include identification of major water borne pollutants and known concentrations, a work plan for a three to five year project, and evaluation of potential benefits and costs. Dr. Thomas will be prepared to give a seminar in this area on his own work as well as others in NASA who have conducted extensive studies in this area. *First year costs:* Trip to Hungary for two weeks to inspect and study polluted water bodies-\$5000

Subsequent years cost: none (covered by new grant?)

Proposed CUAP Research Area: *Control of Particulate Emissions from Diesel Engines.* Special techniques have been developed for methanol as a diesel engine fuel. When properly operated, a diesel engine running on methanol emits virtually no particulate emissions. Diesel trucks are very prominent particulate polluters in Europe as well as the U.S. Also, methanol has several other advantages as a fuel that might make it particularly interesting for Hungary. Among these are: (1) it can be manufactured from several feedstocks, including natural gas and coal; (2) it can be used as a low emission power plant fuel and (3) it has very low or no emissions of sulfur, polyaromatic hydrocarbons, or olefins. The usefulness of methanol as an atmospheric particulate pollution reducer in Hungary cannot be discerned without first acquiring some knowledge of the particulate problem in Hungary.

Principal Investigator: Dr. John Thomas (Florida Tech); BUTE collaborator TBD.

First Year Activities: Develop and submit proposals for extramural support of this activity. This will include identification of the atmospheric particulate pollution problems in Hungary, a work plan for a three to five year project, and evaluation of potential benefits and costs associated with a methanol fuel program in Hungary. Dr. Thomas will give a seminar concerning his work in this area. *First year costs:* Trip to Hungary for two weeks to learn, first hand about the atmospheric particulate problems-\$5000

Subsequent years cost: none (covered by new grant?)