

## **JONG-PYNG HSU, Ph.D.**

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### Education:

B.S. in Chemistry, Fu-Jen University, Taiwan, Republic of China, 1973

Ph.D. in Organic Chemistry, Washington University, St. Louis, MO, 1981

### Work History:

President, SMART CHEMISTRY Corporation, Sacramento, CA, Nov. 25, 1998 to Present  
Southwest Research Institute

Manager of Mass Spectrometry, 1985 - 1987

Manager of Organic Analysis, 1987 - 1990

Assistant Director, Department of Environmental Sciences, 1990 - 1991

Director, Department of Analytical & Environmental Chemistry, 1991 - July, 1998

Adjoin Professor, University of Texas at San Antonio, 1992-1996.

Organic Manager, NUS Corporation, Pittsburgh, PA, 1983 - 1985

Organic Analyst, Sverdrup Technology, Tullahoma, TN, 1981 - 1983

### Experience Summary:

Dr. Hsu has significant knowledge and experience in problem solving, technology development, operation set-up and project management.

Dr. Hsu has developed, from few people, both well known Analytical & Environmental Chemistry Department of Southwest Research Institute (SwRI) and full service environmental NUS organic laboratory. This development was fostered through his involvement with research, marketing and sale, project management, personnel hiring and training.

### **In the Area of Problem Solving**

Dr. Hsu has solved thousands of problems from chemical, environmental, soft drink, semiconductor, and food industries through his capability on research. Most of these problems were solved within short time frame. In addition to the environmental research and development described in next subject, he has involved in

- sampling and analysis of clean room air and reagent water, solving the crystal problems on wafer for semiconductor industries,
- the analysis of impurities in pure chemicals for chemical industries,
- reverse engineering, or figuring out unknown compositions,
- finding out the variation of taste in soft drinks,
- developing the procedures for rendering and processing of the EMU oil and scaling up the procedures to a pilot plant.

### **In The Area of Environmental Health**

In 1985, he worked as a project manager on an EPA sponsored program for method development for pesticides in indoor air. This program resulted in a method of collecting and analyzing pesticides and chlordane using a personal sampling pump with a polyurethane plug (PUF) as trapping medium, followed by extraction and GC analyses. The method was initially field tested successfully in a pilot study of five homes in Research Triangle Park and was later used to collect over two thousand indoor air samples for a non-occupational pesticide exposure project in Florida and Massachusetts. In addition, Dr. Hsu supervised the analyses for this program and developed automatic programs for the data processing and reporting. This sampling and analytical method was later published by the EPA as method TO-12. After this program, Dr. Hsu continued the method development for semivolatiles and pesticides in air and house dust. In the mean time, EPA was interested in dermal sampling to determine pesticide

exposure of toddlers since their crawling and hand to mouth habits. He invented a PUF roller to sample pesticides from carpet or hard surfaces with a sampling efficiency equivalent to that of the human hand. This tool has been widely used by EPA and the industry for dermal sampling. Since 1988, he was directly, or indirectly involved in HIPES (Toddler/Infant Pesticides Exposure Study), NEFOES (NCI/EPA Farmer Occupational Pesticides Exposure Study), AHS (Agricultural Health Study), and Pesticides Exposure Studies around the U.S. Texas/Arizona and Mexico border and Women Breast Cancer Studies. All of these studies include air and dust sampling and analysis for pesticides.

### **In The Area of Air Analysis**

In 1981, while working for Sverdrup Technology, Dr. Hsu developed Tenax and charcoal tube collection and analytical methods for volatiles in air. From 1983 to 1985, he developed air analyses techniques using Tenax and charcoal tubes in conjunction with automatic thermal desorbers to perform several hundred volatile analyses collected at a superfund site in the Boston area. Additionally, he took a leading role in the method development for collection and analyses of semivolatile organics, pesticides and PCB's in air using polyurethane foam (PUF) plugs.

In 1988, he developed an analytical method for canisters at 1 ppb or less without using a Permapure dryer to remove both water and polar compounds. This method is similar to TO-15 and has been published and was presented at EPA's Third Air Toxics Workgroup Meeting. He was also the first chemist to develop canister cleaning equipment using diffusion pumps and Infrared heating lamps to clean 17 canisters in a batch. He developed a method to prepare a canister standard starting from neat compounds, making it possible to prepare standards for any air project with non-routine target compounds. Since then, more than a thousand canisters per year from

- many EPA superfund sites through EPA Special Analytical Services (SAS),
- the indoor air monitoring in the houses surrounding Kelly Air Force Base in San Antonio,
- Idaho National Engineering Lab, Rocky Flat in Denver, Lockheed Martin (currently called Bactel Jacobs) in Oak Ridge National Lab in TN,
- State of Missouri for ozone precursor compounds,
- environmental engineering firms, such as Jacobs Engineering, URS, Roy F. Weston, Medcaff Eddy, Radian International, etc. and
- many industries, such as clean room air sampling and analysis for semi-conducting industries,

have been analyzed under Dr. Hsu supervision.

### **In The Area of Dioxins/Furans**

Dr. Hsu has set up the operation, automatic procedures and marketing strategy for dioxins/furans sampling and GC/high resolution mass spectrum (HRMS) analysis by TO-9, EPA Method 23, 8290 and 1613 for any sample matrices. He also trained personnel from EPA in Taiwan for stack gas sampling, extraction, clean-up and GC/HRMS analysis of dioxins/furans by EPA Method 23.

### **In The Area of Fast Turnaround Multiresidue Produce Pesticide Screen**

Dr. Hsu initiated a 10-years program with a large Texas Grocery Store chain for a multiresidue produce screening of 10 samples daily for approximate 150 pesticides, herbicides and carbamates at a turnaround time of six hours from sample receipt. For any pesticides over EPA tolerance, GC/MS confirmation will be performed within 24 hours. As a program manager, he led a group of chemists to set up the whole operation, which included developing the fast

turnaround pesticides extraction and analytical method, setting up instrumentation operation, automating data processing and reporting, and QA/QC within two weeks. After this setup, all the samples received since 1989 (more than 25,000 samples) were reported on time and three papers were published, based on the analytical methods and results.

### **In The Area of Chemical Analysis by Good Laboratory Practice**

As a result of the success of the program of fast turnaround time produce screening, Dr. Hsu led SwRI through proposal effort to become an FDA research contract laboratory in 1994 to develop methods for food analysis, following good laboratory practice (GLP). Through his invention of the PUF roller for dermal exposure sampling, Dr. Hsu convinced a large pesticides manufacturing company to perform sampling and analysis following GLP for their effort on pesticides registration. This project led to many pesticide registration projects for SwRI until present.

### **In The Area of Mixed Waste Analysis**

In 1991, Dr. Hsu guided SwRI into the analytical areas of mixed waste analysis under NRC regulation and DOE NQA-1 quality criteria. In 1993, he set up both radiation and ICP/MS operations for radioactive and ultra-low trace metal analyses. Since then, SwRI became a major DOE mixed waste laboratory and has performed thousands of mixed waste analyses on various matrices by many methods, including non-routine analyses, geophysical measurement of soil properties, trace metals, dioxins/furans, air canister, and other environmental parameters for

- Idaho National Engineering Laboratory through EG&G and LITCO (Lockheed Idaho Technology Company),
- Oak Ridge National Laboratory through Lockheed Martin and Bachtel/Jacob LLP.
- DOE Rocky Flat through EG&G,
- DOE Hanford Site through Bachtel,
- West Valley Nuclear Power Plant.

### **In The Area of Environmental Analysis**

For environmental analyses of samples from superfund sites, such as EPA contract laboratory programs (CLPs), EPA special analytical service (SAS) and New York State CLPs for the analysis of volatile organics, semivolatile organics and pesticides in Superfund samples, Dr. Hsu set up operation of these programs for both SwRI and NUS. In addition, Dr. Hsu was the project manager for an EPA drinking water program in which volatile organics, pesticides and phenols in drinking water were analyzed by GC/Hall/PID, GC/ECD and GC/MS following EPA drinking water methods. Since 1991 to 96, Dr. Hsu with his department has performed all the environmental analyses for EPA Region VII RECAP (Regional Environmental Collection and Analysis Program). Most of the analyses were non-routine, extremely low detection limit, and difficult matrix. In 1997, Dr. Hsu has led an extensive proposal effort to the continuity of this program - EPA RECAP II.

### **In The Area of Emergency Response**

Dr. Hsu has joined three emergency responses for disasters. In these disasters, he worked with emergency response contractors to work up the sampling/analytical plan and determine target compounds. He then led a team to perform sampling for air by canister, water, soil, and wipe and environmental analyses with 24 to 48 hours turnaround time. For each case, Dr. Hsu reported all the analytical results on time at the lowest possible detection limits.

## Publications

J. P. Hsu. The Mechanistic Study of the Rearrangement of Arylcarbenes in the Gas Phase. Ph.D. Dissertation, Washington University, St. Louis, MO, 1981.

D. S. Weinberg and J. P. Hsu. Comparison of Gas Chromatographic and Gas Chromatographic/Mass Spectrometric Techniques for the Analysis of TNT and Related Nitroaromatic Compounds. *J. Of High Resolution Chromatogr. And Chromatogr. Commun.*, **1983**, 6, 404-418.

Peter P. Gaspar, J. P. Hsu, and Sarangan Chari. The Phenylcarbene Rearrangement Revisited. *Tetrahedron* **1985**, 41(8), 1479-1507.

J.P. Hsu, Herbert G. Wheeler, David E. Camann, Herbert J. Schattenberg III, Robert G. Lewis and Andrew E. Bond. Analytical Methods for Detection of Nonoccupational Exposure to Pesticides. *J.of Chromatographic Science* **1988**, 26(4), 181-189.

Robert G. Lewis, Andrew E. Bond, Donald E. Johnson, and J. P. Hsu. Measurement of Atmospheric Concentrations of Common Household Pesticides: A Pilot Study. *Environmental Monitoring and Assessment*, **1988**, 10, 59-73.

J.P. Hsu, Greg Miller and Victor Moran III. Analytical Method for Determination of Trace Organics in Gas Samples Collected by Canister. *J. of Chromatographic Science* **1991**, 29(2), 83-88.

J. P. Hsu, Herbert J. Schattenberg III, and Martha M. Garza. Fast Turnaround Multiresidue Screen for Pesticides in Produce. *J. Assoc. Off. Anal. Chem.* **1991**, 74(5), 886-892.

Herbert J. Schattenberg III and J. P. Hsu. Pesticides Residue Survey of Produce from 1989 to 1991. *J. Assoc. Off. Anal. Chem.*, **1992**, 75(5), 1-10.

J. P. Hsu. High and Low Resolution GC/MS in Environmental Science. *VG Monographs in Mass Spectrometry*, 6, (1994).

## Patents

J.P. Hsu, Dermal Exposure Testing Method and Apparatus Therefor. U.S. Patent 5,243, 865, September 14, 1989.

J. P. Hsu, Cigarette Filter Which Removes Carcinogens and Toxic Chemicals. U. S. Patent 6,273,095, August 14, 2001.

## **Presentations/Abstracts**

J. P. Hsu. The Gas Chromatographic/Mass Spectrometric Analysis of Nonextractable, Nonvolatile Trace Organic Compounds in Water. Presented at the Mid-South Chromatography Symposium, Memphis, TN, 1981.

J. P. Hsu. Gas Chromatographic/Mass Spectrometric Analysis of Organic Compounds Absorbed on Charcoal Tubes. Presented at 34<sup>th</sup> Annual Southeastern Regional Meeting of the American Chemical Society, Birmingham, AL, November, 1982.

J. P. Hsu. Gas Chromatographic/Mass Spectrometric Analysis of Trace Amounts of TNT and Related Compounds. Presented at the 34<sup>th</sup> Annual Southeastern Regional Meeting of the American Chemical Society, Birmingham, AL, November 1982.

J. P. Hsu. Gas Chromatographic/Mass Spectrometric Analysis of Ethylene Glycol and Terephthalic Acid in Water Stream. Presented at 34<sup>th</sup> Annual Southeastern Regional Meeting of the American Chemical Society, Birmingham, AL, November 1982.

J. P. Hsu. Using Fused Silica Column as Trapping Device for Semivolatile Organics in Air. Presented at the Pittsburgh Conference, March 1984.

J. P. Hsu. Evaluation of Analytical Methods for Measurement of Selected Pesticides in Indoor Environments. Presented at the Pittsburgh Conference, March 1986.

J. P. Hsu. Introduction to Organic Analytical Methods of Wastewater, Waste Soil, and Drinking Water. Presented at Union Chemical Laboratories, Industrial Technology Research Institute, Taiwan, Republic of China, December 1987.

J. P. Hsu. Non-occupational Pesticides Exposure Study. Presented at Union Chemical Laboratories, Industrial Technology Research Institute, Taiwan, Republic of China, December 1987.

J. P. Hsu. Air Sampling Analysis. Presented at Union Chemical Laboratories, Industrial Technology Research Institute, Taiwan, Republic of China, December 1987.

J. P. Hsu. The Capillary Column Analysis of Volatile Organics in Drinking Water. Presented at the Pittsburgh Conference, February 1988.

J. P. Hsu, H. G. Wheeler, Jr., H. J. Schattenberg III, P. V. Kuhrt, H. J. Harding, and D. E. Camann. Analytical and Sampling Methods of the Non-Occupational Pesticides Exposure Study (NOPES). Presented at the 1988 EPA/APCA Symposium on Measurement of Toxic and Related Air pollutants, Raleigh, NC, May 1988. This paper was published in APCA Publication VIP-10, Pittsburgh, PA, pp 34-41, May 1988.

J. P. Hsu and H. G. Wheeler, Jr., LC/MS Analysis of Appendix IX Compounds. Presented at the U. S. Environmental Protection Agency Symposium on Waste Testing and Quality Assurance, July 11-15, 1988, in Washington, D.C.

J. P. Hsu, G. P. Miller, and H. J. Schattenberg III. Analytical Method for Determination of Trace Organics in Gas Samples Collected by Canister. Abstracts of Papers, 1989 EPA/AWMA

International Symposium on Measurement of Toxic and Related Air Pollutants, May 2, 1989. This paper was published in APCA Publication VIP-13, Pittsburgh, PA, pp. 51-54, May 1989.

J. P. Hsu. Analytical Improvements to Methods TO-14 Applicable to the Organic Statement of Work. Presented at the U. S. EPA's Third Air Toxics Workgroup Meeting, Research Triangle Park, NC, February 21, 1990.

J. P. Hsu, H. J. Schattenberg III, M. Kyle, M. Garza, S. DeViney, and L. Meeker. Fast Turnaround Multiresidue Produce Pesticide Screen. Presented at the Pittsburgh Conference, New York City, March 5-9, 1990.

J. P. Hsu, D. Camann, H. Schattenberg III, B. Wheeler, K. Villalobos, M. Garza, P. Millard, and R. G. Lewis. New Dermal Exposure Sampling Technique. 1990 EPA/Air & Waste Management Association International Symposium on Measurement of Toxic and Related Air Pollutants, Raleigh, NC, April 30-May 4, 1990. This paper was published in AWMA Publication VIP-17, Pittsburgh, PA, pp 489-497, May 1990.

J. P. Hsu, Hebert J. Schattenberg III, Michele V. Kyle, Martha M. Garza, and Sam DeViney. Fast Turnaround Multiresidue Screen for Pesticides in Produce. Presented at the 27<sup>th</sup> Annual Pesticide Residue Workshop, St. Petersburg, FL, July 15-18, 1990.

J. P. Hsu, JoAnn Boyd, and Sam DeViney. Environmental Analytical Laboratory Set-Up Operation and QA/QC. Presented at the Hazardous Materials Control Research Institute/Hazardous Materials Conference-South 1991 Conference and Exhibition, Houston, Texas, April 24-26, 1991.

J. P. Hsu, Herbert Schattenberg III, Kevin Villalobos, and Greg P. Miller. Application for Supercritical Fluid Extraction of Pesticides from Polyurethane Foam Plug and House Dust. Presented at the 1991 Environmental Protection Agency/Air & Waste Management Association Symposium, Durham, NC, May 6-10, 1991.

J. P. Hsu, Greg Miller, and Victor Moran III. Analytical Method for Determination of Trace Organics in Gas Samples Collected by Canister. 1990 Science, Engineering, and Technology Seminars (SETS) Proceedings, American Association of Chinese Professionals, Houston, Texas, pp T6 8-11, June-July 1990.

J. P. Hsu, J. C. Pan, and Greg P. Miller. Supercritical Fluid Extraction of Dioxins/Furans from PUF. Presented at the 7<sup>th</sup> Annual Waste Testing and Quality Assurance Symposium, Washington, D.C., July 11-14, 1991.

J. P. Hsu, Herbert Schattenberg III, and Martha M. Garza. Fast Turnaround Multiresidue Screen for Pesticides in Produce. Presented at Microencapsulation as Related to Food Science, San Antonio, Texas, May 30-31, 1991.

J. P. Hsu. Analytical Method for Determination of Trace Organics in Gas Samples Collected by Canister. Presented at Modern Engineering and Technology Seminar 1992, Environment Protection Session, Taipei, Taiwan, Republic of China, December 8, 1992.

J. P. Hsu. New Dermal Exposure Sampling Technique. Presented at Modern Engineering and Technology Seminar 1992, Environment Protection Session, Taipei, Taiwan, Republic of China, December 8, 1992.

J. P. Hsu. Air Canister Analysis by GC/MS and GC/HRMS. VOST Tube Preparation and Analysis. Environmental Laboratory Management and QA/QC. Presented at National Institute of Environmental Analysis, EPA, Republic of China, December 14, 1992.

J. P. Hsu. Trace Analysis of PCDD/PCDF by Gas Chromatography/High Resolution Mass Spectrometry. Presented at Environmental Hazardous Material Monitoring Seminar. Taiwan University, Taipei, Republic of China, December 15, 1992.

J. P. Hsu. Mass Spectrometry in Environmental Sciences. Department of Chemistry, University of Texas at San Antonio, Texas, April 14, 1993.

J. P. Hsu. Mass Spectrometry in Environmental Sciences. 1993 Science, Engineering and Technology Seminars (SETS), American Association of Chinese Professionals, Houston, Texas, May 30, 1993.

J. P. Hsu, Greg P. Miller, and J. Pan. Canister Analysis by Gas Chromatography/High Resolution Mass Spectrometer. 9<sup>th</sup> Annual Waste Testing and Quality Assurance Symposium, Arlington, VA, July 12-16, 1993.

J. P. Hsu, David Camann, and P. Geno. Sampling and Analytical Methods for House Dust and Dermal Exposure. 10<sup>th</sup> Annual Waste Testing and Quality Assurance Symposium, Arlington, VA, July 11-15, 1994.

J. P. Hsu. Air Analysis for Organic Compounds: Volatiles, Semi-Volatiles, Pesticides and Dioxins. Presented at Symposium entitled, "Environmental Air Analysis, Regulations, Sampling, Analysis and Modeling", Duquesne University, December 3, 1994.

J. P. Hsu. Total Human Pesticides Exposure, 1995 International Chinese Environmental Protection Conference, February 21, 1995.

J. P. Hsu, Greg Miller, and J. Pan. Air Analysis by Using Gas Chromatography/High Resolution Mass Spectrometry. Presented at the 1995 Air & Waste Management Association International Symposium on Measurement of Toxic and Related Air Pollutants, Durham, NC, May 16-19, 1995.

J. P. Hsu and J. Pan. Photolysis of Laboratory Dioxins/Furans Waste. Presented at 11<sup>th</sup> Annual Waste Testing and Quality Assurance Symposium, Washington, DC, July 23-28, 1995.