

PAUL J. GIAMMATTEO

Paul J. Giammatteo, Ph.D. co-founded Process NMR Associates, LLC (PNA), the originators and leaders in applying on-line NMR technology in the refinery, in December, 1997. In 2006 Paul also co-founded and is Sales, Marketing, and Technical Manager of NMR Process Systems, LLC, a joint venture company between Process NMR Associates, LLC (Danbury CT), and TTC Labs Inc., (Fond du Lac WI). NPS markets, installs and supports process NMR and other technology solutions for control and optimization in the refining, petrochemical, pharmaceutical and food industries. Paul received his bachelor's degree in Biology and Chemistry from St. Michael's College in 1978, his Master's in Chemistry from the University at Albany in 1980, and his Doctorate in Chemistry from Wesleyan University in 1989. Employed with Texaco Research and Development in 1980, Paul held various positions including Program Manager for fouling and corrosion for a 3,500 barrel per day used oil recycling refinery, Team Leader and Senior Technologist for process analytical research, Group Leader of organic, spectroscopic, and compositional analyses, and Team Leader of a product contamination team. It was with Texaco that Paul developed and installed the first patented high resolution NMR process analyzer and control system into Texaco's Wilmington, California refinery.



Paul has more than 28 years experience in applied petroleum, petrochemical, chemical and biological, research and development. He has served as an advisor to the Board of Directors of Foxboro NMR and Qualion NMR Ltd. In addition to the continued development of advanced analyzer application solutions for the refining and petrochemical industries, Paul is also a consultant in the fields of energy, refining, petrochemical, chemicals and laboratory analyses.

Resume - PAUL J. GIAMMATTEO, Ph.D.

Process NMR Associates, LLC
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SUMMARY:

Over 28 years experience in applied petroleum, petrochemical, and chemical research and development including:

Technical Experience:

- Developed and installed the first patented high resolution NMR process analyzer and control system.
- Implemented mid and near infra red product quality monitoring systems.
- Provided NMR spectroscopic services to Texaco and its subsidiaries (liquids, solids, multinuclear, two-dimensional).
- Published and presented papers in various technical journals, symposia, and national meetings.

Managerial Experience:

- Program Manager for fouling and corrosion for a 3,500 barrel per day used oil recycling refinery.
- Team Leader for process analytical research.
- Group Leader of organic, spectroscopic, and compositional analyses.
- Team Leader of a product contamination team.

PROFESSIONAL EXPERIENCE:

NMR Process Systems, LLC

August 2006 – Present

Sales, Marketing, and Technical Manager of NMR Process Systems, LLC, a joint venture company between Process NMR Associates, LLC (Danbury CT), and TTC Labs Inc. (Fond du Lac WI). NPS markets, installs and supports process NMR and other technology solutions for control and optimization in the refining, petrochemical, pharmaceutical and food industries. Gross 2007 – 2008 project sales in excess of \$1.4 million.

Process NMR Associates, LLC

December 1997-Present

Manager of Business Development for PNA, the world's first on-line, high-resolution FT-NMR application development company. Developed, validated and maintained applications on over 30 installed process NMR units. Oversaw global product marketing and strategic planning for the Invensys *Foxboro MRA* process NMR business from 1997 - 2004.

Texaco Fuel and Marine Marketing Department

April, 1996 - Dec. 1997

Program Manager - Fouling and Corrosion: Responsible for managing and coordinating internal and external programs designed to reduce catastrophic fouling and corrosion at a 3,500 barrel per day used oil recycling refinery. Direct reports include four Texaco professionals and technical staff of two vendor/supplier companies. Program objectives are to reduce fouling and achieve operational profitability by August, 1996.

Texaco Fuels and Lubricants Technology Department

1994 - 1996

Senior Technologist - Process Analytical and Organic Spectroscopy: Team Leader for developing and implementing unique process analysis/control systems and product quality monitoring systems. Developed, patented, and installed the first high resolution process NMR analyzer and controller at Texaco's Los Angeles Refinery. Nominated by Texaco for the Industrial Research Institute's 1996 Technology Award. Manages infra red based fuel and lubricant product quality monitoring programs.

Texaco Research and Development Department

1980 - 1994

Group Leader - Organic Spectroscopy, Compositional and Thermal Analyses (1990 - 1994): Managed eight professional and two technicians in delivery of NMR, mass spec, IR spectroscopies, compositional analyses, and thermal analyses (including DSC and TGA).

Team Leader - Coolant Contamination (1990): Led analytical team of three professionals in determining source of coolant contamination at General Motors' Saturn Division's manufacturing facility. Results of team's work mitigated Texaco's \$28 million liability in a 1,500 car recall by Saturn. Received Texaco's Outstanding Contributor Award.

Technical Positions (1980 - 1990): Held various technical positions of increasing responsibility in NMR, compositional, and surface analyses.

MEMBERSHIPS:

American Chemical Society

American Association for the Advancement of Science

Sigma Xi

EDUCATION:

Ph.D. Chemistry, Wesleyan University, Middletown, CT 1989

Thesis: "Determination of the Primary, Secondary and Tertiary Structures of Polysaccharides: An NMR Study"

M. S. Chemistry, State University of New York at Albany, Albany, NY 1980

Thesis: "Synthesis and Rotational Barrier Studies of Select Methyl-Substituted Diphenylmethyl Anions"

B. A. Biology and Chemistry, St. Michael's College, Colchester, VT 1978

Selected Patents and Publications:

"NMR Probe with Flow Restriction Element" Tal Cohen, Paul J. Giammatteo, John C. Edwards, Uri Rapoport, and Naim Levi, United States Patent 20,050,040,827, February 2005

"Laboratory Analysis" **Environmental Instrumentation and Analysis Handbook**, Chapter 13. Randy D. Down and Jay H. Lehr, ed., Wiley-Interscience, New Jersey, 2005

"Control Means and Method for Controlling Feed Gases". Paul J. Giammatteo, Richard J Trocino and Gregory Marsh, Texaco Inc., United States Patent 5, 265, 635, November 1993

"An Easy Sealing MAS Rotor Insert for Liquids, Gels, and Air-Sensitive Solid Samples", Paul J Giammatteo, Walter W Hellmuth, F. Gordon Ticehurst, and Paul W. Cope, **J. Mag. Reson.**, **71**, 147 (1987).

"Curdlan and Scleroglucan. NMR Characterization of Solution and Gel Properties", Paul J. Giammatteo, and Arthur J. Stipanovic, *Advances in Chemistry*, 233, *Polymers in Aqueous Media: Performance Through Association*, 75-87 (1989)

"CP/MAS 13C-NMR Studies on Aqueous Polysaccharide Gels" Paul J Giammatteo and Arthur J Stipanovic, Published in **Progress in Biotechnology - Industrial Polysaccharides**, Edited by Manssur Yalpani, Elsevier, 1987

"Structure-Property Relationships of Base Oils", Greg Marsh, Paul Giammatteo, Vincent Nero, Arthur McCormack, Presented at the National ACS Meeting, New York, August 25-30, 1991.

"Multinuclear Solid-State NMR Investigation of Boron-Zeolites and Borosilicates". *J.C. Edwards*, C.L. O'Young, P.J. Giammatteo, presented at the National ACS Meeting, New York, NY, August 25-30, 1991.

"Process Applications of NMR on Flowing Gaseous Streams". P.J. Giammatteo, G.Marsh, J.C.Edwards, presented at the 35th Experimental NMR Conference, Asilomar, California, April 10-15, 1994.

"Process Applications of NMR on Flowing Gaseous Streams. Part II". P.J. Giammatteo, J.C. Edwards, presented at the 36th Experimental NMR Conference, Boston MA, March 26-30, 1995.

"Development of a Process NMR Gasoline Analysis System". J.C.Edwards, P.J. Giammatteo, G.P. Firmstone, P.D. Cusatis, presented at the 37th Experimental NMR Conference, Pacific Grove, CA, March 17-22, 1996.

"Process Applications of NMR on Flowing Gaseous Streams. Part III. The Installation and Operation of an On-Line NMR in a Refinery". P.J. Giammatteo, J.C. Edwards, T. Cohen, M.W. Blakley, presented at the 37th Experimental NMR Conference, Pacific Grove, CA, March 17-22, 1996.

"²H NMR of Low Temperature Crystallization Processes in Base Oils Utilizing a Perdeuterated Probe Molecule". J.C. Edwards, P.J. Giammatteo, A.J. Stipanovic, M.P. Smith, presented at the 37th Experimental NMR Conference, Pacific Grove, CA, March 17-22, 1996.

"NMR Based Refinery Process Control Systems: New Technology for Process Optimization". P.J. Giammatteo, J.C. Edwards, G.P. Firmstone, presented at the Texaco Technology Conference, Houston TX, July 15-17, 1996.

"NMR Based Process Analysis and Control: New Technology for Process Optimization". P.J. Giammatteo, J.C. Edwards, presented at the Instrument Society of America Meeting, Chicago IL, October 7-11, 1996.

"High Resolution NMR Based Process Control for Petroleum Refining - Part I". P.J. Giammatteo, J.C. Edwards, presented at the Eastern Analytical Conference, Somerset, New Jersey, November 18, 1996.

"High Resolution NMR Based Process Control for Petroleum Refining - Part II". J.C. Edwards, P.J. Giammatteo, presented at the Eastern Analytical Conference, Somerset, New Jersey, November 18, 1996.

"High Resolution NMR Based Process Control for Petroleum Refining". P.J. Giammatteo, J.C. Edwards, presented at the Annual New Jersey ISA Chapter Meeting, Princeton, New Jersey, November 20, 1996.

"Investigation of Low Temperature Crystallization Processes in Base Oils Utilizing a Perdeuterated Probe Molecule and ²H NMR". J.C. Edwards, A.J. Stipanovic, P. J. Giammatteo, M.P. Smith, Invited presentation at the American Chemical Society National Meeting, San Francisco, CA, April 13-17, 1997.

"On-line Acid Strength Measurement and Sulfuric Acid Alkylation Process Control Using Process NMR". J.C. Edwards and Paul J. Giammatteo, presented at the ISA Analytical Division Meeting, Research Triangle Park, April 26-29, 1998.

"Utilization of Process NMR for On-Line Acid Strength Determination and Sulfuric Acid Alkylation Process Control" J.C. Edwards, P.J. Giammatteo, E. Ross, presented at ISA Expo98, Houston, Texas, October 19-22, 1998.

"Detailed Hydrocarbon Analysis of Naphtha by On-Line NMR : Integration of Real-Time NMR Feed Analysis With Advanced Process Control and Optimization" J.C. Edwards, P.J. Giammatteo, Presented at Eastern Analytical Symposium, Somerset, New Jersey, November 18-21, 2002.

"On-Line Analysis of Crude Feeds and Distillation Products: Utilization of On-Line NMR on a Refinery's Crude Distillation Unit", P.J. Giammatteo, J.C. Edwards, Presented at Eastern Analytical Symposium, Somerset, New Jersey, November 18-21, 2002.

"Process NMR Applications: Utilization, Closed Loop Control, and Value Added Statements", John C. Edwards and Paul J. Giammatteo, Presented at CPAC Fall 2003 Sponsor Meeting, Seattle, WA, November 3-6, 2003.

"High resolution NMR for On-Line Process Analysis and Control: Application and Utilization in Petroleum Refining and Petrochemical Industries", Paul J. Giammatteo and John C. Edwards, Presented at Eighteenth International Forum Process Analytical Chemistry - IFPAC, Arlington, VA, January 12-15, 2004