Daniel D. Smolko

•Chemical Engineer w/ Process Engineering, Green Engineering & Management Experience

Eagleville, PA - Email me on Indeed: indeed.com/r/Daniel-D-Smolko/1bde6cd0f3628405

Over 18 years of Experience in Process Engineering, Chemical Processes, Water Purification, Green Engineering, Microbial & Contaminant Testing, Instrumentation and Process Integration.

WORK EXPERIENCE

Process Engineer & Development Specialist

Chayil Technologies LLC - San Diego, CA - July 2009 to October 2012

Provided process engineering and development services in the areas of energy, materials and chemical technologies. Developed and optimized production processes and assisted other companies in the areas of fuels, materials and specialty chemicals. Developed and Tested Novel Routes for the Production of Chemicals, Materials and Fuel Additives.

Developed lightweight instruments for "portable" diagnostic and genetic applications. Managed the development and manufacture of instrument mechanical systems, thermal systems, sensors and system boards. Helped optimize the performance of instrument mechanical, fluidic, thermal, electrochemical, electronic and other systems. Led the development of system software and optimized instrument operation and scripts for microbe and genetic sampling, processing and detection.

Project Manager & Process Engineer

Nanogen Incorporated - San Diego, CA - June 1996 to July 2009

Designed, developed, fabricated and assisted in the commercialization of chemical and biological detection-based products, diagnostics and instrumentation. Jointly developed and carried innovative, cutting-edge products to commercialization. Formulated and developed commercially successful synthetic gel matrices to replace polysaccharide coatings for microarrays. Developed radio frequency plasma surface treatment protocols, investigated chemical surface treatments and formulated surface chemistries for microarrays. Reduced the variability and increased analyte signals in synthetic gel-based layers by several fold on the NanoChip® 100, NanoChip® 400 and ACV400 instruments. Designed, tested and assembled a reactive polymerization process for coating hydrogels onto microarray chips used in the NanoChip® instruments and on other platforms. Supervised and validated the installation of the reaction coating process into manufacturing. Constructed a modified reaction coating system, and increased the yield of the new reaction coating system by introducing changes into the process, supervised and assisted manufacturing personnel with modifications to the existing process and assisted manufacturing personnel in improving the yield of the process from a 78% yield to a 99.3% overall yield. Supervised the addition of more reaction coating systems into manufacturing. Supervised, validated and approved changes to the reaction coating process, cartridge manufacturing, testing procedures, upgrades, burn-in and shipping.

Assisted in the conception and design; and supervised and assisted with the development and manufacture of a "next generation" instrument for DNA diagnostic applications. Supervised the development and manufacture of instrument systems, assembly, motion controls, electronics and software. This instrument provides DNA sample processing, ultrafast DNA amplification and array based sample detection. Setup, ran, assisted with and supervised polymer, device and systems research, chemistry, detection and development studies. Achieved milestones, analyzed data, organized and presented results for projects and developments in

electrochemical detection, sample processing, attachment chemistries and engineering projects. Organized data and wrote reports for internal projects.

Process Engineer & Head Chemist

Somerset Environmental Services & Somerset Oil - Somerset, KY - January 1995 to March 1996

Assisted in the construction, setup and management of a hydrocarbon and environmental services laboratory for water, soil and refinery sample testing. Supervised and instructed laboratory and field personnel in various tests, sample collection procedures and onsite water testing. Developed software, taught laboratory personnel and provided test methods such as water and soil hydrocarbons, chloride, sulfide and soil particle size. Developed a test procedure for analyzing hydrocarbon components, assembled laboratory databases and developed a procedure for determining and testing octane numbers for refinery gasoline samples. Setup and qualified a Mass Spectroscopy System for the testing of medium to high molecular hydrocarbons. Installed the company's LAN communication network.

EDUCATION

Ph.D. in Chemical Engineering

North Carolina State University
1994

Minor in Biotechnology

North Carolina State University
1994

SKILLS

Chemical Processes, Process Engineering, Green Engineering, Water Purification, Grey Water Recovery, Industrial Water Processes, Ultrafiltration, Fluidized-Bed Activated Carbon Systems, Solar Distillation, Electrokinetic Separation Processes, Hydrogels, Solgels, Polymers, Biodegradable Systems, Microbial Detection & Contaminant Testing, Genetic Analysis, Microarrays, Diagnostic Devices, DSC, Liquid Chromatography, High Pressure Liquid Chromatography, Mass Spectroscopy, Instrument Development, Boards, Electronics, Computers, Computer Simulation, Process Controls, Electrical System Controls, Czech & Other Languages

ADDITIONAL INFORMATION

PUBLICATIONS (select):

• "Electronic Microarray Technology and Applications in Genomics and Proteomics" chapter in BioMEMS and Biomedical Nanotechnology, Volume II: Micro/Nano Technology for Genomics and Proteomics", (eds.) Mauro, F., Ozkan, M. and Heller, M.J., Biomems and Biomedical Nanotechnology Series, 3-31. (2007)

• "Numerical Modeling of Transport and Accumulation of DNA on Electronically Active Biochips" Sensors and Actuators B: Chemical Volume 94, 81-98. (2003)

• "Microelectro-Optical DNA Array Sensor" in Smart Structures and Materials 2002, (ed.) Vardan, V.K., SPIE Proceedings Volume 4700, […] (2002)
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PRESENTATION LIST (select):

• "MDx Electronic Systems", Nanogen, San Diego, CA (February 2009)

• "Integrated Sample to Answer System", Nanogen, San Diego, CA (October 2007)

• "Centrifugal MicroFluidics for Sample Processing", Nanogen, San Diego, CA (April 2007)

• "Three Dimensional Dielectrophoretic Separation of Cells", San Diego, CA (January 2005)

• "Development of a MEMS Based Hydrogel MicroReaction Molding System to Coat Electroactive DNA Microchip Arrays", AIChE Meeting, Los Angeles, CA (November 2000)
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PATENTS & APPLICATIONS (abbreviated):

• "Enhanced Detection and Fluorescent Imaging System" […] […]

• "Methods and Materials for Optimization of Electronic Transport and Hybridization Reactions" […] […]

• "Mesoporous Permeation Layers for Use on Active Electronic Matrix Devices" […] & […] & […] […] […] & […]

• "Platinum Silicide Permeation Layer Device with MicroLocations" […] […]

• "Microreaction Systems and Methods for Molding and Grafting Highly Uniform Layers onto Electronic Microchips and Other Substrates" […] […]

• "Integrated Portable Detection System" […] & […] […] & […]

• "Permeation Layer Attachment Chemistry and Method" […] […]
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AFFILIATIONS AND AWARDS:

• American Chemical Society

• NanoGrant Award (Distinguished Achievement Award)

• Omega Chi Epsilon (Chemical Engineering Honorary)

• Tau Beta Pi (Engineering Honorary)