Dr. Gerald John (Jerry) DeMenna

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Curriculum Vitae

INDEPENDENT CONSULTANT: CHEM-CHEK Labs, Cape May, NJ 12/20 – present

- Resumed work as Consultant @ Chem-Chek Labs (see below)
- Formed PTOE Services LLC subsidiary to support Precious Metal Mining & Refining sector

GLOBAL LABORATORY DIRECTOR: Troy Corporation, Florham Park, NJ 6/15-12/20

- Oversee the operation of the Analytical Research Lab using HPLC/LC-MS, GC/GC-MS, FTIR (all Accessories), Raman, Near-IR, UV-Vis / Colorimetry, Fluorescence, ICP/ICP-MS, GFAAS/AAS, Ion Chromatography, DSC/TGA Thermal Analyzer, Laser-Scattering Particle Size Analyzer, Titration (Auto, K-F) for ISO-9000-2015 compliance.
- Develop high-Throughput Global Analytical Methods for Biocide Preservatives, Performance Additives for Coatings and Petroleum Solvent Products for Troy Factories globally.
- Perform Product Failure and Complaint Analyses using Forensic Test protocols per ASTM, ISO/IUPAC and AAFS protocols.
- Participate in Regulatory Affairs, Product Registrations and FDA/CODEX product filings.

QC LABORATORY DIRECTOR: Sonar Products, Inc; Carlstadt, NJ 12/10 – 6/15

- Oversee the operation of the QC / R&D Lab (using HPLC, GC/GC-MS, FTIR, Raman, Near-IR, UV-Vis/Dissolution, Fluorescence) for Pharmaceutical cGMP / GLP compliance, observe FDA & CFR 210/211 guidelines, develop SOPs for Lab use, validate Analytical methods
- Implement a LIMS-program to integrate Data from multiple manufacturing locations.
- Generate Certificates-of-Analysis for generic Topical Drug & Cosmetic Products.
- Maintain Instrument Logs, perform OQ/PQ Calibrations & Service.

NATL PRODUCTS / FLAVOR RESEARCH CHEMIST: Pepsi, Valhalla, NY 12/09-12/10

- Develop & validate Characterization Methods for Natl. Products & Flavors using GC/GC-MS, LC/LC-MS, Near-IR/Raman & Fluorescence technology, Selective Extractions, Phase Isolation for product development; make nutritional assays of Protein Supplements & Sports Drinks.
- Implement a series of GRAS Tracers to detect Counterfeit products and Adulteration.

INDEPENDENT CONSULTANT: CHEM-CHEK Labs, Bronx, NY 5/90 – present

- Perform Contract R&D Testing and Method Development programs for many industries: Industrial Chemicals, Criminalistics / Forensics (Drugs, Explosives, Metallurgy), Food & Nutritional Science, Precious Metals Mining & Recovery, Pharmaceuticals, Agriculture & Feeds, Ecology & Environmental Engineering, Consumer Products, Energy Resources, Glass & Ceramic Refractories, Petrochemicals, Plating & Metal Finishing, De-Formulation Testing
- *Director of Analytical Research, VTEC Laboratories, Bronx, NY 2/95 – present*
  Perform on-site cGMP Evaluations and Audits for Food Labs (USFDA), Cosmetics (USP/CODEX), Construction & Consumer Product manufacturer; ISO/QC Protocols
  - Perform Analysis of materials according to Standard Methods of Analysis per USEPA, USFDA, State DEP, & Industrial Regulatory Agency Protocols (IUPAC, ASTM, ACS).
  - Develop De-formulation Protocols for product Reverse-Engineering

- Define Programs & issue Reports conforming to Gov't & Commercial Regulations for Environmental Assessment & Impact Studies, Consumer Product QA Certification.
- ISO-17025 Certified Lab for Chemical, Physical & Thermal testing of Consumer Products, Pharmaceuticals, Inorganics, Munitions & High-Energy Materials, Military Wastes, Polymers, Composites & Coatings, Trace Forensic Samples
- Employed ISO-Certified Instrumentation: GC & GC-MS, HPLC & LC-MS, FTIR, Fluorescence, UV-Vis Spectroscopy, Thermal Analysis (DSC, DTA, TGA), AAS/GFAAS/CVAAS, ICP & ICP-MS, DCP Emission, XRF, Electro-Chemistry (Conductivity, pH, ORP, Ion-Chromatography)
- See the targeted Client List at the end of the resume for additional information.

ASSOCIATE PROFESSOR of CHEMISTRY: Sacred Heart Univ, Fairfield, CT 5/99 – 2/08

- Teach Graduate-level Advanced Analytical Courses -
  - Forensic Analysis (part of Criminal Justice program)
  - Molecular Biology (part of Nursing program)
  - Analytical Spectroscopy
- Member of ACS / Chemical Education & Nat'l Speakers Tour, present Workshops.
- Maintain multiple research laboratories with various high-end instrumentation in Spectroscopy (Mid-Near-Far IR, UV-Vis, Fluor, Raman, ICP/ICP-MS, DCP, XRF); Chromatography (GC, GC-MS, HPLC); Electrochemistry (ISE, I-C, ORP) & Sample Prep (Microwave, Soxhlet, ASE)

DIRECTOR OF RESEARCH: Libra Laboratories, Inc., Piscataway, NJ 5/89 – 5/90

- Developed markets in the food technology, nutritional assay, fragrance/aroma and flavor area using GC, HPLC and FTIR.
- Managed lab, prepared and implemented research proposals & QC programs for major food producers (Frito, Bordens, P&G, Best Foods) and pet food producers (Ralston-Purina, Iams).
- Designed "quick tests" for oils and shortenings, process-line QC and field QC (for adulterants) using Near-IR properties and portable LED-based Spectrometers.

APPLICATION SCIENTIST: Mattson-Analect Instruments, Princeton, NJ 5/87 – 5/89

- Regional applications specialist for Mid- & Near-IR, Laser-Raman, Fluorescence, DCP, ICP/ICP-MS, FTIR, GC/GC-MS/GC-FTIR, HPLC & TLC.
- Developed Analytical and Quality Assurance / Control methods in for Gov't Research Labs, al, Forensic Test Methods, Metals, Surface Finishing, Environmental, Cosmetics, Beverage, Textile, Polymer and Pharmaceutical applications.

REGIONAL LABORATORY MANAGER: Beckman Instruments, Somerset, NJ 1/82 – 5/87

- Region manager for customer support of extensive Data Management and Analytical Instrumentation product line: LIMS Network, IR, UV, AAS, GC, DCP/ICP, HPLC, Centrifuge, Nuclear and Bioassay instrumentation.
- Developed customer-based Applications focusing on Chemical Manufacturing & Formulations, Petrochemicals, Inorganic Catalysts, Pharmaceutical and Personal Care products, Industrial Hygiene & Environmental, Power Generation, Military-Spec protocols, Forensic Testing, etc.
- Performed on-site Client Training in use of Instrumentation, Applications of Standard Analytical Methods, Validation of Data and Report Formats for Gov't submission.

SYNTHETIC / ANALYTICAL CHEMIST: Spex Industries, Metuchen, NJ 1/78 – 1/82

- Create and maintain a product line of high-purity Inorganic, Organo-Metallic and Precious Metal Catalyst compounds for specialty Chemical sales (Vaska's complex, Ziegler-Natta, etc).
- Develop Custom-blends of Inorganic Oxides & related Compounds for Laser Optics, Specialty Glass and Refractory Ceramic Manufacturing.
- Manage Analytical Lab with AA, ICP, Arc/Spark Spectrometry, ISE, Transmission & Reflectance Colorimetry, Laser-Raman, Fluorescence and IR Spectroscopy for characterization and quantitative analysis.

PUBLISHED ARTICLES / PROFESSIONAL AFFILIATIONS & related ACTIVITIES:

- Member in good standing & Contributing Author with the following organizations -
  - Society for Applied Spectroscopy (SAS)
  - International Precious Metal Institute (IPMI)
  - Coblentz Society for Vibrational Spectroscopy (CSVS)
  - American Society for Testing and Materials (ASTM)
  - American Chemical Society (ACS)
  - International Standards Organization (ISO)
  - American Association for the Advancement of Science (AAAS)
  - American Academy of Forensic Scientists (AAFS)
  - International Society of Explosive Engineers (ISEE)

- Contributing Author and/or Editorial Board member for the following publications -
  - Spectroscopy
  - Environmental Testing and Analysis
  - Food Testing and Analysis
  - GC/LC
  - Today's Chemist
  - Industrial R&D

- Chem-Chek Labs is ISO-17025 Accredited for selective testing procedures, a member of ELPAT and ELAP Gov't Programs.

- Certified Expert Witness in fields of Analytical Chemistry and Forensic Sciences in NJ and NY

EDUCATION

- Awarded B.S. in Chemistry (transfer from Pharmacy program), 1980 from Rutgers University NCAS, NJ
- Completed Ph.D. Graduate research in Analytical Chemistry with focus on Precious Metal Catalysts @ Rutgers Univ, New Brunswick, NJ, 1994 (transfer)

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Instrumental Analysis & Sciences expertise

TECHNOLOGIES:

Chromatography =

GC (FID, TCD, "Sniffer", Headspace / Purge&Trap / Thermal Desorption Sampling, selective Detectors); GC-MS (Quadrupole Mass Spectroscopy with EI and CI, MALDI / TOF)

HPLC (with GPC/SEC, UV / PDA / RI / FLUOR Detectors, Gradient / Isocratic Pumps, GPC / SEC, Normal / Reverse Phase, early Electro-Spray MS)

ElectroChemistry = Hydrogen (pH), Ion-Selective Electrodes (ISE), Ion Chromatography (I-C), Potentio- / Amperometry (RedOx), Polarography, Anode-StrippingVoltametry (ASV)

Optical = Refractive Index, Surface Color Matching, Circular Dichroism, Optical Rotation, Microscopy [Polarized / Fluorescent / Infra-Red / Phase-Contrast]

Physical = Tablet Compressibility, Friability, Hardness, Surface Tensiometry, Viscosity (Brookes, Saybolt), Granularity, Visual Microscopy (VIS Light, Polarized, Fluorescent), Rheology, Laser-Scattering Particle Size Analysis

Preparatory Methodology = Extractions (Liquid-Liquid, Supercritical Fluid, Accelerated Solvent), Microwave Digestion / Extraction, Solid-Phase Extractions, Furnace Ashing, LOD, LOI, Fire Assay, UV Photolysis / Hydrolysis, Parr-Bomb Dissolutions

Spectroscopy =

Infra-Red (Dispersive Mid-IR, FT-IR, Near-IR, Raman) + Sample Prep (ATR, Trans)
UV-Visible (Colorimetry, Kinetics, Multi-Component Photometrics, Dissolution)
Fluorescence (Photometric, Spectrophotofluorometry)
Atomic Absorption (Flame / Graphite Furnace, Cold Vapor Hg, Hydride Generation)
Plasma (ICP-AES, ICP-OES, ICP-MS, DCP-OES, Arc/Spark OES)
X-Ray Fluorescence (Wavelength & Energy-Dispersive XRF, Microprobe)

Thermal = Smoke Point, Flash Point (Open / Closed Cup), Bomb Calorimetry, Differential Thermal Analysis (DSC / TGA / DSC)

Inside:
▸Weather
▸Deaths

METRO

Scientist cooks up some bite-size looks at what's in food

By JOHN POPE
Staff writer

Don't be put off by what Gerald J. DeMenna wants to do to a steaming plateful of crawfish etouffee.

Instead of savoring the crawfish and rice, he'd like to pour it into a blender, pulverize it and smear some of the goo onto a thin rectangle of yellow glass.

The glass is part of a spectroscope, which translates a compound into a rainbow of colors, based on the radiation each component element gives off.

The picture would not be for after-dinner entertainment but for reference. DeMenna, a scientist from Princeton, N.J., would use the etouffee to gauge differences in the dish before and after cooking to see what vitamins, proteins and other substances might be lost in its preparation.

"I'd expect to see proteins, water, amines — those are the nitrogen-bearing compounds that give it a smell — and oils and solid fats," said DeMenna, a gourmet cook who has done similar experiments with Chinese and Italian foods and several kinds of cheese.

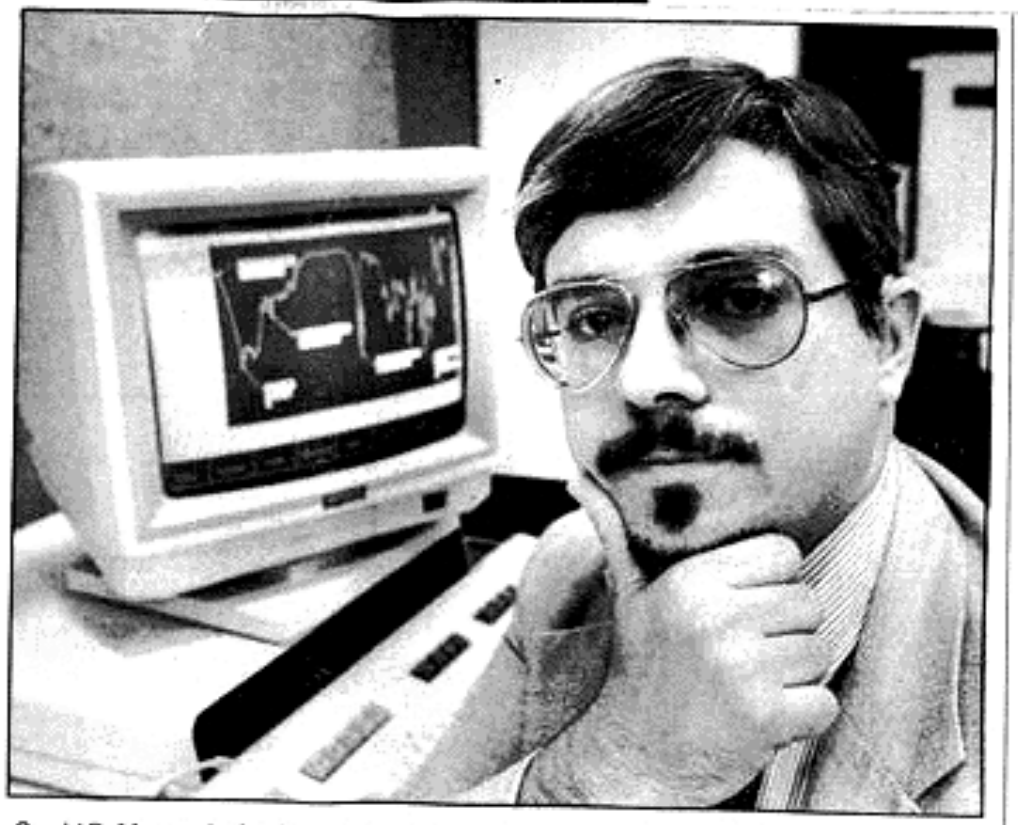
DeMenna, who is in New Orleans for the 29th annual Pittsburgh Conference, said the information could have a variety of applications. A consumer agency, for instance, could monitor fast-food hamburgers to compare fat levels, and health organizations could analyze the food that Third World people eat to determine the nutrients they need.

Eventually, DeMenna said, this information could be added to food labels.

"This is an area no one has looked at," said DeMenna, who is in New Orleans for the 29th annual Pittsburgh Conference. "People look at parts of food, but not at a whole dish."

This is a logical extension of DeMenna's job as a scientist for Mattson Instruments Inc., which finds practical applications for research.

Food studies have shown that residents of northern Italy have a 30 percent higher rate of heart disease caused by hardening of the arteries. The reason, DeMenna said, is that their foods are richer in cream and cheese sauces than those of their counterparts to the south.



Gerald DeMenna sits beside a computer, one of the tools he uses to analyze food.
STAFF PHOTO BY TED JACKSON

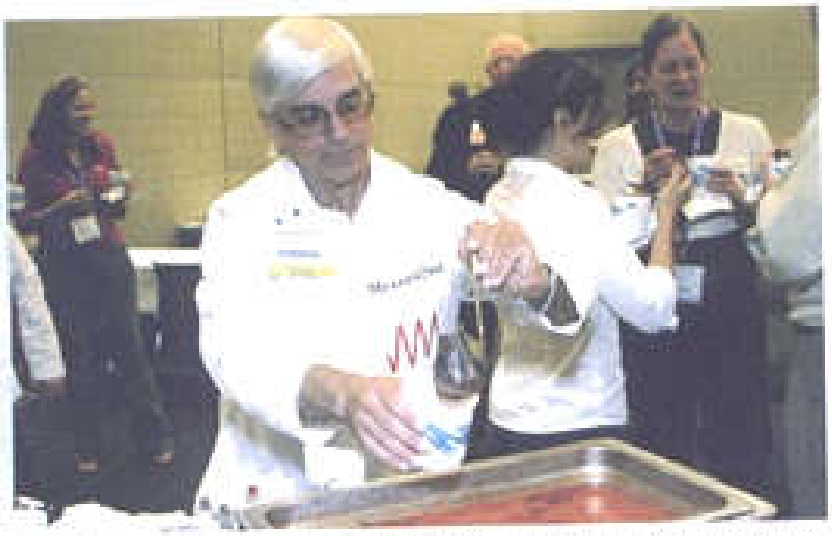
Spectroscopes also can measure the bitterness of beer, wine and cheese, he said.

If he studied spectroscopic pictures of seafood in this part of the country, DeMenna said he probably would find more cholesterol in crawfish and other crustaceans than in fish.

A study of fish before and after blackening probably would show a loss of protein, he said, "but since fish is nearly all protein, it probably wouldn't destroy too much."

ACS Show Daily 22 August 2007

It's Boston. It's Chemistry. It's Clam Chowder.



The symposium was called "Soup to Nuts: It's All Good Chemistry," and it took place on Tuesday. One of the presentations was given by Gerald DeMenna of Sacred Heart University in Fairfield, CT, who teaches analytical chemistry and also travels the country giving food workshops and science demonstrations.

As DeMenna offered "chemically correct" recipes for New England and Manhattan chowders, he explained that the secret of perfect clam chowder is in the chemistry of cooking it and, as an expert on kitchen chemistry reactions, he said that many of the routine chemical reactions familiar to chemists—pyrolysis, dehydration, and phase extraction—are better known in the kitchen as broiling, sautéing, and adding salt. "A good cook is really a synthetic organic chemist that uses edible reagents—edible chemicals," DeMenna said. "When you saute something in a frying pan at low heat, that's essentially dehydration. When you see steam coming off the vegetables, you're driving off water, or dehydrating the samples. Broiling or pan searing, which is high heat, that's pyrolysis, which essentially burns the surface. . ." DeMenna offered two of his own recipes, each employing synthetic reaction procedures: one for New England chemically correct clam chowder; the other for pH balanced Manhattan clam chowder.

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Client List 1990-present / Criminalistics, High-Energy and Explosive materials:

Hercules Powder (Wilmington, DE): 1991-2005

Develop and validate Analytical Methodology for Raw Material QC, In-Process Testing and Finished Product release using X-Ray Fluorescence, Atomic Spectroscopy, Ion Chromatography and Laser-Scattering Particle-Size Analysis.

U. S. Army Aberdeen Proving Grounds (Aberdeen, MD): 1998-2015

Develop and validate Rapid-Screening Analytical Methods for Nerve Gas and Munition Residues by Flash Chromatography

Support evaluation of Long-Range Explosive Detection (LRED) by Laser-Induced Breakdown Spectroscopy (LIBS)

U.S. Department of Defence / DARPA (Arlington, VA): 2001-present

Develop a prototype non-destructive L-RED technology by Laser-Induced Fluorescence of Vapor-phase [NO] species associated with Nitrate-based Explosives

Investigate alternative Tracer Elements for C4 / RDX fingerprinting using Multi-Wavelength Fluorescence Spectroscopy

New Jersey State Police Forensic Lab (Hammonton, NJ & Sea Girt, NJ): 1990-2005

Support Dr. Richard Saferstein with independent validation of Forensic Test Method being used throughout NJ for collection, preservation, analysis and detection of Crime Scene Evidence: Accelerants & Combustibles (Arson), Drugs, Munitions & Explosives, Gunshot Residue, Drugs (C-III through C-I Narcotics)

FAA William J. Hughes Technical Center (Egg Harbor, NJ): 2010-present

Evaluation of Explosive potential of Lithium-Ion Batteries by determination of Off-Gases Produced under stressed conditions (Heat, Over-Charging, Compression)

Westchester County Dept. of Laboratories & Research (Valhalla, NY): 1990-2005

Develop advanced Sampling & Analytical protocols for Gunshot Residue by Atomic Analysis and Micro-Fiber Analysis using FTIR Microscopy

Performed independent advisory and consultation services for several private Explosive Research facilities in Arizona and Nevada under NDA.

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Technical Support for CERAMIC & GLASS Clients: **From 1990-present**

Accu-Glass, St. Louis, MO: Evaluate Electronic Glass substrates for QC specifications

- **Customer-specific requirements for electronic glass substrates involved both dielectric strength and surface-leachable elements.**
- **Characterize the DS by ASTM-D1039 using NIST-traceable reference material.**
- **Determine any leachable elements by Flame-AAS and ICP Spectroscopy.**

Alcoa Inc; Pittsburgh, PA & Bristol, TN: Independent Laboratory ISO Audit

- **Review and update product development & physical/chemical testing of high-temperature sintered ceramics based on non-fibrous aluminum oxide, titanium silicate, charcoal and organic "binders" (NDA applies)**

Coors Technologies; Golden, CO: Analytical Method Validation for proprietary Compsities

- **Evaluation of R&D materials for automotive applications, power industry and specialty ceramics produced from assorted Al2O3, Al2O2+SiO2, ZrO2, ZrO2+Y2O3, SiC and Nitride composites**
- **Evaluation of analytical laboratory SOPs for use of atomic analysis (AAS, ICP, XRF), FTIR and UV-Vis Spectroscopy instrumentation.**

Crystex Composites, Clifton, NJ: Develop Analytical Protocol for Mica-based Ceramics

- **Perform statistical analyses on validation batches of new formulations intended for temperature, low-friction applications.**
- **Develop and validate chemical analysis using microwave digestion and Flame-AAS.**
- **Determine the Friction Coefficient by ASTM-G115 using NIST-traceable reference.**

Owens-Illinois, Perrysburg, OH: Review of Incoming Raw Material QC Protocola

- **Evaluate multiple lots of various RMs for consumer container production for heavy metals by GFAAS/ICP, recycled conten by high-temperature thermal analysis and color by VIS Spectroscopy.**
- **Update existing SOPs to conform to new regulatory requirements.**

PPG, Huntsville, AL: Develop QC Protocol for Aircraft Plate Glass Window Manufacturing

- **Analyze multiple lots of stressed plate glass used for impact-resistance in aircraft windows for the Li/Na/K ratios.**
- **Develop and validate chemical analysis using microwave digestion and Flame-Emission Spectroscopy.**

PQ Corporation; Chester, PA: Evaluation of Silicates for selective Adsorbent applications

- **Statistical analysis of synthesized Silicates for user-specific Vapor & Liquid Adsorbent applications in Beverage, Frying Oil and Food Processing industry.**
- **Analytical Method Development for Frying Oil treatment using mixed Aluminum-Magnesium Silicate (synthetic) versus natural Zeolite / Clay adsorbents.**

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Technical Support for PRECIOUS METALS Clients: **From 1990-present**

Degussa-Metz Metallurgial, S. Plainfield, NJ: Purification of Rhodium Nitrate for ICP-MS

- **Process low-purity 3-9s material to remove both Metallic and Halogen impurities to produce a 5-9s5 minimum purity Rhodium Nitrate solution for use in ICP-MS Calibration for Atomic Weight**
- **Analysis involved selective Solvent-Extraction and Ion-Exchange to concentrate the impurities for Atomic Analysis by GFAAS and ICP-MS**
- **Direct Calibration and Method-of-Additions are used to generate the best accuracy**

Engelhard Corp, Iselin, NJ & Carteret, NJ: Independent Assay for 5-9s Purity Palladium

- **Provide 3rd party Analytical support to generate Total Metallic Impurity data for a custom-batch of 5-9s minimum purity Palladium based on a MILSPEC protocol**
- **Perform a full-Elemental Screening of this material using Microwave Digestion and both GFAAS & ICP-MS analyses.**

Handy & Harmon, S. Windsor, CT: Synthesis & Analysis of specialty 6-9s Silver Chloride

- **Convert 4-9s pure Silver Ingot Feed-stock to 6-9s pure Silver Chloride for a Medical Device application using proprietary methods for selective Extraction , Crystallization and Precipitation**
- **Generate ultra-low Trace Impurity & Heavy Metals analyses using Fluoropolymer Parr-Bomb and High-Pressure Microwave Digestion, followed by specialized multiple-injection GFAAS testing**

Heraeus Precious Metals, Santa Fe Springs, CA: Electronic Waste Total Resouce Recovery

- **Develop validated Sampling Protocol for Shredded e-Waste from Commercial sources**
- **Create SOP for categorizing the Precious (Ag, Au, Pd) & Strategic (Pb, Sn, Cu) Metals**
- **Validate methods for Precious & Strategic Metals Analyses by ICP-OES**

Spex Industries, Metuchen, NJ: Sub-contract a High-Purity Element Standards Line

- **Synthesize and analyze a full selection of Inorganic Compounds purified to 5-9s+ Spectroscopic purity to supplement their Fine Chemicals catalog**
- **Prepare high-purity aqueous Standard solutions for Atomic Spectroscopy Calibration; Stock Single-Element, Multi-Element and Custom-blends**

Texas Instuments, Inc., Attleboro, MA: Evaluation of Circuit Board Process Contaminants

- **Perform selective Acid / Chelate Leaches on failed multi-layer Boards to isolate specific detrimental impurities**
- **Validate methods for Trace Metal analysis using D-C Plasma Emission and GFAAS Spectroscopy**