

EMSP COMMUNICATION PRODUCTS

One of the goals of the EMSP is to focus the nation's science infrastructure on critical Department of Energy environmental problems. One of the "tried and true" ways to increase the general body of knowledge within the scientific community is through publication of research methods, results, and issues. EMSP research has provided a basis for numerous information exchanges through this method. EMSP researchers and staff have developed 2001 journal articles, papers, presentations, and other communication products. Many other news articles and press releases are either in development or planned as research within the program matures. The numbers of known publications and presentations as of October 31, 2001 are as follows:

- 674 Journal Articles
- 1 Media Report
- 45 Other (Encyclopedias, manuscripts)
- 38 Papers
- 37 Patent disclosures and applications
- 60 Posters
- 833 Presentations
- 6 Press Releases
- 185 Proceeding Contributions
- 68 Reports
- 54 Theses/Dissertations

NOTE: In instances where an author was not identified for a particular communication product, the lead principal investigator of the respective program has been listed as the author.

DEACTIVATION AND DECOMMISSIONING

Analytical Chemistry & Instrumentation

Project: 65001

Title: Development of Novel, Simple Multianalyte Sensors for Remote Environmental Analysis

PI: Dr. Sanford A. Asher

Institution: University of Pittsburgh

Publication Type: Journal

Holtz, J. H. & Asher, S. A. (1997). Intelligent polymerized crystalline colloidal array hydrogel film chemical sensing materials. *Nature*. 389, 829-832.

Holtz, J. H., Holtz, J. S. W., Munro, C. H., & Asher, S. A. (1998). Intelligent polymerized crystalline colloidal arrays: Novel chemical sensor materials. *Anal. Chem.* 70, 780-791.

Holtz, J., Weissman, J., Pan, G., & Asher, S. A. (1998). Mesoscopically periodic photonic crystal materials for linear and nonlinear optics and chemical sensing. *Material Research Soc.* 23, 44-50.

Project: 65004

Title: Real-Time Identification and Characterization of Asbestos and Concrete Materials with Radioactive Contamination

PI: Dr. George Xu

Institution: Rensselaer Polytechnic Institute

Publication Type: Journal

Naessens, E. P. & Xu, X. G. (1999). A non-destructive method to determine the depth of radionuclides in materials in-situ. *Health Phys.* 77(1), 76-88.

Publication Type: Presentation

Chen, Q., Jiang, Z., Sun, F. G., & Zhang, X. -C. (1999, May). Two-fold improvement of THz optoelectronic generation and detection. CLEO'99. Baltimore, MD.

Jiang, Z., Sun, F. G., Chen, Q., & Zhang, X. -C. (1999, May). Electro-optic sampling near zero optical transmission point. CLEO'99. Baltimore, MD.

Biogeochemistry

ORNL research, Cathy McKeown, working with depleted uranium and contaminated steel coupons. [see Project #64907]

Project: 64907

Title: "Green" Biopolymers for Improved Decontamination of Metals from Surfaces: Sorptive Characterization and Costing Properties

PI: Dr. Brian H. Davison

Institution: Oak Ridge National Laboratory

Publication Type: Poster

Davison, B. H. (1998, Nov. 17-18). Green biopolymers for decontamination. Poster presentation at Workshop on integration of end user needs with research projects for EMSP: Focus on Deactivation and Decommissioning at Savannah River Site.

Publication Type: Presentation



Preparation of Contaminated Steel Coupons. [see Project #64907]

Davison, B. H. (1999, Sept. 12-17). Green biopolymer for decon of contaminated surfaces. Decontamination, Demolition, and Restoration (DD&R) Topical Meeting on Site Restoration of Government and Commercial Facilities. Knoxville, TN.

Kuritz, T. (1999, Sep.). Remediation by cyanobacteria. International Meeting on Applied Algology, Monte Cantini Terme, Italy.

Project: 64931

Title: Microbially Promoted Solubilization of Steel Corrosion Products and Fate of Associated Actinides

PI: Dr. Yuri A. Gorby

Institution: Pacific Northwest National
Laboratory

Publication Type: Journal

Das, A. & Caccavo, F. (2000). Dissimilatory Fe(III) oxide reduction by *Shewnella* alga BrY requires adhesion. *Current Microbiology*. 40(5), 344-347.

Das, A. & Caccavo, F. (2001). Adhesion of the dissimilatory Fe(III)-reducing bacterium *Shewnella* alga BrY to crystalline Fe(III) oxides. *Current Microbiology*. 42(3), 151-154.

Engineering Science

Project: 55052

Title: Advanced Sensing and Control Techniques to Facilitate Semi-Autonomous Decommissioning

PI: Dr. Robert J. Schalkoff

Institution: Clemson University

Publication Type: Journal

Costescu, N., Dawson, D., & Loffler, M. (1999, Jun.). Qmotor 2.0 - A real-time PC based control environment. *IEEE Contr. Syst. Mag.* 19(3), 68-76.

Costescu, N., Loffler, M., Zergeroglu, E., & Dawson, D. (1998, in press). Q robot - a multitasking PC based robot control system. *Microcomputer Applications Journal Special Issue on Robotics*.

Publication Type: Other

Geist, R., Schalkoff, R., Stinson, T., & Gurbuz, S., (1997). Autonomous virtualization of real environments for telepresence applications. *PRESENCE: Teleoperators and Virtual Environments*, 6,6. MIT Press, 645-657.

Publication Type: Proceeding

Costescu, N., Loffler, M., Zergeroglu, E., & Dawson, D. (1998, Sept.). Q robot: A Multitasking PC based robot control system. *Proceedings of the IEEE Conference on Control Applications*. Trieste, Italy. 892-896.

Geist, R., Vernon, D., & Schalkoff, R. (1998, Apr.). Rendering inversion in the automated construction of virtual environments. *Proceedings of the 3rd ASCE Specialty Conf. on Robotics for Challenging Environments (ROBOTICS '98)*. Albuquerque, NM. 85-91.

Geist, R., Westall, J., Tregila, D., & Smotherman, M. (1998, Dec.). Real-time, 3-D graphics for the Linux PC. *Proceeds of the 24th Annual Int. Conf. of the Computer Measurement Group (CMG98)*, Anaheim, CA. 863 - 873.

Van Pernis, A. (1999, Apr.). Surface construction from within a virtual environment. Proceedings of the Annual ACM Southeast Conference. Mobile, AL. NOTE: this was the winning paper in the ACM SE student paper competition.

Project: 64979

Title: Basic Engineering Research for D&D of R.Reactor Storage Pond Sludge: Electrokinetics, Carbon Dioxide Extraction, and Supercritical Water Oxidation

PI: Dr. Edward A. Hamilton *Institution:* SCUREF

Publication Type: Journal

Yang, X. -N., Coelho, L. A. F., & Matthews, M. A. (2000). Near-critical behavior of mutual coefficients for five solutes in supercritical carbon dioxide. *Industrial & Engineering Chemistry Research*. 39(8), 3059-3068.

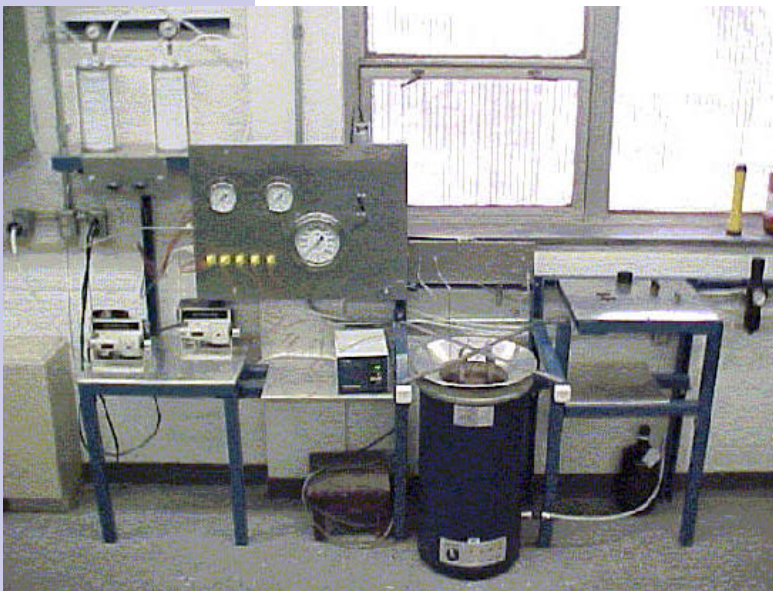
Publication Type: Poster

Bruce, D. (1998, Nov. 15-20). Sonochemical oxidation of organic contaminants in waste water. Presentation at the AIChE Annual Meeting. Miami Beach, FL.

Bruce, D. A., Nareddy, A. (1999, Nov. 3). Prediction of sonochemical oxidation rates for organic contaminants in water. AIChE National Meeting, Dallas, TX.

Leonard, M. L., Weidner, J. W., White, R. E., & Matthews, M. A. (1999, Sept. 26 - Oct. 1). Electrochemical reactions in supercritical fluids in materials processing and synthesis. Davos, Switzerland.

Matthews, M. (1998, Nov. 15-20). Mass transfer in CO₂/surfactant systems. Presentation at the 1998 AIChE Annual Meeting. Miami Beach, FL.



Supercritical Water Oxidation Test Stand at Clemson University.
[see Project #64979]

Matthews, M. A. (2000, Apr. 24-27). Basic engineering research for D&D of PCB wastes at DOE sites. Mixed Waste Focus Area Working Group, Environmental Management Science Program National Workshop, Atlanta, GA.

Matthews, M. A., Bruce, D., & Thies, M. (2000, Apr. 24-27). Decontamination and decommissioning of PCB sites at DOE: Extraction, electrokinetics, and hydrothermal oxidation. Environmental Management Science Program National Workshop, Atlanta, GA.

Pickett, J., et. al. (1998, Nov. 17-18). Decontamination and decommissioning

of PCB sites at SRS. Poster presentation at the Workshop on Integration of End User Needs with Research Projects for the Environmental Management Science Program. Savannah River Site. Aiken, SC.

Publication Type: Presentation

Bruce, D. A. & Nareddy, A. (2000, Nov.). Dynamics of sonochemical reactors. AIChE. Los Angeles, CA.

Bruce, D. A., Dolan, H., Nareddy, A., & Haseltine, E. (1999, Nov. 3). Diffusional effects on the sonochemical oxidation of organic contaminants in wastewater. AIChE Annual Meeting, Dallas, TX.

Hamilton, E. A. & Matthews, M. A. (2000, Apr. 24-27). Linking EMSP research to end-user's needs: A case study. Environmental Management Science Program National Workshop, Atlanta, GA.

Jun, L. & Matthews, M. A. (2000, Aug. 20-24). Supercritical CO₂ extraction of chlorinated aromatics from job control waste. 2000 Annual Meeting of the American Chemical Society, Washington, D. C.

Leonard, M. L., Weidner, J. W., & Matthews, M. A. (2000, Sept. 3-8). Electrochemical reactions in supercritical carbon dioxide. 51st Annual Meeting of the International Society of Electrochemists. Warsaw, Poland.

Project: 65015

Title: Three-Dimensional Position-Sensitive Germanium Detectors

PI: Dr. Mark Amman

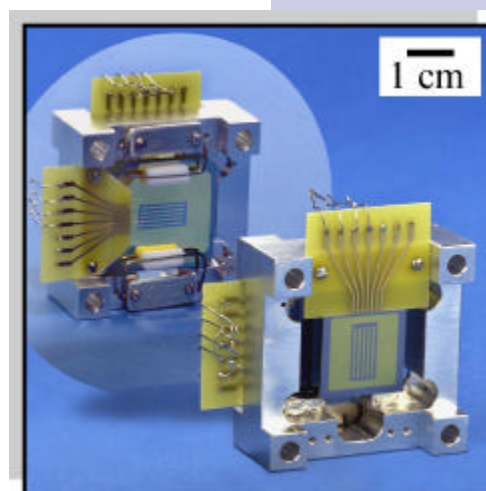
Institution: Lawrence Berkeley National Laboratory

Publication Type: Presentation

Amman, M. & Luke, P. N. (2000, Aug.). Position-sensitive germanium detectors for gamma-ray imaging and spectroscopy. Hard X-Ray, Gamma-Ray, and Neutron Detector Physics II Conference, SPIE Annual Meeting, San Diego, CA.



Extraction apparatus at University of South Carolina [Project #64979]



One of several small prototype position-sensitive germanium detectors fabricated for this project. Using such detectors, we have refined our detector fabrication process and developed techniques to improve both the imaging and spectroscopic performance of the detectors. [see Project #65015]

Amman, M., Luke, P. N., & Burks, M. T. (2000, Apr.). Three-dimensional position-sensitive germanium detectors. Environmental Management Science Program National Workshop, Atlanta, GA.

Publication Type: Report

Amman, M. & Luke, P. N. (2000). Position-sensitive germanium detectors for gamma-ray imaging and spectroscopy. Proceedings of SPIE, Hard X-Ray, Gamma-Ray, and Neutron Detector Physics II Conference. Lawrence Berkeley National Laboratory Report LBNL-45022.

Amman, M. & Luke, P. N. (2000). Three-dimensional position sensing and field shaping in orthogonalstrip germanium gamma-ray detectors. Nuclear Instruments and Methods in Physics Research A. 452, 155-166. Lawrence Berkeley National Laboratory Report LBNL-44898.

Luke, P. N., Amman, M., Philips, B. F., Johnson, W. N., & Kroeger, R. A. (2000). Germanium orthogonal strip detectors with amorphous-semiconductor contacts. IEEE Transactions on Nuclear Science. Lawrence Berkeley National Laboratory Report LBNL-44444.

Project: 82773 (Renewal of Project No. 64947)

Title: Contaminant-Organic Complexes: Their Structure and Energetics in Surface Decontamination Processes

PI: Dr. Calvin C. Ainsworth

Institution: Pacific Northwest National Laboratory

Publication Type: Journal

Hay, B. P. & Hancock, R. D. (2001). The role of donor group orientation as a factor in metal ion recognition by ligands. *Coord. Chem. Rev.* 212, 61+.

Vargas, R., Garza, J., Dixon, D. A., & Hay, B. P. (2001). C(sp²)-C(aryl) bond rotation barrier in N-methylbenzamide. *J. Phys. Chem. A.* 105, 774-778.

Vargas, R., Garza, J., Dixon, D. A., & Hay, B. P. (2001, in press). Conformational analysis of N-benzylformamide. *J. Mol. Struct. (THEOCHEM)*.

Publication Type: Presentation

Beak, D. G., Chen, C. C., Bigham, J. M., & Traina, S. J. (1999, Jun.). Synthesis and properties of hematite, maghematite, and their chromium substituted analogs. The Clay Minerals Society 36th Annual Meeting. Purdue University, IN.

Chen, C. C. & Traina, S. J. (2000, Apr.). Macroscopic and microscopic investigation of lanthanide ions partitioning at oxide/water surfaces. EMSP National Workshop. Atlanta, GA.

Chen, C. C. & Traina, S. J. (2001, May). Dissolution of iron oxides and Cr-substituted iron oxides with sorbed europium by the Siderophore Desferrioxamine B. Goldschmidt Conference. Hot Springs, VA.

Hay, B. P. (2000, Dec. 16). Building a better mousetrap: Ligand design with molecular mechanics. Invited presentation at the American Chemical Society Pacificchem 2000 Meeting. Honolulu, HI.

Hay, B. P. (2000, Mar. 23). Ligand design with molecular mechanics. Theory, Modeling, and Simulation Monthly Seminar Series. Richland, VA.

Hay, B. P. (2000, Mar. 26). Ligand design with molecular mechanics. 219th American Chemical Society Meeting. San Francisco, CA.

Hay, B. P., Vargas, R., Garza, J., & Dixon, D. A. (2000, Mar. 26). Metal ion complementarity in a series of Tris-Catecholamides. 219th American Chemical Society Meeting. San Francisco, CA.

Traina, S. J. & Chen, C. C. (2000, Sept.). XAS investigation of lanthanide ion sorption on iron oxide and Cr-substituted iron oxide surfaces. Goldschmidt Conference. Oxford, UK.

Inorganic Chemistry

Project: 54724

Title: Synthesis of New Water-Soluble Metal-Binding Polymers: Combinatorial Chemistry Approach

PI: Dr. Barbara F. Smith

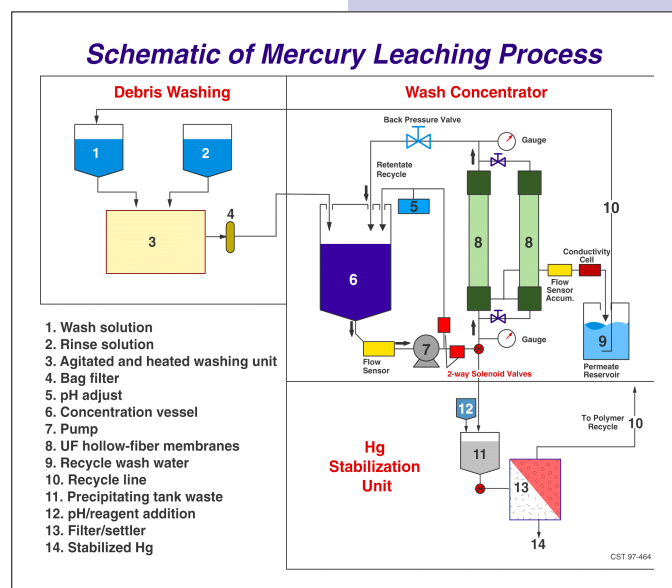
Institution: Los Alamos National Laboratory

Publication Type: Journal

Colletti, L. & Havrilla, G. (1999). Trace element detection with micro-x-ray fluorescence. *Advances in X-Ray Analysis*, 44.

Corrales, L. R., Song, J., & Van Ginhoven, R. (1999, Mar. 21). The formation and migration energetics of radical defects in silica polymorphs. *Abstr. Pap. Am. Chem. S.* 217, U293-U293, Part 2.

Kizer, D. E., Miller, R. B., & Kurth, M. J. (1999). Fused pyrazolo heterocycles: intramolecular [3+2]-nitrile oxide cycloadditions applied to syntheses of pyrazolo[3,4-g][2,1]dihydrobenzoxazol(in)es. *Tetrahedron Letters*. 40, 3535-38.



Schematic of Groundwater and Soil Remediation Process
[see Project #54724]

Publication Type: Proceeding

Smith, B. F., Robison, T. W., & Jarvinen, G. D. (1998). Water-soluble metal-binding polymers with ultrafiltration: A technology for the removal, concentration, and recovery of metal ions from aqueous streams. Rogers, R., Bond, A., & Dietz, M. (Eds.), ACS Symposium Series volume, Advances in Metal Ion Separation and Preconcentration, Chap. 20, 294-330.

Song, J., Corrales, L. R., & Jónsson, H. (1999, in press). Exploring the excited states of vacancy defects in silica. Zinkle, S. J., Ewing, R. C., Lucas, G. E., & Williams, J. S. (Eds.), Microstructural Processes in Irradiated Materials. Mater. Res. Soc. Symp. Proc. 540, Warrendale, PA.

Materials Science**Project: 55380**

Title: In-Situ Spectro-Electrochemical Studies of Radionuclide Contaminated Surface Films on Metals and the Mechanism of their Formation and Dissolution

PI: Dr. Carlos A. Melendres *Institution:* Argonne National Laboratory

Publication Type: Journal

Balasubramanian, M. & Melendres, C. A. (1999). An x-ray absorption near-edge spectroscopy study of the oxidation state of chromium in electrodeposited oxide films. *Electrochim. Acta.* 44, 2941.

Balasubramanian, M. & Melendres, C. A. (1999). Selective site occupancy exhibited by Cr³⁺ and Cr⁶⁺ incorporated into electrochemically deposited nickel hydroxide films. *Electrochem. and Solid State Lett.* 2, 167.

Balasubramanian, M., Melendres, C. A., & Mansour, A. N. (1999). X-ray absorption spectroscopy study of the local structure of heavy metal ions incorporated into electrodeposited nickel oxide films. *J. Electrochem. Soc.* 146, 607.

Balasubramanian, M., Melendres, C. A., Mansour, A. N., & Mini, S. (1999). X-ray absorption spectroscopy studies of electrochemically deposited thin oxide films. *Mater. Res. Symp. Proc.* 524.

Wang, H., et. al. (1998). Integrated x-ray L absorption spectra: Counting holes in Ni complexes. *J. Phys. Chem. B* 102, 8343.

Publication Type: Paper

Carlos, A. (1999, Apr. 5). X-ray absorption spectroscopy studies of electrochemically deposited thin oxide films. Materials Research Society Spring Meeting.

Melendres, C. A. (1999, May 3). X-ray absorption spectroscopy studies of the structure of electrodeposited metal oxide films and some applications. 193rd Meeting of the Electrochemical Society.

Publication Type: Presentation

Balasubramanian, M. & Melendres, C. A. (1999). Local structure of chromium incorporated into electrodeposited nickel hydroxide films. *J. Synchrotron Radiat.* 6, 594.

Balasubramanian, M., Melendres, C. A., & Mansour, A. N. (1999). An x-ray absorption study of the local structure of cerium in electrochemically deposited thin films. *Thin Solid Films.* 347, 178.

Project: 59925

Title: Modeling of Diffusion of Plutonium in Other Metals and of Gaseous Species in Plutonium-Based Systems

PI: Dr. Bernard R. Cooper

Institution: West Virginia University

Publication Type: Journal

Cooper, B. R., Becker, J. D., Wills, J. M., & Cox, L. (1998). Calculated lattice relaxation in Pu-Ga alloys. *Journal of Alloys and Compounds.* 271-273, 367.

Cooper, B. R., Becker, J. D., Wills, J. M., & Cox, L. (1998). Calculated lattice relaxation in Pu-Ga. *Phys. Rev. B.* 58B, 5143.

Cooper, B. R., Vogt, O., Sheng, Q.G., & Lin, Y.L. (1999, May). From heavy fermions to random-localized-site behavior via Anderson localization. *Philosophical Magazine B* 79. No. 5, 683-702.

Publication Type: Other

Cooper, B. R., Turchi, P.E.A., Gonis, A., Kioussis, N., & Price, D. L. (1999). Correlation effects on stability in Pu metal and its alloys. Gonis, A. & Kioussis, N. (Eds.), *Electron Correlations and Materials Properties*. Plenum Publishing.

Publication Type: Presentation

Cooper, B. R. & Beiden, S. (1998). Diffusion of plutonium into transition metallic alloys and of transition metal species into plutonium. Eighth Conference on Computational Research on Materials. Lakeview, WV.

Cooper, B. R. & Beiden, S. (1998). Modeling of diffusion of plutonium in other metals and of gaseous species in plutonium-based systems. Environmental Management Science Workshop. Chicago, IL.

Cooper, B. R. & Beiden, S. (1998, Nov.). Modeling of diffusion of plutonium. Workshop on Environmental Management Science: Integration with End User Needs. Savannah River Site. Aiken, SC.

Cooper, B. R. & Beiden, S. (1998, Nov.). Modeling of interdiffusion of plutonium and other metals. Materials Research Society Meeting. Boston, MA.

Cooper, B. R. & Lederman, D. (1998, Nov.). Portable detection and analysis of plutonium content. Workshop on Environmental Management Science: Integration with End User Needs. Savannah River Site. Aiken, SC.

Cooper, B. R. (1998, Jun. 28 - Jul. 3). Synthesis of many-body theory and electronic structure. International Workshop on Electron Correlations and Materials Properties. Heraklion, Crete, Greece.

Cooper, B. R. (1998, May). Treating electronic and magnetic properties of actinide-based materials beyond one-electron dynamics. School of Actinide Physics and Chemistry. Uppsala, Sweden.

Cooper, B. R. (1999, Apr.). Random 5f localization and the fcc transition and depression of melting temperature in plutonium. 29th Journées des Actinides Conference. Luso, Portugal.

Cooper, B. R. (1999, Mar.). Anomalous electronic behavior and relationship to thermostructural behavior of light actinides. American Physical Society Meeting. Atlanta, GA.

Cooper, B. R., Becker, J. D., Wills, J. M. & Cox, L. (1997, Sept.). Structural relaxation in Pu-Ga via full-potential LMTO calculations. Actinides 97. International Conference. Baden-Baden, Germany.

Cooper, B. R., Kiuoussis, N., Turchi, P. E. A., Gonis, A., & Price, D. L. (1999, Mar.). Electronic structure of alpha and delta plutonium. American Physical Society Meeting. Atlanta, GA.

Cooper, B. R., Sevilla, E. H., & Fernando, G. W. (1999, Mar.). Equilibrium lattice volume of fcc Pu. American Physical Society Meeting. Atlanta, GA.

Project: 64896

Title: Decontamination of Radionuclides from Concrete During and After Thermal Treatment

PI: Dr. Brian P. Spalding

Institution: Oak Ridge National Laboratory

Publication Type: Journal

Spalding, B. (2000). Simple heating of contaminated cement paste between 800-1300°C can lead to complete volatilization of 137Cs making its facile decontamination from concrete a feasible remedial technique. Environ. Sci. Technol. 34, 5051-5058.

Spalding, B. P. (2000, in press). A chemical equilibria model of strontium-90 adsorption and movement in soil under dynamic alkaline conditions. Environmental Science & Technology.

Spalding, B. P. (2000, in press). Volatility and extractability of cesium-134, strontium-85, cobalt-57, and uranium after heating hardened portland cement paste. *Environmental Science & Technology*.

Publication Type: Presentation

Spalding, B. P. (1998, Nov. 17-18). Decontamination of radionuclides from concrete during and after thermal treatment. Workshop on Integration of End User Needs with Research Projects for Environmental Management Science Program, Savannah River Site, Aiken, SC.

Spalding, B. P. (1999, Jan. 13). Is it a good idea to heat radioactively-contaminated concrete or soil? Civil Engineering Dept., Northwestern University, Evanston, IL.

Spalding, B. P. (1999, Sep. 22). Decontamination of radionuclides from concrete during and after thermal treatment. U. S. Dept. of Energy - Oak Ridge Operations, Environmental Management Science Program National Workshop, Oak Ridge, TN.

Spalding, B. P. (2000, Apr. 24). Decontamination of radionuclides from concrete during and after thermal treatment. 2nd Annual Environmental Management Science Program National Workshop, Atlanta, GA.

Project: 64946

Title: Mechanisms of Radionuclide-Hydroxycarboxylic Acid Interactions for Decontamination of Metallic Surfaces

PI: Dr. Arokiasamy J. Francis

Institution: Brookhaven National Laboratory

Publication Type: Presentation

Halada, G. P., et. al. (1999, May 2-6). Interaction of uranium with corrosion products formed on plain carbon steel. Paper presentation at the 195th Meeting of the Electrochemical Society. Seattle, WA.

Publication Type: Proceeding

Francis, A. J., Dodge, C. J., Gillow, J. B., Halada, G. B., & Clayton, C. R. (1999, Aug. 22-26). Decontamination of uranium contaminated metallic surfaces with uranium recovery. Paper presentation NUCL-65 at the Symposium on First Accomplishments of Environmental Management Science Program, 218th Annual Meeting of the American Chemical Society. New Orleans, LA.

Halada, G. P., et. al. (1999, Aug. 22-26). A spectroscopic study of the association of contaminant uranium with mild steel corrosion products. Paper presentation NUCL-61 at the Symposium on First Accomplishments of Environmental Management Science Program, 218th Annual Meeting of the American Chemical Society. New Orleans, LA.

Project: 73835 (Renewal of Project No. 54914)

Title: Atmospheric-Pressure Plasma Cleaning of Contaminated Surfaces

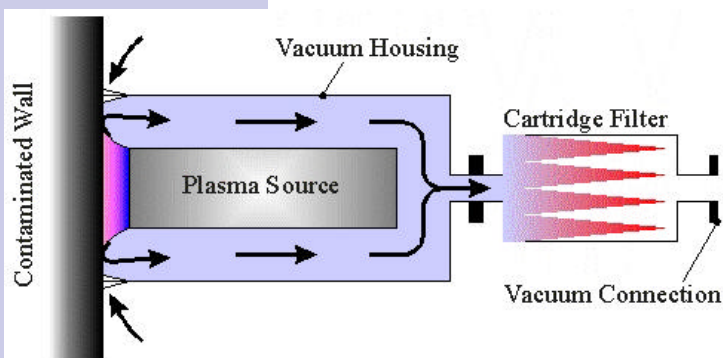
PI: Dr. Robert F. Hicks

Institution: University of California at Los Angeles

Publication Type: Journal

Babayan, S. E., et. al. (1998, Aug.). Deposition of silicon dioxide films with an atmospheric-pressure plasma jet. *Plasma Sources Sci. T.* 7(3), 286-288.

Babayan, S. E., et. al. (1998, in press). Plasma source science and technology.



Schematic of a method for decontaminating surfaces, such as building wall. The plasma source is mounted within a housing that keeps the pressure slightly below ambient to prevent the etch products from escaping the device. A cartridge filter for the radioactive contaminants can be placed near the plasma source and replaced periodically as needed. [see Project #73835, renewal of #54914]

Babayan, S. E., Jeong, J. Y., Tu, V. J., Selwyn, G. S., & Hicks, R. F. (1998). Deposition of glass films with an atmospheric-pressure plasma jet. *Plasma Sources Sci. and Tech.* 7, 286-288.

Jeong, J. Y., et. al. (1998, Aug.). Etching materials with an atmospheric-pressure plasma jet. *Plasma Sources Sci. T.* 7(3), 282-285.

Jeong, J. Y., et. al. (1999, Sep.-Oct.). Etching polyimide with a non-equilibrium atmospheric-pressure plasma jet. *J. Vac. Sci. Technol. A.* 17(5), 2581-2585.

Park, J., et. al. (2000, in press). An atmospheric pressure plasma source. *Appl. Phys. Lett.*

Schutze, A., et. al. (1998, Dec.). The atmospheric-pressure plasma jet: A review and comparison to other plasma sources. *IEEE T. Plasma Sci.* 26(6), 1685-1694.

Publication Type: Patent

Selwyn, G. S. (1999, Oct. 5). Atmospheric-pressure plasma jet. US #5,961,772.



Side view of a 4" wide atmospheric-pressure plasma source operating with 750 Torr helium and 10 Torr oxygen. [see Project #73835, renewal of #54914]

Publication Type: Presentation

Henins, I., Selwyn, G. S., Park, J., Snyder, H., & Herrmann, H. (1999, Mar. 31). The atmospheric pressure plasma jet (2 presentations, Parts A & B). New Mexico Chapter Meeting of the American Vacuum Society, Albuquerque, NM.

Hicks, R. F. (1998, Feb. 27). Materials processing with atmospheric-pressure plasma jets. Solid State Technology and Devices Seminar, Electrical Engineering and Computer Sciences Department, University of California, Berkeley, CA.

Hicks, R. F. (1999, Feb. 1). Materials processing with atmospheric-pressure plasma jets. Université D'Orléans, France.

Hicks, R. F., Babayan, S. E., Jeong, J. Y., Henins, I., & Selwyn, G. S. (1998, Jun. 2). Atmospheric-pressure plasma jet processing of materials. The 25th International Conference on Plasma Science, Raleigh, NC.

Hicks, R. F., Babayan, S. E., Jeong, J. Y., Henins, I., & Selwyn, G. S. (1997, Sep.). Atmospheric-pressure plasma jet processing of materials. ISAPS Conference, Los Angeles, CA.

Hicks, R. F., et. al. (1998, Nov. 17). Characterization of the atmospheric pressure plasma jet effluent. AIChE Annual Meeting, Miami, FL.

Hicks, R. F., et. al. (1999, Nov. 2). Gas-phase chemistry of atmospheric pressure plasmas. AIChE Annual Meeting. Dallas, TX.

Jeong, J. Y., Babayan, S. E., Selwyn, G. S., & Hicks, R. F. (1997, Oct. 20). Atmospheric-pressure plasma jet etching of materials. 44th International Symposium of the American Vacuum Society, San Jose, CA.

Jeong, J. Y., et. al. (1997, Nov. 19). Atmospheric-pressure plasma jet etching of materials. AIChE Annual Meeting, Los Angeles, CA.

Jeong, J. Y., et. al. (1998, Nov. 5). Characterization of the reactive species in a helium/oxygen atmospheric-pressure plasma jet. 45th International Symposium of the American Vacuum Society, Baltimore, MD.

Schuetze, A., Babayan, S. E., Jeong, J. Y., Tu, V. J., & Hicks, R. F. (1998, Nov. 18). Atmospheric-pressure plasma cleaning of Si(100) surfaces. AIChE Annual Meeting, Miami, FL.

Schuetze, A., et. al. (1998, Nov. 4). The atmospheric-pressure plasma jet: Properties and materials applications. 45th International Symposium of the American Vacuum Society, Baltimore, MD.

Selwyn, G. S. (1998, May 5). Cleaning and decontamination using the atmospheric pressure plasma jet. International Science and Technology Conference, Albuquerque, NM.

Selwyn, G. S., et. al. (1997, Nov. 17). Contamination control for future device processing: Good vibrations to plasma jets. AIChE Annual Meeting, Los Angeles, CA.

Selwyn, G. S., Henins, I., Jeong, J. Y., Babayan, S. E., & Hicks, R. F. (1997, Oct. 22). High rate cleaning of surfaces using atmospheric pressure generation of reactive metastable species. American Vacuum Society Annual Meeting, San Jose, CA.

Selwyn, G. S., Henins, I., Park, J., Snyder, H., & Herrmann, H. (1999, Feb. 24). The atmospheric pressure plasma jet. IPEC-Precision, Bethel, CT.

Selwyn, G. S., Henins, I., Park, J., Snyder, H., & Herrmann, H. (1999, Mar. 18). The atmospheric pressure plasma jet. Watkins-Johnson, Scotts Valley, CA.

Separations Chemistry

Project: 60283

Title: Waste Volume Reduction Using Surface Characterization and Decontamination by Laser Ablation

PI: Dr. Michael J. Pellin

Institution: Argonne National Laboratory

Publication Type: Journal

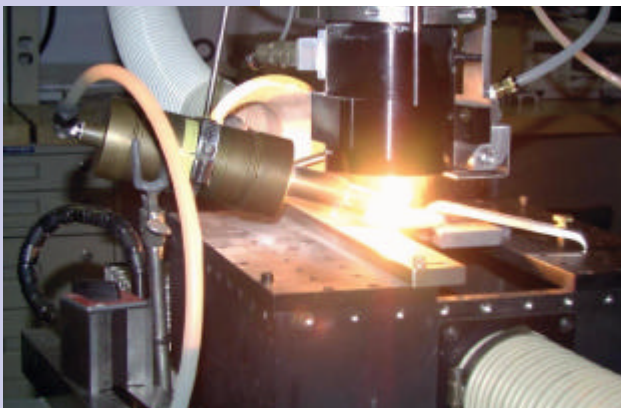
Savina, M., Xu, Z. Y., Wang, Y., Pellin, M., & Leong, K. (1999, Dec.). Pulsed laser ablation of cement and concrete. *J. Laser Appl.* 11(6), 882-886.

Publication Type: Poster

Savina, M. R., Pellin, M. J., Leong, K., & Xu, Z. (1998, Jul.). Waste volume reduction using surface characterization and decontamination by laser ablation. Presentation at EMSP Workshop. Rosemont, IL.

Publication Type: Presentation

Pellin, M. J., Savina, M. R., Reed, C. B., Wang, Y., & Xu, Z. (1999, Mar.). Waste volume reduction using surface characterization and decontamination by laser ablation. Presentation at Characterization, Monitoring, and Sensing Workshop. Gaithersburg, MD.



Laser Ablation System – 1.6 kw pulsed Nd:YAG laser system with fiber optic beam delivery. Advantages of this system over conventional scabbling are for hard-to-reach places and remote decontamination. [see Project #60283]

Publication Type: Proceeding

Savina, M. R., Xu, Z., Wang, Y., Leong, K., & Pellin, M. J. (1998). Laser ablation of concrete. Proceedings of the 17th International Conference on Applications of Lasers and Electro-Optics. 85A, 219-226.

Project: 64912

Title: Improved Decontamination: Interfacial, Transport, and Chemical Properties of Aqueous Surfactant Cleaners

PI: Dr. David W. DePaoli

Institution: Oak Ridge National Laboratory

Publication Type: Presentation

Counce, R. M. (1999, Nov. 17-18). Improved decontamination: Interfacial, transport, and chemical properties of aqueous surfactant cleaners. Presentation at the EMSP/D&D Workshop, Savannah River Site, Aiken, SC.

DePaoli, D. W., Hu, M. Z., Counce, R. M., & Rowe, A. W. (1999, Nov. 30). Overview of improved decontamination: Interfacial, transport, and chemical properties of aqueous surfactant cleaners. Presentation at the DOE Oak Ridge Operations D&D Focus Area Site Visit, Oak Ridge, TN.

DePaoli, D. W., Hu, M. Z., Counce, R. M., & Rowe, A. W. (2000, Apr. 26). Surface decontamination with aqueous-based surfactant solutions. Presentation at the 2nd Annual Environmental Management Science Program National Workshop, Atlanta, GA.

DePaoli, D. W., Hu, M. Z., Rowe, A. W., & Counce, R. M. (1999, Sep. 22). Improved decontamination: Interfacial, transport, and chemical properties of aqueous surfactant cleaners. Presentation at the Oak Ridge Operations Environmental Management Science Program Workshop, Oak Ridge, TN.

DePaoli, D. W., Hu, M. Z., Rowe, A. W., & Counce, R. M. (2000, Nov. 15). Surface cleaning with aqueous-based surfactant solutions. Presentation at the annual meeting of Chemical Engineers, Los Angeles, CA.

Perkins, L. W., Counce, R. M., Hu, M. Z.- C., & DePaoli, D. W. (1999, Oct. 17-21). Separation of oil from prototypic industrial cleaning/degreasing effluents. Eleventh Symposium on Separation Science and Technology for Energy Applications, Gatlinburg, TN.

Rowe, A. W., Counce, R. M., Hu, M. Z.- C., & DePaoli, D. W. (1999, Oct. 17-21). Surface decontamination with aqueous-based surfactant solutions. Eleventh Symposium on Separation Science and Technology for Energy Applications, Gatlinburg, TN.

Publication Type: Theses/Dissertations

Morton, S. (in progress). Improved decontamination: Interfacial, transport, and chemical properties of aqueous surfactant cleaners. PhD. Dissertation, University of Tennessee, Knoxville, TN.

Rowe, A. W. (2000, Aug.). Improved decontamination: Interfacial, transport, and chemical properties of aqueous surfactant cleaners. M. S. Thesis, University of Tennessee, Knoxville, TN.

Project: 64965

Title: Supercritical Carbon Dioxide-Soluble Ligands for Extracting Actinide Metal Ions from Porous Solids

PI: Dr. Mark L. Dietz

Institution: Argonne National Laboratory

Publication Type: Journal

Griffith-Dzielawa, J. A., Barrans, R. E., McAlister, D. R., Dietz, M. L., & Herlinger, A. W. (2000). Synthesis and characterization of di-[3-(trimethylsilyl)1-propylene]alkylenediphosphonic acids. *Synthetic Commun.* 30(12), 2121-2132.

Publication Type: Poster

Herlinger, A. W., Griffith, J. A., McAlister, D. R., & Barrans Jr., R. E. (1999, Aug. 22-26). Functionalized diphosphonic acid ligands for metal ion coordination in supercritical carbon dioxide. Poster presentation #33 at the First Accomplishments of the Environmental Management Sciences Program Symposium sponsored by the Division of Nuclear Chemistry and Technology at the 218th National A.C.S. Meeting. New Orleans, LA.

HEALTH/ECOLOGY/RISK

Analytical Chemistry & Instrumentation

Project: 60163

Title: Investigation of Techniques to Improve Continuous Air Monitors Under Conditions of High Dust Loading in Environmental Settings

PI: Dr. Stephen D. Schery

Institution: New Mexico Institute of Mining & Technology

Publication Type: Presentation

Rodgers, J. C., Wasiolek, P. T., Schery, S. D., & Alcantara, R. E. (1998, Nov. 1-6). High resolution real-time optical studies of radiological air sample processes in an environmental continuous air monitor. 1998 SPIA Symposium on Industrial and Environmental Monitors and Biosensors. Boston, MA. LA-UR-98-1684.

Project: 60474

Title: Ultrahigh Sensitivity Heavy Noble Gas Detectors for Long-Term Monitoring and Monitoring Air

PI: Dr. John D. Valentine

Institution: Georgia Institute of Technology

Publication Type: Journal

Valentine, J. D. (1999). Evaluating detectors and pulse processing techniques. *IEEE Transactions in Nuclear Science.* 46(3).