CURRICULUM VITAE

ROBERT G. ARNOLD

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EDUCATION:

1986 Ph.D. California Institute of Technology
Pasadena, California

Thesis: "Dissimilative Fe(III) Reduction by Pseudomonas sp. 200", 345 pp. Advisor: Michael R. Hoffmann

1976 MSEE University of North Carolina
Chapel Hill, North Carolina

Thesis: "Optimization of Unit Processes for Sulfide Removal from the Municipal Groundwater Supply at Roper, North Carolina", 139 pp. Advisor: Philip C. Singer.

1969 BSME United States Naval Academy, Annapolis, Maryland

EMPLOYMENT:

1997-Present Professor
Department of Chemical and Environmental Engineering
The University of Arizona, Tucson, Arizona

1992-1997 Associate Professor
Department of Chemical and Environmental Engineering
The University of Arizona, Tucson, Arizona

1986-1992 Assistant Professor
Department of Civil Engineering and Engineering Mechanics
The University of Arizona, Tucson, Arizona

1977-1981 Environmental Engineer
County Sanitation Districts of Los Angeles County

1969-1974 Military Service, U.S. Naval Officer

REGISTRATION: State of California Civil Engineer
License No. C031415

PROFESSIONAL HONORS:

1987	National Science Foundation Presidential Young Investigator
1989	"Outstanding Faculty Member--Civil Engineering," 1989--awarded annually by University of Arizona Civil Engineering undergraduates.
1992	Quentin Mees award recipient for research. Annual award for research in environmental engineering from the Arizona Water and Pollution Control Association.
2002	Quentin Mees award recipient for research.

PROFESSIONAL SERVICE:

1996-2002	Associate editor and/or editor-in-chief for ASCE *Journal of Environmental Engineering*.
2000-present	Member, Water Environment Research Foundation Research Council
2002-present	Member, Water Reuse Foundation's Research Advisory Council

PEER-REVIEWED PUBLICATIONS—through 2012

Arnold, R., Saez, A., Snyder, S., Maeng, S., Lee, C., Woods, G., Li, X., Choi, H. (2012). Direct potable reuse of reclaimed wastewater— it is time for a rational discussion. *Rev Environ Health*. 27(4), 197–206.

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Gavidia T, Brune MN, McCarty KM, Pronczuk J, Etzel R, Neira M, Carpenter DO, Suk WA, Arnold RG, Ha EH, Sly PD. Children's environmental health-from knowledge to action. *Lancet*. 2010 Jul 26.

Rojas, M.R., F. Pérez, D. Whitley, R.G. Arnold and A.E. Sáez, Modeling of Advanced Oxidation of Trace Organic Contaminants by Hydrogen Peroxide Photolysis and Fenton's Reaction, *Industrial & Engineering Chemistry Research*, **49**, 11331–11343, (2010).

Rupp, E.C., E.A. Betterton, R.G. Arnold and A.E. Sáez. 2009. Interaction of Perchloroethylene with Cerium Oxide in Three-Way Catalysts, Catalysis Letters, 132:153-158 (2009).

Willinger, M., E. Rupp, B. Barbaris, S. Gao, R. Arnold, E. Betterton, and A. Saez. 2009. Thermocatalytic destruction of gas-phase perchloroethylene using propane as a hydrogen source. Journal of Hazardous Materials. 167:770-776.

Arnold, R. and K. Arnold. 2009. Integrated Urban Water Management: Arid and Semi-Arid Regions Integrated. Urban Water Management in the Tucson, Arizona Metropolitan Area. UNESCO. pp 113-138.

Gao, S., E. Rupp., S. Bell, M. Willinger, *et al.* 2008. Mixed redox catalytic destruction of chlorinated solvents in soils and groundwater: from the laboratory to the field. Annals of the New York Academy of Sciences. 1140:435-445.

Teske, S. and R. Arnold. 2008. Removal of natural and xeno-estrogens during conventional wastewater treatment. Rev Environ Sci Biotechnol. 7:107-124.

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Zhang, J., M. Tomanek, H. Dong, R. Arnold, *et al.* 2008. Fate of polybrominated diphenyl ethers, nonylphenol, and estrogenic activity during managed infiltration of wastewater effluent. J Environ Engr. 134(6): 433-442.

Orbay, O., S. Gao, B. Barbaris, E. Rupp, E. Saez, R. Arnold and E. Betterton. 2007. Catalytic dechlorination of gas-phase perchloroethylene under mixed redox conditions. Appl. Catalysis (B Environmental). Science Direct at www.sciencedirect.com.

Arnold, Carpenter, Kirk, Koh, Armour, Cebrian, *et al.* 2007. Meeting Report: Threats to human health and environmental sustainability in the Pacific Basin. Environ. Health Perspect. 115: 1770-1775.

Conroy, O., A.E. Saez, D. Quanrud, W.P. Ela and R.G. Arnold. 2007. Changes in estrogen/anti-estrogen activities in ponded secondary effluent. Sci. Total Environ. 382: 311-323.

Miller, J.H., W.P. Ela, K.E. Lansey, P.L. Chipello and R.G. Arnold. 2006. Nitrogen transformations during soil-aquifer treatment of wastewater effluent – oxygen effects in field studies. J. Environ. Engr. 132(10): 1298-1306.

Quast, K., K. Lansey and R. Arnold. 2006. Boron isotopes as artificial tracers. Ground Water 44: 453-466.

De Las Casas, C.L., K.G. Bishop, L.M. Bercik, M. Johnson, M. Potzler, W.P. Ela, A.E. Saez, S.G. Huling and R.G. Arnold. 2006. In-place regeneration of granular activated carbon using Fenton's reagents. In: Innovative Approaches for the Remediation of Subsurface Contaminated Hazardous Waste Sites: Bridging Flask and Field Scales, ACS Symposium Series 940: 43-65.

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Liu, Z., R.G. Arnold, E.A. Betterton and K.D. Festa, 1999. Electrolytic reduction of CCl_4 — effects of cathode material and potential on kinetics, selectivity and product stoichiometry. Environ. Engineering. Sci. 16:1-13.

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*Derived from dissertation.

RESEARCH IN PROGRESS

I am involved in ongoing research in the following areas:

1. ***Abiotic and biochemical catalysis of reductive dehalogenation.*** Heavily halogenated aliphatic contaminants such as perchloroethene, carbon tetrachloride and (to an extent) trichloroethene generally resist aerobic transformation mechanisms. The same compounds, however, are generally amenable to reductive transformations that yield less halogenated homologues. The several mechanisms of reductive dehalogenation are incompletely known. Mechanistic studies and dehalogenating systems under development in this laboratory follow:

    i. Treatment of contaminated gas streams containing semi-volatile chlorinated solvents using a membrane electrode assembly (modified fuel cell apparatus).

    ii. Electrolytic transformation of aqueous-phase chlorinated solvents.

    iii. Catalyzed thermochemical destruction of gas-phase solvents.

    iv. Photocatalytic, two-solvent systems consisting of acetone, isopropanol and the halogenated targets for reductive transformation reactions.

2. ***Oxidation of hazardous organic compounds in soils using H_2O_2 and Fenton-derived hydroxyl radicals.***
    Research includes methods for quantifying radical production in environmental samples; utilization of Fenton-driven systems for in-place recovery of spent activated carbon.

3. ***Engineered systems leading to water reuse following infiltration and aquifer storage – the effect of soil-aquifer treatment on organic residuals, available nitrogen forms and pathogens in treated municipal wastewaters.***
    Current research emphasis is on the fate of estrogenic and other endocrine disrupting compounds during wastewater treatment processes, biosolids handling and disposal, and effluent polishing operations.

4. ***Trace organic chemicals in products derived from wastewater treatment – reclaimed water and biosolids.***
    Current research emphasis is on endocrine disrupting compounds and measurement of EDC activity in chemically complex environmental samples.

5. ***Engineering methods for minimum-cost salt removal from public water sources.***
    Ongoing work is designed to establish the feasibility of salt management methods that are affordable in southwestern communities. Emphasis is an optimization of reverse osmosis (for maximum water recovery) and brine disposal.