

Pei Xu, PhD

Research Associate Professor

Colorado School of Mines, Civil and Environmental Engineering, Golden, CO 80401-1887

Phone: 303-273-3932 Fax: 303-273-3413 E-mail: pxu@mines.edu

AREAS OF EXPERTISES

Water and wastewater engineering; membrane processes; desalination; potable and non-potable water reuse; produced water treatment; advanced oxidation and disinfection; biological and bioelectrochemical processes; removal of emerging contaminants; membrane fouling; water resources management.

EDUCATION

Ph.D., 2002, Water Sciences, Ecole Nationale du Génie Rural, des Eaux et des Forêts (ENGREF), Paris, France. PhD Dissertation – “Technical-Economic Modeling of Water Resources Management Integrated With Water Reuse”.

M. Eng., 1991, Water and Wastewater Engineering, Lanzhou Jiaotong University, China. Master Thesis – “Study of Anaerobic Fluidized Bed Reactor Treating High Organic Strength Industrial Wastewater”.

B. Eng., 1988, Environmental Engineering, Xi’an University of Architecture & Technology, China

EXPERIENCE

- 4/2010-present: Research Associate Professor, Civil and Environmental Engineering Department, Colorado School of Mines, Golden CO.
- 1/2004-4/2010: Research Assistant Professor, Environmental Science and Engineering Division, Colorado School of Mines, Golden CO.
- 10/2002-12/2003: Postdoctoral Research Associate, Environmental Science and Engineering Division, Colorado School of Mines, Golden CO.
- 4/2002-9/2002: Postdoctoral Research Associate, National Centre of Sciences and Research (CNRS), Montpellier, France.
- 3/1999-3/2002: Research Associate, Institute of Water Sciences, University of Montpellier II, France.
- 2/1998-2/1999: Visiting Researcher, CIRSEE (International Research Centre on Water and Environment), Group of Lyonnaise des Eaux (Ondeo Services), Paris, France.
- 12/1992-2/1998: Lecturer, Department of Environmental Engineering, Lanzhou Jiaotong University, China.
- 6/1991-12/1992: Assistant Professor, Department of Environmental Engineering, Lanzhou Jiaotong University, China.

PROFESSIONAL SERVICE ACTIVITIES

Project Advisory Committee:

- *WateReuse Foundation Tailored Collaboration Project 08-11 “Process Optimization, Monitoring and Control Strategies, and Carbon and Energy Footprint Evaluation in Water Reuse: Full-Scale Microfiltration, Reverse Osmosis, and UV/H₂O₂”*
- *Water Research Foundation Tailored Collaboration Project 09-05 “Lowering Chemical and Energy Usage for Inland Desalination Concentrate Volume Reduction”*

Proposal Review:

- *National Atmospheric and Space Administration (NASA) Experimental Program to Stimulate Competitive Research (EPSCoR)*
- *Research Partnership to Secure Energy for America (RPSEA) ’s Unconventional Resources Program, U.S. Department of Energy*
- *U.S. Bureau of Reclamation’s Science and Technology Program, U.S. Department of the Interior*
- *Civilian Research and Development Foundation (CRDF), U.S. Department of State*
- *Water Research Foundation (Formerly AwwaRF)*
- *Qatar National Research Fund (QNRF)*
- *Romania National Council*

Journal/Book Review:

- *Environmental Science & Technology*
- *Water Research*
- *Journal of Membrane Science*
- *Desalination*
- *Separation & Purification Technology*
- *Water Science and Technology*
- *Chemosphere*
- *Colloids and Surfaces A: Physicochemical and Engineering Aspect*
- *AWWA Membrane Book*
- *Science of the Total Environment*
- *Journal of Hazardous Material*
- *Process Biochemistry*
- *International Journal of Ecological Economics and Statistics, Chemical Engineering and Processing*
- *Water, Air, & Soil Pollution*

CURRENT AND COMPLETED RESEARCH PROJECTS

- Co-Principal Investigator: “Novel Engineered Osmosis Technology: A Comprehensive Approach to the Treatment and Reuse of Produced Water and Drilling Wastewater”. \$1,709,454 with \$1,323,806 requested to U.S. DOE/RPSEA (Research Partnership

- to Secure Energy for America). 2011-2013. With PI Dr. Tzahi Cath (Colorado School of Mines); Co-PIs Dr. Edward Beaudry (Hydration Technology Innovations, LLC), and Dr. Nathan Hutchings (Bear Creek Services).
- Project Lead: “Enhanced Water Recovery Using Cost-effective Electrodialysis Process for Water Reuse – Improve Energy Efficiency and Reduce Chemical Demand”. Funded by NSF/ERC. Year 1: 2011-2012. With Project participants – Drs. Tzahi Cath (CSM), Jim Leckie (Stanford University), Martin Reinhard (Stanford University).
 - Project participant: “Tools to support decision making for nested, spatially-scaled, integrated urban water infrastructure”. Funded by NSF/ERC. Year 1: 2011-2012. With Project Lead and participants Drs. – David Sunding (UC-Berkley), Tzahi Cath (CSM), Craig Criddle (Stanford), Jörg Drewes (CSM), Harrison Fraker (UC-Berkley), David Freyberg (Stanford), Brian Halaburka (Stanford), Richard Luthy (Stanford), Reed Maxwell (CSM), David Sedlak (UC-Berkley).
 - Project participant: “Sustainable landscape irrigation with reclaimed water”. Funded by NSF/ERC. Year 1: 2011-2012. With Project Lead and participants Drs. – Bernd Leinauer (NMSU), Junko Munakata-Marr (CSM), Martin Reinhard (Stanford).
 - Co-Principal Investigator: “An Integrated Framework for Treatment and Management of Produced Water”. \$3,890,000 with \$1,560,393 requested to U.S. DOE/RPSEA (Research Partnership to Secure Energy for America). 2008-2011. With PI Dr. Jörg E. Drewes, and Co-PIs Dr. Tzahi Cath, Colorado School of Mines; John Veil and Dr. Seth Snyder, Argonne National Laboratory; and Jim Graydon, Kennedy/Jenks Consultants.
 - Co-Principal Investigator: “Guidelines for Implementation of Seawater and Brackish Water Desalination”. \$908,051 with \$500,000 requested to Water Research Foundation. 2008-2010. With PI Robert Raucher, Stratus Consulting; Co-PIs Jörg E. Drewes and Tzahi Cath, Colorado School of Mines.
 - Principal Investigator: “Critical assessment of implementing desalination technology”. \$268,325 with \$200,000 requested Water Research Foundation. 2006-2008. With Co-PIs Jörg E. Drewes and Tzahi Cath, Colorado School of Mines; Andrea Shafer, University of Edinburg.
 - Principal Investigator: “Assessment of capacitive deionization for metals recovery”. \$23,842 funded by Water Company. 2007-2008. With Co-PI Jörg E. Drewes.
 - Co-Principal Investigator: “Desalination product water recovery and concentrate volume minimization Phase II study”. \$384,133 with \$250,000 requested to Water Research Foundation. 2006-2008. With PI Sandeep Sethi, Carollo Engineers; Co-PI Jörg E. Drewes, Colorado School of Mines.
 - Key Researcher: “State-of-the-Science Review of Membrane Fouling: Organic, Inorganic, and Biological”. \$205,000 with \$160,000 requested from the WateReuse Foundation. 2007-2009. Project #WRF-06-010A. With PI Tim Chinn and Co-PI Jonathan Brent, HDR.

- Co-Principal Investigator: “Multi-beneficial use of co-produced water through high-pressure membrane treatment and capacitive deionization technology”. \$159,100 with \$92,089 requested from U.S. Bureau of Reclamation. 2004-2005. With PI Jörg E. Drewes, Colorado School of Mines.
- Lead-researcher: “Desalination product water recovery and concentrate volume minimization Phase I study”. \$160,000 with \$150,000 through Awwa Research Foundation. 2005-2006. With PI Sandeep Sethi, Carollo Engineers; Co-PI Jörg E. Drewes, Colorado School of Mines.
- Key-researcher: “Comparison of nanofiltration and reverse osmosis in terms of water quality and operational performance of treating recycled water”. \$336,000 with \$100,000 through Awwa Research Foundation. 2004-2006. With PI Jörg E. Drewes, Colorado School of Mines; Co-PI Gary Amy, University of Colorado-Boulder.
- Lead-researcher: “Rejection of wastewater-derived micropollutants in high-pressure membrane applications leading to indirect potable reuse”. \$215,000 with \$170,051 requested from WateReuse Foundation. 2002-2004. With PI Jörg E. Drewes, Colorado School of Mines; Co-PI Gary Amy, University of Colorado-Boulder.
- Lead-researcher: “Enhancement of Integrated Water Resources Management Strategies with Water Reuse at Catchment Scale” funded by the European Commission through Program Environment and Climate (with PIs Valentina Lazarova, CIRSEE, Suez-environment; Francois Brissaud, University of Montpellier)
- Lead-researcher: “Wastewater ozonation for water reuse”. 1998-1999. Ondeo Services, France.
- Co-Principal Investigator: “Photocatalytic degradation of organic contaminated water with photocatalytic oxide semiconductor thin films”. 1997-1998. Gansu Provincial Natural Science Foundation.

PUBLICATIONS

Peer Reviewed Journals

1. Luo, H., **Xu, P.**, Roanec, T.M., Jenkins, P.E., Ren, Z. (2012) Microbial Desalination Cells for Improved Performance in Wastewater Treatment, Electricity Production, and Desalination. *Bioresource Technology*, 105, 60-65.
2. Hancock, N.T., **Xu, P.**, Heil, D.M., Bellona, C., Cath, T.Y. (2011). Comprehensive Bench- and Pilot-Scale Investigation of Trace Organic Compounds Rejection by Forward Osmosis. *Environmental Science & Technology*, 45 (19), 8483–8490.
3. Dahm, K.G., Guerra, K.L., **Xu, P.**, Drewes, J.E. (2011). Composite Geochemical Database for Coalbed Methane Produced Water Quality in the Rocky Mountain Region. *Environmental Science & Technology*, 45 (18), 7655–7663.

4. **Xu, P.**, Bellona, C. and Drewes, J.E. (2010). Fouling of Nanofiltration and Reverse Osmosis Membranes in Municipal Wastewater Reclamation: Membrane Autopsy Results from Pilot-scale Investigations. *Journal of Membrane Science*, 353(1-2), 111-121.
5. Bellona, C., Wuertle, A., **Xu, P.** and Drewes, J.E. (2010). Evaluation of a bench-scale membrane fouling protocol to determine fouling propensities of membranes during full-scale water reuse application. *Water Science and Technology*, 62(5),1198-204.
6. **Xu, P.**, Drewes, J.E., Heil, D. and Wang, W. (2008). Treatment of brackish produced water using carbon aerogel based capacitive deionization technology. *Water Research*, 42, 2605-2617.
7. **Xu, P.**, Drewes, J.E., and Heil, D. (2008). Beneficial use of co-produced water through membrane treatment: technical-economic assessment. *Desalination*, 225(1-3), 139-155.
8. **Xu, P.** and Drewes, J.E. (2006). Viability of Nanofiltration and Ultra Low Pressure Reverse Osmosis Membranes for Multi-Beneficial Use of Methane Produced Water. *Separation & Purification Technology*, 52, 67-76.
9. **Xu, P.**, Drewes, J.E., Kim, T-U., Bellona, C. and Amy, G. (2006). Effect of Membrane Fouling on Transport of Emerging Organic Contaminants in NF/RO Membrane Applications. *Journal of Membrane Science*, 279(1-2): 165-175.
10. Kim, T.U., Bellona, C., **Xu, P.**, Drewe, J., Amy, G. (2006). Rejection of organic micropollutants by high pressure membranes: Comparison of bench-scale versus single element tests. *Water Science and Technology: Water Supply*. 6 (4), 107-116.
11. **Xu, P.**, Drewes, J. E., Bellona, C., Amy, G., Kim, T-U., Adam, M., and Heberer, T. (2005). Rejection of emerging organic micropollutants in nanofiltration/reverse osmosis membrane application. *Water Environment Research*. 17(1), 40-48.
12. He, Y., **Xu, P.**, Li, C. and Zhang, B. (2005). High concentration food wastewater treatment by an anaerobic membrane bioreactor. *Water Research*. 39, 4110-4118.
13. Drewes, J.E., Bellona, C., Oedekoven, M., **Xu, P.**, Kim, T-U., and Amy, G. (2005). Rejection of Wastewater-Derived Micropollutants in High-Pressure Membrane Applications leading to Indirect Potable Reuse. *Environmental Progress*, 24(4), 400-409.
14. Bellona, C., Drewes, J. E., **Xu, P.**, and Amy, G. (2004). Factors affecting the rejection of organic solutes during NF/RO treatment – A Literature Review. *Water Research*. 38, 2795–2809
15. **Xu, P.**, Brissaud, F. and Salgot, M. (2003). Facing water shortage in Mediterranean tourist area: seawater desalination or water reuse? *Water Science & Technology: Water Supply*, 3(3), 63-70.

16. Brissaud, F., **Xu, P.** and Auset, M. (2003). Extensive reclamation technologies, assets for the development of water reuse in the Mediterranean. *Water Science & Technology: Water Supply*, 3(4), 209–216.
17. **Xu, P.**, Brissaud, F. and Fazio, A. (2002). Non-steady state modelling of bacterial removal in deep tertiary lagoons. *Water Research*, 36(12), 3074-3082.
18. **Xu, P.**, Janex, M.-L., Savoye, P., Cockx, A. and Lazarova, V. (2002). Wastewater disinfection by ozone: main parameters for process design. *Water Research*, 36(4), 1043-1055.
19. **Xu, P.**, Brissaud, F., Mailhol, J.-C., Valette, F. and Lazarova, V. (2002). Design of climatic-dependent wastewater reuse project. *Water Science & Technology*, 46(6-7), 289-296.
20. **Xu, P.**, Valette, F., Brissaud, F., Fazio, A. and Lazarova, V. (2001). Technical–economic modelling of integrated water management: wastewater reuse in a French island. *Water Science & Technology*, 43(10), 67-74.
21. Wang, H-Y, Wang, T-M, **Xu, P.** (2002). The preparation and properties research on photocatalytic nanocrystalline / nanoporous WO₃ thin films. *Material & Design*, 23, 33.
22. Wang, H-Y., **Xu, P.** and Wang, T-M. (2001). Doping of Nb₂O₅ in photocatalytic nanocrystalline/nanoporous WO₃ films. *Thin Solid Films*, 338, 68.
23. Wang, H-Y., **Xu, P.** and Wang, T-M. (2001). A study on dark specific resistance of Au-TiO₂ nano-granular films. *Journal of Vacuum Science and Technology*, 19, 645.
24. Wang, T-M., Wang, H-Y., **Xu, P.** (1998). The effect of properties of semiconductor oxide thin films on photocatalytic decomposition of dyeing waste water. *Thin Solid Films*, 334, 103.
25. Wang, H-Y., Wang, T-M. and **Xu, P.** (1998). Effects of substrate temperature on the microstructure and photocatalytic reactivity of TiO₂ films. *Journal of Materials Science: Materials in electronics*, 9, 327.
26. **Xu, P.** (1996). Research on oily wastewater treatment of locomotive repairing factory. *Gansu Environmental Research and Monitoring*, 9(1). In Chinese.
27. He, Y-L., and **Xu, P.** (1996). Reverse osmosis system plant design with hollow fiber B-9 permeators for desalting underground water. *Membrane Science and Technology*, 16(2). In Chinese.
28. He, Y-L, Li, D-S. and **Xu, P.** (1996). The deoxidization technology by alkali negative resin deoxidization equipment. *Journal of Lanzhou Railway Institute*, 15(1). In Chinese.
29. **Xu, P.**, Ouyang, M. (1993). Research on treating alcoholic distilleries wastewater in anaerobic fluidized bed reactor. *China Biogas*, 11(2). In Chinese.

30. Ouyang, M. and **Xu, P.** (1993). Study on hydraulic mixing behavior of biological fluidized bed reactor. *Environmental Science*, 14(3). In Chinese.
31. Ouyang, M. and **Xu, P.** (1992). Study on expansion and mixing behaviour of bioparticles in anaerobic fluidized bed reactor. *China Biogas*, 10(3). In Chinese.
32. **Xu, P.** and Ouyang, M. (1992). Steady state process kinetics study on anaerobic fluidized bed reactor. *Journal of Lanzhou Railway Institute*, 11(4). In Chinese.
33. Ouyang, M. and **Xu, P.** (1991). Anaerobic fluidized bed reactor start-up investigation. *Journal of Lanzhou Railway Institute*, 10(4). In Chinese.

Book Chapters

1. **Xu, P.**, Cath, T., Wang, G., Drewes, J.E. and Ruetten, J. (2010). Consider the Pros and Cons of Desalination. In *Sustainability of Water Resources and Supplies*. Editor Frederick Bloetscher. Publisher American Water Works Association (AWWA).
2. Gabelich, C.J., **P. Xu** and Y. Cohen. (2009). Chapter 10 Concentrate Treatment for Inland Desalting. In *Sustainability Science and Engineering*. Edited by Isabel, C. Escobar and Andrea, I. Schäfer. Publisher Elsevier.
3. **Xu, P.**, Drewes, J.E., Oedekoven, M., Bellona, C. and Amy, G. (2007). Rejection of Non-ionic Organic Micropollutants by Nanofiltration Membranes: Effect of Membrane Fouling. In *Membrane Treatment for Drinking Water & Reuse Applications: A Compendium of Peer Reviewed Papers*. Edited by Kerry J. Howe. Publisher American Water Works Association (AWWA).

Peer Reviewed Technical Reports

1. Robert Raucher, **Xu, P.**, Janet Clement. (2010). Guidelines for Implementation of Seawater and Brackish Water Desalination. Published by Water Research Foundation, Denver, CO
2. **Xu, P.**, Cath, T., Wang, G., Drewes, J.E. and Dolnicar, S. (2009). Critical assessment of implementing desalination technology. Published by Water Research Foundation, Denver, CO.
3. Sethi, S., **Xu, P.** and Drewes, J.E. (2009). Desalination product water recovery and concentrate volume minimization. Published by American Water Works Association Research Foundation, Denver, CO.
4. Drewes, J.E., **Xu, P.**, Heil, D. and Wang, G. (2008). Multi-beneficial use of co-produced water through high-pressure membrane treatment and capacitive deionization technology. Published by U.S. Bureau of Reclamation, Denver, CO.
5. Drewes, J.E., Bellona, C., **Xu, P.**, Amy, G., Filteau, G. and Oelker, G. (2007). Comparison of nanofiltration and reverse osmosis in terms of water quality and

operational performance for treating recycled water. Published by American Water Works Association Research Foundation, Denver, CO.

6. Drewes, J.E., **Xu, P.**, Bellona, C., Oedekoven, M., Macalady, D., Amy, G. and Kim, T-U. (2006). Rejection of wastewater-derived micropollutants in high-pressure membrane applications leading to indirect potable reuse: effects of membrane and micropollutants properties. Published by WateReuse Foundation, Alexandria, VA.

Non-Peer Reviewed Journals and Magazines

1. **Xu, P.**, Cath, T., Wang, G., Drewes, J.E. and Ruetten, J. (2009). Consider the Pros and Cons of Desalination. *Opflow*, March 2009:10-13.
2. Drewes, J.E., Hancock, N., Benko, K., Dahm, K., **Xu, P.**, Heil, D. and Cath, T. (2009). Treatment of Coalbed Methane (CBM) Produced Water. *Exploration and Production: Oil and Gas Review*. 7(2): 126-127.
3. Sethi, S., **Xu, P.** and Drewes, J.E. (2007). When Less is More: Emerging approaches for minimizing concentrate generation and increasing recovery rates during desalination of brackish water. *ASCE Civil Engineering Magazine*, Volume 77, Number 9, September 2007.
4. Sethi, S., Walker, S., Drewes, J.E. and **Xu, P.** (2006). Existing and Emerging Concentrate Minimization and Disposal Practices for Membrane Systems, *Florida Water Resources Journal (Florida section AWWA)*, June 2006: 38-48.

Conference Presentations

1. **Xu, P.**, Cath, T. and Drewes, J.E. (2011). Novel and Emerging Technologies for Produced Water Treatment. Invited talk at the US EPA Technical Workshops for the Hydraulic Fracturing. Arlington, VA, March 30, 2011.
2. **Xu, P.**, Ren, Z., Luo, H., and Forrestal, C. (2011). Self-Sustained Desalination in Combination with Wastewater Treatment – Hybrid Microbial Desalination System. 15th Annual Water Reuse & Desalination Research Conference. Las Vegas, May 16-17, 2011.
3. Luo, H., **Xu, P.**, Forrestal, C, and Ren, Z. Bioelectrochemical Systems for Simultaneous Wastewater Treatment, Energy Production, and Desalination. The 7th International Conference on Environmental Anaerobic Technologies and Bioenergy, Tianjin, China, November 12-13, 2011
4. Forrestal, C., **Xu, P.**, and Ren, Z. (2011). Capacitive Deionization in Combination with Microbial Fuel Cell for Desalination. In *Proceeding of the 242nd ACS National Meeting*, Denver, Colorado, August 28 - September 1, 2011.
5. Luo H., **Xu P.**, and Ren Z. (2011). Complementary functions within microbial fuel cells: Energy production and desalination. In *Proceeding of the 242nd Annual Conference of American Chemical Society*. Denver, Colorado, August 28 - September 1, 2011.

6. Luo H., **Xu P.**, Ren Z. (2011). Domestic wastewater treatment using microbial fuel cells and microbial desalination cells. In Proceeding of the ASME 2011 International Mechanical Engineering Congress & Exposition. Denver, Colorado, November 14, 2011.
7. Ren Z., Luo H., Forrestal C., **Xu P.** (2011). Simultaneous water desalination, energy production, and wastewater treatment in bioelectrochemical systems. In Proceeding of the AEESP, Tampa, FL, July 10-12, 2011.
8. Luo, H., **Xu, P.**, Jenkins, PE., and Ren, Z. (2011). Simultaneous energy production and desalination in microbial electrochemical systems. 241th American Chemical Society (ACS) National Meeting, Anaheim , CA, March 27-31, 2011.
9. Tzahi Y. Cath, Nathan T. Hancock, **Pei Xu**, Nathan Black, and Molly J. Roby. (2011). Low energy seawater desalination and wastewater reclamation with osmotic dilution hybrid system. 15th Annual Water Reuse & Desalination Research Conference. Las Vegas, May 16-17, 2011.
10. Jörg E. Drewes, Tzahi Cath, **Pei Xu**, Nathan Hancock, Katharine Dahm, Katherine L. Guerra and Dean Heil (2010). An Integrated Framework for Treatment and Management of CBM Produced Water. 17th International Petroleum and Biofuels Environmental Conference, San Antonio, Texas, August 30-September 2, 2010.
11. **Pei Xu**, Xanthe Mayer, Katharine Dahm et al. (2010). Feasibility and Economic Analysis of Beneficial Use of Produced Water. 17th International Petroleum and Biofuels Environmental Conference, San Antonio, Texas, August 30-September 2, 2010.
12. **Pei Xu**, Xanthe Mayer, Katharine Dahm et al. (2010). Evaluation of Beneficial Use Options of Produced Water. 2010 National Groundwater Association Ground Water Summit, April 12, 2010, Denver, CO.
13. **Xu, P.**, Benko, K., Hancock, N., Cath, T. and Drewes, J.E. (2009). Beneficial Use Options and Limitations of CBM Produced Water. 16th International Petroleum and Biofuels Environmental Conference, Huston, Texas, November 11-13, 2009.
14. Cath, T, Hancock, N., **Xu, P.**, Benko, K. and Drewes, J.E. (2009). Emerging Treatment Processes for CBM Produced Water Purification. 16th International Petroleum and Biofuels Environmental Conference, Huston, Texas, November 11-13, 2009.
15. Drewes, J.E. Cath, T, **Xu, P.**, Hancock, N., Dahm, K., Benko, K. and Heil, D. (2009). An Integrated Framework for Treatment and Management of CBM Produced Water. 16th International Petroleum and Biofuels Environmental Conference, Huston, Texas, November 11-13, 2009.
16. **Xu, P.**, Hancock, N., Benko, K., Cath, T. and Drewes, J.E. (2009). Viable Treatment Technologies for Promoting Beneficial Use of Produced Water. 2009 Groundwater Protection Council Annual Forum. Salt Lake City, Utah, September 13-16, 2009

17. **Xu, P.**, Cath, T., Drewes, J.E., Raucher, B. and Clement, J. (2009). Coastal Water Intakes: Regulatory and Permitting Challenges. AWWA Annual Conference ACE09, San Diego, California, June 14-19, 2009
18. **Xu, P.**, Benko, K., Cath, T., Hancock, N. and Drewes, J. (2008). Produced Water Beneficial Use: Assessment of Emerging Desalination Technologies & Hybrid Configurations. 15th International Petroleum and Biofuels Environmental Conference, Albuquerque, New Mexico, November 11-13, 2008.
19. Benko, K., Dundorf, S., Drewes, J. and **Xu, P.** (2008). Treatment of Produced Water Using Ceramic Membranes. 15th International Petroleum and Biofuels Environmental Conference, Albuquerque, New Mexico, November 11-13, 2008.
20. **Xu, P.**, Wang, G., Cath, T., Drewes, J.E. and Ruetten, J. (2008). Sustainability of Implementing Desalination Technologies. 12th Annual Water Reuse & Desalination Research Conference, Denver, Colorado, May 5-6, 2008.
21. **Xu, P.**, Wang, G., Cath, T., Drewes, J.E. and Ruetten, J. (2008). Critical Assessment of Implementing Desalination Technologies. 23rd Annual Water Reuse & Desalination Symposium, Dallas, Texas, September 7-10, 2008.
22. **Xu, P.**, Drewes, J.E. and Sethi, S. (2008). Assessment of a Hybrid Approach for Desalination Concentrate Minimization. 23rd Annual Water Reuse & Desalination Symposium, Dallas, Texas, September 7-10, 2008.
23. **Xu, P.**, Wang, G., Cath, T., Drewes, J.E. and Ruetten, J. (2008). Critical Assessment of Implementing Desalination Technologies. ACE08, Atlanta, Georgia, June 9-12, 2008.
24. **Xu, P.**, Drewes, J.E. and Sethi, S. (2008). Assessment of a Hybrid Approach for Desalination Concentrate Minimization. ACE08, Atlanta, Georgia, June 9-12, 2008.
25. **Xu, P.**, Drewes, J.E. and Sethi, S. (2007). A hybrid desalination approach for enhancement of water recovery and concentrate minimization. 22nd Annual Water Reuse Symposium, Tampa, Florida, September 9-12, 2007.
26. **Xu, P.**, Drewes, J.E. and Sethi, S. (2007). A hybrid desalination approach for enhancement of water recovery and concentrate minimization. 233rd ACS National Meeting Chicago, IL, March 29, 2007.
27. **Xu, P.**, Drewes, J.E. and Sethi, S. (2007). A hybrid desalination approach for enhancement of water recovery and concentrate minimization. 2007 Membrane Technology Conference, Tampa, FL, March 18-21, 2007.
28. **Xu, P.**, Drewes, J.E. and Sethi, S. (2006). Review of emerging desalination technologies and hybrid configuration for concentrate minimization. 21st Annual Water Reuse Symposium, Hollywood, California, September 10-13, 2006.

29. Bellona, C., Drewes, J.E., **Xu, P.**, Amy, G. and Filteau, G. (2006). Laboratory, pilot, and full-scale investigation into the viability of ultra low pressure reverse osmosis and nanofiltration for treating water of impaired quality during water reuse projects. 21st annual WaterReuse Symposium, Hollywood, California, September 10-13, 2006.
30. **Xu, P.**, Drewes, J. E. and Bellona, C. (2006). Pilot study on understanding membrane fouling in wastewater reclamation. 232nd American Chemistry Society (ACS) National Meeting & Exposition. September 10-14, 2006, San Francisco, CA.
31. Kim, T-U., Bellona, C., **Xu, P.**, Drewes, J. E., Amy, G. (2006). Rejection of organic micropollutants by high pressure membranes: comparison of bench-scale versus single element tests. IWA World Water Congress and Exhibition, 10-14 September 2006, Beijing, China.
32. **Xu, P.**, Drewes, J.E., Wang, G. and Heil, D. (2006). Field study on capacitive deionization for produced water reuse. 2006 Water Quality Technology Conference (WQTC), Denver, Colorado, November 5-9, 2006.
33. Drewes, J.E., Bellona, C. and **Xu, P.** (2006). Viability of nanofiltration and reverse osmosis in removing emerging trace organic contaminants. 2006 AIChE Annual Meeting, November 12-17, 2006, San Francisco, CA.
34. **Xu, P.** and Drewes, J.E. (2006) Multi-beneficial use of co-produced water through high-pressure membrane treatment. AMTA Biennial Conference “Desalination Comes of Age – The Answer for New Supplies” July 30 – August 2, 2006, Anaheim, California.
35. Drewes, J.E., **Xu, P.**, Bellona, C. and Amy, G. (2006) Influence of fouling on the operation of low pressure reverse osmosis and nanofiltration in treating water of impaired quality. AMTA Biennial Conference “Desalination Comes of Age – The Answer for New Supplies” July 30 – August 2, 2006, Anaheim, California.
36. Bellona, C., Drewes, J.E., **Xu, P.**, Filteau, G. and Amy, G. (2006). Comparison of nanofiltration and reverse osmosis in terms of water quality and operational performance for treating recycled water. Biennial Conference “Desalination Comes of Age – The Answer for New Supplies” July 30 – August 2, 2006, Anaheim, California.
37. **Xu, P.** and Drewes, J. E. (2006). Multi-beneficial use of produced water through high pressure membranes and capacitive deionization technology. Produced Water Workshop. April 4-5, 2006, Fort Collins, Colorado.
38. Sethi, S., Drewes, J.E. and **Xu, P.** (2006). Evaluation of Emerging Desalination Technologies for Recovery Enhancement and Concentrate Volume Minimization. ACE 06 AWWA Annual Conference and Exposition, June 11-15, 2006, San Antonio, Texas.
39. Sethi, S., Drewes, J.E. and **Xu, P.** (2006). Assessment of Emerging Desalination and Concentrate Disposal Methods. AWWA 2006 Texas Section.

40. Sethi, S., Drewes, J.E. and **Xu, P.** (2006). Comparison of Conventional and Emerging Approaches to Desalination. 2006 Water Resources Conference.
41. **Xu, P.**, Heil, D. and Drewes, J. E. (2005) Viability of capacitive deionization technology (CDT) in water reuse and desalination. 20th Annual Watereuse Symposium on Water reuse & desalination, Denver, Colorado. September 18-21, 2005.
42. Drewes, J. E., **Xu, P.**, Bellona C., Oedekoven, M., Kim, T.U., Amy, G. (2005) Rejection of wastewater derived micropollutants in high-pressure membrane applications leading to indirect potable reuse. 20th Annual Watereuse Symposium on Water reuse & desalination, Denver, Colorado. September 18-21, 2005.
43. Bellona C., Drewes, J. E., Luna, J., **Xu, P.**, Hoppe, C., Amy, G. (2005). Laboratory- and pilot-scale investigation into the viability of ultra low pressure reverse osmosis and nanofiltration for treating waters of impaired quality during water reuse projects. 20th Annual Watereuse Symposium on Water reuse & desalination, Denver, Colorado. September 18-21, 2005.
44. **Xu, P.**, Drewes, J. E., Oedekoven, M., Bellona C., Amy, G. (2005) Rejection of non-ionic organic micropollutants by reverse osmosis and nanofiltration membranes: effect of membrane fouling. Proceedings of AWWA 2005 Membrane Technology Conference, Phoenix, Arizona. March 6-9, 2005.
45. Drewes, J. E., **Xu, P.**, Oedekoven, M., Bellona, C., Kim, T., Amy, G., Heberer, T.. (2005). Viability of Reverse Osmosis Membranes in Removing Emerging Organic Micropollutants in Indirect Potable Reuse Applications. Proceedings of AWWA 2005 Membrane Technology Conference, Phoenix, Arizona. March 6-9, 2005.
46. Drewes, J. E., **Xu, P.**, Bellona, C., Amy, G., Kim, T-U., Adam, M., and Heberer, T. (2004). Rejection of emerging organic micropollutants in nanofiltration/reverse osmosis membrane application. Proceedings of WEFTEC 2004, New Orleans, October 4-6, 2004.
47. **Xu, P.**, Drewes, J.E., Bellona, C., Amy, G. and Macalady, D. (2003). Removal mechanism for trace organics during high-pressure membrane treatment leading to indirect potable reuse – Can we predict rejection? Proceedings of IWA 4th International Symposium on Wastewater Reclamation and Reuse, Mexico City, November 12-14, 2003.
48. **Xu, P.**, Drewes, J.E., Bellona, C. and Amy, G. (2003). The Role of Membrane Properties for Rejecting Organic Micropollutants during NF/RO Treatment. Proceedings of the 14th annual meeting of North American Membrane Society (NAMS), Jackson Hole, May 17-21, 2003.
49. **Xu, P.**, Drewes, J.E., Bellona, C., Amy, G. and Macalady, D. (2003). Utilizing membrane surface and solute properties to assess the rejection behavior of organic trace pollutants in high-pressure membrane applications. Proceedings of 2003 Reuse Symposium XVIII, San Antonio, Texas, September 7-10, 2003.

50. **Xu, P.**, Bellona, C., Drewes, J.E., Amy, G. (2003). Factors driving the rejection of emerging micropollutants in indirect potable reuse – a literature review. Proceedings of 2003 Reuse Symposium XVIII, San Antonio, Texas, September 7-10, 2003.
51. **Xu, P.**, Brissaud, F. and Salgot, M. (2002). Facing water shortage in Mediterranean tourist area: seawater desalination or water reuse? Proceedings of the 3rd World Water Congress of the International Water Association, Melbourne, Australia, April 7-12, 2002.
52. Brissaud, F., **Xu, P.** and Auset, M. (2002). Extensive reclamation technologies, assets for the development of water reuse in the mediterranean. Proceedings of the IWA regional Symposium on Water Recycling in the Mediterranean Region, Iraklio, Greece, September 26-29, 2002.
53. **Xu, P.**, Brissaud, F., Mailhol, J-C., Valette, F. and Lazarova, V. (2001). Design of climatic-dependent wastewater reuse project. Proceedings of the 2nd World Water Congress of the International Water Association, Berlin, Germany, October 15-19, 2001.
54. **Xu, P.**, Valette, F., Brissaud, F., Fazio, A. and Lazarova, V. (2000). Technical–economic modelling of integrated water management: wastewater reuse in a French island. Proceedings of the 3rd International Symposium on Waste Water Reclamation, Recycling and Reuse, Paris, France, July 3-6, 2000.
55. Cockx, A., Janex, M. L., **Xu, P.** and Lazarova, V. (2000). Development of ozonation modeling for the disinfection of wastewater effluents. Proceedings of International Ozone Association, Berlin, Germany, October 22-25, 2000.
56. Janex, M. L., **Xu, P.**, Savoye, P., Lâiné, J. M. and Lazarova, V. (1999). Ozonation as a wastewater disinfection process to meet reuse regulations. Proceedings of International Ozone Association, Dearborn, USA, August 22-26, 1999.
57. **Xu, P.**, Janex, M. L., Renaud, P. and Lazarova, V. (1998). Le recyclage des eaux résiduaires urbaines : enjeux et perspectives. Colloque Eau 50 (ISBN: 2-85555-054-8), Nancy, France, October 5-7, 1998,
58. Zhao, Y., **Xu, P.** and Ouyang, Ming. (1995). Oily wastewater treatment for the purpose of reuses. Second International Symposium on Waste Water Reclamation and Reuse. Proceedings of International Association on Water Quality, Iraklio, Greece, October 17-20, 1995.
59. **Xu, P.**, Wang, H-Y. and Wang, T-M. (1998). The Application Of Semiconductor Oxides In Environment Purification. Proceedings of the Fifth International Symposium Between Two Sides of Strait on Environmental Protection, Nanjing, China, May 26~30, 1998.
60. Wang, H-Y., Liu, Y., **Xu, P.** and Wang, T-M. (1998). Study on the influencing factors of photocatalytic reaction fixed film system. Proceedings of the Fifth International Symposium Between Two Sides of Strait on Environmental Protection, Nanjing, China, May 26~30, 1998.

61. **Xu, P.** (1996). A new approach to estimate the biomass in anaerobic fluidized bed reactor. Chinese Young Scholars Treatises on Environment, published by The Committee of China Environmental Science.
62. Wang, H-Y. and **Xu, P.** (1996). Decomposition of water organic contamination using immobilized photocatalyst thin film. Proceedings of 96 Chinese Material Research Symposium on Eco-materials. Beijing, China
63. **Xu, P.** and Ouyang, M. (1996). The effect of biofilm formation on flow pattern of fluidized bed reactor. Fourth International Symposium between two sides of Taiwan Strait on Environmental Protection. Taiwan, China.
64. Wang, H-Y., **Xu, P.**, Zhao, X-C. and Wang, T-M. (1997). Photocatalytic degradation of dyeing waste water using nanocrystalline/nanoporous TiO₂ thin films, Journal of Lanzhou University, Vol. 33 (SIEMME'5), The 5th China-Japan Bilateral Symposium on Intelligent Electrophotonic Materials and Molecular Electronics, 1997, China.