

## David L. Johnsen

Ph.D. Candidate – Air Quality Engineering and Science Group  
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### EDUCATION

#### University of Illinois at Urbana-Champaign (UI),

Ph.D. in Environmental Engineering and Science in Civil Engineering - Advisor: Prof. Mark J. Rood  
Department of Civil and Environmental Engineering (CEE), expected completion May 2014  
Dissertation: “Monitoring and control of electrothermal swing adsorption based on electrical properties of the adsorbent”  
*Certificate in Energy and Sustainability Engineering*

M.S. in Environmental Engineering and Science in Civil Engineering - Advisor: Prof. Mark J. Rood  
Department of CEE, Dec 2009  
Thesis: “Bench-scale gas capture and recovery system using activated carbon fiber cloth”

**Graduate GPA: 3.9/4.0**

B.S. in General Engineering  
Department of Industrial and Enterprise Systems Engineering (IESE), May 2008  
*Gamma Epsilon Honor Society*  
*Minor in Business*

**Undergraduate GPA: 3.8/4.0**

### WORK AND RESEARCH EXPERIENCE

1. Graduate Research Assistant, UI, Department of CEE. Aug 2008 – Present.
2. Undergraduate Research Supervisor, UI, Department of CEE. Feb 2010 – Present.
3. Manuscript Editor, American Journal Experts. Jan – Dec 2012.
4. Tutor of Finance and Statistics Courses, Independent Contractor. Jan – May 2012.
5. Full-scale Electrothermal Adsorption and Recovery System Field Researcher at Hill Air Force Base, UT, UI, Department of CEE. Oct – Nov 2011.
6. Optical Remote Sensing Field Researcher at Tooele Army Depot, UT, UI, Department of CEE. Feb - Apr 2010.
7. Engineering Intern, Clean Air Engineering Express, Palatine, IL. May - Aug 2008.
8. Undergraduate Research Assistant, UI, Department of CEE. Feb - May 2008.
9. Design Group Member, Whirlpool, Benton Harbor, MI, UI, Department of IESE. Jan - May 2008.
10. Laboratory Teaching Assistant, UI, Department of IESE. Aug - Dec 2007.
11. Technical Service Intern, Prince Castle, Carol Stream, IL. May - Aug 2007.

## PUBLICATIONS

### Peer Reviewed Publications

1. **Johnsen DL**, Emamipour H, Zhang Z, Yan Z, Rood MJ. Electrical resistance of activated carbon fiber cloth during acetone and isobutane adsorption. In preparation for submission to *Carbon*. 2013.
2. Emamipour H, **Johnsen DL**, Rood MJ. Adsorption and desorption of toxic industrial chemicals on silica coated activated carbon fiber cloth. In preparation for submission to *Adsorption*. 2013.
3. Zhao Y, Li X, Li Y, Zhanquan Z, **Johnsen DL**, Rood MJ, Zhang Y, Yan Z. High strength and super-plastic amorphous silica nanowires grown by a facile hydrothermal method. Submitted to *Nanoscale*. 2013.
4. Yuen W, **Johnsen DL**, Koloutsou-Vakakis S, Rood MJ. Open burning and open detonation PM<sub>10</sub> mass emission factor measurements with optical remote sensing. Accepted pending minor revisions in *Journal of the Air & Waste Management Association*. 2013.
5. **Johnsen DL**, Rood MJ. Temperature control of activated carbon fiber cloth regeneration with resistance feedback. *Environmental Science & Technology*. 2012; 46(20):11305-11312.
6. **Johnsen DL**, Mallouk KE, Rood MJ, Hay KJ. Control of electrothermal heating during regeneration of activated carbon fiber cloth. *Environmental Science & Technology*. 2011; 45(2):738-743.
7. Mallouk KE, **Johnsen DL**, Rood MJ. Capture and recovery of isobutane by electrothermal swing adsorption with post-desorption liquefaction. *Environmental Science & Technology*. 2010; 44(18):7070-7075.

### Conference Proceedings

1. **Johnsen DL**, Emamipour H, Rood MJ. Effects of activated carbon fiber cloth's physical structure, chemical composition, and adsorbed material on its electrical resistance. 106<sup>th</sup> Annual Meeting of the Air & Waste Management Association. Chicago, IL, 2013: No. 12476, pp. 14.
2. **Johnsen DL**, Emamipour H, Zhang Z, Yan Z, Rood MJ. Relationship between activated carbon fiber cloth's structure and electrical resistance. *Carbon*. Rio de Janeiro, Br, 2013: No. 120, pp. 4.
3. **Johnsen DL**, Emamipour H, Rood MJ. Monitor and control of an electrothermal swing adsorption based on remote electrical measurements. 105<sup>th</sup> Annual Meeting of the Air & Waste Management Association. San Antonio, TX, 2012: No. 75, pp. 14.
4. Yuen W, **Johnsen DL**, Koloutsou-Vakakis S, Rood MJ. Open burning and open detonation PM<sub>10</sub> mass emission factor measurements with optical remote sensing. 105<sup>th</sup> Annual Meeting of the Air & Waste Management Association. San Antonio, TX, 2012: No. 61, pp. 11.
5. Rood MJ, Nguyen H, Koloutsou-Vakakis S, Emamipour H, **Johnsen DL**, Ganguly S, Nelson AJ, Vargas Herrera A. Bioaerosol and organic gas filtration with bioaerosol inactivation utilizing nanoporous fiber cloth. Chemical and Biological Defense Science and Technology Conference and Exhibition. Las Vegas, NV, 2011:14-18.

6. **Johnsen DL**, Rood MJ. Temperature control of activated carbon fiber cloth regeneration with resistance feedback. 104<sup>th</sup> Annual Meeting of the Air & Waste Management Association. Orlando, FL, 2011: No. 148, pp. 12.
7. Mallouk KE, **Johnsen DL**, Rood MJ. Energy efficiency during capture and recovery of organic gases with activated carbon fiber cloth, electrothermal desorption, and post-desorption treatment. 104<sup>th</sup> Annual Meeting of the Air & Waste Management Association. Orlando, FL, 2011: No. 53, pp. 14.
8. Mallouk KE, **Johnsen DL**, Rood MJ. Capture and recovery of organic gases with activated carbon fiber cloth, electrothermal desorption, and post-desorption treatment. 103<sup>rd</sup> Annual Meeting of the Air & Waste Management Association. Calgary, AB, 2010: No. 85, pp. 10.
9. Mallouk KE, **Johnsen DL**, Rood MJ, Hay KJ. Capture and recovery of organic gases for reuse. 102<sup>nd</sup> Annual Meeting of the Air & Waste Management Association. Detroit, MI, 2009: No. 66, pp. 9.

### **Student Presentations and Seminars**

1. **Johnsen DL**. Dependence of activated carbon fiber cloth's electrical resistance on its structure, composition, and adsorbed mass. Platform. 19<sup>th</sup> Annual Environmental Engineering and Science Symposium, UI. 2013.
2. **Johnsen DL**. Electrothermal swing adsorption controlled based on adsorbent electrical properties. Platform. 18<sup>th</sup> Annual Environmental Engineering and Science Symposium, UI. 2012.
3. Mallouk KE, **Johnsen DL**, Rood MJ. Energy efficiency for capture and recovery of isobutane using electrothermal swing adsorption and post-desorption liquefaction. Poster. Association of Environmental Engineering and Science Professors Research & Education Conference. 2011.
4. **Johnsen DL**. Electrothermal heating control during regeneration of activated carbon fiber cloth. Platform. Graduate Seminar, UI. 2010.
5. **Johnsen DL**. Electrothermal heating control during regeneration of activated carbon fiber cloth. Poster. 103<sup>rd</sup> Annual Meeting of the Air & Waste Management Association. 2010.
6. **Johnsen DL**. Electrothermal heating control during regeneration of activated carbon fiber cloth. Platform. 16<sup>th</sup> Annual Environmental Engineering and Science Symposium, UI. 2010.
7. **Johnsen DL**. Computer interface for bench-scale gas capture and recovery system. Poster. 102<sup>nd</sup> Annual Meeting of the Air & Waste Management Association. 2009.
8. **Johnsen DL**. Computer interface for bench-scale gas capture and recovery system. Platform. 15<sup>th</sup> Annual Environmental Engineering and Science Symposium, UI. 2009.

### **Patents**

1. Rood MJ, Mallouk KE, **Johnsen DL**, Hay KJ. Gas purification system and method for liquefaction of dilute gas components. US Patent Application No. 13/804,910. Published Aug 2013.
2. Rood MJ, **Johnsen DL**. Indirect Real-Time Monitoring and Control of Electrical Resistively Heated Adsorbent System. US Patent Application No. 61/604,618. Filed Feb 2012.

### **Funded Proposals**

1. Rood MJ, **Johnsen DL**. Portable adsorption and regeneration system with recovery for reuse for classroom demonstrations. UI, Department of CEE. 2013. \$29,000.
2. Rood MJ, **Johnsen DL**, Emamipour H. Gas purification with recovery and reuse to achieve more sustainable and competitive manufacturing. National Science Foundation Division of Chemical, Bioengineering, Environmental and Transport Systems: Environmental Sustainability. 2012. \$300,000.
3. Rood MJ, Mallouk KE, **Johnsen DL**. Adsorption isotherms for gas capture and recovery system. Sponsored Research Agreement with Pregis. 2011. \$10,000.

### **Technical Reports**

1. Rood MJ, Mallouk KE, **Johnsen DL**. Isobutane recovery for reuse project. Final Report submitted to Pregis. 2010.

## **HONORS AND AWARDS**

1. Platform Paper Award 3<sup>rd</sup> Place, 106<sup>th</sup> Annual Meeting of the Air & Waste Management Association. Jun 2013.
2. Doctoral Student Poster Award 1<sup>st</sup> Place, 103<sup>rd</sup> Annual Meeting of the Air & Waste Management Association. Jul 2010.
3. Masters Student Thesis Award 2<sup>nd</sup> Place, 103<sup>rd</sup> Annual Meeting of the Air & Waste Management Association. Jul 2010.
4. Milton Feldstein Memorial Scholarship for Air Quality Research, 1<sup>st</sup> Place scholarship, 103<sup>rd</sup> Annual Meeting of the Air & Waste Management Association. Jul 2010.
5. U.S. Department of Energy Graduate Assistance in Areas of National Need Fellowship, UI, Department of CEE. Aug 2009 - Aug 2010.
6. Walter E. Deuchler Fellowship, UI, Department of CEE. Aug 2008 - Aug 2009.
7. Environmental Undergraduate Senior Design Team Project, 1<sup>st</sup> place, Whirlpool. Jun 2008.
8. Mike Harper Leadership Scholarship, Conagra Foods. Aug 2004 - May 2008.

## **MEMBERSHIPS**

1. Member - Air & Waste Management Association. Aug 2008 - Present.
2. LabVIEW Associate Developer, Certified by National Instruments. Aug 2010 - Aug 2012.
3. Member - Association of Environmental Engineering and Science Professors. Jan 2011 – Jan 2012.

## **PROFESSIONAL SERVICES**

1. Journal Article Reviewer, Peer reviewed articles for *Atmospheric Environment*, *Carbon*, *Chemical Engineering Journal*, and *Environmental Science & Technology*. 2011 - Present.

2. Professional Development Program Peer Mentor, Organized monthly meetings to discuss graduate life at UI with a first year PhD student, UI, Department of CEE. Feb 2013 – Present.
3. Webmaster, Redesigned and maintained website for air quality and engineering science research group and two air quality engineering classes, UI, Department of CEE. Aug 2008 – Present.
4. Instructor, Developed and presented 3 hours of Environmental Engineering modules for 14 high school students in the Girls Adventures in Mathematics, Engineering, and Science program, UI, Department of CEE. May - Jul 2013.
5. Volunteer, Designed and constructed a portable silica gel swing adsorption system and presented system to undergraduate and graduate students in Environmental Engineering and Science as well as at Engineering Open House for children grades K-12, UI. Jan - Jun 2013.
6. Session Monitor, Assisted with electronics and documentation of greenhouse gas emission mini-symposium panel discussion sessions, 106<sup>th</sup> Annual meeting of the Air & Waste Management Association. Jun 2013.
7. Instructor, Co-developed and presented 20 hours of Environmental Engineering modules for 18 high school students in the Gains in Education of Mathematics and Science program, US Army Core of Engineers. May - Jul 2012.
8. Webmaster, Set-up and maintain Air & Waste Management Association Education Council web server. Feb 2011 – Feb 2012.
9. Volunteer, Acquired and provided contact information for all technical sessions at the 103<sup>rd</sup> Annual Meeting of the Air & Waste Management Association. Jul 2010.
10. Contest Monitor, Recorded videos for design contest for children grades 3-9, First Lego League, UI. Nov 2009.
11. Symposium Organizer, Arranged facilities for 54 graduate platform presentations at the 15<sup>th</sup> Annual Environmental Engineering and Science Symposium, UI. Apr 2009.
12. Volunteer, Created poster of eco-friendly washing machine project for children grades K-12 at Engineering Open House, UI. Mar 2008.

## **PROFESSIONAL DEVELOPMENT**

1. Attended Advanced Materials Characterization workshop, Seitz Material Research Lab, UI. 2013.
2. Prepared lectures, assignments, exam questions, and held weekly office hours for senior-level Air Quality Engineering course, UI, Aug 2012 - Dec 2012.
3. Attended symposium on grading and office hours, Center for Teaching Excellence, UI. 2011.
4. Attended “Sharp’n Your Oral Presentation Skills” workshop, 102<sup>nd</sup> Annual Meeting of the Air & Waste Management Association. Detroit, MI. 2009.