CURRICULUM VITAE

Zhenghe Xu

(Teck Professor, PhD., P.Eng., FRSC, FCAE, FCIM)

Table of Contents

Contact Information

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Education

1982 B.Sc. in Mining Engineering, Central-South Institute of Mining and Metallurgy, PRC

1985 M.Sc. in Minerals Engineering, Central-South Institute of Mining and Metallurgy, PRC (Supervisors: Professors J. Chen and W. Chen)

Thesis: The adsorption of sulphonated polyacrylamide on and flocculation separation of titanomagnetite, ilmenite and feldspar

1990 Ph.D. in Materials Science and Engineering, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, USA (Supervisor: Dr. Roe-Hoan Yoon)

Dissertation: A study of hydrophobic interaction in fine particle coagulation

Academic and Research Experience

2014-2019 NSERC Industry Research Chair in Oil Sands Engineering (Renewal): Department of Chemical and Materials Engineering, University of Alberta, Edmonton, Canada

2013-2020 Canada Research Chair in Mineral Processing (Tier I Renewal): Department of Chemical and Materials Engineering, University of Alberta, Edmonton, Canada

2012-2013 Visiting Professor: Institute of Nuclear and New Energy Technology, Tsinghua University, Beijing, China

2008-2014 NSERC Industry Research Chair in Oil Sands Engineering: Department of Chemical and Materials Engineering, University of Alberta, Edmonton, Canada

May 2007- Teck Cominco Professor (now Teck Professor): Department of Chemical and Materials Engineering, University of Alberta, Edmonton, Canada

2006-2013 Canada Research Chair in Mineral Processing (Tier I): Department of Chemical and Materials Engineering, University of Alberta, Edmonton, Canada

2002-2008 NSERC/EPCOR/AERI Industrial Research Chair: Department of Chemical and Materials Engineering, University of Alberta, Edmonton, Canada

2001-2002 McCalla Professor of University of Alberta: Department of Chemical and Materials Engineering, University of Alberta, Edmonton, Canada

2000-	Professor: Department of Chemical and Materials Engineering, University of Alberta, Edmonton, Canada
1997-1999	Associate Professor: Department of Chemical and Materials Engineering, University of Alberta, Edmonton, Canada
1992-1996	Assistant Professor: Department of Mining and Metallurgical Engineering, McGill University, Montreal, Canada
1991-1992	Postdoctoral Fellow: Department of Chemical and Nuclear Engineering, University of California, Santa Barbara, USA (Supervisor: Dr. Jacob Israelachvili)
1990-1991	Research Associate: Department of Mining and Minerals Processing Engineering, Virginia polytechnic Institute and State University, Blacksburg, USA (Supervisor: Dr. Roe-Hoan Yoon)
1990-1991	Research Assistant: Department of Mining and Minerals Processing Engineering, Virginia Polytechnic Institute and State University, Blacksburg, USA (Supervisor: Dr. Roe-Hoan Yoon)
1982-1985	Lecturer: Department of Minerals Engineering, Central South Institute of Mining and Metallurgy, PRC

Professional Memberships

American Chemical Society (ACS)

Canadian Society for Chemical Engineering (CSChE)

American Society of Mining, Metallurgy and Exploration (SME)

Canadian Institute of Mining, Metallurgy and Petroleum (CIM)

International Association of Colloid and Interface Scientists (IACIS)

Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Major Recognitions

14 IMPC Council Member, 2016-2020.

13 MetSoc Award for Research Excellence, 2016.

12 Fellow of Royal Society of Canada (FRSC), 2015

11 Syncrude Award for Excellence in Sustainable Development, Canadian Institute of Mining, Metallurgy and Petroleum (CIM), 2015

10 The Teck Environmental Award, Metallurgical and Materials Society of CIM, Canada, 2013.

9 APEGA Frank Spragins Technical Award (Association of Professional Engineers and Geoscientists), 2012.

8 Fellow of Canadian Institute of Mining, Metallurgy and Petroleum (CIM), 2010.

7 Bantrel Award in Design and Industrial Practice, Canadian Society for Chemical Engineering, 2009.

6 NSERC Industry Research Chair in Oil Sands Engineering, 2008-2018.

5 Fellow of Canadian Academy of Engineering, 2008.

4 Bill Moore Special Achievement Award of Canadian Mineral Processor, 2008.

3 Teck Cominco Professor (now Teck Professor), May 2007.

2 Canada Research Chair (Tier I) in Mineral Processing, 2006-2020.

1 NSERC/EPCOR/AERI Industrial Research Chair in Advanced Coal Cleaning and Combustion Technology, 2002-2007.

Major Contributions

18 Basic science in reducing operating temperature of oil sands processing (J255, J257):

Recognizing the need to reduce operating temperature with thorough analysis on the theory of oil sands extraction, Dr. Xu's team studied interactions of bitumen with solids and air bubble. Basic knowledge from their study led to the development of a robust, aqueous-nonaqueous hybrid extraction process operating at ambient temperatures. This new line of thinking is anticipated to greatly reduce energy intensity of oil sands extraction, and hence green-house gas emission and operating cost, while improving utilization of oil sands reserves by robust, high bitumen recovery operations.

17 Design of interfacially active and magnetically responsive demulsifiers (J244, J251):

Despite generations' effort of scientist and engineers, effective separation of water from crude oil continuous to be a major challenge. By applying basic surface science and materials synthesis to design of a novel interfacially active and magnetically responsive demulsifier with a combination of nano technology with surface science, interfacially active magnetic nano particles were designed to effectively attach these particles to the emulsified water droplets in crude oil. The magnetic properties of the particles allow enhanced coalescence of the water droplets and effective separation of water by an external magnetic field, not only improving the quality of crude oil at reduced capital and operating cost due to shortened separation time, but also reducing the oil loss and associated environmental impact as a result of reduced sludge (waste) volume. More importantly, the magnetic demulsifiers can be regenerated for reuse, reducing again the operating cost.

16 Comprehensive Handbook on Theory and Practice of Bitumen Recovery from Athabasca Oil Sands, Vol. 1: Theoretical Basis (co-author, Kingsley, Calgary, 2011):

As noted by Dr. Eric Newell (OC), this handbook is "to provide the technology foundation that will serve as the springboard for the future enhancement required for sustainable development of our vast oil sands resource. It is their bright ideas and innovations that will be so vitally important if we, as Canadians, are to realize the huge socio-economic potential of this strategic global resource." Vol. 2: Industry Practice (co-editor, Kingsley, Calgary, 2013): Dr. Clem Bowman (FCAE) noted that "Achieving full value from this treasure house will be the task for the next generation of researchers and project developers. But they will be standing on the shoulders of those visionaries who brought the oil sands into full commercial development, as evidenced in the two volumes that comprise this Handbook. Full recognition should be given to the authors of these two volumes for their commitment of time and energy in highlighting this fast moving technological venture, and to their organizations for sharing their experiences.".

15 Report of The Royal Society of Canada Expert Panel: Environmental and Health Impacts of Canada's Oil Sands Industry (co-author, Royal Society of Canada, 2010):

This 438-page report is being used as bench-mark by government and industry to evaluate their programs and to measure their performances. It also provides a scientific and accurate view of oil sands industry. Since its publication, many initiatives have been taken by government and industry to address environmental and sustainability issues facing the oil sands industry. As noted by Senator Elaine McCoy, reprinted in the Ottawa Citizen, "Happily, the Royal Society of Canada

has given us a roadmap outlining precisely what we do know and, more importantly, what we still need to learn. Its expert panel issued their exhaustive review of environmental and health impacts of the oil sands last December. Their 438-page report is the best I've seen on this subject - it deals with the issues clearly, objectively, and without hyperbole, giving us all a much-needed beacon for establishing a research agenda." The report attracted a high level of media interest, including the front page of the Globe and Mail, an editorial of the National Post, Nature.com, Reuters International, The Economist and the New York Times, just to name a few. It is interesting to note that the report has been quoted in media stories by sources as diverse as the Canadian Association of Petroleum Producers and Green Peace.

14 Development of flocculation-enhanced filtration of oil sands tailings for improved water and energy recovery and rapid land reclamation (J217, J259):

After identifying a critical role of effective flocculation of ultrafine particles, a novel organic-inorganic hybrid polymer was applied to fluid fine tailings prior to filtration to produce stackable filter cake while recycle the maximum amount of clear (warm) water. By innovative design of process, a flocculation-assisted thickening followed by filtration of sediments (thickener underflow) was proven to be most viable and economical, providing a sustainable solution to challenges of managing tailings, land reclamation, water and energy.

13 Introduction of the state-of-the-art instrumentation to probe molecular level science behind mega scale industrial processing of minerals and oil sands (J89, J98, J113, J121, J136, J138, J144, J148, J149, J159):

The atomic force microscope (AFM) was used for the first time to measure interaction forces between various components in oil sands in both aqueous and nonaqueous solutions, providing scientific basis for developing cutting edge technology for processing and utilization of natural resources and materials recycling. Combined with ultra-microtome, AFM also allowed us to probe anisotropic properties of clays, providing critical information needed to enhance process performance and tailings handling.

12 Establishment of slime coating theory to account for poor processability of high fine and high salt water (electrolyte concentration) ores (J67, J77, J81, J153):

We pioneered study on particle interactions by zeta potential distribution measurement (J77, J81). With this method, we established a detrimental synergistic effect of swelling clays and divalent cations and developed a slime coating theory to explain the depression of bitumen (or coal) recovery and poor froth quality. From this fundamental understanding, we were able to invent a novel process of selective flocculation of solid fines to avoid slime coating, not only improving bitumen (or coal) recovery and froth quality, but also enhancing settling of fine solids in tailings. The determination of fine particle interactions by zeta potential distribution measurement has been extended to a number of other important systems, and adopted by many other research laboratories.

11 Establishment of hydrodynamic cavitation theory for enhanced fine particle flotation (J35, J42, J43, J57, J122, J241):

The concept proved in this area had significant impact on how one thinks and designs new flotation machines. The recognition of the work is also illustrated by the invitation for two book

chapter contributions (Flotation Development and Feed Aeration) to Encyclopedia of Separation Science, published by Academic Press. The concept has been adapted by CSIRO (Australia) in to their flotation machine design for fine coal cleaning and implemented in pico bubble flotation technology. Recently, the concept is introduced to oil sands processing with an estimated overall increase in bitumen recovery by up to 2%, accounting for an additional $1,000,000/day net revenue gain, with a significantly reduced impact on environment and greenhouse gas emission. Due to its commercialization and impact to mineral and oil sands industry, this work was highly recognized by invitation to make a plenary presentation at XXIV International Mineral Processing Congress.

10 Oily bubble flotation technology (J79, J97, J137, P1, P6):

Taking advantage of oil spreading characteristics and easy attachment of oil with air bubbles, an (reactive) oily bubble flotation technology was developed and tested to demonstrate significant improvement in valuable (minerals or bitumen) recovery while reducing variability of flotation process dependency on ore characteristics. The paper published (J79) won 2004 best paper award for papers published in Can. J. Chem Eng. and led to an invitation to make a plenary presentation at 6th World Congress of Beneficiation of Phosphate.

9 Design of regenerable mercury sorbent (J183, 185, J198, J203, P7):

With urgent need to reduce mercury emissions in flue gases of coal fired plant while maintain the cost effectiveness of power generation, Dr. Xu's group applied basic surface science and materials synthesis to design of novel regenerable reactive sorbent. A combination of nano technology with surface science led to the development of silver nanoparticles supported on natural zeolite minerals-magnetite composites. While silver nano particles act as the reactors for amalgamation of mercury, the magnetic properties of the reactive sorbent allowed effective recovery of spent sorbent and regeneration. This type of recycle sorbent is anticipated to become a future generation of technology for abetment of mercury emissions from coal-fired power plant and municipal waste incinerators.

8 Chemical and mechanical bromination of biomass ash as mercury sorbent (P8, J250):

The idea is to replace more expensive activated carbon based sorbent using a waste product of biomass combustion to engineer mercury sorbent using novel chemical and mechanical bromination process. Our patented technology has been demonstrated successful capture of mercury from a plant test, with the potential to be commercialized as replacement of costly activated carbon based sorbent.

7 Coal cleaning and upgrading as an attractive alternative for mercury emission control (J115, J 142, J154, J163, J178, J192, J229):

Based on fundamental understanding of mercury association with mineral matter in coal, coal cleaning by air dense medium fluidized bed separator as an effective alternative for abetment of mercury emission from coal fired power plants, a major environmental concern. Incorporated with thermal upgrading of coal, this integrated technology will become a corner stone technology for improving air quality by reducing mercury emissions. This work was awarded an outstanding poster award at the 21PstP Annual International Pittsburgh Coal Conference and recently a distinguished paper award at the 33PrdP International Symposium on Combustion. We were

invited to make a plenary presentation on this subject at ChemCon 2006 and at the 6PthP International Symposium on Coal Combustion.

6 A novel process for recovering clean coal and water from coal tailings (J62, J64):

Based on hydrophobic nature of coals, we developed a hydrophobic extraction process using waste oil to recover fine coal lost in tailings ponds, as fuels in the form of coal-in-oil slurry suitable for direct firing in boilers. Our patented technology (P3) has been licensed by Energy Pacific in Idaho, USA.

5 An ambient temperature ferrite process for acid mine drainage treatment (J29, J60, J61, J65):

We developed a process not only to treat acid rock (mine) drainage-an environmental hazardous, but also to produce valuable ferrite of many important uses. This has been widely publicized by news media, including New Scientist (August 10, 1996, p.23), American Chemical Society Press Digest (No. 12050, July 25, 1996), Ground Water Monitor (September 18, 1996, p. 176) and Hazardous Waste News (August 26, p. 272, 1996). The impact of this work is also illustrated by inclusion of the technology in the data base by Industry Canada in Canadian Environmental Solutions.

4 A novel coating technology for self-assembly of bio-specific monolayers on nano-sized magnetic particles using a bolaamphiphile (16-mercaptohexadecanoic acid) (J19, J36):

In this study, we proposed the use of self-assembly with bolaamphiphile molecules to engineer magnetically responsive bio tags for blood cell separation. This work has been recognized internationally as illustrated by an invitation for a keynote presentation at Composites at Lake Louise and for a book chapter contribution to Surfaces of Nanosize Particles and Porous Materials (Marcel Dekker, 1999). The work continued by Dr. S. Gelinas won the best poster award at the Engineering Foundation Conference, Kona, Hawaii, January 1998.

3 Novel two-step silica coating process (J52, J103, J104, J127, J128, J170):

We developed a two- step silica coating theory and technology which allowed extra-thin silica film to protect magnetic nano particles while providing a surface amenable for further modification to tailored applications, such as sorbent for recovery of valuable metals or detoxification of industrial effluent, magnetic demulsifiers, switchable soft gels. This importance of this work is recognized by a high number of more than 300 citations.

2 Direct measurement of hydrophobic and DLVO forces in bubble-surface interactions in aqueous solutions using atomic force microscope (J10):

This pioneer work laid the foundation for understanding interaction forces between an air bubble and a solid substrate, which is extremely important in flotation widely used in mineral recovery, paper recycling (de-inking), waste water treatment, bitumen recovery and de-oiling of petroleum processing water. The impact of our work is clearly demonstrated by the article having been cited by other researchers for more than 235 times.

1 Identification of hydrophobic forces in colloidal suspensions (J6, J7):

By careful design of experiments, the long range hydrophobic attraction which was not considered in the classical DLVO theory, was identified to play a critical role in determining the

stability of a colloidal suspension. A theory was developed to link the additional attractive forces with particle surface hydrophobicity. Incorporating this theory in the classical DLVO theory provides a much more accurate prediction of colloidal suspensions. Built on this foundation, a novel fine coal cleaning process was developed by taking advantage of hydrophobic attractive force to selectively coagulate hydrophobic fine coal, followed by gravity separation of fine coal aggregates.

Other Evidence of Impact and Contributions

22 President, Metallurgy and Materials Society of CIM, 2016-2017.

21 Session organizer, New Opportunities for Recovery and Conversion of Fossil Fuels, 247PthP ACS National Meeting, Dallas, Texas, March 2014.

20 Vice President, Metallurgical Society of CIM, Canada, 2013

19 Session organizer, Oil sands and heavy oil processing at 62PndP CSChE Conference, Vancouver, October 2012.

18 Conference chair, Oilsands 2012, Edmonton, August 2012.

17 Symposium co-organizer, The First International Symposium: Water in Mineral Processing at 2012 SME, Seattle, WA, February 2012.

16 Conference chair, Oilsands 2011, Edmonton, February 2011.

15 Member of NSERC Strategic Project Grant Selection Panel (Energy and Environment panel), 2009-2011.

14 Distinguished paper award (Identifying modes of occurrence of mercury in coal by temperature programmed pyrolysis) selected by Stationary Combustion: 33rd International Symposium on Combustion, 2010.

13 Technical Program Co-Chair, Conference of Metallurgists 2010, Vancouver.

12 Guest co-editor, Asia-Pacific J. Chem Eng., Vol 5, No. 3, 2010.

11 Member of Royal Society Canada Expert Panel on Environmental and Health Impacts of Canada's Oil Sands Industry, 2009-2010.

10 Co-chair, Oil Sands symposium at the 8PthP World Congress of Chemical Engineering in Montreal, Montreal, August 2009.

9 Co-chair, Oil Sands Symposium at the 57PthP CSChE Conference, Edmonton, October 2007.

8 Symposium chair, 6th UBC-McGill-UA Biennial International Symposium on Fundamentals of Mineral Processing, Montreal, October 1-4, 2006.

7 Chair of Mineral Sciences and Engineering, Metallurgical Society of Canadian Institute of Mining, Metallurgy and Petroleum Engineering, 2003-2006.

6 The poster entitled "Mercury release characteristics from subbituminous coals during thermal upgrading", by Zhenghe Xu, Guoqing Lu and Onyi Chan, won the Award for Outstanding Technical Poster of 21st Annual International Pittsburgh Coal Conference, Osaka, Japan, September 2004.

5 The paper entitled "Bitumen recovery with oily air bubbles", co-authored with V. Wallwork and J. Masliyah and published in Canadian Journal of Chemical Engineering (2003, 81: 993-997) won the 2004 CSChE Best Paper Award for the papers published in the Canadian Journal of Chemical Engineering.

4 Regional representative of Canadian Mineral Processors-Albert, NWT and Nunuvat (2003-2004)

3 Member of Editorial Board of Multinational Journal Coal Preparation since 2002

2 Awarded a McCalla Professorship by the University of Alberta for 2001-2002.

1 Served as Treasurer for 37th Conference of Metallurgists (1998).

Research/Training Summary (h-index: 39; Total citations 7100+)*

Year	2009	2010	2011	2012	2013	2014	2015	Total (Life)
Refereed Journal publications	22	15	21	20	21	25	26	352
Conference Proceedings	1	5	0	3	1	3	1	62
Book and book chapters	1	0	2	0	1	2	1	15
Patents granted (pending)	0	0	0	2	1	0	0	7
External research fund (CAN$)	2,740k	2,420 k	1,937 k	1,845 k	2,780 k	1,192k	1,782k	25,520 k
MSc, PhD students graduated	2, 2	6, 1	9, 1	9, 1	3, 3	7, 5	5, 3	72, 29
PDF completed	4	2	3	4	3	5	4	49
U/G researcher	5	11	7	7	4	4	5	68

*based on Research ID of Web of Science

Books

B3 Czarnecki, J., Masliyah, J., Xu, Z. and M. Dabros (eds.), 2013, *Handbook on Theory and Practice of Bitumen Recovery from Athabasca Oil Sands*, Vol. 2: Industry Practice, Kingsley, Calgary.

B2 Masliyah, J., Czarnecki, J. and Z. Xu, 2011, *Handbook on Theory and Practice of Bitumen Recovery from Athabasca Oil Sands*, Vol. 1: Theoretical Basis, Kingsley, Calgary. (Translated to Chinese by Chinese Petroleum Press, 2016)

B1 Xu, Z. and Q. Liu (eds.), 2006, *Interfacial Phenomena in Fine Particle Technology*, MetSoc, Montreal.

Book Chapters

BC12 Harbottle, D., Liang, C., El-Thaher, N., Liu, Q., Masliyah, J. and Z. Xu, 2015, Particle-stabilized emulsions in heavy oil processing, in *Particle-Stabilized Emulsions and Colloids: Formation and Application*, T. Ngai and S.A.F. Bon (eds.), The Royal Society of Chemistry, London, 283-316.

BC11 Cadien, K., Nolan, L., Pirayesh, H., Dawkins, K. and Z. Xu, 2014, Electrochemical Aspects of Chemical Mechanical Polishing, in *Electrodeposition and Surface Finishing, Fundamentals and Applications*, S. S. Djokic (ed.), Springer, New York, 303-339.

BC10 Wang, L., Curran, M., Deng, M., Liu, Q., Xu, Z. and J. Masliyah, 2014, Physicochemical properties of heavy oil-water interface in the context of oil removal from sea water by froth flotation, in *Oil Spill Remediation: Colloid Chemistry-Based Principles and Solutions*, P. Somasundaran, R. Farinato, P. Patra and K. Papadopolous (eds.), John Wiley & Sons, Hoboken, NJ, 279-294.

BC9 Wang, L., Englert, A., Masliyah, J. and Z. Xu, 2011, Role of colloidal chemistry in oil sands processing, in *Encyclopedia of Surface and Colloid Science*, P. Somasundaran (ed.), Taylor & Francis, London, in press.

BC8 Long, J., Xu, Z. and J. Masliyah, 2009 Bitumen recovery from oil sands, in *Encyclopedia of Surface and Colloid Science* (2nd ed.), P. Somasundaran (ed.), Taylor & Francis, London, 1: 1, 1-18.

BC7 Xu, Z. and J. Dong, 2008, Synthesis, characterization and application of magnetic nanocomposites for removal of heavy metals from industrial effluents, in *Emerging Environmental Technologies V*, Shah (ed.), Springer Publications, 105-148.

BC6 Lopetinsky, R., Masliyah, J. and Z. Xu, 2006, Solids-stabilized emulsions: A review, in *Colloidal Particles at Liquid Interfaces*, B.P. Binks and T.S. Horozov (eds.), Cambridge University Press, 186-224.

BC5 Xu, Z. and J.H. Masliyah, 2007, Contact angle measurements for oxide and related surfaces, in *Encyclopedia of Surface and Colloid Science* (2nd Edition), P. Somasundaran (ed.), Taylor & Francis, New York, 1540-1554.

BC4 Xu, Z., 2000, Flotation Historical Development, in *Encyclopedia of Separation Science*, I. D. Wilson, T. R. Adlard, C. F. Poole and M. Cook (eds.), Academic Press, 1527-1537.

BC3 Xu, M, Zhou, Z. and Z. Xu, 2000, Feed aeration, in *Encyclopedia of Separation Science*, I. D. Wilson, T. R. Adlard, C. F. Poole and M. Cook (eds.), Academic Press, 1556-1562.

BC2 Xu, Z., Liu Q. and J.A. Finch, 1999, Engineering of Nano-size Superparamagnetic particles for the use in magnetic carrier technology, in *Surfaces of Nanoparticles and Porous Materials*, J. Schwarz and C. Contescu (eds.), Marcel Dekker, New York, pp. 31-50.

BC1 Xu, Z., Zhang, Q. and J.A. Finch, 1999, Surface ionization and complexation, in *Surfaces of Nanoparticles and Porous Materials*, J. Schwarz and C. Contescu (eds.), Marcel Dekker, New York, pp. 593-612.

Publications and Presentations

Refereed Journal Papers

J355 Ivanova, N., Xu, Z., Liu, Q. J. Masliyah, 2016, Surface forces in unconventional oil processing, Current Opinion Colloid Interface Sci., accepted.

J354 Chen, T., Lin, F., Primkulov, B., He, L. and Z. Xu, 2016, Impact of salinity on warm water-based mineable oil sands processing, *Can. J. Chem. Eng.*, in press.

J353 Guo, J., Li, Z., Li, Y., Liu, Q., Yan, C. and Z. Xu, 2016, Synthesis and characterization of tunable dual-pH switchable zwitterionic copolymers, *Macromolecular Chemistry Physics*, 217: 1614-1619.

J352 Kuznicki, N., Harbottle, D., Masliyah, J. and Z. Xu, 2016, Dynamic interactions between a silica sphere and deformable interfaces in organic solvents studied by atomic force microscopy, *Langmuir*, in press.

J351 Xu, P., Wang, Z., Xu, Z., Hao, J. and D. Sun, 2016, Highly effective emulsification/demulsification with a CO_2-switchable superamphiphile, *J. Colloids Interface Sci.*, 480:198-204.

J350 Yang, Y., Xu, S., Li, Z., Wang, J., Zhao, Z., Z. Xu, 2016, Oil removal of spent hydrotreating catalyst CoMo/Al2O3 via a facile method with enhanced metal recovery, J. Hazardous Materials, 318: 723-731.

J349 Liang, C., Liu, Q. and Z. Xu, 2016, Dewatering bitumen emulsions using interfacially-active organic composite absorbent particles, *Energy & Fuels*, 30: 5253-5258.

J348 Wang, C., Han, C., Lin, Z., Masliyah, J., Liu, Q. and Z. Xu, 2016, Role of pre-conditioning cationic Zetag flocculant in enhancing MFT flocculation, *Energy & Fuels*, 30: 5223-5231.

J347 Liu, G., Huang, Y., Qu, X., Xiao, J., Yang, X. and Z. Xu, 2016, Understanding the hydrophobic mechanism of 3-hexyl-4-amino-1,2,4-triazole-5-thione to malachite by ToF-SIMS, XPS, FTIR, contact angle, zeta potential and micro-flotation, *Colloids Surfaces A:*, 503: 34-42.

J346 Liu, L., Sjoblom, J. and Z. Xu, 2016, Nanoaggregation of polyaromatic compounds probed by electrospray ionization mass spectrometry, *Energy & Fuels*, 30: 3742-3751.

J345 Li, H., Li, Q., Hao, J., Xu, Z. and D. Sun, 2016, Preparation of CO_2-responsive emulsions with switchable hydrophobic tertiary amine, *Colloids Surfaces A:*, 502: 107-113.

J344 Chen, Q., Xu, S., Liu, Q., Masliyah, J. and Z. Xu, 2016, QCM-D study of nanoparticle interactions, *Adv. Colloid Interface Sci.*, 233: 94-114.

J343 Peng, X., An, J., Xu, S., Chen, W. and Z. Xu, 2016, Hydroiodic acid reduced graphene hybrid with δ-MnO_2 for electrode material in supercapacitors, *ECS J. Solid Sci. Tech.*, 5: M51-M57.

J342 Borujeny, R., Dawkins, K., Li, P., Xu, Z. and K. Cadien, 2016, Ceria coated silica particles: one step preparation and settling behavior under the influence of colloidal and hydrodynamic interactions, *Materials Chem. Phys.*, 173: 467-474.

J341 Alagha, L., Guo, L., Ghuzi, M., Molatlhegi, O., Z. Xu, 2016, Adsorption of hybrid polyacrylamides on anisotropic kaolinite surfaces: effect of polymer characteristics and solution properties, *Colloids Surfaces A:*, 498: 285-296.

J340 Teklebrhan, R., Jian, C., Choi, P., Xu, Z. and J. Sjoblom, 2016, Role of naphthenic acids in controlling self-aggregation of a polyaromatic compound in toluene, *J. Phys. Chem. B*, 120: 3516-3526.

J339 He, L., Lin, F., Li, X., Xu, Z. and H. Sui, 2016, Enhancing heavy oil liberation from solid surfaces using biodegradable demulsifiers, *J. Env. Chem. Eng.*, 4: 1753-1758.

J338 Primkulov, B., Lin, F. and Z. Xu, 2016, Microscale liquid-liquid displacement dynamics: Molecular kinetic or hydrodynamic control, *Colloids Surfaces A:*, 497:336-343.

J337 Lin, F., He, L., Hou, J., Masliyah, J. and Z. Xu, 2016, Role of ethyl cellulose in bitumen extraction from oil sands ores using an aqueous-nonaqueous hybrid process, *Energy & Fuels*, 30: 121-129.

J336 Qin, W., Wang J. L., Xu S., Xie, Q. and Z. Xu, 2016, Selectivity of 2-mercaptobenzimidazole derivatives on metal ions studied by UV-vis spectrometry and DFT calculations, *Colloids Surfaces A:*, 490: 318-325.

J335 Huang, G., Xu, S., Yang, Y., Sun, H. and Z. Xu, 2016, Synthesis of porous $MnCo_2O_4$ microspheres with yolk-shell structure induced by concentration gradient and the effect on their performance in electrochemical energy storage, *RSC Advances*, 6: 10763-10774.

J334 Bi, J., Yang, F., Harbottle, D., Pensini, E., Tchoukov, P., Simon, S., Sjöblom, J., Dabros, T., Czarnecki, J., Liu, Q. and Z. Xu, 2015, Interfacial layer properties of a polyaromatic compound and its role in stabilizing water-in-oil emulsions, *Langmuir*, 31: 10382-10391.

J333 Bisson, T., Ong, Z., MacLennan, A., Hu, Y. and Z. Xu, 2015, Impact of sulfur loading on brominated biomass ash in mercury capture, *Energy & Fuels*, 29: 8110-8117.

J332 An, J., Peng, X., Xu, S., Xu, Z. and J. Wang, 2015, Fabrication of coral like carbon black/MnO_2 nano composites from commercial carbon black and their application in supercapacitors, *RSC Advances*, 5: 97080-97088.

J331 Lu, Z., Liu, Q., Xu, Z. and H. Zeng, 2015, Probing anisotropic surface properties of molybdenite by direct force measurements, *Langmuir*, 31: 11409-11418.

J330 Li, H., Afacan, A., Liu, Q. and Z. Xu, 2015, Study interactions between fine particles and micron size bubbles generated by hydrodynamic cavitation, *Minerals Engineering*, 84: 106-115.

J329 Liang, C., Liu, Q. and Z. Xu, 2015, Synthesis of surface-responsive composite particles by dehydration of water-in-oil emulsions, *ACS Appl. Mater. Interfaces*, 7: 20631-20639.

J328 Yang, F., Tchoukov, P., Dettman, H., Teklebrhan, R., Liu, L., Dabros, T., Czarnecki, J. and Z. Xu, 2015, Asphaltene sub-fractions responsible for stabilizing water-in-crude oil emulsions: Part 2. Molecular representations and molecular dynamics simulations, *Energy & Fuels*, 29: 4783-4794.

J327 Ghadirian, M., Afacan, A., Hayes, R., Mmbaga, J., Mahmood, T., Xu, Z. and J. Masliyah, 2015, A study of the hydrocyclone for the separation of light and heavy particles in aqueous slurry, *Can. J. Chem. Eng.*, 93: 1667-1677.

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Invited Presentations

57 Xu, Z., Sjoblom, J., Masliyah, J., Liu, Q. and D. Harbottle, Molecular mechanisms of petroleum emulsion stabilization and demulsification, PetroPhase 2016, Elsinore, Denmark, June 19-23, 2016. (Keynote)

56 Xu, Z., Production of oil from Canadian oil sands: Challenges and opportunities, International Energy Raw Materials and Energy Summit (Inerma 2015), Istanbul, Turkey, October 1-3, 2015. (Invited)

55 Xu, Z. and J. Masliyah, Interfacial sciences in water-in-oil petroleum emulsions, International Association of Colloid Interface Scientists (IACIS 2015), Mainz, Germany, May 24-29, 2015. (Keynote)

54 Xu, Z., Current state of technology for ore upgrading in hydrometallurgy, 6th International Hydrometallurgy Conference, Beijing, China, October 16-19, 2014. (Plenary)

53 Xu, Z., Zhang, X., Tchoukov, P., Wang, L., Liu, Q. and J. Masliyah, Role of colloidal forces in unconventional oil processing, 88th ACS Colloid & Surface Science Symposium, Philadelphia, PA, June 22-25, 2014. (Keynote)

52 Xu, Z., Cadien, K. and M. Wyman, Energy and mineral resource development and utilization: past, present and future, International Conference on Engineering Science and Technology (ICEST2014), Beijing, China, June 2-3, 2014. (Keynote)

51 Xu, Z., Separation of emulsified water in oil emulsions by interfacially active magnetic nano particles, Separation Technology 2013, Stavanger, Norway, September 25-26, 2013. (Invited)

50 Xu, Z., Zhou, F., Wang, L., Liu, Q(X)., Liu, Q., Masliyah, J. and R. Chi, Flotation technology for upgrading of rare earth ores, The 7th International Conference on Rare Earth Development and Application, Ganzhou, China, August 10-13, 2013. (Plenary)

49 Xu, Z. and J. Masliyah, Fundamental research and industrial innovation: A case study, Current State and Trend in Low Grade Complex Mineral Resource Utilization: A Life Time Celebration of Professor Wang Dianzuo, Changsha, China, June 14-16, 2013. (Invited)

48 Xu, Z. and Q. Liu, Surface engineering and application of magnetic particles, 2013 Taiwan-Mainland Functional Materials Summit, Chongqing, China, May 23-26, 2013. (Invited).

47 Xu, Z., Wang, L., Tchoukov, P. and J. Masliyah, Study of film drainage dynamics by thin film force apparatus, Sixth Biennial Australian Colloid & Interface Symposium, Noosa, Australia, February 3-7, 2013. (Keynote)

46 Xu, Z. and J. Masliyah, Production of bitumen from Canadian oil sands: challenges and opportunities for mineral processing, SUSMP'12 International Conference on Sustainable Mineral Processing, Oulu, Finland, December 10-13, 2012. (Invited)

45 Xu, Z. and J. Masliyah, Colloidal chemistry in fine particle flotation, International Mineral Processing Symposium 2012, Bodrum, Turkey, October 9-12, 2012. (Plenary)

44 Xu, Z., Zhou, F., Wang, L., Liu, Q., Masliyah, J. and R. Chi, Fundamental study on reactive oil bubble flotation technology, ECI on Rare Earth Minerals/Metals-Sustainable Technologies for the Future, San Diego, CA, August 12-17, 2012. (Plenary)

43 Xu, Z., Hou, J., Feng, X. and J. Masliyah, Interfacial characteristics of a biodegradable ethyl cellulose in demulsification of water-in-heavy oil emulsions, 19th International Symposium on Surfactant in Solution, Edmonton, AB, June 24-28, 2012. (Keynote)

42 Wang, L., Masliyah, J. and Z. Xu, Dissipation of hydrodynamic forces by hydrophobic surfaces in aqueous solutions, IACIS 2012, Sendai, Japan, May 13-18, 2012. (Keynote)

41 Wang, J., Natarajan, A., Xie, J., Sjoblom, J., Zeng, H. and Z. Xu, Intermolecular interactions of asphaltenes and an asphaltene model compound in organic solvents using a surface forces apparatus, PetroPhase 2011, London, UK, July 10-14, 2011. (Keynote)

40 Xu, Z. and J. Masliyah, Solvent-assisted hybrid bitumen extraction from Athabasca oil sands, Los Alamos National Laboratory of DOE, Los Alamos, NM, USA, May 2011. (Invited)

39 Xu, Z., Wang, L. and J. Masliyah, Aqueous film rupture between hydrophobic particles and air bubbles measured by a new surface force device, 241st ACS National Meeting and Exposition, Anaheim, CA, March 27-31, 2011. (Invited)

38 Xu, Z., Wang, L., Wu, C. and Q. Liu, Phosphate flotation using reactive oily bubbles, 6th World Congress of Beneficiation of Phosphate, Kunming, China, March 6-9, 2011. (Plenary)

37 Xu, Z., Wang, L. and J. Masliyah, Role of colloidal forces in flotation, 5th Biennial Australian Colloid & Interface Symposium, Hobart, Tasmania, January 30 - February 3, 2011. (keynote)

36 Xu, Z., Bisson, T., Xia, S. and R. Gupta, Novel developments in mercury removal technologies, 60th Can. Chem. Eng. Conference, Saskatoon, SK, October 24-27, 2010. (Keynote)

35 Xu, Z. and J. Masliyah, Understanding molecular mechanism of demulsifying water-in-oil emulsions using a biodegradable demulsifier, The Statoil Research Summit, Trondheim, Norway, September 27-29, 2010. (Invited)

34 Xu, Z. and J. Masliyah, Enhance fine particle flotation by hydrodynamic cavitation, XXV International Mineral Processing Congress, Brisbane, QL, September 6-10, 2010. (Keynote)

33 Xu, Z. and J. Masliyah, Xu, Z., Current state of technology for mercury emission control from coal-fired power plants, 8th World Congress of Chemical Engineering, Montreal, QC, Canada, August 23-27, 2009. (Keynote)

32 Xu, Z., Production of petroleum from Canadian oil sands, Energia para el Desarrollo Sustentable en America del Norte, Puebla, Mexico, March 19-20, 2009. (Invited)

31 Xu, Z. and J. Masliyah, Understanding flotation by visualization, XXIV International Mineral Processing Congress, Beijing, China, September 24-28, 2008. (Plenary)

30 Xu, Z. and J. Masliyah, Bitumen production from Canadian oil sands deposits, Symposium of Frontier Energy Resources, ISOPE 2008, Vancouver, BC, Canada, July 6-11, 2008. (Invited)

29 Xu, Z., Bitumen production from Alberta oil sands, Workshop at University of Southern California on The Security & Prosperity Partnership: Expanding the Boundaries of North America?, Los Angeles, CA, USA, April 11, 2008. (Invited)

28 Xu. Z. and R. Gupta, Recent advances in mercury emission control from coal-fired power plant, 6th International Symposium on Coal Combustion, Wuhan, China, December 1-4, 2007. (Plenary)

27 Xu, Z., A comparison of mineral and oil sands flotation systems, 57th CSChE Conference, Edmonton, AB, Canada, October 28-31, 2007. (Keynote)

26 Xu, Z. and J. Masliyah, Bitumen production from Canadian oil sands deposits: opportunities and challenges, 3rd Canada-China Economic Cooperation Conference, Edmonton, AB, Canada, June 22, 2007. (Invited)

25 Xu, Z. and J. Masliyah, Bitumen production from Canadian oil sands deposits, AIChE 2007 Spring Meeting, Houston, TX, USA, April 24, 2007. (Invited)

24 Xu, Z., Kelly, D. and R. Gupta, Mercury emission control from coal fired power plant, ChemCon 2006, December 27-30, 2006, Bharuch, Gujarat, India. (Plenary).

23 Xu, Z. and J. Masliyah, Bitumen production from Canadian oil sands deposits, North West Mining Association Annual Meeting, Reno, NV, December 6-8, 2006. (Invited)

22 Xu, Z., Magnetic nanocomposites for bio and environmental applications, Department of Materials Science and Engineering, Michigan Technological University, Houghton, MI, USA November 10, 2006. (Invited)

21 Xu, Z., Xu, Z., Liu, Y., Kelly, D., Kuznicki, S., Mitlin, D. and C. Lin, Regenerable sorbent for mercury emission control, 19th Canadian Symposium on Catalysis, Saskatoon, SK, May 14-17, 2006. (Keynote)

20 Xu, Z., Lu, G., Choung, J., Kelly, D. and D. Tao, Potential of coal cleaning for mercury emission control from Western Canadian Coals, Symposium on Impact of Evolving Mercury Emission Regulations on the Low Rank and Bituminous Coal Industry, Coal Prep 2006, Lexington, KY, May 1-4, 2006. (Invited)

19 Xu, Z. and J. Masliyah, Role of fundamental research in bitumen production from oil sands ores, Laboratory of Environment and Minerals, CNRS/INPL, Nancy, France, July 2005. (Invited)

18 J. Masliyah and Z. Xu, Potential of flotation technology in bitumen recovery from oil sands, Centenary of Flotation Symposium, Brisbane, Australia, June 6-9, 2005. (Keynote)

17 Xu, Z. and J. Masliyah, Modern approach to induction time measurement, Ian Wark Research Institute, University of South Australia, Australia, May 2005. (Invited)

16 Xu, Z., Development of Novel sorbents for emission control from coal-fired power plants, 2nd International Conference on Energy and Environmental Materials, Guangzhou, China, December 27-29, 2004. (Plenary)

15 Xu, Z., The potential of coal cleaning and combustion technology for China, Canada-China Energy Cooperation Conference, Edmonton, AB, Canada, November 26-27, 2004. (Invited)

14 Xu, Z. and G. Lu, Mercury emission control by pre-combustion thermal upgrading, 2nd International Symposium on Energy and Environmental Materials, Zhang Jiajie, China, June 15, 2004. (Invited)

13 Xu, Z., Magnetic nano particles and composites for environmental applications, International Conference on Energy and Environmental Materials, Guangzhou, China, December 2002. (Plenary)

12 Xu, Z. and J. Liu, Study of interfacial phenomena with AFM, 9th National Conference on Colloid and Interfacial Chemistry, Jinan, China, October 22, 2002. (Plenary)

11 Xu, Z., Recent development in coal cleaning and combustion technology, State-Key Laboratory in Coal Chemistry, Chinese Academy of Science, Taiyuan, China, May 20, 2002. (Invited)

10 Xu, Z., Oil sands: Alberta treasure, Graduate Student Seminar series, Department of Chemical Engineering, Queens' University, Kingston, ON, Canada, March 21, 2002. (Invited)

9 Xu, Z., Atomic force microscopic study of colloidal forces, Graduate Student Seminar series, State-Key Laboratory in Colloidal and Interfacial Chemistry, Shandong University, Jinan, People's Republic of China, December 2, 2001. (Invited)

8 Liu, J. and Z. Xu, Study of slime-coatings by electrophoretic mobility distribution measurement, INCO Research, Inc., Mississauga, ON, Canada, August 24, 2001. (Invited)

7 Xu, Z., Gu, Y. and J. Zhu, Engineering of magnetic nanoparticles for bioseparation applications, 2001s' International Symposium on Nano Materials Technology, Beijing, China, July 4, 2001. (Invited)

6 Zhu, J. and Z. Xu, Recovery of metal ions using functionalised mesoporous magnetite/silica composites, Symposium on Recycling, 2001 SME Annual Meeting, Denver, CO, USA February 28, 2001. (Invited)

5 Xu, Z., Engineering of magnetic nanocomposites for bio and environmental applications, Brockhouse Institute for Material Research Seminar Series, McMaster University, Hamilton, ON, Canada, February 19, 2001. (Invited)

4 Xu, Z., In situ spectroelectrochemistry and STM, Workshop on the Application of Surface Science to Mineral Processing Research, UBC, Vancouver, BC, May 11-12, 2000. (Invited)

3 Xu, Z., Interfacial phenomena in primary oil recovery, Applications of Microgravity Sciences in Oil Recovery Workshop, Montreal, QC, Canada, June 21, 1999. (Invited)

2 Z. Xu, Surface engineering of nanosize supermagnetic particles for bio- and environmental applications, 3rd Annual Materials Symposium, University of Alberta, Edmonton, AB, Canada, April 28, 1997. (Keynote)

1 Xu, Z., Liu, Q. and J.A. Finch, Engineering of magnetic nanocomposites for biological and environmental applications, Composites at Lake Louise '97: Design for Performance, Lake Louise, AB, October 12-17, 1997. (Keynote)

Other Technical Conference Presentations since 1997:

100 Masliyah, J. and Z. Xu, Oil sands tailings: A challenge, 65PthP Canadian Chemical Engineering Conference, Calgary, AB, Canada, October 4-7, 2015.

99 Hosseininejad, S., Hayes, R.E. and Z. Xu, CFD modeling of bubble interactions in pipe flow using Eulerian and Lagrangian approaches, 65PthP Canadian Chemical Engineering Conference, Calgary, AB, Canada, October 4-7, 2015.

98 Zhang, Y., Xu, Z. and Q. Zhao, Oil sands processability analysis using symbolic regression, 65PthP Canadian Chemical Engineering Conference, Calgary, AB, Canada, October 4-7, 2015.

97 Chao, H., Tang, Y., Li, Z., Liu, Q. and Z. Xu, Design, synthesis and application of temperature switchable block co-polymers to oil sands extraction, 65th Canadian Chemical Engineering Conference, Calgary, AB, Canada, October 4-7, 2015.

96 Zhen, N., Li, Z, and Z. Xu, Demulsification performance of ethylene oxide/propylene oxide copolymer at elevated temperature/pressure studied by focused beam reflectance measurement, 65th Canadian Chemical Engineering Conference, Calgary, Alberta, October 4-7, 2015.

95 Liang, C. Liu, Q. and Z. Xu, Magnetic demulsifier nanoparticles using cellulosic derivatives, 65th Canadian Chemical Engineering Conference, Calgary, AB. Canada, October 4-7, 2015.

94 Wang, C., Han, C., Liu, Q. and Z. Xu, Role of pre-conditioning cationic Zetag® flocculant in enhancing MFT flocculation, 65th Canadian Chemical Engineering Conference, Calgary, AB, Canada, October 4-7, 2015.

93 Yan, L., Xu, Z. and J. Masliyah, Adsorption of carboxymethyl cellulose on talc basal and edge surfaces probed by atomic force microscopy, IMPC 2014, Santiago, Chile, October 20-24, 2014.

92 Bisson, T., Xu, Z., Zhou, Z., Liu, X. and M. Xu, Removal of Hg0 and NO by novel Ag-VR2ROR5 Rchabazite catalytic sorbent, 64PthP Canadian Chemical Engineering Conference, Niagara Falls, ON, Canada, October 19-22, 2014.

91 Chen, T., F. Lin, Xu, Z., Effect of salinity on the warm-water based processing of oil sands, 11th Annual Canadian Mineral Processors Conference, Fort McMurray, AB, Canada, October 8, 2014.

90 Lin, F., He, L., Primkulov, B. and Z. Xu, Dewetting dynamics of two-liquid systems: a micro-scale study, 88PthP ACS Colloid and Surface Science Symposium, University of Pennsylvania, Philadelphia, PA, USA, June 22-25, 2014.

89 Li, Z., Sjøblom, J., Liu, Q., Xu, Z., Stabilizing asphaltenes with dodecyl benzene sulfonic acid, Joint Industry Program Meeting, Osnabrück, Germany, June, 4, 2014.

88 Pensini, E., Harbottle, D., Yang, F., Tchoukov, P., Li, Z., Xu, Z., Masliyah, J., Polymeric EO-PO demulsifier to break water-in-oil emulsions, Oil Sands 2014, Edmonton, AB, Canada, April 28-30, 2014.

87 Yang, F., Tchoukov, P., Dettman, H., Pensini, E., Dabros, T., Czarnecki, J., Xu, Z., Role of different asphaltene fractions in stabilization water-in-oil emulsions, Oil Sands 2014, Edmonton, AB, Canada, April 28-30, 2014. (Poster)

86 He, L., Lin, F., Xu, Z., Li, X., Sui, H., Mechanistic study on solvent-enhanced bitumen liberation from oil sands ores, Oil Sands 2014, Edmonton, AB, Canada, April 28-30, 2014. (Poster)

85 Chen, T., Lin, F., Xu, Z., Effect of salinity on the warm-water based processing of oil sands, Oil Sands 2014, Edmonton, AB, Canada, April 28-30, 2014. (Poster)

84 Lin, F., He, L., Hou, J., Masliyah, J., Xu, Z., Understanding the role of demulsifier in processing of mineable oil sands at ambient temperature using aqueous-nonaqueous extraction process, Oil Sands 2014, Edmonton, AB, Canada, April 28-30, 2014.

83 Liang, Y., Pensini, E., Harbottle, D., Xu, Z., Understanding demulsification mechanisms of water-in-oil emulsions by ethylcellulose-rheological properties and film morphology, Oil Sands 2014, Edmonton, AB, Canada, April 28-30, 2014. (Poster)

82 Li, Z., Xu, Z., Aggregation of asphaltenes from Athabasca Oil Sands, Oil Sands 2014, Edmonton, AB, Canada, April 28-30, 2014. (Poster)

81 Tchoukov, P., Harbottle, D., Yang, F., Czarnecki, J., Dabros, T., Xu, Z., A possible stabilization mechanism of water-in-crude oil emulsions: Thin liquid film and interfacial shear rheology study, Oil Sands 2014, Edmonton, AB, Canada, April 28-30, 2014.

80 Xu, Z., Harbottle, D., Moorthy, K., Tchoukov, P., Petroleum emulsion stability governed by interfacial rheological properties, 247PthP ACS National Meeting, Dallas, TX, USA, March 16-20, 2014.

79 Arguelles-Vivas, F., Bobicki, E., Irfan, M. Liu, Q., Babadagli, T., Bisson, and Z. Xu, Understanding CO2 storage under geological storage conditions, 2014 SME Annual Meeting & Exhibit, Salt Lake City, UT, USA, February 23-26, 2014.

78 Xu, Z., Zhou, Z., Wang, L., Liu, Q., Masliyah, J., Xiao, N., Liu, Q. and R. Chi, Application of reactive oil bubble flotation technology to rare earth mineral flotation, MS&T'13, Montreal, QC, Canada, October 27-31, 2013.

77 Xu, Z., Klein, C., Osborn, I., Kaura, A. and D. Harbottle, Creating non-segregating tailings by activated sand particles, 63PrdP Canadian Chemical Engineering Conference, Fredericton, NB, Canada, October 20-23, 2013.

76 Yan, L., Masliyah, J., and Z. Xu, Study anisotropic platy minerals from direct force measurement using AFM, 63PrdP Canadian Chemical Engineering Conference, Fredericton, NB, Canada, October 20-23, 2013.

75 Xu, Z., Lin F., He L., Masliyah J., Hybrid bitumen extraction fundamentals, 10th Alberta Canadian Mineral Processors Conference, Fort McMurray, AB, Canada, October 3, 2013.

74 Kuznicki, N., Krasowska, M., Sellaperumage, P. M. F., Xu, Z., Masliyah, J., Ralston, J. and M. N. Popescu, Cascade partial coalescence of a rising oil droplet at an oil-electrolyte interface, ECIS 2013 - 27th Conference of European Colloid and Interface Society, Sofia, Bulgaria, September 1-6, 2013.

73 Tchoukov, P., Yang, F., Harbottle, D., Czarnecki, J., Dabros, T. and Z. Xu, Interfacial shear rheology and thin liquid film study of water-in-crude oil emulsions, ECIS 2013 - 27th Conference of European Colloid and Interface Society , Sofia, Bulgaria, September 1-6, 2013.

72 Xu, Z., Moorthy, K., Wang, L., Liu, Q., Masliyah, J. and P. Tchoukov, Bridge between drop coalescence and interfacial rheology, Petrophase 2013, Rueil-Malmaison, France, June 10-13, 2013.

71 Alagha, L., Wang, S., Yan, L., Xu, Z. and J. Masliyah, Probing polymer adsorption on anisotropic surfaces using QCM-D, 3PrdP Chinese QCM-D Users Workshop, Beijing, China, May 30-31, 2013.

70 Xu, Z., Yan, L., Alagha, L. and J. Masliyah, Probing anisotropic surface characteristics of clay minerals by atomic force microscope, CONRAD Oilsands Clay Conference, Edmonton, AB, February 20-21, 2013.

69 Kuznicki, N., Krasowska, M., Sellaperumage, P.M.F., Xu, Z., Masliyah, J., Ralston J. and M.N. Popescu, Surface potential bounds inferred from a cascade-partial coalescence phenomenon, ACIS 2013 Australia Colloid & Interface Symposium, Noosa, Australia, February 3-7, 2013.

68 Liang, C., Peng, J., Harbottle, D., Liu, Q., Xu, Z. and J. Masliyah, Dewatering emulsions using magnetic particles functionalized with cellulose, International Conference on Colloids and Complex Fluids: Challenges and Opportunities, Rueil-Malmaison, France, October 17-19, 2012.

67 Alagha, L., Wang, S., Xu, Z. and J. Masliyah, Adsorption kinetics of polyacrylamide-based polymers on kaolinite studied by quartz crystal microbalance, International Conference on Colloids and Complex Fluids: Challenges and Opportunities, Rueil-Malmaison, France, October, 17-19, 2012. (Poster)

66 Harbottle, D., Moorthy, K., Wang, L., Yang, F., Tchoukov, P., Masliyah, J., and Z. Xu, Interfacial rheology and its role in the stability of water-oil interfaces, 62nd CSChE Conference, Vancouver, BC, Canada, October 14-17, 2012.

65 Li, H., Xu, Z., Liu, Q., Afacan, A., Harbottle, D. and J. Masliyah, On line observation of heterogeneous nucleation on a bitumen surface under hydrodynamic conditions, 62nd CSChE Conference, Vancouver, BC, Canada, October 14-17, 2012.

64 Shahalami, M., Wang, L., Masliyah, J., Xu, Z., Wu, Ch. and D. Y. C. Chan, Study in dynamic forces between an air bubble and a hydrophilic glass surface with the integrated thin film drainage apparatus (ITFDA), 62nd CSChE Conference, Vancouver, BC, Canada, October 14-17, 2012.

63 Ghadirian, M., Mmbaga, J. P., Afacan, A., Hayes, R. E. and Z. Xu, A robust model for a hydrocyclone: Methodology and application, 62nd CSChE Conference, Vancouver, BC, Canada, October 14-17, 2012.

62 Curran M., Tamiz Bakhtiari, M., Zhu, Q., Harbottle, D., Xu, Z., Liu, Q., Masliyah, J., Spence, J., Siy, R. and S. Ng, Effect of caustic addition on the processing of oil sands, 62nd CSChE Conference, Vancouver, BC, Canada, October 14-17, 2012.

61 Zhang, Y., Zhao, Q. and Z. Xu, Understanding processability of oil sands ores using principal component analysis and support vector machine, 62nd CSChE Conference, Vancouver, BC, Canada, October 14-17, 2012.

60 Madjlessikupai, M., Harbottle, D., Xu, Z. and J. Masliyah, Characterization of rag-forming solids, Oil Sands 2012 Conference, Edmonton, AB, Canada, August 28-30, 2012.

59 Liang, C., Liu, Q. and Z. Xu, Stabilizing temporary emulsions using switchable wetting particles, Oil Sands 2012 Conference, Edmonton, AB, Canada August28-30, 2012.

58 Curran, M., Tamiz Bakhtiari, M., Zhu, Q., Harbottle, D., Spence, J., Siy, R., Ng, S., Liu, Q.X., Masliyah, J. and Z. Xu, Role of caustic in processing of oil sands, Oil Sands 2012 Conference, Edmonton, AB, Canada, August 28-30, 2012.

57 Klein, C., Harbottle, D., Alagha, L. and Z. Xu, Effect of residual bitumen on polymer-based flocculation of mature fine tailings, Oil Sands 2012 Conference, Edmonton, AB, Canada, August 28-30, 2012.

56 Tchoukov, P., Yang, F., Xu, Z., Dabros, T., Czarnecki, J. and J. Sjoblom, Role of asphaltenes in stabilizing w/o emulsions-thin liquid film study, 19PthP International Symposium on Surfactants in Solutions (SIS2012), Edmonton, AB, Canada, June 24-28, 2012.

55 Tamiz Bakhtiari, M., Zhu, Q., Curran, M., Harbottle, D., Liu, Q., Xu, Z. and J. Masliyah, Effect of water chemistry on the processing performance of oil sands ores, 95PthP Canadian Chemistry Conference, Calgary, AB, Canada, May 26-30, 2012.

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University Teaching Portfolio

Course number	Course Title	Affiliation
Core Chemical and Materials Engineering courses		
Ch E 265	Process Analysis	U of A
Mat E 331/306-341B	Introduction to Mineral Processing	U of A/McGill
306-317A	Materials Characterization	McGill
CME 422	Interfacial Engineering in Mineral Processing	U of A
Ch E 436	Colloids and Surfaces	U of A
Mat E 433	Applied Surface Chemistry in Minerals and Materials Processing	U of A
Advanced Engineering courses		
Ch E 617	Colloids and Interfaces	U of A
Ch E 534	Fundamentals in Oil Sands Engineering	U of A
Mat E 633	Surface Chemistry in Minerals and Materials Processing	U of A
306-546	Interfacial Phenomena in Engineering	McGill
Laboratory courses		
306-250A	Introduction to Extraction Metallurgy (lab-data analysis)	McGill
Ch E 531	Chemical Engineering Laboratory I (lab-data analysis and technical writing)	U of A
Technical Presentation courses		
Ch E 481	Colloquium I, non-technical	U of A
Ch E 483	Colloquium II, Technical	U of A
Ch E 632	Graduate Seminar	U of A