Alexander Rowland Lowe: Adjunkt Uniwersytet Śląski

Research Experience:

My research stems from fundamental concepts in chemistry and chemical equilibrium. Particularly how pressure and temperature force changes in chemical equilibria and molecular structure. My current research projects include

Education:

Doctorate de Chemie Physique, Université Clermont-Auvergne, France 2016-2013

Supervisors: Karine Ballerat-Busserolles & Jean-Yves Coxam

Thesis: Demixing Alkyl piperidines for CO_2 capture: A thermodynamic approach

Masters of Science, University of Guelph , Canada 2013-2010

Supervisor: Peter Tremaine

Thesis: Measuring the thermodynamic properties of adenine; towards a model for the origins of life

Bachelors of Science (Honours), Memorial University, Canada 2010-2005

Supervisor: David Thompson

Thesis: Metal-Oxide Supported Photoredox Assemblies: Use for Synthesis

Teaching Experience

Lecturing Uniwersytet Śląski w Katowicach:

Doctoral School: Academic English

(Graduate / Masters Students) Cycle 2 Students: English in Chemistry

(Undergraduate / Bachelors) Cycle 1 Students: Special Topics Communication in Chemistry

Lab teaching assistant University of Guelph:

Chemistry 1040

Physical chemistry

Analytical chemistry

Lab teaching assistant Memorial University:

Chemistry 1050

Awards

2023: Award from the Rectors Office from Uniwersytet Śląski.

Research Articles (Most Recent First)

(1) Merchiori, S.; Le Donne, A.; Littlefair, J. D.; **Lowe, A. R.**; Yu, J.-J.; Wu, X.-D.; Li, M.; Li, D.; Geppert-Rybczyńska, M.; Scheller, L.; Trump, B. A.; Yakovenko, A. A.; Zajdel, P.; Chorążewski, M.; Grosu, Y.; Meloni, S. Mild-Temperature Supercritical Water Confined in Hydrophobic Metal–Organic Frameworks. *Journal of the American Chemical Society* **2024**, *146* (19), 13236–13246. https://doi.org/10.1021/jacs.4c01226.

(2) **Lowe, A. R**.; Ślęczkowski, P.; Arkan, E.; Le Donne, A.; Bartolomé, L.; Amayuelas, E.; Zajdel, P.; Chorążewski, M.; Meloni, S.; Grosu, Y. Exploring the Heat of Water Intrusion into a Metal–Organic Framework by Experiment and Simulation. *ACS Applied Materials & Interfaces* **2024**, *16* (4), 5286–5293. https://doi.org/10.1021/acsami.3c15447.

(3) Bartolomé, L.; Anagnostopoulos, A.; **Lowe, A. R.**; Ślęczkowski, P.; Amayuelas, E.; Le Donne, A.; Wasiak, M.; Chorążewski, M.; Meloni, S.; Grosu, Y. Tuning Wetting–Dewetting Thermomechanical Energy for Hydrophobic Nanopores via Preferential Intrusion. *The Journal of Physical Chemistry Letters* **2024**, *15* (4), 880–887. https://doi.org/10.1021/acs.jpclett.3c03330.

(4) Zajdel, P.; Madden, D. G.; Babu, R.; Tortora, M.; Mirani, D.; Tsyrin, N. N.; Bartolomé, L.; Amayuelas, E.; Fairen-Jimenez, D.; **Lowe, A. R.**; Chorążewski, M.; Leao, J. B.; Brown, C. M.; Bleuel, M.; Stoudenets, V.; Casciola, C. M.; Echeverría, M.; Bonilla, F.; Grancini, G.; Meloni, S.; Grosu, Y. Turning Molecular Springs into Nano-Shock Absorbers: The Effect of Macroscopic Morphology and Crystal Size on the Dynamic Hysteresis of Water Intrusion–Extrusion into-

from Hydrophobic Nanopores. *ACS Applied Materials & Interfaces* **2022**, *14* (23), 26699–26713. https://doi.org/10.1021/acsami.2c04314.

(5) Grzybowski, A.; **Lowe, A. R.**; Jasiok, B.; Chorążewski, M. Volumetric and Viscosity Data of Selected Oils Analyzed in the Density Scaling Regime. *Journal of Molecular Liquids* **2022**, *353*, 118728. https://doi.org/10.1016/j.molliq.2022.118728.

(6) Luo, D.; Peng, Y.-L.; Xie, M.; Li, M.; Bezrukov, A. A.; Zuo, T.; Wang, X.-Z.; Wu, Y.; Li, Y. Y.; **Lowe, A. R.**; Chorążewski, M.; Grosu, Y.; Zhang, Z.; Zaworotko, M. J.; Zhou, X.-P.; Li, D. Improving Ethane/Ethylene Separation Performance under Humid Conditions by Spatially Modified Zeolitic Imidazolate Frameworks. *ACS Applied Materials & Interfaces* **2022**, *14* (9), 11547–11558. https://doi.org/10.1021/acsami.2c00118.

(7) Zajdel, P.; Chorążewski, M.; Leão, J. B.; Jensen, G. V.; Bleuel, M.; Zhang, H.-F.; Feng, T.; Luo, D.; Li, M.; **Lowe, A. R.**; Geppert-Rybczynska, M.; Li, D.; Grosu, Y. Inflation Negative Compressibility during Intrusion–Extrusion of a Non-Wetting Liquid into a Flexible Nanoporous Framework. *The Journal of Physical Chemistry Letters* **2021**, *12* (20), 4951–4957. https://doi.org/10.1021/acs.jpclett.1c01305.

(8) Chorążewski, M.; Zajdel, P.; Feng, T.; Luo, D.; **Lowe, A. R.**; Brown, C. M.; Leão, J. B.; Li, M.; Bleuel, M.; Jensen, G.; Li, D.; Faik, A.; Grosu, Y. Compact Thermal Actuation by Water and Flexible Hydrophobic Nanopore. *ACS Nano* **2021**, *15* (5), 9048–9056. https://doi.org/10.1021/acsnano.1c02175.

(9) **Lowe, A. R.**; Wong, W. S. Y.; Tsyrin, N.; Chorążewski, M. A.; Zaki, A.; Geppert-Rybczyńska, M.; Stoudenets, V.; Tricoli, A.; Faik, A.; Grosu, Y. The Effect of Surface Entropy on the Heat of Non-Wetting Liquid Intrusion into Nanopores. *Langmuir* **2021**, *37* (16), 4827–4835. https://doi.org/10.1021/acs.langmuir.1c00005.

(10) Tortora, M.; Zajdel, P.; **Lowe, A. R.**; Chorążewski, M.; Leão, J. B.; Jensen, G. V.; Bleuel, M.; Giacomello, A.; Casciola, C. M.; Meloni, S.; Grosu, Y. Giant Negative Compressibility by Liquid Intrusion into Superhydrophobic Flexible Nanoporous Frameworks. *Nano Letters* **2021**, *21* (7), 2848–2853. https://doi.org/10.1021/acs.nanolett.0c04941.

(11) Postnikov, E. B.; Jasiok, B.; Melent'ev, V. V.; Ryshkova, O. S.; Korotkovskii, V. I.; Radchenko, A. K.; **Lowe, A. R.**; Chorążewski, M. Prediction of High Pressure Properties of Complex Mixtures without Knowledge of Their Composition as a Problem of Thermodynamic Linear Analysis. *Journal of Molecular Liquids* **2020**, *310*.

(12) **Lowe, A. R.**; Jasiok, B.; Melent'ev, V. V.; Ryshkova, O. S.; Korotkovskii, V. I.; Radchenko, A. K.; Postnikov, E. B.; Spinnler, M.; Ashurova, U.; Safarov, J.; Hassel, E.; Chor??ewski, M. High-Temperature and High-Pressure Thermophysical Property Measurements and Thermodynamic Modelling of an International Oil Standard: RAVENOL Diesel Rail Injector Calibration Fluid. *Fuel Processing Technology* **2020**, *199*.

(13) Polak, J.; Bartoszek, M.; **Lowe, A. R.;** Postnikov, E. B.; Chorążewski, M. Antioxidant Properties of Various Alcoholic Beverages: Application of a Semiempirical Equation. *Analytical Chemistry* **2019**, *92* (2), 2145–2150. https://doi.org/10.1021/acs.analchem.9b04692.

(14) **Lowe, A.**; Tsyrin, N.; Chorążewski, M.; Zajdel, P.; Mierzwa, M.; Leão, J. B.; Bleuel, M.; Feng, T.; Luo, D.; Li, M.; Li, D.; Stoudenets, V.; Pawlus, S.; Faik, A.; Grosu, Y. Effect of Flexibility and Nanotriboelectrification on the Dynamic Reversibility of Water Intrusion into Nanopores: Pressure-Transmitting Fluid with Frequency-Dependent Dissipation Capability. *ACS Applied Materials & Interfaces* **2019**, *11* (43), 40842–40849. https://doi.org/10.1021/acsami.9b14031.

(15) Dzienia, A.; Koperwas, K.; Tarnacka, M.; Chorążewski, M.; Postnikov, E. B.; **Lowe, A. R.**; Kaminski, K.; Paluch, M. Direct Insight into the Kinetics of the High-Pressure Step-Growth Polymerization of DGEBA/Aniline Model System. *Polymer* **2019**, *172*, 322–329.

(16) Jasiok, B.; **Lowe, A. R.**; Postnikov, E. B.; Feder-Kubis, J.; Chorążewski. High-Pressure Densities of Industrial Lubricants and Complex Oils Predicted by the Fluctuation Theory-Based Equation of State. *Industrial and Engineering Chemistry Research* **2018**, *57* (34), 11797–11803.

(17) Coulier, Y.; **Lowe, A. R.**; Coxam, J.-Y.; Ballerat-Busserolles, K. Thermodynamic Modeling and Experimental Study of CO<inf>2</Inf> Dissolution in New Absorbents for Post-Combustion CO<inf>2</Inf> Capture Processes. *ACS Sustainable Chemistry and Engineering* **2018**, *6* (1), 918–926.

(18) **Lowe, A. R.**; Cox, J. S.; Tremaine, P. R. Thermodynamics of Aqueous Adenine: Standard Partial Molar Volumes and Heat Capacities of Adenine, Adeninium Chloride, and Sodium Adeninate from T = 278.15 K to 393.15 K. *Journal of Chemical Thermodynamics* **2017**, *112*, 129–145.

(19) Coulier, Y.; **Lowe, A. R.**; Moreau, A.; Ballerat-Busserolles, K.; Coxam, J.-Y. Liquid-Liquid Phase Separation of {amine ? H<inf>2</inf>O ? CO<inf>2</Inf>} Systems: New Methods for Key Data. *Fluid Phase Equilibria* **2017**, *431*, 1–7.

(20) Coulier, Y.; **Lowe, A.**; Tremaine, P. R.; Coxam, J.-Y.; Ballerat-Busserolles, K. Absorption of CO<inf>2</Inf> in Aqueous Solutions of 2-Methylpiperidine: Heats of Solution and Modeling. *International Journal of Greenhouse Gas Control* **2016**, *47*, 322–329.

(21) Ballerat-Busserolles, K.; **Lowe, A. R.**; Coulier, Y.; Coxam, J.-Y. Thermodynamic Approach of CO<inf>2</Inf> Capture, Combination of Experimental Study and Modeling. *Acid Gas Extraction for Disposal and Related Topics* **2016**, 29–37.

(22) Ballerat-Busserolles, K.; **Lowe, A. R.**; Coulier, Y.; Coxam, J.-Y. Calorimetry in Aqueous Solutions of Demixing Amines for Processes in CO<inf>2</Inf> Capture. *Acid Gas Extraction for Disposal and Related Topics* **2016**, 69–80.

(23) Coulier, Y.; Ballerat-Busserolles, K.; Mesones, J.; **Lowe, A.**; Coxam, J.-Y. Excess Molar Enthalpies and Heat Capacities of {2-Methylpiperidine-Water} and { N-Methylpiperidine-Water} Systems of Low to Moderate Amine Compositions. *Journal of Chemical and Engineering Data* **2015**, *60* (6), 1563–1571.