

## CURRICULUM VITAE OF MATTHEW STEELE-MACINNIS

Assistant Professor of Earth and Atmospheric Sciences  
The University of Alberta  
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### EDUCATION

**2013 PhD** Geosciences, *Virginia Tech*

Dissertation: Thermodynamics of geologic fluids

**2008 BSc (Hons.)** Earth Sciences (minor in mathematics), *Memorial University*

### RESEARCH INTERESTS

*Fluids* play a vital role in essentially all geologic environments and processes, and are the principal media of heat and mass transfer in the Earth. I combine experimental, theoretical and analytical methods to understand the properties and roles of aqueous fluids, silicate melts and other geofluids in Earth and planetary systems.

### APPOINTMENTS

**2017 –** Assistant Professor, Dept. of Earth and Atmospheric Sciences,  
The University of Alberta  
**2015 – 2017** Assistant Professor, Dept. of Geosciences, The University of Arizona  
**2013 – 2015** Marie Curie postdoctoral fellow, Inst. f. Geochemie und Petrologie, ETH Zürich  
**2013 – 2015** Associate, Department of Geosciences, The University of Arizona  
**2012 – 2013** Research/teaching assistant, Department of Geosciences, Virginia Tech  
**2008 – 2012** ICTAS Doctoral Scholar, Department of Geosciences, Virginia Tech  
**2010 – 2011** Visiting Researcher, GeoForschungsZentrum (GFZ) Potsdam  
**2007 – 2008** Teaching Assistant, Department of Earth Sciences, Memorial University  
**2007 – 2008** Research Assistant, MUN/CREAIT Laser Ablation ICPMS Laboratory  
**2007** Summer Intern, basin-centered gas group, Shell Canada  
**2006** Field Assistant, Geologic Survey of Newfoundland

### FUNDING HISTORY

**2017-2021** NSF-EAR-CH grant# **1653977**, "**CAREER**: Mass Transport and Fluid-Rock Reactions Driven by Multicomponent Aqueous Fluids."  
**Sole PI. [\$506,961]**  
**2016-2018** American Chemical Society Petroleum Research Fund grant# 56766-DNI2,  
"Fluid+thermal history reconstruction of basins and fault zones, from combined fluid-inclusion and (U+Th)/He analyses applied to hematite."  
**Sole PI. [\$110,000]**

- 2013-2015** Marie Curie International Incoming Fellowship *FLUIDEQ* "A new equation of state for solutes in high-temperature fluids" [€184,709.40]  
**2013** Geochemical Society Travel Grant [\$700]  
**2013** Virginia Tech Graduate Student Assembly Travel Grant [\$450]  
**2011** Geochemical Society Travel Grant [\$1000]  
**2011** Virginia Tech Graduate Student Assembly Travel Grant [\$260]

### **SYNCHROTRON BEAMTIME**

- 2017** Advanced Photon Source, proposal #46509: "Solubility and speciation of iron in magmatic-hydrothermal fluids." PI. 9 shifts. March 14-16, 2017.

### **AWARDS AND FELLOWSHIPS**

- 2017** Hisashi Kuno Award [Volcanology, Geochemistry, and Petrology Section of the American Geophysical Union]  
**2017** NSF CAREER award  
**2014** Best Reviewer Award for the journal *Geofluids* in 2013  
**2013** College of Science 2013 Outstanding Doctoral Student, Virginia Tech  
**2013** Department of Geosciences Outstanding Service Recognition Award  
**2013** Marie Curie Postdoctoral Fellowship  
**2013** ETH Postdoctoral Fellowship [declined, in order to accept Marie Curie Fellowship]  
**2008 – 2012** ICTAS Doctoral Scholarship, Virginia Tech  
**2008** NSERC – Undergraduate Student Research Award [declined, in order to accept ICTAS doctoral scholarship]  
**2008** PEGNL Scholarship: Highest honor for undergraduate geoscientists in Newfoundland (Canada)  
**2008** University Medal for Academic Excellence in Geoscience, Lou Visentin Award  
**2008** Centenary of Responsible Government Scholarship, Dr. Byron Hynes Memorial Scholarship, Eric A. Swanson Scholarship in Earth Sciences, Ethel H. Judson Memorial Scholarship  
**2007** Centenary of Responsible Government Scholarship, Eric A. Swanson Scholarship in Earth Sciences, Memorial University of Newfoundland Endowment Scholarship, Noranda Scholarship  
**2007** Society of Exploration Geophysicists, Canadian "Challenge Bowl" champion team  
**2006** O.C. Irwin Memorial Scholarship in Earth Science, Williams Science Scholarship  
**2004 – 2008** Four consecutive academic years on the Deans' List (for maintaining GPA of 4.0)  
**2001** Long Course Champion, Newfoundland and Labrador Provincial Orienteering Championships, Oct. 21, 2001, Cape St. Francis  
**2001** Duke of Edinburgh's Award, Bronze

### **TEACHING EXPERIENCE**

- 2017** Physical Geology [Overall TCE scores 4.3 out of 5.0]

- 2016** Introduction to Geochemistry [Overall TCE scores 4.5 out of 5.0]  
Graduate seminar on Fluids in the Earth [Overall TCE scores 4.8 out of 5.0]
- 2015** Introduction to Geochemistry (co-taught with J. Quade) [Overall TCE scores 4.7 out of 5.0]
- 2015** Fluid and Melt Inclusions, Theory and Practice (ETH Zürich, co-taught with T. Driesner, P. Lecumberri-Sanchez & M. Wälle)
- 2013** Numerical Modeling of Ore-forming Hydrothermal Processes (ETH Zürich, co-taught with T. Driesner and P. Lecumberri-Sanchez)
- 2012** Mineralogy: Graduate Teaching Assistant, Virginia Tech [Overall SPOT scores 3.7 and 3.9 out of 4.0]
- 2008** Paleontology: Teaching Assistant, Memorial University
- 2007** Economic Mineral Deposits: Teaching Assistant, Memorial University

## **STUDENTS ADVISED**

### ***primary advisor***

- 2016 –** Hanna Brooks, MSc Geosciences, University of Arizona
- 2016 –** Jordan Jensen, (joint with P. Reinert), MSc Geosciences, University of Arizona
- 2015 –** Wyatt Bain, PhD Geosciences, University of Arizona
- 2015 – 2017** Drew Barkoff, MSc Geosciences, University of Arizona

### ***graduate committee member***

- 2016 – 2017** D. Matthew Sublett, PhD Geosciences, Virginia Tech
- 2015 – 2016** Jennifer M. Dabbs, MSc Geosciences, University of Arizona
- 2016 – 2017** Caleb King, PhD Geosciences, University of Arizona
- 2015 – 2017** Simone E. Runyon, PhD Geosciences, University of Arizona
- 2015 –** Jack V. Gibbons
- 2016 –** Jason Burwell
- 2016 –** Roy Greig

### ***undergraduate students***

- 2017 –** Paulo Coutinho
- 2017 – 2017** Michael Decindis
- 2016 – 2017** Luke Berry
- 2016 – 2016** Raquel Guimaraes

## **SERVICE**

### ***extramural***

- 2017 –** Co-convenor, session V029. Spectroscopic analyses of mineral inclusions for petrologic investigation. American Geophysical Union Fall Meeting 2017 (New Orleans)
- 2017 –** Co-convenor, session T152. Fluids and Melts in Geologic Systems. Geological Society of America Annual Meeting 2017 (Seattle)
- 2017 –** Co-convenor, session 06g: Fluid, Mineral and Melt Inclusions as Petrologic Indicators to Unravel Geologic Processes. Goldschmidt 2017 (Paris)
- 2016 –** Associate Editor, *The Canadian Mineralogist*
- 2015 –** Ad hoc proposal reviewer for the US National Science Foundation (NSF) 1 proposal in 2015

1 proposal in 2016  
3 proposals in 2017

**2012 – 2014** Associate Editor, *Central European Journal of Geosciences*

**2011 –** Journal reviewer, *American Journal of Science*; *American Mineralogist*; *Contributions to Mineralogy and Petrology*; *Environmental Science & Technology*; *European Journal of Mineralogy*; *Geochemistry, Geophysics, Geosystems (G<sup>3</sup>)*; *Geochimica et Cosmochimica Acta*; *Geofluids*; *Journal of Geochemical Exploration*; *Journal of Petrology*; *Mineralium Deposita*; *Minerals*; *Nature Geosciences*; *Ore Geology Reviews*; *Periodico di Mineralogia*; *Tectonophysics*; *Turkish Journal of Earth Sciences*. Awarded the "Best Reviewer Award" for *Geofluids* in 2013.

### ***intramural***

**2016 – 2017** UA Dept. of Geosciences Peer Performance Evaluation Committee member

**2015 – 2017** UA Dept. of Geosciences Graduate Admission Committee member

**2015 – 2016** UA Dept. of Geosciences Colloquium Series co-organizer (with J. Tierney)

### **WORKSHOPS**

**2016** Participant, *Early Career Geoscience Faculty Workshop: Teaching, Research and Managing Your Career* workshop organized by the National Association of Geoscience Teachers ("On the Cutting Edge"). University of Maryland, July 24-29, College Park.

**2016** Lecturer, short course on *Short Course on Cu, Mo, and Au Porphyry Deposits*, University of Arizona, Dec. 6-15, Tucson. Lecture on fluid inclusions in ore deposits.

**2015** Lecturer, short course on *Porphyry, IOCG, and Alkaline Cu-Au Deposits*, University of Arizona, Dec. 8-17, Tucson. Lecture on fluid inclusions in ore deposits.

**2014** Participant, short course on *Transitions from porphyry to epithermal ore environments*, University of Geneva, Sept. 21<sup>st</sup>, Geneva.

**2014** Participant, Lowell Program in Economic Geology field course on *Ore Deposits Mapping*, August 28-September 6<sup>th</sup>, Yerington, NV.

**2014** Assistant organizer and participant, ETH Zürich field course on *Ore Deposits, Magmatism and Precambrian Geology of Finland* (led by K. Schlöglóvá and C.A. Heinrich), July 10-28<sup>th</sup>, Finland.

**2014** Participant in the 2014 Swiss *Journée Metallogénique*, March 14<sup>th</sup>, Geneva.

**2014** Participant, short course in *Hydrothermal modeling with CSMP++*, January 7-17<sup>th</sup>, Zürich.

**2013** Participant, Lowell Program in Economic Geology short course on *Porphyry Cu, Mo and Au*, December 3-12<sup>th</sup>, Tucson AZ.

**2013** Participant, 2013 Mineralogical Society of America short course on *Thermodynamics of Geothermal Fluids*, August 24-25<sup>th</sup>, Florence, Italy.

**2012** Participant, 2012 Gordon Research Conference on *Geochemistry of Mineral Deposits*, July 15-20<sup>th</sup>, Andover NH. Presented a poster entitled "Fluid inclusions in submarine hydrothermal systems and volcanogenic massive sulfide deposits."

**2010** Participant, 2010 EURISPET (European Intensive Seminars in Petrology) Zürich on *Experimental petrology and rock deformation*, Nov. 20-27<sup>th</sup>, Zürich. Presented a poster entitled "Quartz solubility and speciation in multi-component fluids."

### **INVITED PRESENTATIONS**

- 2017** Colloquium Series, Dept. of Earth and Atmospheric Sciences, *University of Alberta*, "Reconstructing physical and chemical conditions of ore formation, and using ore-forming conditions to reconstruct geologic processes" [hosted by S. Johnston]
- 2016** Colloquium Series (Geocheminar), Earth Planetary and Space Sciences, *University of California – Los Angeles*, "The Secret Life of Salts" [hosted by C.E. Manning]
- 2014** Brown bag seminar, Fluids and Mineral Deposits Group, *ETH Zürich*, "Salty fluids in hydrothermal systems: The fluid inclusion perspective" [hosted by T. Driesner]
- 2014** Invited presentation at the 24<sup>th</sup> V.M. Goldschmidt Conference, Sacramento CA., "Linking structural and thermodynamic properties of solutes in high-temperature fluids"
- 2013** Geosciences Colloquium Series, Department of Geosciences, *University of Arizona*, "Fluids in geologic systems: New insights into subduction zones, volcanoes and mineral deposits" [hosted by M. Barton]
- 2013** Brown bag seminar, Lowell Program in Economic Geology, *University of Arizona*, "Hydrothermal fluids in ore-forming systems: Theoretical, experimental and analytical approaches to submarine and terrestrial hydrothermal systems" [hosted by M. Barton]
- 2013** Geosciences Seminar, *University of Nevada - Las Vegas*, "Fluids in magmatic-hydrothermal ore-forming systems: New insights from experimental, analytical and theoretical studies" [hosted by J. Cline]
- 2010** Invited presentation, Fluids and Mineral Deposits Group, *ETH Zürich*, "Volumetric constraints on CO<sub>2</sub> storage in saline aquifers" [hosted by C.A. Heinrich]

## **PROFESSIONAL MEMBERSHIPS**

Arizona Geological Society, American Geophysical Union, Geological Society of America, Geological Association of Canada, Society of Economic Geologists, Geochemical Society, Mineralogical Association of Canada

## **PRESS**

- 2016** Article in *American Mineralogist* was featured in the "Notable Papers" section: [http://www.minsocam.org/MSA/Ammin/AM\\_Notable\\_Articles.html](http://www.minsocam.org/MSA/Ammin/AM_Notable_Articles.html)
- 2016** Article in *ChemPhysChem* was featured on the back cover of the journal: <http://onlinelibrary.wiley.com/doi/10.1002/cphc.201600406/full>
- 2015** Article in *Geology* was highlighted in the "News Releases" section: <http://www.geosociety.org/GSA/News/Releases/GSA/News/pr/2015/15-73.aspx>
- 2015** Article in *American Mineralogist* was featured in the "Highlights and Breakthroughs" section (highlight by J. Lowenstern): <http://dx.doi.org/10.2138/am-2015-5254>
- 2013** Virginia Tech newsletter: <http://www.vtnews.vt.edu/articles/2013/04/040213-gradschool-collegewinners.html>
- 2013** Virginia Tech Institute for Critical Technology and Applied Science (ICTAS) newsletter article: <http://www.ictas.vt.edu/communication/fullStory.php?id=90>
- 2013** Article in *Geochemistry, Geophysics, Geosystems (G<sup>3</sup>)* was featured in the "Editors' Highlights" section of that journal, as well as the Research Spotlight section of *Eos*: [doi:10.1002/2014EO170014](http://dx.doi.org/10.1002/2014EO170014)

**2012** Article in *Environmental Science & Technology* was featured in the "Editors' Choice" segment of the journal *Science*:  
[doi:10.1126/science.337.6101.1435-c](https://doi.org/10.1126/science.337.6101.1435-c)

## **PUBLICATIONS**

Citations: **578**; h-index: **15**; Google Scholar profile: [Matthew Steele-MacInnis](#)

\* denotes student author

## **Published/in press articles:**

- 38.** Barkoff, D.W.\*, Ashley, K.T., Steele-MacInnis, M. (2017) Pressures of skarn mineralization at Casting Copper, Nevada, USA, based on apatite inclusions in garnet. *Geology* **45**, 947-950. [doi:10.1130/G39177.1](https://doi.org/10.1130/G39177.1)
- 37.** Walter, B., **Steele-MacInnis**, M., Markl, G. (2017) Sulfate brines in fluid inclusions of hydrothermal veins: Compositional determinations in the system H<sub>2</sub>O-Na-Ca-Cl-SO<sub>4</sub>. *Geochimica et Cosmochimica Acta* **209**, 184-203. [doi:10.1016/j.gca.2017.04.027](https://doi.org/10.1016/j.gca.2017.04.027)
- 36.** **Steele-MacInnis**, M., Esposito, R., Moore, L.R., Hartley, M.E. (2017) Heterogeneously entrapped, vapor-rich melt inclusions record pre-eruptive volatile contents of magmas. *Contributions to Mineralogy and Petrology* **172**, 18. [doi:10.1007/s00410-017-1343-3](https://doi.org/10.1007/s00410-017-1343-3)
- 35.** Runyon, S.E.\*, **Steele-MacInnis**, M., Seedorff, E., Lecumberri-Sanchez, P., Mazdab, F.K. (2017) Coarse muscovite veins and alteration deep in the Yerington batholith, Nevada: Insights into fluid exsolution in the roots of porphyry copper systems. *Mineralium Deposita* **52**, 463-470. [doi:10.1007/s00126-017-0720-1](https://doi.org/10.1007/s00126-017-0720-1)
- 34.** Ashley, K.T., Barkoff, D.W.\*, **Steele-MacInnis**, M. (2017) Barometric constraints based on apatite inclusions in garnet. *American Mineralogist* **102**, 743-749. [doi:10.2138/am-2017-5898](https://doi.org/10.2138/am-2017-5898)
- 33.** Ashley, K.T., **Steele-MacInnis**, M., Bodnar, R.J., Darling, R.S. (2016) Mineral inclusion thermobarometry under fire: Reducing uncertainty from model estimates. *Geology* **44**, 699-702. [doi:10.1130/G38211.1](https://doi.org/10.1130/G38211.1)
- 32.** Chen, Y., Ge, Y., **Steele-MacInnis**, M., Zhou, Z. & Zhou, Y. (2016) Synthetic saline-aqueous and hydrocarbon fluid inclusions trapped in calcite at temperatures and pressures relevant to hydrocarbon basins: A reconnaissance study. *Marine and Petroleum Geology* **76**, 88-97. [doi:10.1016/j.marpetgeo.2016.05.015](https://doi.org/10.1016/j.marpetgeo.2016.05.015)
- 31.** Klyukin, Yu.I., Driesner, T., **Steele-MacInnis**, M., Bodnar, R.J. (2016) Effect of salinity on mass and energy transport by hydrothermal fluids in the critical region based on the physical and thermodynamic properties of H<sub>2</sub>O-NaCl. *Geofluids* **16**, 585-603. [doi:10.1111/gfl.12181](https://doi.org/10.1111/gfl.12181)
- 30.** **Steele-MacInnis**, M., Ridley, J., Lecumberri-Sanchez, P., Schlegel, T., Heinrich, C.A. (2016) Application of low-temperature microthermometric data for interpreting multicomponent fluid inclusion compositions. *Earth-Science Reviews* **159**, 14-35. [doi:10.1016/j.earscirev.2016.04.011](https://doi.org/10.1016/j.earscirev.2016.04.011)
- 29.** Esposito, R., Lamadrid, H., Redi D., **Steele-MacInnis** M., Bodnar R.J., Manning, C.E., De Vivo B., Cannatelli C., Lima A. (2016) Detection of liquid H<sub>2</sub>O in vapor bubbles in melt inclusions: Implications for magmatic fluid composition and volatile budgets of magmas? *American Mineralogist* **101**, 1691-1695. [doi:10.2138/am-2016-5689](https://doi.org/10.2138/am-2016-5689)

28. Reimer, J., **Steele-MacInnis**, M., Vogel, F. (2016) Speciation and Structural Properties of Hydrothermal Solutions of Sodium and Potassium Sulfate Studied by Molecular Dynamics Simulations. *ChemPhysChem* **17**, 1446-1453. [doi:10.1002/cphc.201600042](https://doi.org/10.1002/cphc.201600042).....[back cover, page 1540: [10.1002/cphc.201600406](https://doi.org/10.1002/cphc.201600406)]
27. Lecumberri-Sanchez, P., Steele-MacInnis, M., Weis, P., Driesner, T., Bodnar, R.J. (2015) Salt precipitation in magmatic-hydrothermal systems around upper-crustal plutons. *Geology* **43**, 1063-1066. [doi:10.1130/G37163.1](https://doi.org/10.1130/G37163.1)
26. **Steele-MacInnis**, M., Reimer, J., Bachmann, S. (2015) Hydrothermal properties of the COS/D2 water model: A polarizable charge-on-spring water model, at elevated temperatures and pressures. *RSC Advances* **5**, 75846 - 75856. [doi:10.1039/c5ra13495a](https://doi.org/10.1039/c5ra13495a)
25. Reimer, J., **Steele-MacInnis**, M., Wambach, J.M., Vogel, F. (2015) Ion association in hydrothermal sodium sulfate solutions studied by modulated FT-IR-Raman spectroscopy and molecular dynamics. *Journal of Physical Chemistry B* **119**, 9847-9857. [doi:10.1021/acs.jpcc.5b03192](https://doi.org/10.1021/acs.jpcc.5b03192)
24. Moore, L.R., Gazel, E., Tuohy, R., Lloyd, A., Esposito, R., **Steele-MacInnis**, M., Hauri, E.H., Wallace, P.J., Plank, T. & Bodnar, R.J. (2015) Bubbles matter: An assessment of the contribution of vapor bubbles to melt inclusion volatile budgets. *American Mineralogist* **100**, 806-823. [doi:10.2138/am-2015-5036](https://doi.org/10.2138/am-2015-5036)
23. **Steele-MacInnis**, M., Lecumberri-Sanchez, P. & Bodnar, R.J. (2015) Synthetic fluid inclusions XX. Critical  $PT_x$  properties of  $H_2O$ - $FeCl_2$  fluids. *Geochimica et Cosmochimica Acta* **148**, 50-61. [doi:10.1016/j.gca.2014.09.026](https://doi.org/10.1016/j.gca.2014.09.026)
22. Lecumberri-Sanchez, P., **Steele-MacInnis**, M. & Bodnar, R.J. (2015) Synthetic fluid inclusions XIX. Experimental determination of the vapor-saturated liquidus of the system  $H_2O$ - $NaCl$ - $FeCl_2$ . *Geochimica et Cosmochimica Acta* **148**, 34-49. [doi:10.1016/j.gca.2014.08.015](https://doi.org/10.1016/j.gca.2014.08.015)
21. Géli, L., Piau, J. M., Maury, V., Fitzenz, D., Dziak, R., Coutellier, Q., Henry, P., Broseta, D., **Steele-MacInnis**, M., Driesner, T. (2014) Seismic precursors linked to highly compressible fluids at oceanic transform faults. *Nature Geosciences* **7**, 757-761. [doi:10.1038/ngeo2244](https://doi.org/10.1038/ngeo2244).....[corrigendum: [doi:10.1038/ngeo2356](https://doi.org/10.1038/ngeo2356)]
20. Sides, I., Edmonds, M., MacLennan, J., Houghton, B., Swanson, D. & **Steele-MacInnis**, M.J. (2014) Magma mixing and high fountaining during the 1959 Kīlauea Iki eruption, Hawai'i. *Earth and Planetary Science Letters* **400**, 102-112. [doi:10.1016/j.epsl.2014.05.024](https://doi.org/10.1016/j.epsl.2014.05.024)
19. **Steele-MacInnis**, M. & Schmidt, C. (2014) Silicate speciation in  $H_2O$ - $Na_2O$ - $SiO_2$  fluids from 3 to 40 mol%  $SiO_2$ , to 600 °C and 2 GPa. *Geochimica et Cosmochimica Acta* **136**, 126-141. [doi:10.1016/j.gca.2014.04.009](https://doi.org/10.1016/j.gca.2014.04.009)
18. **Steele-MacInnis**, M. & Bodnar, R.J. (2014) Reply to the comment by R.J. Bakker on the paper "Effect of the vapor phase on the salinity of halite-bearing aqueous fluid inclusions" by M. Steele-MacInnis and R.J. Bodnar. *Geochimica et Cosmochimica Acta* **135**, 354-358. [doi:10.1016/j.gca.2014.02.030](https://doi.org/10.1016/j.gca.2014.02.030)
17. Ashley, K., **Steele-MacInnis**, M. & Caddick, M. (2014) *QuIB Calc*: A MATLAB® script for geobarometry based on Raman spectroscopy and elastic modeling of quartz inclusions in garnet. *Computers & Geosciences* **66**, 155-157. [doi:10.1016/j.cageo.2014.01.005](https://doi.org/10.1016/j.cageo.2014.01.005)
16. Ashley, K., Caddick, M., Steele-MacInnis, M.J., Bodnar, R.J., & Dragovic, B. (2014) Geothermobarometric history of subduction recorded by quartz inclusions in garnet. *Geochemistry, Geophysics, Geosystems (G<sup>3</sup>)* **15**, 350-360. [doi:10.1002/2013GC005106](https://doi.org/10.1002/2013GC005106)



15. Bodnar, R. J., Lecumberri-Sanchez, P., Moncada, D. & **Steele-MacInnis**, M. (2014) Fluid inclusions in hydrothermal ore deposits. In: Holland, H.D. and Turekian, K.K. (eds.), *Treatise on Geochemistry, Second Edition*, v. 13, pp. 119-142. Oxford: Elsevier. [doi:10.1016/B978-0-08-095975-7.01105-0](https://doi.org/10.1016/B978-0-08-095975-7.01105-0)
14. Bodnar, R.J., **Steele-MacInnis**, M., Capobianco, R., Rimstidt, J.D., Dillmore, R., Goodman, A. & Guthrie, G. (2013) PVTX Properties of H<sub>2</sub>O-CO<sub>2</sub>-“salt” at PTX conditions applicable to carbon sequestration in saline formations. In: DePaolo, D.J., Cole, D.R., Navrotsky, A. and Bourg, I.C. (eds.), *Geochemistry of Geologic CO<sub>2</sub> Sequestration. Reviews in Mineralogy and Geochemistry* **77**, 123-152. [doi:10.2138/rmg.2013.77.4](https://doi.org/10.2138/rmg.2013.77.4)
13. **Steele-MacInnis**, M. & Bodnar, R.J. (2013) Effect of the vapor phase on the salinity of halite-bearing aqueous fluid inclusions estimated from the halite dissolution temperature. *Geochimica et Cosmochimica Acta* **115**, 205-216. [doi:10.1016/j.gca.2013.04.009](https://doi.org/10.1016/j.gca.2013.04.009)
12. Schmidt, C., **Steele-MacInnis**, M., Watenphul, A. & Wilke, M. (2013) Calibration of zircon as a Raman spectroscopic pressure sensor to high temperatures and application to water-silicate melt systems. *American Mineralogist* **98**, 643-650. [doi:10.2138/am.2013.4143](https://doi.org/10.2138/am.2013.4143)
11. **Steele-MacInnis**, M., Capobianco, R. M., Rimstidt, J. D. & Bodnar, R. J. (2013) Volumetrics of CO<sub>2</sub> storage in saline aquifers. *Environmental Science & Technology* **47**, 79-86. [doi:10.1021/es301598t](https://doi.org/10.1021/es301598t)
10. Spiekermann, G., **Steele-MacInnis**, M., Kowalski, P., Schmidt, C. & Jahn, S. (2013) Vibrational properties of silica species in MgO-SiO<sub>2</sub> glasses obtained from ab initio molecular dynamics. *Chemical Geology* **346**, 22-33. [doi:10.1016/j.chemgeo.2012.08.020](https://doi.org/10.1016/j.chemgeo.2012.08.020)
9. Schlegel, T.U., Wälle, M., **Steele-MacInnis**, M. & Heinrich, C.A. (2012) Accurate and precise quantification of major and trace element compositions of calcic-sodic brines in fluid inclusions by combining microthermometry and LA-ICPMS analysis. *Chemical Geology* **334**, 144-153. [doi:10.1016/j.chemgeo.2012.10.001](https://doi.org/10.1016/j.chemgeo.2012.10.001)
8. Spiekermann, G., **Steele-MacInnis**, M., Kowalski, P., Schmidt, C & Jahn, S. (2012) Vibrational mode frequencies of H<sub>4</sub>SiO<sub>4</sub>, D<sub>4</sub>SiO<sub>4</sub>, H<sub>6</sub>Si<sub>2</sub>O<sub>7</sub> and H<sub>6</sub>Si<sub>3</sub>O<sub>9</sub> in aqueous environment, obtained from ab initio molecular dynamics. *Journal of Chemical Physics* **137**, 164506. [doi:10.1063/1.4761824](https://doi.org/10.1063/1.4761824)
7. **Steele-MacInnis**, M., Lecumberri-Sanchez, P. & Bodnar, R.J. (2012) HOKIEFLINCS\_H2O-NACL: A Microsoft Excel spreadsheet for interpreting microthermometric data from fluid inclusions based on the PVTX properties of H<sub>2</sub>O-NaCl. *Computers & Geosciences* **49**, 334-337. [doi:10.1016/j.cageo.2012.01.022](https://doi.org/10.1016/j.cageo.2012.01.022)
6. Lecumberri-Sanchez, P., **Steele-MacInnis**, M. & Bodnar, R. J. (2012) A numerical model to estimate trapping conditions of fluid inclusions that homogenize by halite disappearance. *Geochimica et Cosmochimica Acta* **92**, 14-22. [doi:10.1016/j.gca.2012.05.044](https://doi.org/10.1016/j.gca.2012.05.044)
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1. **Steele-MacInnis**, M., Bodnar, R. J. & Naden, J. (2011) Numerical model to determine the composition of H<sub>2</sub>O-NaCl-CaCl<sub>2</sub> fluid inclusions based on microthermometric and microanalytical data. *Geochimica et Cosmochimica Acta* **75**, 21-41.  
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#### **Invited presentations at scientific meetings:**

- Steele-MacInnis**, M., Schlegel, T., Ridley, J., Heinrich, C.A. (2015) Deciphering compositions of saline, multicomponent fluid inclusions from combined microthermometric and microanalytical data: Approaches for interpreting fluids containing multiple major salts. AGU-GAC-MAC-CGU Joint Assembly, Montréal QC, Canada, May 3-7. Abstracts Volume, p. 586.
- Steele-MacInnis**, M., Bieler, N., Zevin, D., Hünenberger, P., Driesner, T. (2014) Linking structural and thermodynamic properties of solutes in high-temperature fluids. 24<sup>th</sup> V.M. Goldschmidt Conference, Sacramento CA, USA, June 8-13. Abstracts Volume p. 2374.