

# Clinton King

54 E 300 South • Ephraim, Ut 84627 • clintonking36@gmail.com

**November 2019**

## Curriculum Vitae

### Education

- BS Chemistry, Mathematics minor; Brigham Young University (Provo), Aug 1997 – Aug 2004
- MS Chemistry; University of Illinois (Urbana-Champaign), Aug 2004 – Dec 2007; Research Advisor: Andrew A Gewirth, Thesis Title: “Photoelectrochemical Studies of Selected Oxide Materials”
- PhD Chemistry; Brigham Young University (Provo), Aug 2014 – August 2019; Research Advisor: Daniel H Ess, Dissertation Title: “Computational Studies of Main Group C-H Activation”

### Teaching

- Math Lab TA, Brigham Young University (Provo), Jan 2001 – Jul 2002
- TA for freshman chemistry lecture and lab courses, University of Illinois (Urbana-Champaign), Aug 2004 – May 2005
- TA for analytical laboratory class with responsibility for ISE, NMR, and GCMS experiments, University of Illinois (Urbana-Champaign), Aug 2007 – Dec 2007
- Adjunct Instructor for general chemistry, Parkland College (Champaign, IL), Aug 2007 – Aug 2008
- Instructor, Snow College (Ephraim, UT), Aug 2008 – May 2014
  - Taught the following courses (including affiliated lab courses): Liberal arts chemistry for non-science majors, chemistry for the allied health sciences (GOB), and organic chemistry.
  - Developed new laboratory activities and procedures for laboratory courses
  - Trained students in the use of analytical instrumentation including FTIR, GC, UV-vis and other instruments
  - Served on the Snow College curriculum committee, Aug 2010 – Dec 2013
  - Advised chemistry student club, 2012 – 2013
- TA Organic Chemistry for Engineers course development, spring and summer 2018
- Lecturer in chemistry, Utah Valley University, August 2018 – May 2019
  - Teaching general chemistry, general chemistry labs, and organic chemistry labs

### Research

- Brigham Young University, Research Advisor: Gary D Watt, Jul 2002 – Jul 2004
  - Investigated the kinetics of *Av nitrogenase*
  - Developed analytical techniques for the determination of ammonia concentration
- University of Illinois, Research Advisor: Andrew A Gewirth, Jan 2005 – Dec 2007
  - Used cyclic voltammetry and other electrochemical methods to investigate photoelectrochemistry of oxide materials
  - Used XRD, SEM, and TEM to characterize materials
  - Investigated electrode processes with surface enhanced Raman spectroscopy
- Brigham Young University, Research Advisor: Daniel H Ess, Aug 2014 – June 2019
  - Using QM computational methods to study the homogeneous organometallic chemistry of main group elements

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- Trained undergraduate researchers

## Current Position

Chemist III, technical supervisor at Summit Nutritional Laboratories, located in Spanish Fork, UT.

## Honors and Awards

- National Merit Scholarship recipient, 1998-2003
- Roger Adams Fellowship recipient, 2004
- High Impact Doctoral Research Assistantship recipient, 2014-2017

## Publications

1. King, C. R.; Holdaway, A.; Durrant, G; Wheeler, J.; Suaava, L.; Konnick, M. M.; Periana, R. A.; Ess, D. H. "Supermetal: SbF<sub>5</sub>-Mediated Methane Oxidation Occurs by C–H Activation and Isobutane Oxidation Occurs by Hydride Transfer" *Dalton Trans.*, **2019**, Advance Article. DOI: 10.1039/C9DT03564H
2. Koppaka, A.; Park, S. H.; Hashiguchi, B. G.; Gunsalus, N. J.; King, C. R.; Konnick, M. M.; Ess, D. H. ; Periana, R. A. "Selective C-H Functionalization of Methane and Ethane by a Molecular Sb(V) Complex" *Angewandte Chemie, International Edition* **2019**, 58 (8), 2241-2245. DOI: 10.1002/anie.201809159
3. King, C. R.; Rollins, N.; Holdaway, A.; Konnick, M. M.; Periana, R. A.; Ess, D. H., "Electrophilic Impact of High-Oxidation State Main-Group Metal and Ligands on Alkane C–H Activation and Functionalization Reactions" *Organometallics* **2018**, 37 (18), 3045-3054. DOI: 10.1021/acs.organomet.8b00418
4. King, C. R.; Gustafson, S. J.; Black, B. R.; Butler, S. K.; Konnick, M. M.; Periana, R. A.; Hashiguchi, B. M.; Ess, D. H., "Arene C–H Functionalization by p-Block Metal Tl(III) Occurs at the Borderline of C–H Activation and Electron Transfer." *Organometallics* **2017**, 36 (1), 109-113. DOI: 10.1021/acs.organomet.6b00475
5. King, C. R.; Gustafson, S. J.; Ess, D. H., The Electronics of CH Activation by Energy Decomposition Analysis: From Transition Metals to Main-Group Metals. In *Computational Studies in Organometallic Chemistry*, Macgregor, S. A.; Eisenstein, O., Eds. Springer International Publishing: Cham, 2016; pp 163-178. DOI: 10.1007/430\_2015\_178
6. Wilson, P. E.; Nyborg, A. C.; Kenealey, J.; Lowery, T. J.; Crawford, K.; King, C. R.; Engan, A. J.; Johnson, J. L.; Watt, G. D., "Evidence for a Synergistic Salt–Protein Interaction—Complex Patterns of Activation vs. Inhibition of Nitrogenase by Salt" *Biophysical Chemistry* **2006**, 122 (3), 184-194. DOI: 10.1016/j.bpc.2006.03.007

## Presentations

- Spring Research Conference, Brigham Young University
  - "The salt effect on Av nitrogenase" 2004
  - "Computational Study of Arene Thallation" 2016
- Snow College Natural Sciences and Mathematics Division Seminar
  - "Alternative Energy" Jan 2009
  - "The Periodic Table" Oct 2009
  - "Fritz Haber" Oct 2010
  - "Into the Cool: The Second Law of Thermodynamics" Oct 2011

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- “The 2012 Nobel Prize in Chemistry” Feb 2013
- “Theoretical Chemistry: A Study of the Mechanism of the Reaction of Arenes with  $Tl(TFA)_3$ ” Sep 2016
- "Can the functionalization of methane be mediated by main group metals?" Feb 2018
- Utah Inorganic-Organometallic Symposium
  - “Reactions of  $Tl(TFA)_3$ ” Poster 2015
  - “Computational Study of Arene Thallation” Poster 2016

## Other Service

- Full time missionary for the Church of Jesus Christ of Latter-day Saints, Philippines Cebu Mission, Jul 1998 – Jul 2000
- LDS ARP service missionary, Ephraim Utah YSA stakes, Aug 2009 – Dec 2013
- Presented lessons on chemical and physical changes to Ephraim Elementary students annually, 2011 – 2013
- Served as a Science Olympiad judge at the Snow College Utah Regional Science Olympiad 2011 – 2013