**About Dr. Luedtke**



Avery Luedtke is a Senior Scientist at MilliporeSigma where he enjoys being part of the Research and Development team in Milwaukee focusing on Materials Science and other Emerging Technologies. In 2002, Avery graduated with a BS in Chemistry from San Diego State University. He then moved to the University of Washington in Seattle Washington where he studied under the supervision of Professor Karen Goldberg researching the functionalization of C–H bonds using organometallic platinum complexes and graduated with a Ph. D. in 2007. In 2008, Avery took a postdoctoral position at the Department of Energy in Richland Washington developing new materials for the chemical storage of hydrogen. Avery moved to Milwaukee in 2010 taking a Scientist position in Materials Science at then Sigma-Aldrich, which was purchased by Merck KGaA, Darmstadt, Germany in 2015 and renamed MilliporeSigma.

Selected Publications:

Clement, Marie L.; Grice, Kyle A.; Luedtke, Avery T.; Kaminsky, Werner; Goldberg, Karen I. “Platinum(II) olefin hydroarylation catalysts: tuning selectivity for the anti-Markovnikov product”

*Chemistry - A European Journal* 2014, *20*, 17287. DOI:10.1002/chem.201405174

Scheuermann, Margaret L.; Luedtke, Avery T.; Hanson, Susan K.; Fekl, Ulrich; Kaminsky, Werner; Goldberg, Karen I. “Reactions of Five-Coordinate Platinum(IV) Complexes with Molecular Oxygen” *Organometallics* 2013, *32*, 4752. DOI:10.1021/om4003363

Neiner, Doinita; Luedtke, Avery; Karkamkar, Abhijeet; Shaw, Wendy; Wang, Jialing; Browning, Nigel D.; Autrey, Tom; Kauzlarich, Susan M. “Decomposition Pathway of Ammonia Borane on the Surface of Nano-BN” *Journal of Physical Chemistry C* 2010, *114*, 13935. DOI:10.1021/jp1042602

Luedtke, Avery T.; Autrey, Tom “Hydrogen Release Studies of Alkali Metal Amidoboranes” *Inorganic Chemistry* 2010, *49*, 3905. DOI:10.1021/ic100119m

Luedtke, Avery T.; Goldberg, Karen I. “Intermolecular hydroarylation of unactivated olefins catalyzed by homogeneous platinum complexes” *Angewandte Chemie, International Edition* 2008, *47*, 7694. DOI:10.1002/anie.200800524

Luedtke, Avery T.; Goldberg, Karen I. “Reductive Elimination of Ethane from Five-Coordinate Platinum(IV) Alkyl Complexes” *Inorganic Chemistry* 2007, *46*, 8496. DOI:10.1021/ic701504z

**Presentation**

Graphite in 2D

Graphene is a two-dimensional (2D) material that can be viewed as a single monomolecular sheet of graphite as shown in Figure 1. Over the past 13 years since graphene was initially isolated and characterized, reports on graphene have shown a material with surprising uniqueness and versatility; the potential applications for graphene are as varied as polymer composites, drug delivery, and energy storage to name a few., The chemistry of graphene type 2D materials will be discussed as well as some of the chemical challenges that arise in developing new products in the materials science industry.



Figure 1. Diagram representing the structure of a small area of graphene. Graphene in real systems is much larger and may have chemical and structural defects.