**Lesson Plan: Lecture 15**

**Catalysis**

**Description**

In this lecture students will learn about the importance of catalysis and the added benefits it provides in all levels of chemistry. Students will see how catalysts make reactions more efficient by means of the activation energy. More importantly, students will be introduced to alternative types of catalysis that Green Chemistry utilizes to create more environmentally responsible processes**.**

**Prior to Lecture**

Optional/ Supplemental Readings:

* Lancaster, Mike; “Green Chemistry An Introductory Text”; 2002, Ch.4, 84-129
  + Editions 1,2 or 3 are sufficient.
* Clark, James; “Catalysis and Green Chemistry”, Pure Appl. Chem., Vol. 73, No. 1, pp. 103–111, 2001.
* “Introduction to Green Chemistry”, Albert S. Matlack, CRC Press, Ch. 5 & 6 2nd Edition, 2010.
* “Getting Down to Earth: The Renaissance of Catalysis with Abundant Metals”, Acc. Chem. Res., 2015, 48, 2495, <https://pubs.acs.org/doi/10.1021/acs.accounts.5b00385>
* “Recent advances in gas storage and separation using metal–organic frameworks”, Li, H., et. al., Materials Today, Vol. 21, Issue 2, March 2018, pp. 108-121, <https://doi.org/10.1016/j.mattod.2017.07.006>
* Enzyme catalysis in organic synthesis, Green Chem., 2017, 19, 331, <http://dx.doi.org/10.1039/C6GC90124G>
* Overview of the Haber-Bosch Process, ThoughtCo., March 6, 2017 by Amanda Briney, <https://www.thoughtco.com/overview-of-the-haber-bosch-process-1434563>

Videos

* Catalysts (in PowerPoint)
* [Catalysis\_Catalysis\_Introduction\_and\_Lifecycle](https://youtu.be/jH7RInRDJPY)

**Topics to Cover**

* Fundamentals of Catalysis (example: activation energy)
* Catalysis and Green Chemistry
* Types of Catalysis
* Advantages vs. Disadvantages
* Alternative catalysts
* Current and Future Trends in Catalysis

**Class Exercise**

* No class exercise for this lecture