**Lesson Plan: Lecture 14**

**Designing Chemistry for Recycling & Degradation**

**Description**

In this class students will learn various processes for recycling and how to leverage it to think of the possibilities to design compounds to biodegrade.

**Prior to Lecture**

Optional Readings:

* “Designing Small Molecules for Biodegradation” R. S Boethling, Chem. Rev. 2007, 107, 2207-2227. <https://pubs.acs.org/doi/10.1021/cr050952t>

Videos

* [Introduction to Biodegradation](https://www.youtube.com/watch?v=k4Vk5zPPMxA&feature=youtu.be)

**Topics to Cover**

* The waste treatment pyramid
* Different treatment options currently available
* Reduced Solvent Use
* Waste as a Feedstock
* Designing Products to Biodegrade
* Molecular fragments to contribute to biodegradation

**Class Exercises**

Two in-class exercises are included in the PowerPoint presentation, along with handouts in the Class Exercises folder. Exercise #1 involves the use of an open-access web-based tool available through the U.S. EPA. The second exercise provides discussion questions and in-class problems that can be used if students are not able to access the on-line tool.

* Exercise 1: Predicting Biodegradation: U.S. EPA EPISuite tool, BIOWIN
* Exercise 2: Design for Biodegradability Discussion Questions

**Homework:** Estimating Biodegradation of Organic Molecules