POLYETHYLENE/STARCH NANOCOMPOSITES MADE IN-SITU USING SINGLE-SITE CATALYSTS J. Clark, B. Shah, M. Miri*, Department of Chemistry, Polymer Research Laboratories, jmc8495@rit.edu, bbs6276@rit.edu, mjmsch@rit.edu

The brilliance of single-site catalysts is their unrivaled level of control over the polymerization and ultimately the polymer properties as they polymerize the monomer as defined catalyst species, in contrast to heterogeneous, multi-site Ziegler/Natta catalysts or radical initiators. We are using nickel based enolates as well as salicylaldiminates as polymerization catalysts. Our main objective is to synthesize a product that has all of the useful characteristics of normal high density polyethylene(HDPE), as well as being biodegradable through the incorporation of starch. The technique being used to produce the polymer composites is the in-situ method, which is the polymerization of the monomer in presence of starch rather than blending the polymer argon to prevent any oxygen from reacting with the oxophillic catalysts. After the product is taken through the workup procedure, the composites undergo a series of characterizations, including infrared spectroscopy, differential scanning calorimetry, and transmission electron microscopy. The composites are heated and pressed into films to undergo biodegradability tests in the biology lab.