

For my honors thesis, I worked with a team to compete in the 31st annual Waste-Management Education Research Conference (WERC). The team worked on task 6 which was an open task. The problem the team decided to focus on was the increasing amount of plastic waste. Our solution consisted of converting the plastic waste to synthetic gas, synthetic oil, and char and estimate the economic feasibility of a commercial plant in the Northwest Arkansas (NWA) region.

On the team, my role was the purchasing coordinator. My main responsibility was to keep track of cost for any material that was bought. Since plastic was bought as bulk amounts, creating a budget sheet and maintain it did not take a lot of time to finish. In the early parts of the project, I mainly worked on literature reviews on plastic sortation, parameters of pyrolysis experiments, treatment of PVC feed for pyrolysis, and compiling common additives in plastics. Later in the project, I worked on the bench-scale experiments and editing the paper, poster, and presentation.

Work on the project began late December as literature reviews for the pyrolysis. My main contribution for the literature review was adding to the excel sheet of the temperatures, pressures, catalysts, rate of heating, and types of reactors for plastic pyrolysis and their respective feed and product compositions. A pilot-scale run was planned but, due to leaking and burning, the run was aborted, and a bench-scale was planned to get data for a mass balance. I worked on all of the 4 bench-scale experiments. I mainly worked on prep which consisted of preparing the feed, insulating the reactor, purging the reactor, extracting the products, and cleaning the reactor between runs.

For the paper, I wrote half of the bench-scale portion and edited mainly the Economics, Experimentation, and Health, Safety, and Environmental regulations. I also confirmed the sizing for the pyrolysis end equipment cost of the economic analysis. On the poster, I contributed by formatting and editing the bench-scale. On the presentation, I edited and formatted bench-scale section, experimental results, and economics.