Mechanical/Environmental Sustainability Project

Plastics to Oil - Phase III

Mission Statement
To develop a prototype and find optimal design conditions for converting plastic to its oil form to promote a cleaner environment and source of energy.

Synopsis

Today, plastic waste is a growing problem for our environment. Oil is one of the major compounds in plastics. When plastics are heated the oil vaporizes while other products remain in liquid form. This oil vapor can then be condensed and may then be burnt as-is or further processed to be used in other applications, rather than not be used and have this plastic waste remain in the environment.

The team did much research on the feasibility of this project. They determined that this project is a possibility. They came up with many different potential sources for plastics to be used in the process, but have not yet decided on which would be the best. This will come when the model is built and the team begins to collect data on the different operating conditions required for the recovery of hydrocarbons from each of the different plastics. The team also developed an electronic model with team specific design features.

This year, the students were able to build and test a functional model. A specific type of plastic (milk carton material) was used in the model, and the hydrocarbons were successfully extracted. The extracted hydrocarbons were flammable, but the exact chemical composition of the hydrocarbons remains to be identified.

The project has a potential to continue, were students can experiment with the yield ratios of different plastic materials, work on identification of product yields and improve the initial design model.

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