Exploring the Conversion of Plastics to Porous Carbon

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Plastic pollution is one of the leading issues facing the environment today. Americans utilize 33.6 million tons of plastic annually, but only recycle about 10% of this. What if there was a solution that could halt this catastrophe in its tracks and create a useful material in the process? This is where activated (porous) carbon comes into play. Porous carbon is essentially charcoal with microscopic pores throughout the sample. The goal of this project is to convert plastics to porous carbon using a plasma reactor. Specifically, polyvinyl chloride (PVC), polymethylmethacrylate (acrylic), and polyethylene terephthalate (PET) were exposed to air plasma and tested for carbon content and porosity using a Scanning Electron Microscope (SEM) and Energy dispersive x-ray spectroscopy (EDAX) respectively. PVC and PET were successfully converted to porous carbon after exposure, while acrylic was not. Ultimately, this project could provide an environmentally friendly option to recycle plastics.

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