Optimization of Storage Capacity Using Activated Carbon Fibers from Sustainable Agricultural Sources for Hydrogen

Satyavolu, Sriram

Fossil fuels are currently used in the automobile industry. Many problems have occurred because of the harmful emission of greenhouse gases and alternatives such as hydrogen fuel can help reduce their emissions. Hydrogen fuel is a clean type of fuel that emits no carbon dioxide. Current methods include hydrogen requiring high pressure and low temperature which would cause hydrogen to be stored in hydrogen gas cylinders. This would cause the overall gas mileage to reduce due to the weight of the hydrogen tanks and not meet the requirements of the Office of Energy Efficiency and Renewable Energy (EERE) which regulate the onboard storage of hydrogen in automobiles. This project focuses on finding a low pressure method of storing hydrogen. An approach to this solution is to find a reliable and abundant biomass source to storage hydrogen on a membrane surface such as building a structured ACF layer on a membrane surface to yield a high surface area and porosity. This approach should meet the requirements of the EERE and provide high gas adsorption of hydrogen. By storing hydrogen on a high surface area adsorbent such as activated carbon fibers (or ACF) from sustainable agricultural sources, we can help make it lightweight and adsorb hydrogen at a low pressure.

Awards Won: