Carbon Filtration: Turning Fossil Fueled Emissions into a Recyclable By Product

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This project was designed to recycle the by-product produced when filtering the carbon output of exhaust of fossil fueled cars to decrease carbon footprint. Filtration occurred when carbon dioxide (CO_2) passed through sodium hydroxide (NaOH) , and was neutralized through an acid-base reaction. Scientists are researching ways to reduce man-mad carbon footprint on the environment. Focus is on eliminating man-mad carbon and also recycling it into a reusable product. A module was built containing a NaOH soaked sponge. Module9s) were fastened to the exhaust pipe of car by copper tubing. The engine was maintained at 2000 revolutions per minute (rpm). Emissions traveled through the module(s) for selected amounts of time in order to reduce PH levels of the solutions within the modules by neutralizing the carbonic acid with NaOH. Theoretically, if the solution was neutralized down to PH of 12, sodium carbonate would have been produced as the by-product. The PH of NaOH solution was measured as 14 before being exposed to carbonic acid. It was measured after being exposed after 10, 20, 30, 40, and 50 minutes. The PH steadily decreased as time lapsed. By the measurement of 50 minutes, PH was reduced to 12. Theoretically, the mixture of NaOH and carbonic acid produced sodium carbonate which can be recycled into materials such as mold killer, glass, and washing soda. This information is important for carbon filtration and/or capturing and developing recyclable/reusable by-product to help decrease the carbon impact on the environment.

Awards Won: