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Fuel tank of the future corncobs

Eric Hand
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Peter Pfeifer wants to turn corncobs into the natural gas fuel tanks of the future.

Pfeifer, a physicist at the University of Missouri at Columbia, bakes the cobs into a charred carbon that can hold 163 times its own volume of natural gas, much like a sponge holds water.

Engineers in Kansas City, Mo., plan to test the carbon tank in a natural gas-powered pickup this month. If it works, it will show automakers a way past the alternative fuel's biggest problem: It's hard to pack enough natural gas for long trips in the bulky, high-pressure tanks currently used. Low-pressure carbon tanks could store natural gas in the unused nooks of a car.

With gasoline prices pushing \$1 a litre, alternative fuels are jostling for attention. Natural gas -- clean, cheap, plentiful and domestically produced -- is in the race. And natural gas is potentially renewable, as engineers could harvest natural gas from decomposing trash in landfills.

But the problem for natural gas vehicles is storage. It takes 123 cubic feet of natural gas to match the energy of one U.S. gallon of gasoline. With a driving range far less than cars that run on gasoline, a natural gas vehicle tethers people who want to travel farther and who need natural gas filling stations.

That's where Pfeifer's work comes in.

To explain why his carbons are so special, he pulls out a cauliflower. The vegetable buds repeat a whorling pattern.

"No matter how zoomed in or out you are, you still see the same pattern," he says. The patterns are called fractals. Ferns, clouds and lungs are also fractals. The fractal nature of the interconnected tunnels makes Pfeifer's carbons good at trapping gas and letting it flow in and out.

In a pressurized tank, molecules of natural gas still take up a lot of room. But the narrow tunnels in Pfeifer's carbons are over one nanometer wide, just the right size to pack in two natural gas molecules side by side. And, he needs low pressures of just 500 pounds per square inch to infuse the carbon with natural gas.

At such low pressures, fuel tanks wouldn't be limited to cylinders -- they could conform to any unused space on the vehicle.

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