Tulane University

Tulane receives grant to reduce auto emissions

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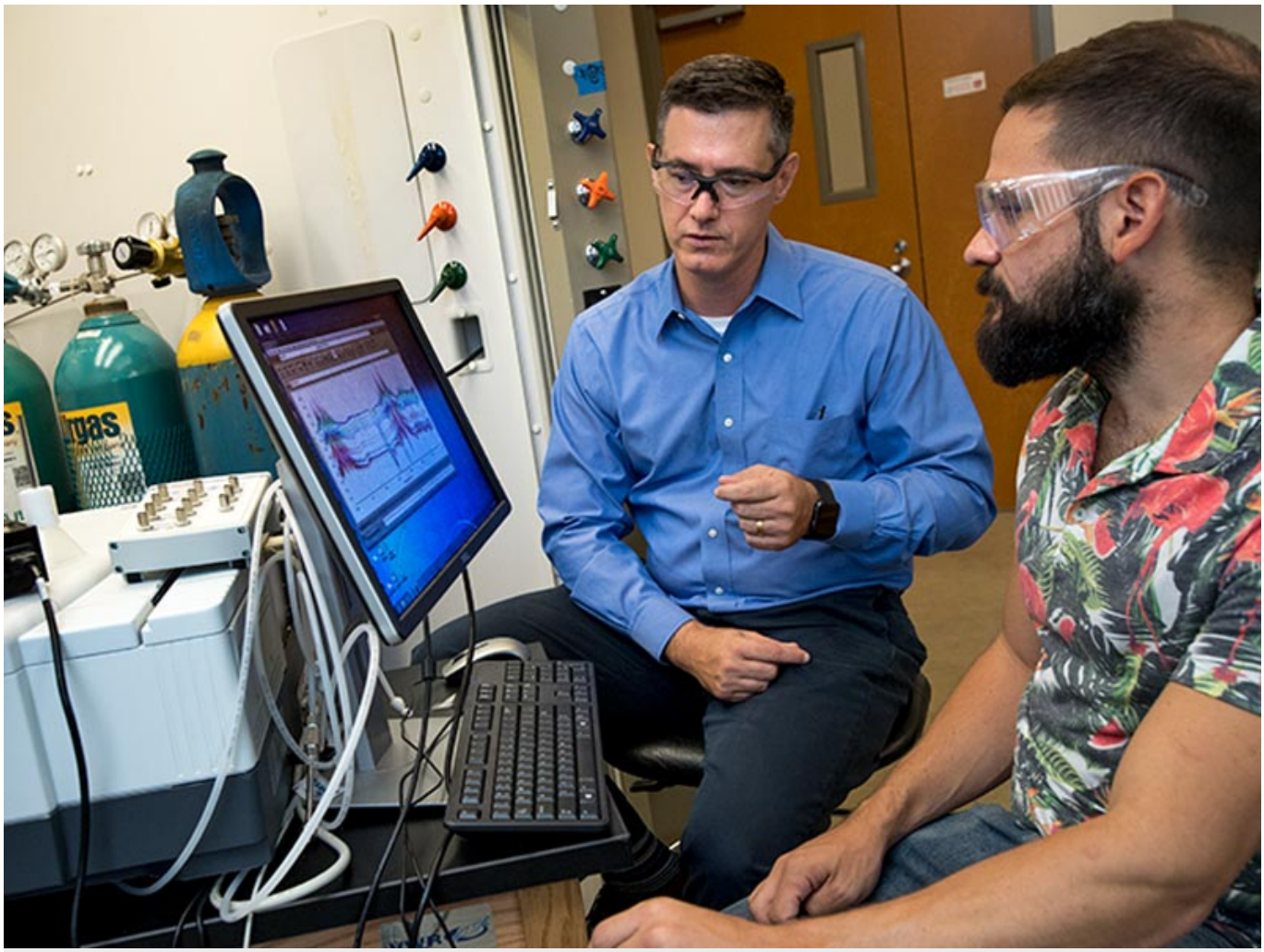

Professor Daniel Shantz (left) and graduate student Ross Ransom analyze data from their research of zeolite SSZ-39 in an effort to reduce harmful chemicals in auto emissions. (photo by Paula Burch-Celentano)

Members of Tulane University's Shantz Lab will work with industrial scientists to assist in the development of next-generation materials designed to reduce harmful automotive emissions. The three-year-old lab and its group of students have received a grant and equipment resources from SACHEM, Inc., a chemical science company.

Under the direction of Daniel Shantz, a professor of chemical and biomolecular engineering and the Entergy Chair of Clean Energy Engineering, the lab members and SACHEM scientists will

collaborate to improve the performance of zeolite SSZ-39 in reducing the amount of harmful chemicals released into the atmosphere through auto exhaust. SSZ-39 is a solid material made of silicon that resembles a sponge.

The Tulane team will test the ability of SSZ-39 in vehicles' selective catalytic reduction (SCR), the system in cars that reduces harmful emissions. Specifically, the Tulane team will test SSZ-39's efficiency in reducing nitrogen oxides, which contribute to the production of acid rain. The focus of this program is to help better understand the properties of SSZ-39, with the goal of demonstrating whether SSZ-39 could be a commercially viable SCR catalyst.

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> *- Professor Daniel Shantz*

"The grant project is certainly relevant in the context of energy and the environment," Shantz said. "This focused project will validate the ability of SSZ-39 to eliminate nitrogen oxides from automotive emissions systems by converting them to molecular nitrogen, the main component of the air we breathe. I am delighted that we will be able to work with scientists from SACHEM on this problem."

According to Shantz, one of the challenges for SCR catalysts are their ability to handle temperature increases from typical operating conditions. If the system typically operates between 300-400 degrees Celsius, materials are needed that can handle higher temperatures for short periods of time. The inability of current materials to be able to handle these high-temperature excursions is a limitation of the current technology.

"The zeolite SSZ-39 material is something that could be potentially implemented in the next three years. What we are trying to do in the lab is to identify what this material can and cannot do: is it a good enough material catalytically? Will it be able to handle the temperature excursions better than the current state of the art?," Shantz said.

"Improvements in SCR technology will result in emissions systems in diesel trucks that will be able to operate longer, and emission systems will be replaced with less frequency. It goes without saying decreased nitrogen oxide emissions are beneficial to the environment," Shantz added.

The Shantz Lab in the Chemical and Biomolecular Engineering Department at Tulane is focused on the development of new materials that will be relevant in energy generation, storage and conversion.