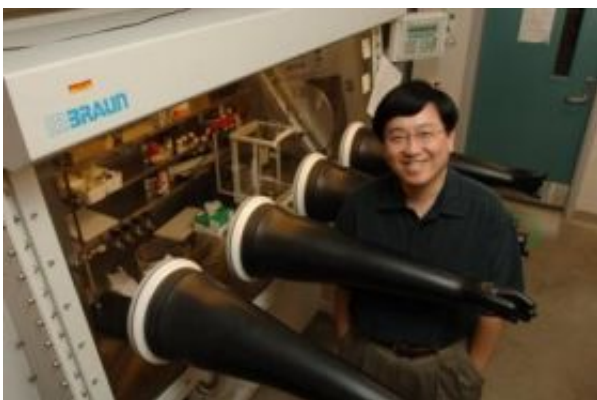


Iowa State chemist hopes startup company can revolutionize biodiesel production

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Victor Lin, an Iowa State University professor of chemistry, is using nanotechnology and chemistry to improve biodiesel production. Credit: Bob Elbert, Iowa State University

Line up 250 billion of Victor Lin's nanospheres and you've traveled a meter. But those particles – and just the right chemistry filling the channels that run through them – could make a big difference in biodiesel production.

They could make production cheaper, faster and less toxic. They could produce a cleaner fuel and a cleaner glycerol co-product. And they could be used in existing biodiesel plants.

“This technology could change how biodiesel is produced,” said Victor

Lin, an Iowa State University professor of chemistry, a program director for the U.S. Department of Energy's Ames Laboratory and the inventor of a nanosphere-based catalyst that reacts vegetable oils and animal fats with methanol to produce biodiesel. "This could make production more economical and more environmentally friendly."

Lin is working with Mohr Davidow Ventures, an early stage venture capital firm based in Menlo Park, Calif., the Iowa State University Research Foundation and three members of his research team to establish a startup company to produce, develop and market the biodiesel technology he invented at Iowa State.

The company, Catilin Inc., is just getting started in Ames. Catilin employees are now working out of two labs and a small office in the Roy J. Carver Co-Laboratory on the Iowa State campus. The company will also build a biodiesel pilot plant at the Iowa Energy Center's Biomass Energy Conversion Facility in Nevada.

Lin said the company's goal over the next 18 months is to produce enough of the nanosphere catalysts to increase biodiesel production from a lab scale to a pilot-plant scale of 300 gallons per day.

Lin will work with three company researchers and co-founders to develop and demonstrate the biodiesel technology and production process. They are Project Manager Jennifer Nieweg, who will earn a doctorate in chemistry from Iowa State this summer; Research Scientist Yang Cai, who earned a doctorate in chemistry from Iowa State in 2004 and worked on campus as a post-doctoral research associate; and Research Scientist Carla Wilkinson, a former Iowa State post-doctoral research associate and a former faculty member at Centro Universitario UNIVATES in Brazil.

Larry Lenhart, the president and chief executive officer of Catilin, said

the company is now up and running. It has a research history. It has employees. It has facilities. It has money in the bank.

And he said the company has proven technology to work with.

The technology allows efficient conversion of vegetable oils or animal fats into fuel by using Lin's nanospheres with acidic catalysts to react with the free fatty acids and basic catalysts for the oils.

All that makes biodiesel production "dramatically better, cheaper, faster," Lenhart said.

The technology replaces sodium methoxide – a toxic, corrosive and flammable catalyst – in biodiesel production. And that eliminates several production steps including acid neutralization, water washes and separations. All those steps dissolve the toxic catalyst so it can't be used again.

Catilin's nanospheres are solid and that makes them easier to handle, Lenhart said. They can also be recovered from the chemical mixture and recycled. And they can be used in existing biodiesel plants without major equipment changes.

Lin said the catalyst has been under development for the past four years. The company will market the third generation of the catalyst – a version that's much cheaper to produce than earlier, more uniform versions.

The technology was developed with the support of grants from the U.S. Department of Agriculture, the U.S. Department of Energy's Office of Basic Energy Sciences and the state's Grow Iowa Values Fund. Patents for the technology are pending. Catilin has signed licensing agreements with Iowa State's research foundation that allows the company to commercialize Lin's invention.

As the company grows and demonstrates its technology, Lin said company leaders will have to decide whether the company will become a catalyst company, will work with partners to develop biodiesel plants or will produce its own biodiesel.

Even though he expects plenty of worldwide business for the new company, Lin said he'll continue to work as an Iowa State professor.

"I'm not going to quit my day job," he said. "And I'll continue to do research in the catalysis and biorenewables area."

Source: Iowa State University

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