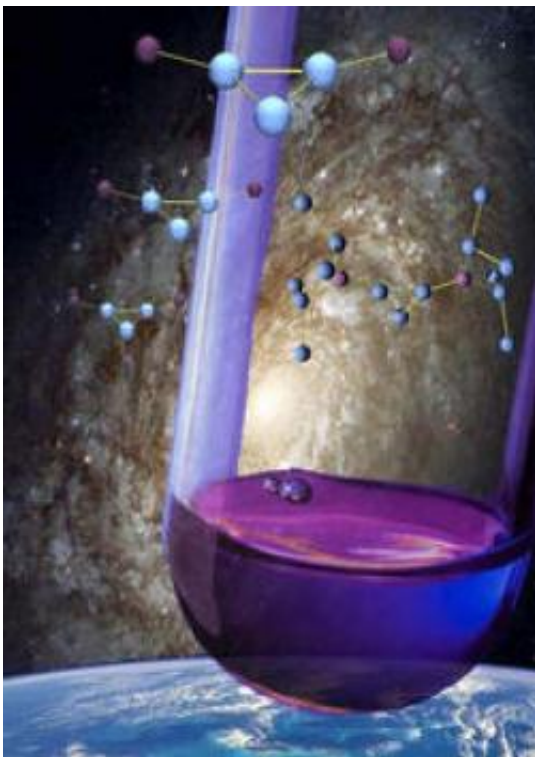


Interstellar chemical tamed in the lab at UCR

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Interstellar molecules in a bottle at UCR. Credit: University of California - Riverside

Chemists at the University of California, Riverside have created in the laboratory a type of molecules thought to exist only in interstellar space, which may have valuable applications in chemical industry.

The finding of their paper, titled "Cyclopropenylidenes: From Interstellar Space to an Isolated Derivative in the Laboratory" are being

released today in *Science Express* a precursor to its publication in the journal *Science*. The co-authors are Vincent Lavallo, Yves Canac and Bruno Donnadiu who work in the laboratory of Distinguished Professor of Chemistry Guy Bertrand at UCR; and Chemistry Professor Wolfgang W. Schoeller of Germany's Universität Bielefeld.

"This is about a compound that is very abundant in deep space, which was supposed to not be able to exist in the laboratory, and we found a way to slightly modify it and make it stable," said Bertrand.

The new molecule belongs to a family of compounds known as carbenes, very few of which are stable. However, carbenes are now widely used to prepare catalysts that have many applications in industries such as pharmaceuticals, plastics and other petrochemicals. The cyclopropenyliene that exists naturally in space is made of three carbon atoms arranged in a triangle with two hydrogen atoms attached. The UCR researchers synthesized a more stable version by replacing the hydrogen with two nitrogen atoms. Because of its unique shape and size, the new carbene prepared at UCR might lead to even more powerful catalysts.

"We purposely targeted this molecule," said Lavallo, a first-year graduate student in Chemistry and the paper's lead author. "I was intrigued by some of the older literature regarding this class of molecules, which indicated that they were too reactive to be isolated, and decided to see if it was true."

"Everyday, scientists realize the usefulness of natural products, which exist on planet Earth, for pharmaceuticals, materials... Why not believe that molecules, which exist in space possess interesting and of course yet unknown properties?" Bertrand said.

Source: University of California - Riverside

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