

UCSD chemists take a new step toward the synthesis of new silicon compounds

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UCSD CHEMISTS SYNTHESIZE STABLE METAL-SILICON DOUBLE-BOND COMPOUND

In a step toward the synthesis of new silicon compounds, University of California, San Diego chemists have stabilized an elusive and highly reactive silicon-carbon double-bonded compound called a silene by attaching it to a metal.

The research team reported in the October 26 issue of the Journal of the American Chemical Society the first successful synthesis of a stable metal-silene complex. They stabilized the compound by attaching it to a transition metal, ruthenium.

Silenes are usually unstable organosilicon intermediates that chemists must study indirectly. The UCSD team has been able to crystallize this silene-ruthenium complex and analyze its structure using X-ray crystallography.

"People are quite interested in metal-catalyzed reactions, and stable transition metal-silene complexes have been proposed as intermediates in a number of metal-mediated transformations of organosilicon compounds," said T. Don Tilley, associate professor of chemistry, who reported the work with graduate students Brian K. Campion and Richard H. Heyn.

"Now that we have one of these, we can see if it has some of the properties that have been postulated," he said. "Study of these new compounds should provide new reactions and processes that could lead to new silicon-based materials."

Organosilicon compounds--organic or carbon-containing derivatives of silicon--were first prepared a little over a century ago and serve as the starting materials for the manufacture of various silicone polymers widely used for adhesives, rubbers, plastics and medical materials.

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