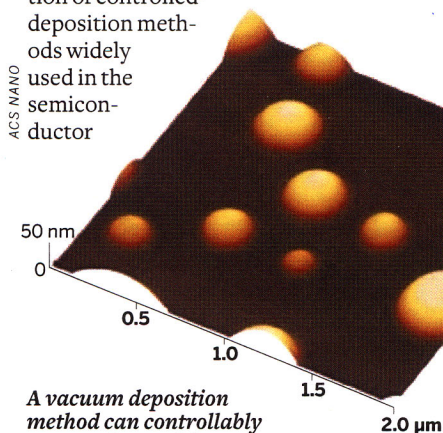


LASER DEPOSITION METHOD LAYS DOWN IONIC LIQUIDS

Ionic liquids can be deposited on solid surfaces as thin films and nanoscale droplets, according to researchers in Japan who developed a molecular-beam-based vacuum deposition method for that purpose (*ACS Nano*, DOI: 10.1021/nn101036v). Ionic liquids are increasingly being used in chemical synthesis, catalysis, and a variety of energy-related applications. But until now, little has been done to extend the collection of controlled-deposition methods widely used in the semiconductor



A vacuum deposition method can controllably coat surfaces with nano- to micrometer-sized droplets of ionic liquids, as seen in this AFM image.

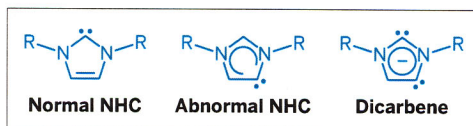
and device-physics fields to ionic liquids because of their negligible vapor pressure, which presents difficulties in handling these materials with standard vacuum techniques. In the system designed by Shingo Maruyama and Yuji Matsumoto of the Tokyo Institute of Technology and coworkers, light from a continuous-wave infrared laser drives a molecular beam of one or more imidazolium salts to a surface. By adjusting the laser parameters and preparing the surface in various ways, the team controlled the thicknesses of the films (up to 100 nm) and the sizes and compositions of the one- and two-component droplets, which varied from tens to hundreds of nanometers in diameter.—MJ

EXPLOSIVE CARBONYL DIAZIDE SAFELY MADE

A team of chemists based in Canada and Germany has developed a safe way to prepare and handle explosive carbonyl diazide

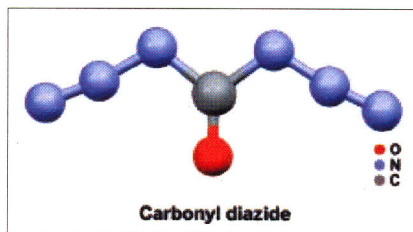
TWO CARBENES BETTER THAN ONE

The first N-heterocyclic dicarbene, which has carbene centers at two positions in the imidazole ring instead of the usual one, has been synthesized by Yuzhong Wang, Gregory H. Robinson, and coworkers at the University of Georgia (*J. Am. Chem. Soc.*, DOI: 10.1021/ja106631r). N-Heterocyclic carbenes (NHCs) are popular ligands for transition-metal homogeneous catalysts and for stabilizing highly reactive main-group compounds. Normal NHCs have the carbene center located between the two nitrogen atoms of an imidazole. But the carbene center can also be located at one of the other ring carbon atoms, resulting in a slightly less stable version dubbed an abnormal NHC. Robinson and colleagues began to wonder if there was a way to install carbene centers at both locations in the same imidazole ring, which they accomplished by using a lithium reagent to reduce a normal NHC containing bulky diisopropylphenyl groups. The researchers showed that treating the dicarbene with trimethylsilylchloride results in a trimethylsilyl-substituted normal NHC. The ability to tune the electronic and steric properties of NHCs by swapping out different substituents could increase the utility of NHCs, Robinson suggests.—SR



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ide, $\text{OC}(\text{N}_3)_2$, going against decades-old advice that it's never wise to isolate it and that the high-energy compound should only be used in situ in small quantities (*Inorg. Chem.*, DOI: 10.1021/ic1015143). Azides are compounds containing N_3 groups, which are prone to violently decompose to form N_2 . They are challenging to synthesize but useful as reagents in organic synthesis and as precursors in materials science. The team, led by Michael Gerken of the University of Lethbridge, in Alberta, and Helge Willner of Bergische University, in Wupp-



portal, Germany, synthesized $\text{OC}(\text{N}_3)_2$ by treating $\text{FC}(\text{O})\text{Cl}$ with NaN_3 , a salt commonly used as a propellant in automobile air bags. The reaction took place over four days at room temperature in a sealed glass ampule, after which the researchers used vacuum-line techniques to isolate and fully characterize the compound for the first

time. They found that $\text{OC}(\text{N}_3)_2$ is a “rather shock sensitive” white solid that melts at about room temperature (16°C), but it has remarkable thermal stability in the gas, liquid, and solid states. Carbonyl diazide is not likely to become commercially available, Gerken says, but, if handled with care, chemists can now explore its full potential as a synthetic reagent.—SR

PHOSPHORYLATION AND ACETYLATION IN ACTION

Protein posttranslational modifications switch essential biological processes on and off, but tracking them in real time is a challenge. Now, researchers led by Philipp Selenko of the Leibniz Institute of Molecular Pharmacology, in Berlin, have developed a way to concurrently watch phosphorylations and acetylations take place (*J. Am. Chem. Soc.*, DOI: 10.1021/ja106764y). The technique involves standard two-dimensional nuclear magnetic resonance spectroscopy and can be used for isotope-labeled proteins in solutions, as well as for cellular extracts. The reason both phosphorylation and acetylation can be observed simultaneously is that backbone amide group NMR signals shift when