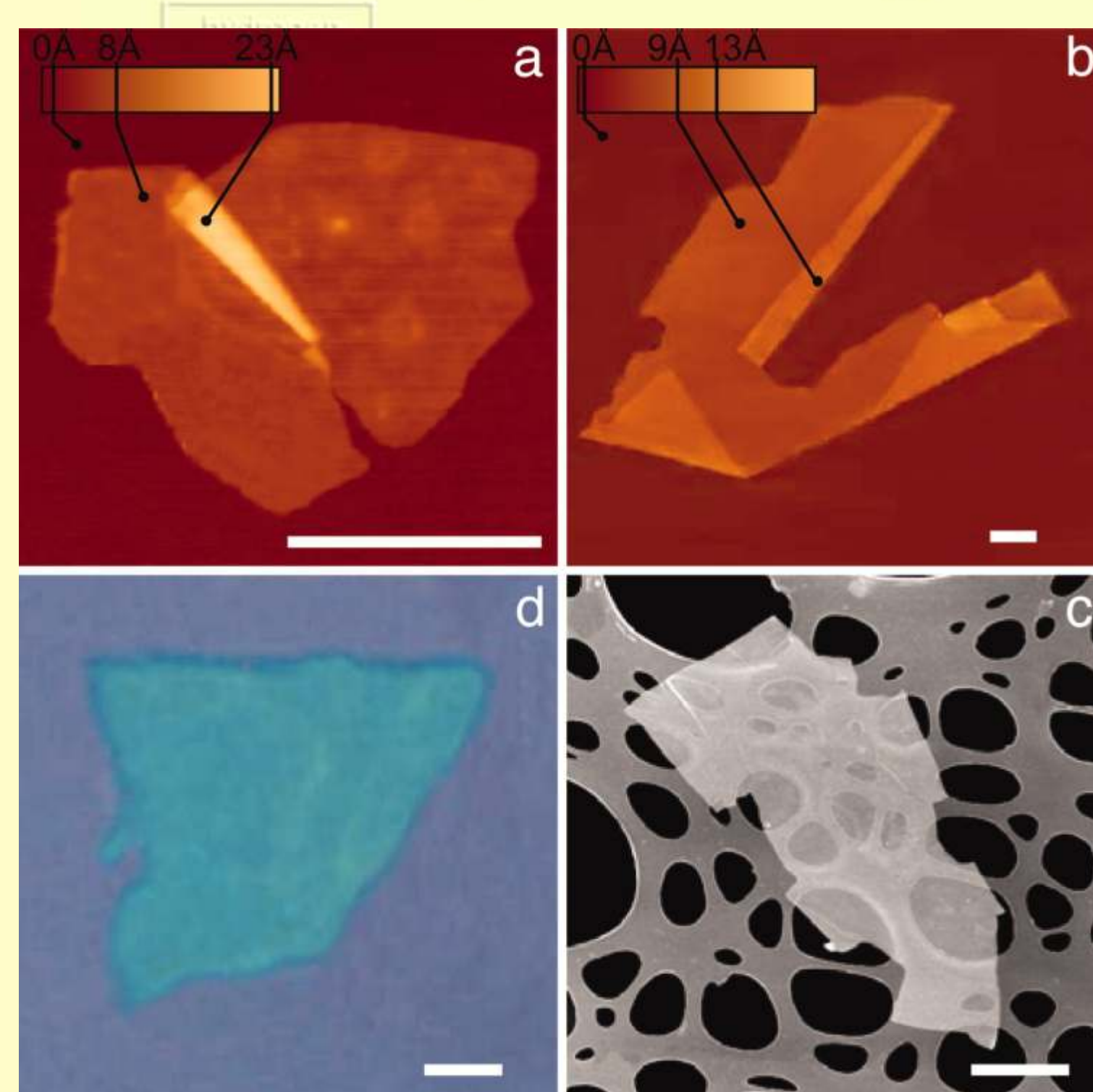


Cristalls més prims, impossible

The first stable crystalline materials confirmed to be but a single atom thick have been prepared and characterized. The materials--whose compositions range from boron nitride, graphite, and dichalcogenides to complex oxides--exhibit properties that could be useful for a range of advanced materials applications.

Andre K. Geim of the Centre for Mesoscience & Nanotechnology at the University of Manchester, in England, and coworkers created the materials by a rubbing technique and successfully visualized them by an optical phase-contrast method. Some materials exhibited conductivity and others showed resistivity, among other properties the researchers found (*Proc. Natl. Acad. Sci. USA* **2005**, *102*, 10451).



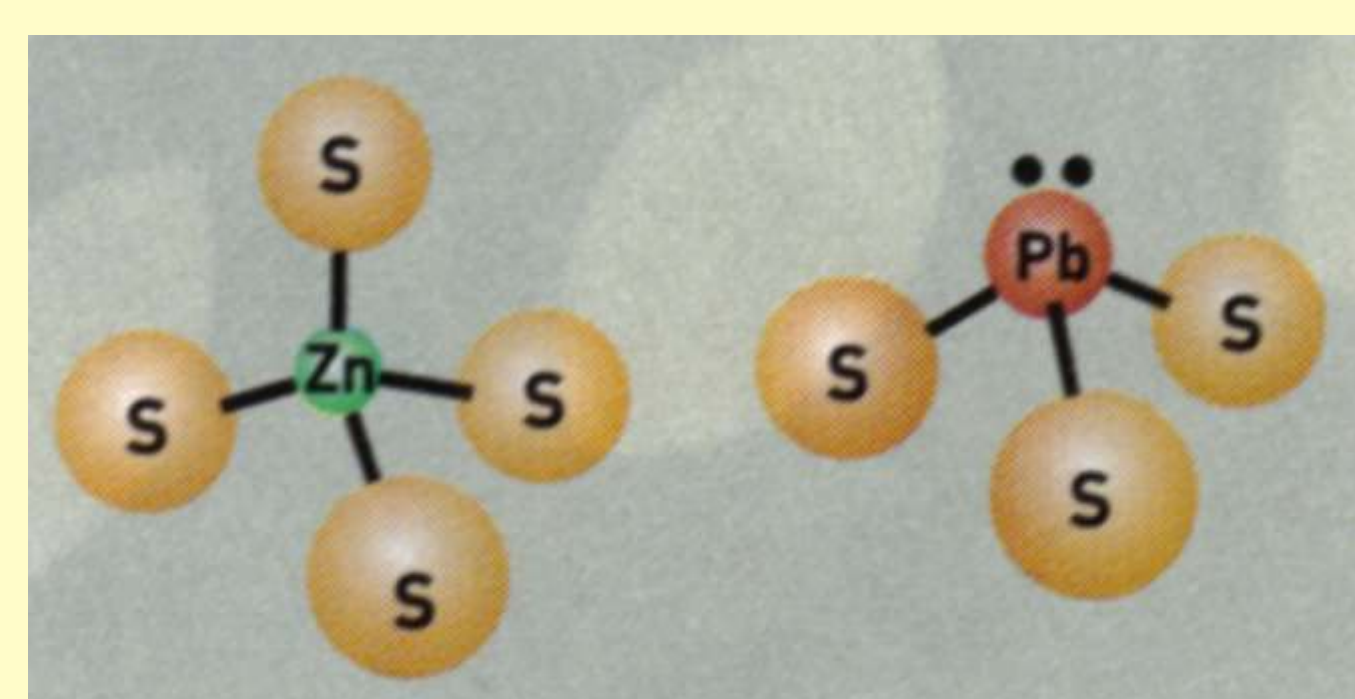
Single-layer crystallites of NbSe₂ (a), graphite (b), Bi₂Sr₂CaCu₂O_x (c), and MoS₂ (d) visualized by AFM (a and b), by scanning electron microscopy (c), and in an optical microscope (d). (All scale bars: 1 μm.)

El plom tòxic és piramidal

Lead poisoning may be due to an unanticipated coordination geometry for lead in sulfur-rich sites, a new study suggests.

In the past decade, biologists have found evidence that low levels of lead can cause developmental disorders in children by disrupting the function of regulatory proteins called transcription factors. The prevailing hypothesis is that lead displaces zinc from sulfur-rich structural binding pockets in the proteins, causing them to fold improperly. Yet a detailed chemical understanding of how lead acts differently from zinc to reshape and disable the proteins has been lacking.

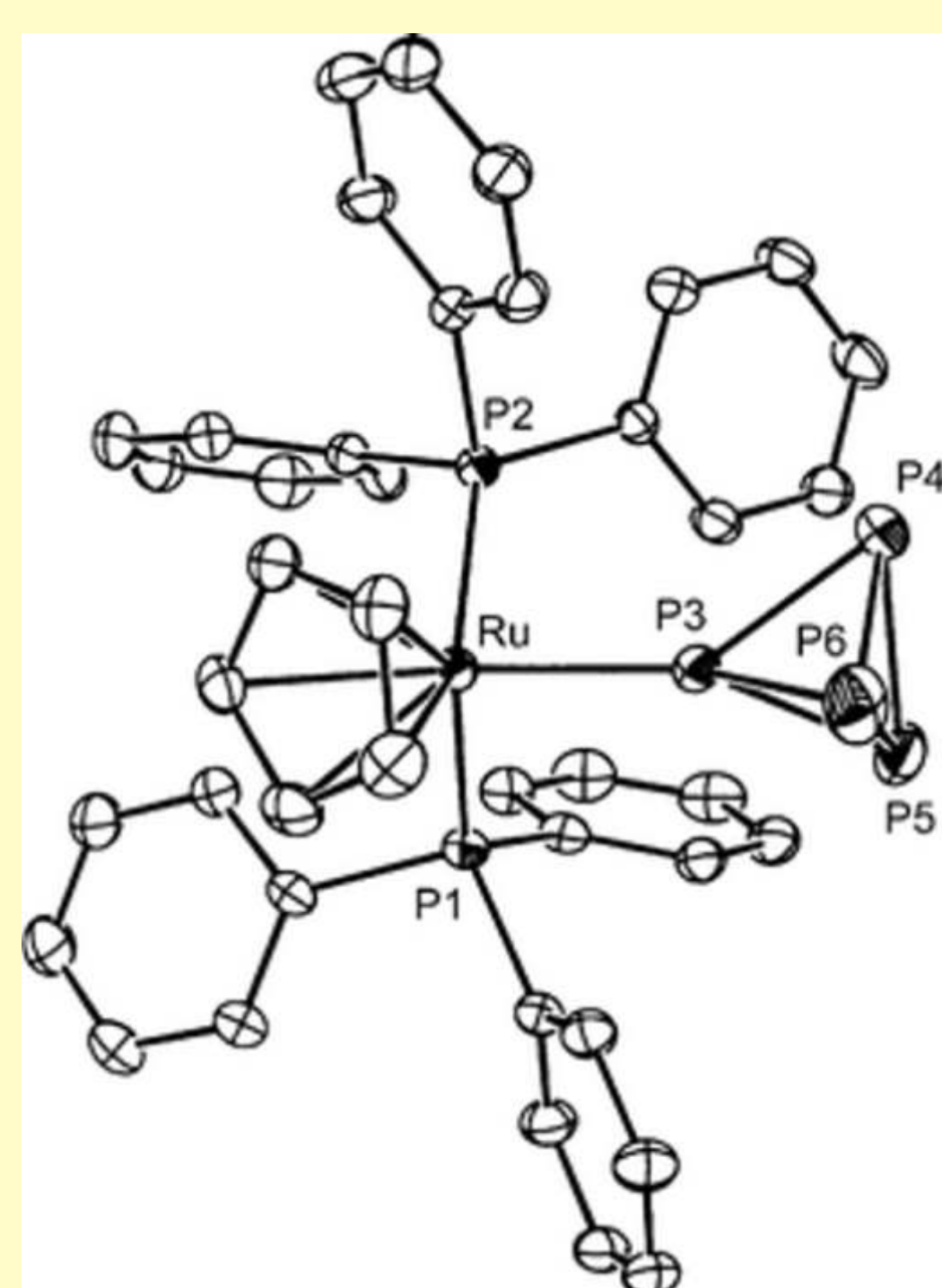
A new study shows that lead preferentially binds to only three sulfurs in a trigonal pyramidal configuration, even when additional sulfurs are available (*J. Am. Chem. Soc.* **2005**, *127*, 9495). Zinc, on the other hand, binds sulfur in a four-coordinate, tetrahedral fashion. A team of scientists led by Hilary A. Godwin at Northwestern University, along with James E. Penner-Hahn and his group at the University of Michigan, carried out the work.



Lead coordinates three sulfurs in structural binding sites of proteins even when four sulfurs are available, unlike zinc, which uses tetrahedral coordination. When the zinc in proteins is substituted with lead, the resulting proteins cannot function.

Fòsfor blanc com a lligand

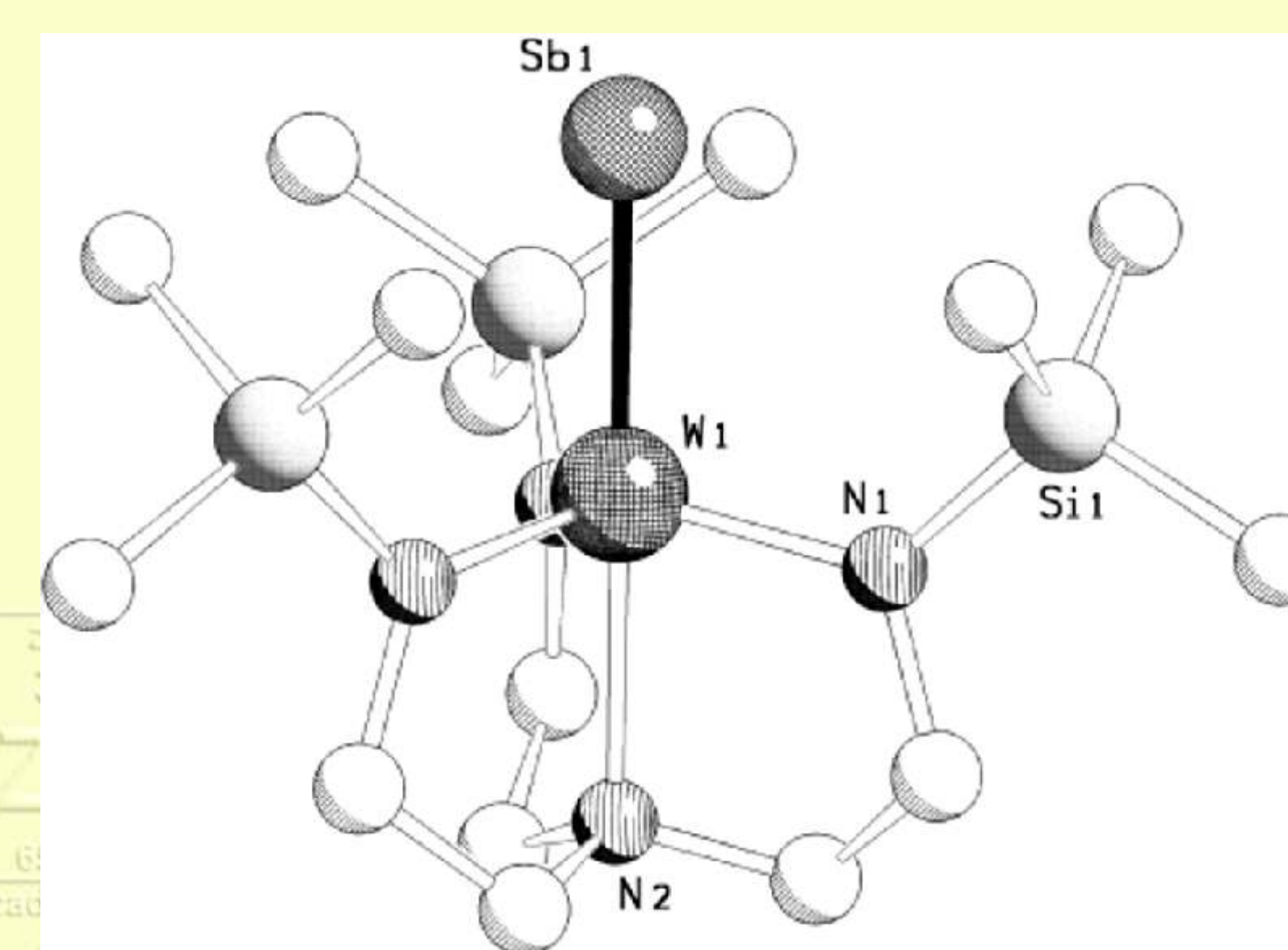
Until recently the coordination of an intact white phosphorus (tetrahedral P₄) molecule to metal fragments has rarely been reported and therefore little is known about the reactivity of the coordinated molecules. Piero Stoppioni and colleagues at the University of Florence, Italy, have now prepared a tetrahedral phosphorus–ruthenium complex which undergoes astonishing hydrolysis to give metal phosphines under very mild conditions. [*Massimo Di Vaira et al. Dalton Trans.*, **2005**, 2234]



Enllaç triple W Sb

Hunters of inorganic triple bonds continue to pursue their quarry, and their latest catch is the first isolable complex containing an antimony-tungsten triple bond [*Angew. Chem. Int. Ed.*, **2005**, *31*, 4920]. The molecule (shown) was synthesized and characterized by chemistry professor Manfred Scheer of the University of Regensburg, in Germany, and coworkers. They prepared it by treating (N₃N)WCl [where N₃N is a silylated tris(2-aminoethyl)amine ligand] with a lithiated stibane of the type LiSb(H)R.

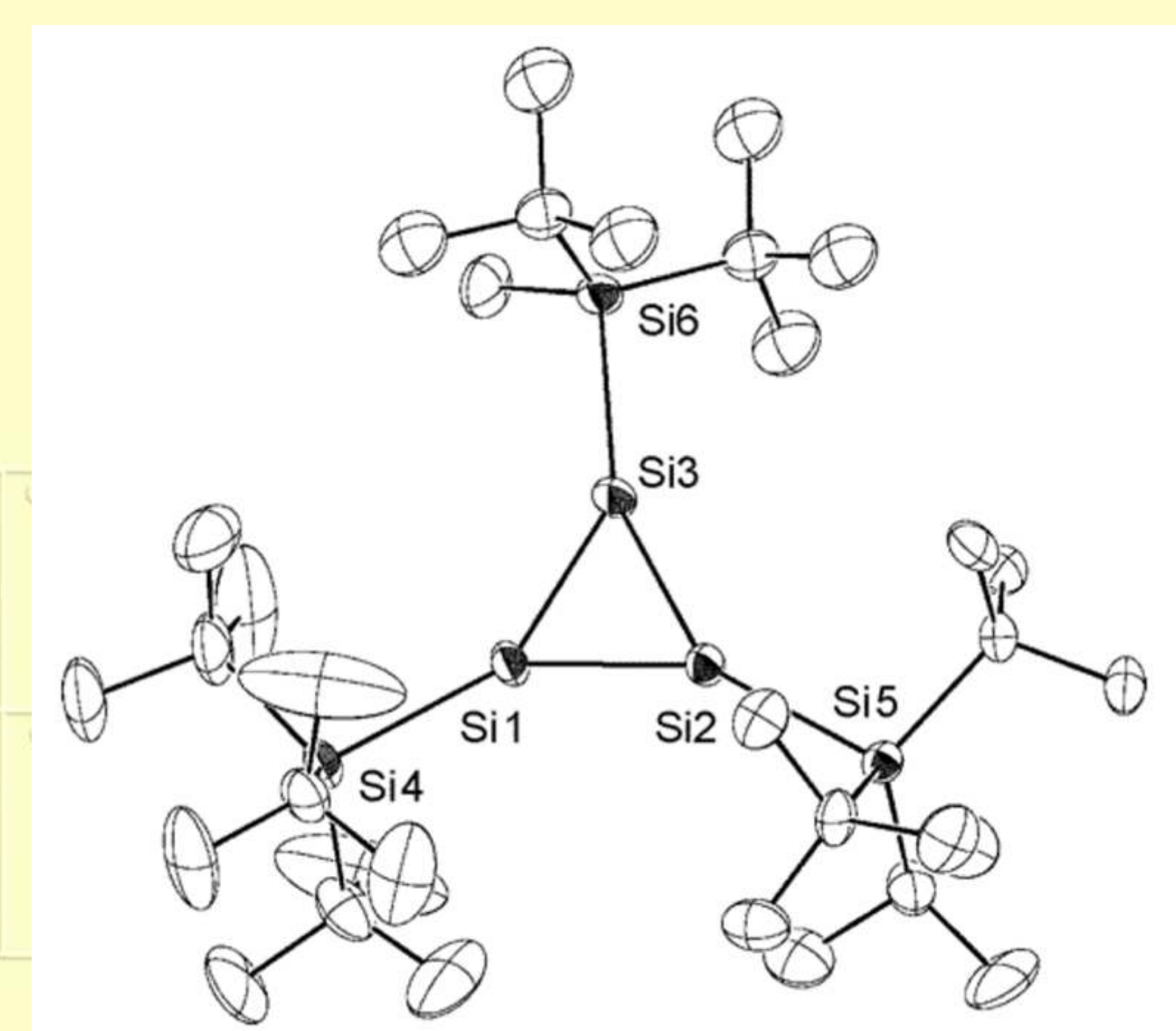
The terminal W–Sb bond of the product is 2.5255 Å long and is the shortest W–Sb bond reported to date, consistent with its representation as a triple bond, according to the researchers. Calculations strongly support their conclusion that they have made a W–Sb triple bond with a weakly polarized character, they add.



Primer compost aromàtic de silici

The first stable all-silicon aromatic ring compound, the cyclotrisilylium cation, has been synthesized by a group in Japan after years of theoretical speculation and failed attempts. The molecule breaks new ground in understanding structure and bonding and could be a stepping-stone toward larger all-silicon aromatic rings.

Chemists have been intrigued with the possibility of preparing silicon, germanium, tin, and lead analogs of all types of carbon compounds. In such analogs, these heavier group-14 elements must be stabilized by bulky substituents. That strategy has proved generally successful, except with pure aromatic compounds. The new cation is analogous to the cyclopropenylium cation, the simplest and smallest aromatic compound with two electrons, first reported by Ronald Breslow of Columbia University in 1957 [*A. Seiguchi et al., J. Am. Chem. Soc.*, **2005**, *127*, 9978].



Breus

- La revista *Chemistry World* publica en el número de setembre un article sobre les aportacions d' Albert Einstein a la Química: <http://www.rsc.org/Chemistryworld>.
- Amb motiu del seu 125è aniversari, la revista *Science* planteja les 125 qüestions més importants per ser resoltes durant els propers 25 anys [<http://www.sciencemag.org/sciext/125th/>].
- *Chemistry & Engineering News*, en el número del 20 de juny, publica un dossier sobre els 46 medicaments que han tingut més impacte en la societat.
- S'ha descobert una nova manera, més segura, de manipular metalls alcalins en el laboratori i en la indústria [*J. L. Dye et al., J. Am. Chem. Soc.*, **2005**, *127*, 9338].

L'element número 23, **vanadi**, va ser descobert el 1803 per Andrés Manuel del Río. El seu nom prové de *Vanadis*, la deessa escandinava de la bellesa.