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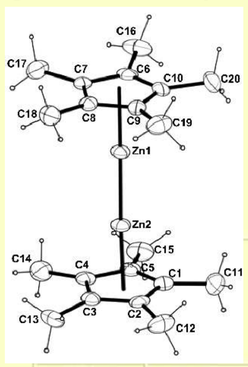
El primer compost amb enllaç Zn-Zn és un organometàl·lic

Unlike mercury, which has an extensive +1 oxidation state chemistry, zinc usually adopts the +2 oxidation state. Decamethyldizincocene, $Zn_2(\eta^5\text{-}C_5Me_5)_2$, an organometallic compound of Zn(I) formally derived from the dimetallic $[Zn\text{-}Zn]^{2+}$ unit, has been isolated from the low temperature (-10º C) reaction of $Zn(C_5Me_5)_2$ and $Zn(C_2H_5)_2$ in diethyl eter, by E. Carmona and coworkers at the Universidad de Sevilla. X-ray studies show that it contains two eclipsed $Zn(\eta^5\text{-}C_5Me_5)$ fragments with a Zn-Zn distance of 2.305 Å, indicative of a metal-metal bonding interaction [*Science*, **305**, 1136 (2004)].

The synthesis of this compound suggests that related complexes of Cd and Hg could be isolated. It also seems plausible that the stabilization of the $[Zn\text{-}Zn]^{2+}$ unit does not require the existence of Zn-C bonds, which means that classical coordination compounds of the Zn_2^{2+} central unit are reasonable targets for future synthetic and structural studies.

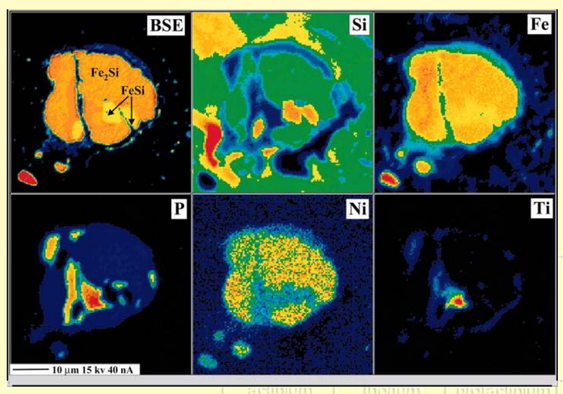


El Fe_2Si, un mineral llunàtic

The moon is probably the most extensively studien planetary body in the solar system, not least because it is the only one that mankind has actually set foon on. However, it is still capable of throwing up the odd surprise, such as the new lunar mineral recently discovered by a team of US planetary scientist and Russian chemists [M. Anand *et al*, *Proc. Natl. Acad. Sci.*, **101**, 6847 (2004)].

The mineral, a species of iron silicide (Fe_2Si), was discovered in a lunar meteorite found in the Dhofar region of Oman in January 2000. This is the first time that iron silicides have been found in lunar rocks and the first time that Fe_2Si has been found naturally. The researchers also discovered two other species of iron silicide in the meteorite, FeSi and $FeSi_2$, which had previously been discovered in terrestrial rocks.

The authors propose that micrometeorites hitting the lunar surface melt and vaporise iron and silicats present in the soil, which then combine and condense to produce iron silicides. They have named the new iron silicide mineral *hapkeite*, after Bruce Hapke, the US scientist who first predicted the presence of impact-induced iron in the lunar soil.

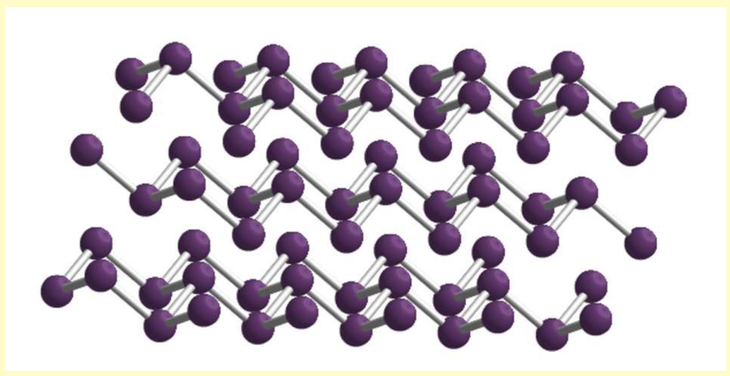


Polinitrogen: un al·lòtrop amb enllaços senzills

Scientists have eagerly studied the behavior of molecular nitrogen under high pressure for nearly 20 years, searching for evidence of polymeric nitrogen, a single-bonded form of nitrogen with a structure similar to that of diamond. Several new nitrogen phases have been discovered, including a nonmolecular semiconducting phase, but polymeric nitrogen has remained elusive. Until now.

Mikhail I. Eremets of Max Planck Institute for Chemistry, in Mainz, and coworkers report the preparation of polynitrogen by compressing N_2 above 110 gigapascals (about 1.1 million atm) and 2,000 K in a tiny laser-heated diamond anvil cell. Raman scattering and X-ray data indicate that each nitrogen atom in the product is connected to three neighbors by single covalent bonds. [*Nat. Mater.*, **3**, 558 (2004)].

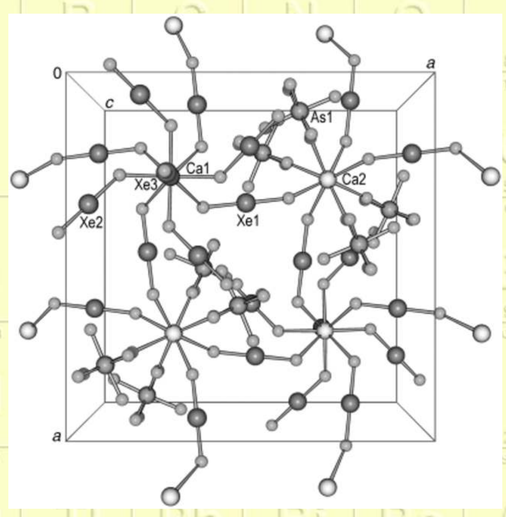
The material is stable at room temperature at pressures above 42 GPa, though the researchers were unable to isolate an intact sample at atmospheric pressure.



Els compostos de xenó, bons lligands

More than 40 years ago, chemist Neil Bartlett and others burst the myth that the "inert gases" were chemically inert by synthesizing xenon compounds. In later work, Bartlett and others showed that XeF_2 can act as a ligand for metal ions, but the metal centers were simultaneously coordinated by AF_6^- (A = As, Sb, P). Boris Žemva of Jožef Stefan Institute, in Ljubljana, Slovenia, and coworkers have now prepared the first compound in which a metal center is coordinated only to XeF_2 molecules [*Angew. Chem. Int. Ed.*, **43**, 3456 (2004)].

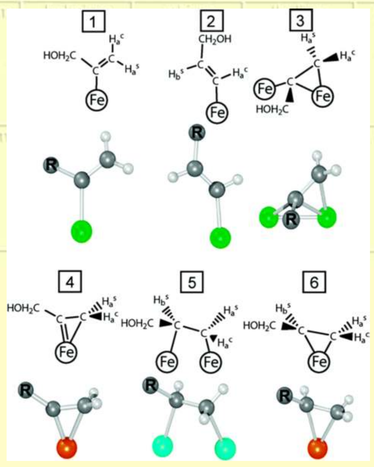
The researchers synthesized $Ca_2(XeF_2)_9(AsF_6)_4$, a white crystalline solid, by reacting a 20-fold excess of XeF_2 with $Ca(AsF_6)_2$ in anhydrous HF solvent. The two calcium atoms are crystallographically different: One calcium atom is coordinated to fluorine atoms from the four AsF_6^- ions and from four XeF_2 molecules, while the other calcium atom is coordinated to fluorine atoms from all nine XeF_2 molecules . The team hopes next to synthesize a compound where all metal centers are coordinated only to XeF_2.



El ferro, reductor en la nitrogenasa

Nitrogenase is the much-studied enzyme that catalyzes the reduction of N_2 to NH_3 and the reduction of other triply bonded substrates such as alkynes. The X-ray structure of the enzyme's active site has been known for a decade, yet chemists still don't know whether reduction occurs at one or more iron atoms in the enzyme's FeMo-cofactor or at a molybdenum atom. Brian M. Hoffman of Northwestern University and colleagues now report the first detailed description of a trapped nitrogenase reduction intermediate (shown), providing new evidence supporting iron as the reduction site [*J. Am. Chem. Soc.*, **126**, 9563 (2004)].

The intermediate (labelled 3 in the figure) was generated by freezing a reaction of isotopically labeled propargyl alcohol with a modified nitrogenase and was characterized in a series of electron-nuclear double resonance spectroscopy experiments. Pinpointing the origin of the hydrogen atoms--either the alcohol or the solvent--allowed the researchers to propose that a cyclic intermediate forms when the triple bond of the alcohol coordinates to an iron atom. This is circumstantial evidence that N_2 binds to the same site, they say, but direct evidence is still needed.



Breus

- Ha mort el Dr. Joan Oró (Lleida, 1923), químic reconegut pels seus estudis sobre l'origen de la vida.
- Els Estats Units i la Unió Europea dels 15 representen el 72 % de la producció científica mundial.
- La IUPAC ha establert el sistema de nomenclatura dels ful·lerens.
- Una tinta intel·ligent que conté diòxid de titani, trietanolamina i blau de metilè controla el bon estat dels aliments envasats [S.K. Lee et al, *Chem. Commun.*, 1912 (2004)].

L'element número **17**, **clor**, va ser descobert el 1774 per Carl Wilhelm Scheele. El seu nom prové del mot grec χλωροζ que significa *verd pàl·lid*.