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Els elements químics encara són notícia

Per què fa olor el ferro?

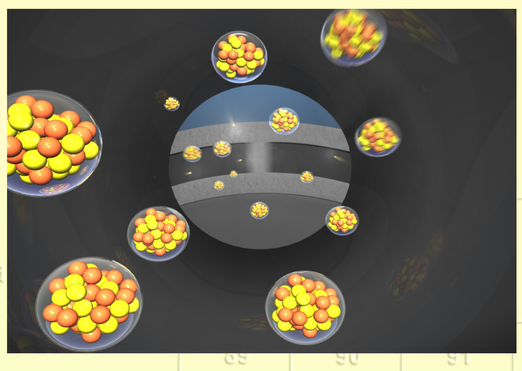
Where does the strange but typical "metallic" smell come from when we touch iron objects such as tools, utensils, railings, or coins? "The smell of iron upon contact with skin is ironically a type of human body odor," states Dietmar Glindemann. "That we are smelling the metal itself is actually an illusion." In conjunction with a team of researchers from the Virginia Polytechnic Institute and State University in the United States, The University of Leipzig and the Leipzig Environmental Research Center, Germany, he has tracked down the responsible scent molecules [*Angew. Chem. Int. Ed.*, **2006**, *42*, 7006].

Seven test subjects immediately recognized the "musty" metallic odor when their hands came into contact with metallic iron or a solution containing Fe^{2+} ions. In contrast, solutions of Fe^{3+} did not cause the odor. Analysis of gas samples from the skin of the test subjects pointed to a bouquet of different organic compounds that seemed to be characteristic of the metallic smell. The key component is called 1-octen-2-one, which smells fungal-metallic even when highly diluted. The precursors to the odor molecules are lipid peroxides, which are produced when oils on skin are oxidized by certain enzymes or other processes (e.g. under UV light). These lipid peroxides are then decomposed by the Fe^{2+} ions, which are consequently oxydized to Fe^{3+}. When touching objects made of iron, the required Fe^{2+} ions are formed when perspiration on the skin corrodes the iron.

Preparat el Uuo

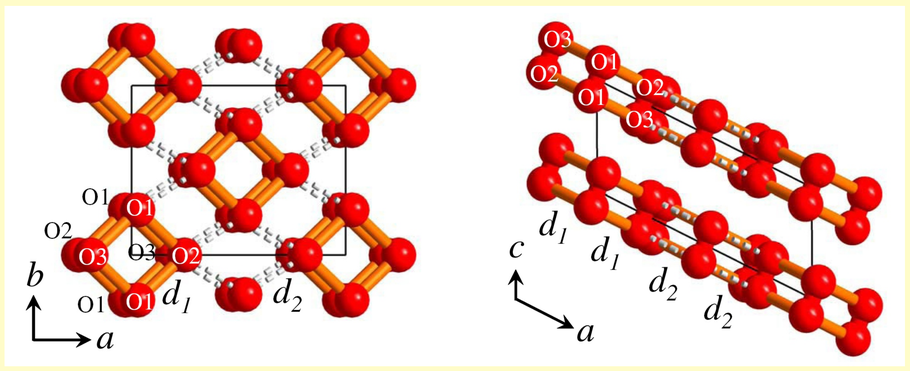
An experiment begun in 2002 has produced three atoms of the heaviest superheavy element yet—element 118—according to a team of researchers from Russia and the U.S. On the basis of the number of protons in its nucleus, the new element belongs just below radon in the periodic table.

Scientists at the Joint Institute for Nuclear Research in Dubna, Russia, working with colleagues from Lawrence Livermore National Laboratory in California, bombarded a target enriched in californium (^{249}Cf, containing 98 protons) with an energetic beam of calcium ions (^{48}Ca, with 20 protons). After thousands of hours of bombardment, the team claims to have detected three series of correlated nuclear events that signify the creation and nearly instantaneous demise of three atoms of element 118 [Y. T. Oganessian *et al.*, *Physical Review C*, **2006**, *74*, 044602].



Un nou al·lòtrop de l'oxígen

As oxygen is squeezed and solidified under increasing pressure, it passes through a series of six distinct crystal phases, one of which-the phase-is marked by a dark red color and the collapse of magnetic behavior. The detailed structure of this phase, which has eluded researchers for 27 years, has now been determined independently by two groups using X-ray diffraction. Their results indicate that in the phase, which persists at pressures from 8 to 96 gigapascals, four O_2 molecules associate into a rhombohedral O_8 unit that is probably held together by weak chemical bonds. These $(O_2)_4$ rhombs (shown) are quite different from the long-sought O_8 rings that would be an analog of the well-known S_8 rings of elemental sulfur. The fact that this rhombohedral tetramer structure hasn't been predicted by theory "presents a challenge to our understanding of dense oxygen," according to a team of physicists from Scotland, Canada, and France (L. F. Lundegaard *et al.*, *Nature* **2006**, *443*, 201). The other structure elucidation of -oxygen was published last month by a Japanese team (H. Fujihisa *et al.*, *Phys. Rev. Lett.* **2006**, *97*, 085503).

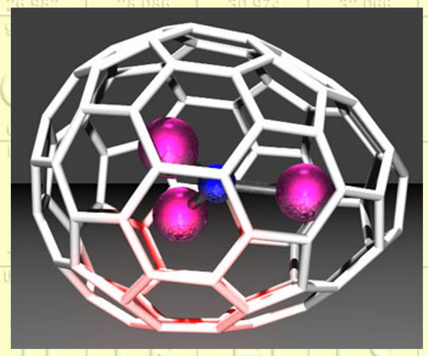


Un fullerè *botorut*

Fullerenes, sometimes called "buckyballs," are usually spherical molecules of carbon, named after the futurist R. Buckminster Fuller, inventor of the geodesic dome. The carbon atoms are arranged in pentagons and hexagons, so their structures can resemble a soccer ball. An important rule -- until now -- is that no two pentagons can touch, but are always surrounded by hexagons.

The "buckyegg" (an egg-shaped fullerene) was made by heating a mixture of carbon and other ingredients under special conditions to make a mixture of fullerenes. This molecule features two pentagons next to each other, making the pointy end of the egg. The egg contains a molecule of triterbium nitride inside [C. M. Beavers *et al.*, *J. Am. Chem. Soc.*, **2006**, *128*, 11352].

The experiment was actually part of a project to find new, more predictable ways to make fullerenes. The researchers were trying to make fullerenes with atoms of terbium trapped inside. Metals similar to terbium are used as contrast agents for some medical scanning procedures. By putting these metals inside fullerenes, the researchers hope to make compounds that could be both medically useful and well-tolerated in the body.



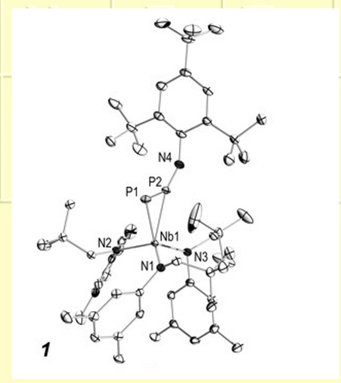
El P_2, més a l'abast

Although the diatomic form of nitrogen is readily available from the air and is exceedingly stable, the diatomic form of phosphorus—the element located just below nitrogen in the periodic table—is rather hard to come by. This dichotomy has stymied chemists who would like to be able to use diphosphorus (P_2) to make new kinds of phosphorus-containing molecules.

Now there may be reason to celebrate: Christopher C. Cummins and coworkers at MIT have developed a mild procedure for generating P_2 or its synthetic equivalent in solution (*Science* **2006**, *313*, 1276). The method promises to greatly expand the range of compounds containing the P_2 moiety, such as phosphine ligands for new catalysts.

The stable molecular form of phosphorus is tetrahedral P_4 (white phosphorus). P_4 can be broken down into reactive P_2, but that requires temperatures in excess of 1,100 K, which is not realistic for organic synthesis.

The MIT advance involves the straightforward synthesis of a niobium complex containing a ligand with the P=P=NR linkage.When heated to 65 °C in solution, this compound extrudes P_2 as a reactive intermediate.



Breus

- Segons dos estudis, fets per la universitat de Shangai i pel *The Times Higher Education*, la Universitat de Barcelona és l'única universitat espanyola que està entre les 200 millors del món.
- Encara que es presenta com *l'últim crit* la utilització de nanomaterials en cosmètica, els romans ja feien servir PbS nanocristal·lí per tenyir el cabell [P. Walter *et. al.*, *Nano Lett.* **2006**, *6*, 2215]
- Els líquids iònics no son tan segurs com semblen, ja que en algunes circumstàncies poden inflamar-se [M. Smiglak *et al.*, *Chem Commun.*, **2006**, 2554].

L'element número **30**, **zinc**, és conegut des de l'antiguitat. Va ser reconegut com a element per l'alemany Andreas Marggraf en 1746.