Általános Kémiához ábrák, etc.
2005. ősz

2004. őszi tételsor az ElmKém web-oldalán:

www.chem.elte.hu/departments/elmkem/fg/oktatas/altkem

(40 + tétel; főbb fejezetek:)

Alapfogalmak
A gázhalmazállapot
A reakciók energetikája (termokémia)
A termodinamika alapjai, a folyamatok iránya, egyensúly
Halmazállapotok és fizikai tulajdonságok
Elektrokémia
Reakciókinetika
Az anyag atomi - molekuláris szerkezete.
Atomok elektronszerkezete és a periódusos rendszer
A kémiai kötés

A kémia felosztása különböző lehet

Egy könyvkiadó: WileyEurope > Chemistry

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General Chemistry

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Polymer Science & Technology

Special Topics

Spectroscopy

Kémia mindenhol

TOP 50 CHEMICALS:

Rank 1995	Rank 1994		Billions of lb 1995	Billions of lb 1994
1	1	Sulfuric acid	95.36	89.63
2	2	**Nitrogen**	68.04	63.91
3	3	**Oxygen**	53.48	50.08
4	4	**Ethylene**	46.97	44.60
5	5	**Lime(b)**	41.23	38.37
6	6	**Ammonia**	35.60	34.51
7	7	**Phosphoric acid**	26.19	25.58
8	8	**Sodium hydroxide**	26.19	25.11
9	10	**Propylene**	25.69	23.94
10	9	**Chlorine**	25.09	24.37
11	11	**Sodium carbonate(c)**	22.28	20.56
12	18	**Methyl *tert-butyl* ether**	17.62	13.61
13	14	**Ethylene dichloride**	17.26	16.76
14	12	**Nitric acid**	17.24	17.22
15	13	**Ammonium nitrate(d)**	15.99	17.03
16	16	**Benzene**	15.97	15.27
22	20	**Carbon dioxide(f)**	10.89	11.80
27	26	**Hydrochloric acid**	7.33	7.47
33	33	**Acetic acid**	4.68	3.98
42	42	**Titanium dioxide**	2.77	2.76
43	43	**Acetone**	2.76	2.66
50	49	**Bisphenol A**	1.62	1.70

Top 50 Chemical Companies in 1999

Rank Company Total sales Chemical sales Chemical operating profits

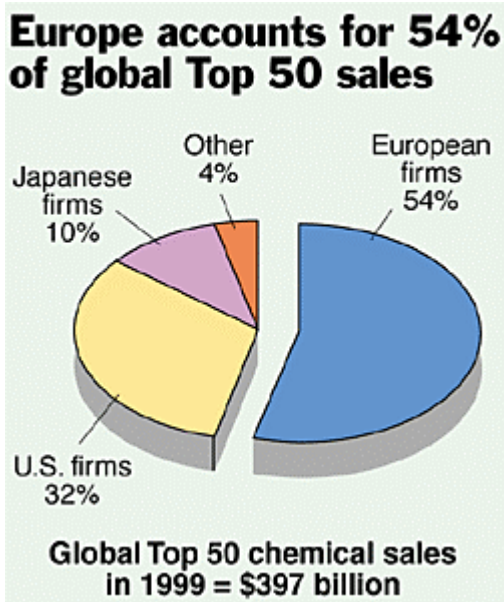
Rank 1999	Rank 1998	Company	Total sales 1999 ($ M)	Chemical sales 1999 ($ M)	% of total	Chem. Oper. profits 1999 ($ M)	%
1	**1**	**BASF (Germany)**	**34,689.4**	**31,250.3**	**90.1%**	**1,350.9**	**4.3**
2	**2**	**DuPont (U.S.)**	**29,740.0**	**27,688 .0**	**93.1**	**2,961.0**	**10.7**
3	**3**	**Bayer (Germany)**	**29,106.7**	**20,192.5**	**69.4**	**3,024.7**	**15.0**
4	**4**	**Dow Chemical (U.S.)**	**18,929.0**	**18,600.0**	**98.3**	**2,732.0**	**14.7**
5	8	Exxon Mobil (U.S.)[b]	185,527.0	13,777.0	7.4	1,354.0	9.8
6	6	ICI (U.K.) 13,671.5	13,671.5	100.0	923.9	6.8	
7	5	Shell (U.K./Netherlands)	149,706.0	12,886.0	8.6	885.0	6.9
8	19	Akzo Nobel (Netherlands)	15,375.9	12,323.5	80.1	819.3	6.6
9	35	Degussa-Hüls (Germany)[c]	13,157.7	10,085.8	76.7	544.6	5.4
10	11	BP Amoco (U.K.)	101,180.0	9,392.0	9.3	1,100.0	11.7
11	28	Total (France)[c] 42,069.0	9,343.6	22.2	643.5	6.9	
12	10	Elf Aquitaine (France)	37,872.8	9,272.2	24.5	540.2	5.8
13	13	Sumimoto Chemical (Japan)	8,342.9	8,136.5	97.5	588.9	7.2
16	18	Henkel (Germany)	12,104.0	7,324.6	60.5	604.1	8.2

Nemzeti jövedelmekhez hasonlítva:

Comparative economic indicators, 2000

	Hungary	Slovenia	Slovakia
GDP (US$ bn)	**45.6**	**18.1**	**19.2**
GDP per head (US$ at PPP)	**9,035**	**14,250**	**8,718**

March 12, 2002 : The survey, published in a recent issue of the Society's publication, *Chemical & Engineering News (C & EN)*, ranks the global **top 50 by their chemical sales**. It also charts their total sales, chemical operating profits and capital spending



TOP "10" HAZARDOUS HOUSEHOLD CHEMICALS

By Richard Alexander

AIR FRESHENERS: Most air fresheners interfere with your ability to smell by coating your nasal passages with an oil film, or by releasing a nerve deadening agent. Known toxic chemicals found in an air freshener: *Formaldehyde:* Highly toxic, known carcinogen. *Phenol:* When phenol touches your skin it can cause it to swell, burn, peel, and break out in hives. Can cause cold sweats,convulsions, circulatory collapse, coma and even death.

AMMONIA: It is a very volatile chemical, it is very damaging to your eyes, respiratory tract and skin.

BLEACH: It is a strong corrosive. It will irritate or burn the skin, eyes and respiratory tract. It may cause pulmonary edema or vomiting and coma if ingested. WARNING: never mix bleach with ammonia it may cause fumes which can be DEADLY.

DISHWASHER DETERGENTS: Most products contain *chlorine* in a dry form that is highly concentrated.# 1 cause of child poisonings, according to poison control centers.

DRAIN CLEANER: Most drain cleaners contain lye, hydrochloric acid or trichloroethane.
Lye: Caustic, burns skin and eyes, if ingested will damage esophagus and stomach.
Hydrochloric acid: Corrosive, eye and skin irritant, damages kidneys, liver and digestive tract.
Trichloroethane: Eye and skin irritant, nervous system depressant; damages liver and kidneys.

contnd,.

FURNITURE POLISH: *Petroleum Distillates:* Highly flammable, can cause skin and lung cancer. *Phenol:* (see Air fresheners, Phenol.) *Nitrobenzene:* Easily absorbed through the skin, extremely toxic.

MOLD AND MILDEW CLEANERS: Chemicals contained are: *Sodium hypochlorite:* Corrosive, irritates or burns skin and eyes, causes fluid in the lungs which can lead to coma or death. *Formaldehyde:* Highly toxic, known carcinogen. Irritant to eyes, nose, throat, and skin. May cause nausea, headaches, nosebleeds, dizziness, memory loss and shortness of breath.

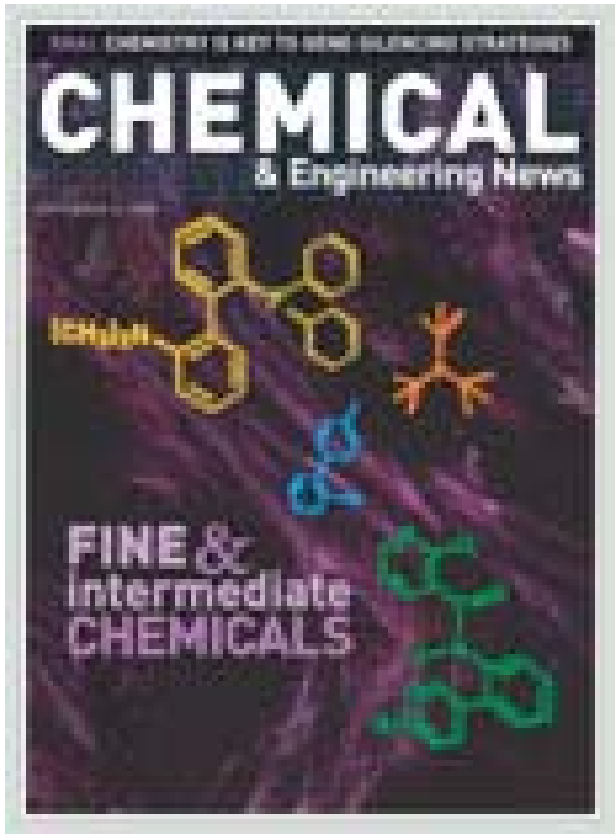
OVEN CLEANER: *Sodium Hydroxide (Lye):* Caustic, strong irritant, burns to both skin and eyes. Inhibits reflexes, will cause severe tissue damage if swallowed.

ANTIBACTERIAL CLEANERS: may contain: *Triclosan:* Absorption through the skin can be tied to liver damage.

LAUNDRY ROOM PRODUCTS: *Sodium or calcium hypocrite:* Highly corrosive, irritates or burns skin, eyes or respiratory tract. *Linear alkylate sulfonate:* Absorbed through the skin. Known liver damaging agent. *Sodium Tripolyphosphate:* Irritates skin and mucous membranes, causes vomiting. Easily absorbed through the skin from clothes.

TOILET BOWL CLEANERS: *Hydrochloric acid:* Highly corrosive, irritant to both skin and eyes. Damages kidneys and liver. *Hypochlorite Bleach:* Corrosive, irritates or burns eyes, skin and respiratory tract. May cause pulmonary edema, vomiting or coma if ingested. Contact with other chemicals may cause chlorine fumes which may be fatal

VÁLOGATÁSOK KURRENS EREDMÉNYEKBŐL:

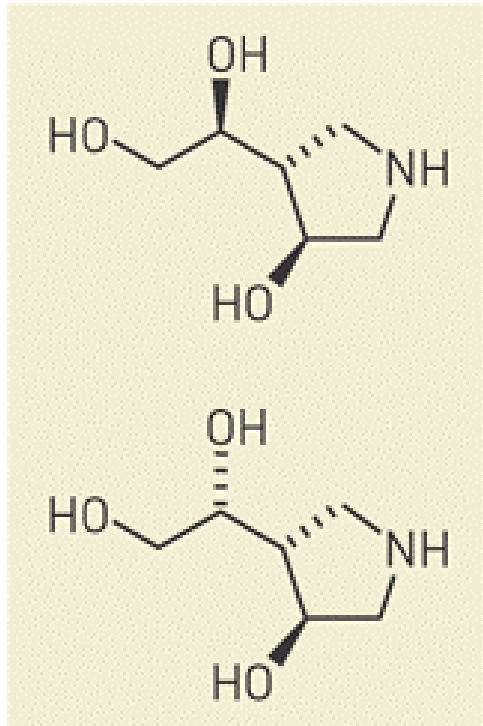


September 6, 2004
Vol. 82, Iss. 36

INHIBITORS TARGET KEY TB ENZYME

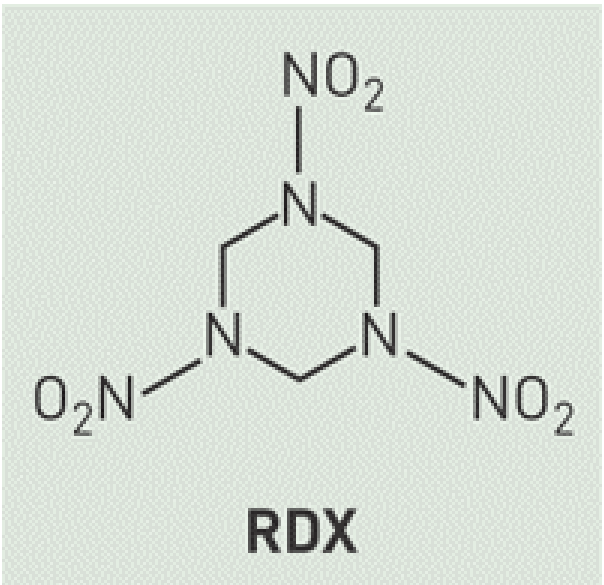
Iminosugars may provide leads for new class of tuberculosis drugs

Scientists in England have designed and synthesized the first inhibitors of an enzyme that is essential for the survival of the tuberculosis bacterium [*Org. Biomol. Chem.*, **2,** 2418 (2004)]. The compounds might lead to better treatments for TB, which annually infects 8 million to 10 million people and kills 2 million to 3 million. e and kills 2 million to 3 million.



RDX LINKS RUSSIAN CRASHES

Powerful explosive found in the debris of two planes that crashed

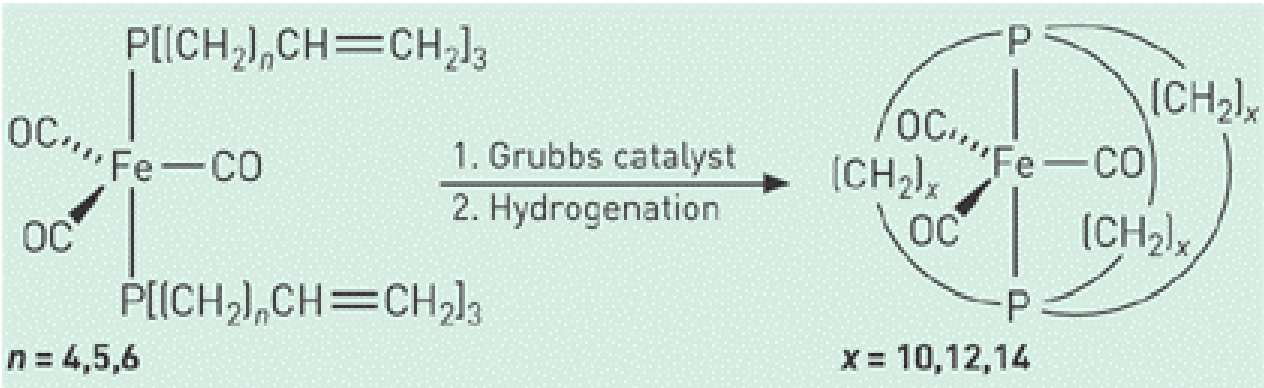


RDX

Traces of RDX, a common military explosive that is also known as hexogen or **cyclonite**, were found at the crash sites of two Russian planes that went down within minutes of each other on Aug. 24, Russian authorities report. RDX was also used in a suicide bombing at a Moscow metro station on Aug. 31, news reports say.

"RDX is a very powerful explosive," says Jimmie C. Oxley, a professor of chemistry at the University of Rhode Island. "A terrorist wouldn't need to conceal very much." RDX has an explosive power considerably greater than that of **TNT**, is chemically stable, and is more susceptible than TNT to shock detonation.

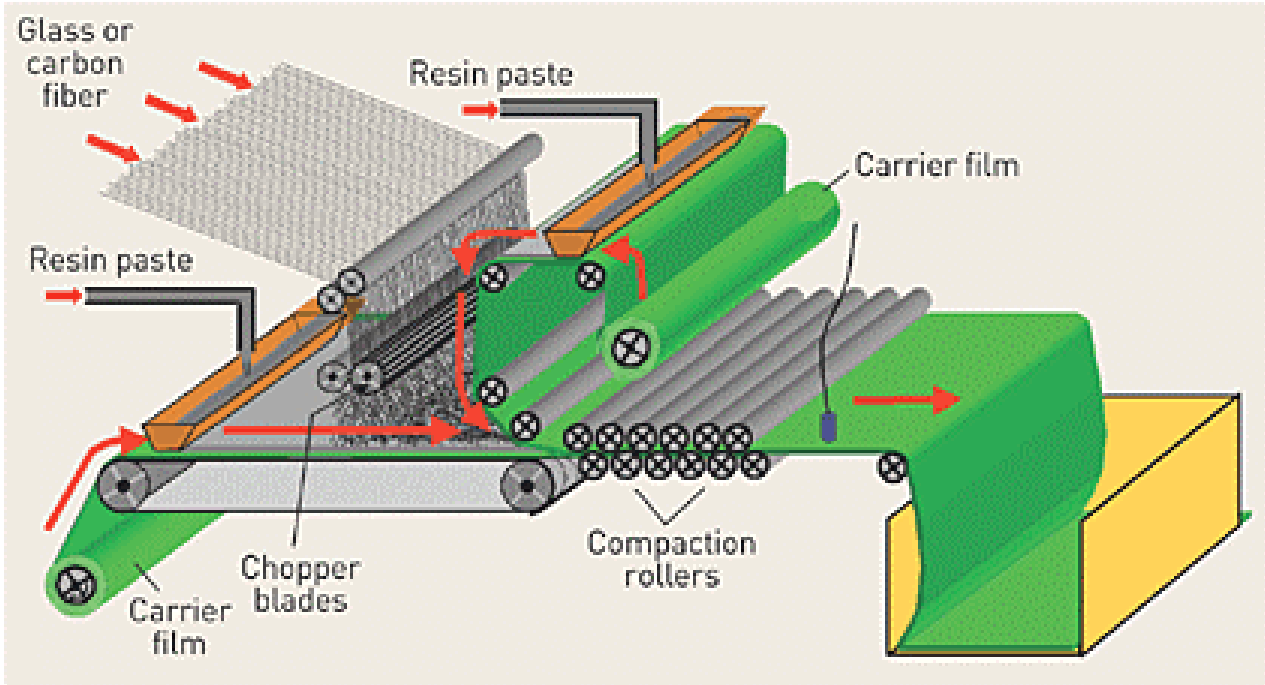
"Molekuláris giroszkóp"



COMPOSITE MATERIALS

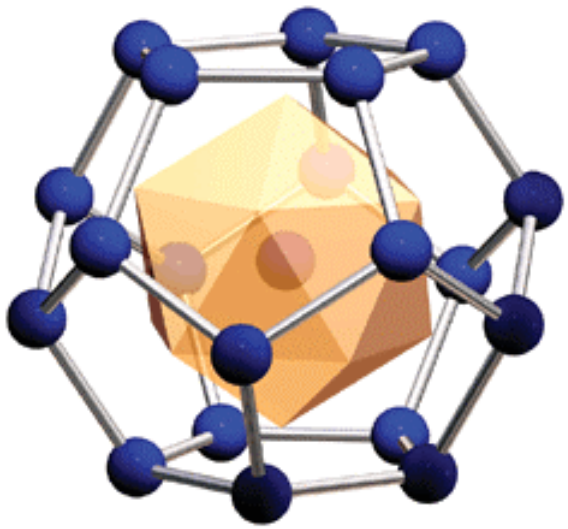
Custom blending of materials with distinct characteristics leads to advanced composites with tailor-made properties

IT'S A BIRD, IT'S A PLANE ... Advanced composite materials in the V-22 Osprey's tilt-rotor system play a key role in enabling the sophisticated plane to take off and land on aircraft carriers like a helicopter and fly like a turboprop airplane.



SHEET MOLDING Sheets of a composite molding material can be prepared by feeding glass or carbon fibers (chopped or intact) and a polymer-based resin (orange trough) between a pair of plastic films

Gyönyörűszép Molekulák



One example, reported by Bryan W. Eichhorn's group at the University of Maryland, is the $[As@Ni_{12}@As_{20}]^{3-}$ ion. This cluster consists of an As_{20} pentagonal dodecahedron that encapsulates a Ni_{12} icosahedron, which contains an arsenic atom at its center. The As_{20} cage is related to the smallest fullerene, C_{20} C&EN **May 5, 2003**

Source: C&EN/ April 14, 2003

MOLECULAR DESIGN

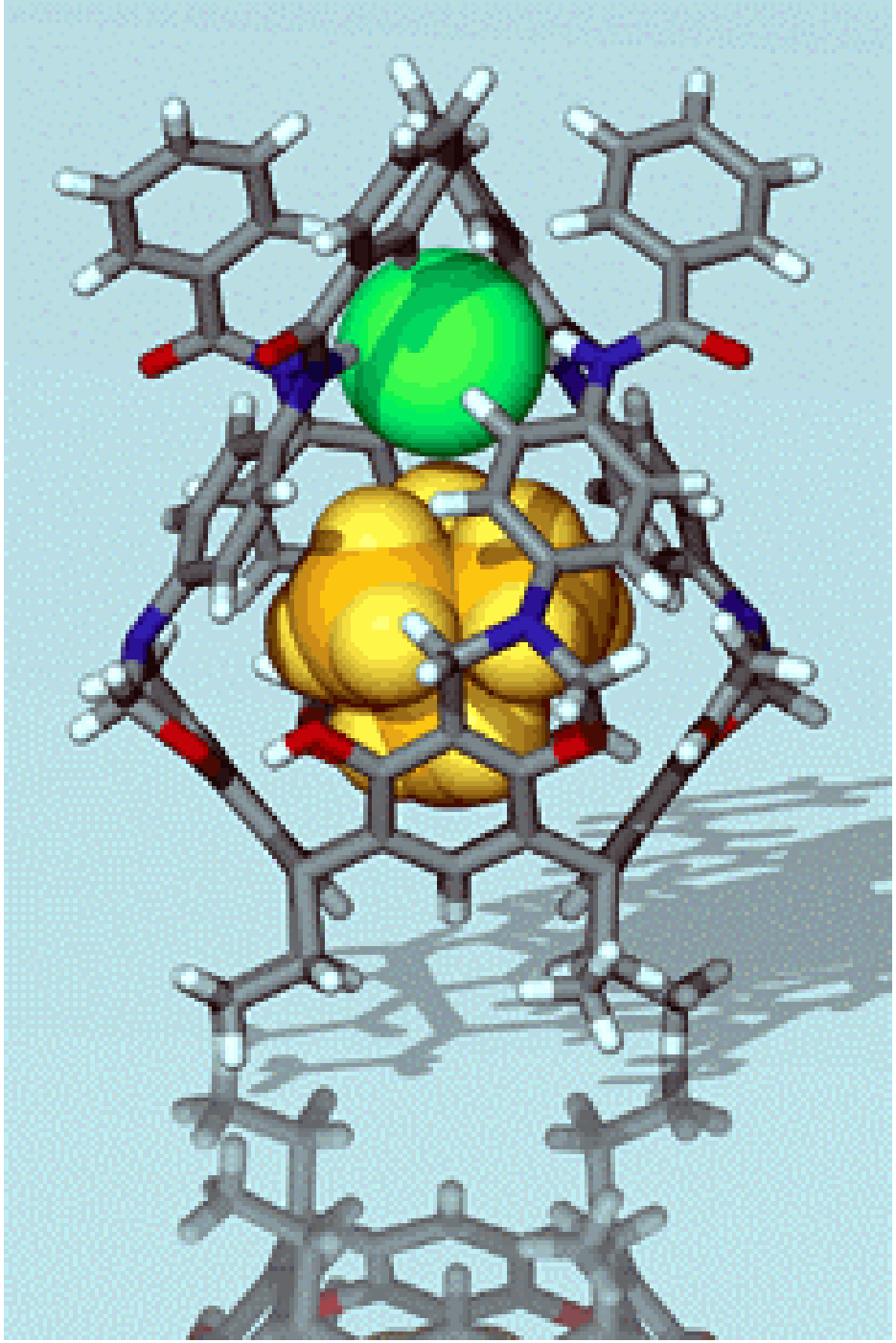
ION RECOGNITION

System exploits weak interactions to attract anion to cation in capsule

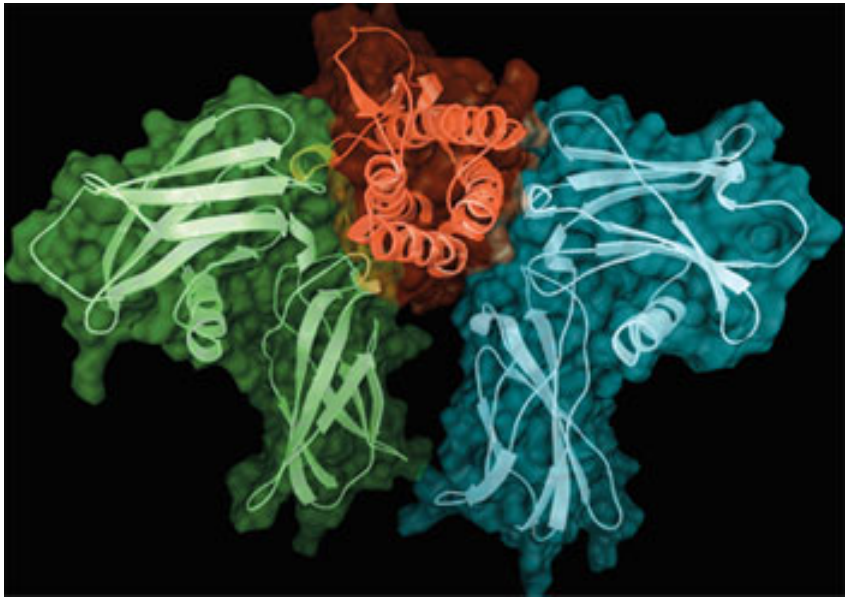
A new approach to anion recognition that uses electrostatic and hydrogen-bonding interactions has been developed by chemists at the University of Missouri, Columbia.

"For the first time, we have utilized a single molecule to completely encapsulate an ion pair in polar media," chemistry professor Jerry L. Atwood tells C&EN. "We envision that resins incorporating these capsules could be used in anion sensing in environmental applications."

Atwood and postdoc Agnieszka Szumna embedded a tetramethylammonium cation in the pocket of a resorcin[4]arene molecule functionalized with bulky amide substituents. The complex selectively binds to a chloride anion in solvents such as methanol [*Chem. Comm.*, **2003,** 940].



Ezt is tudjuk …… EPO



Understanding the function of endogenous hormones and putting them to good use to treat diseases has been one of the great accomplishments of modern medicine. One natural hormone that has turned out to be a blockbuster drug--but not without some controversy--is erythropoietin (EPO).

EPO is a glycoprotein (protein-sugar conjugate) that serves as the primary regulator of red blood cells (erythrocytes) in mammals. It stimulates bone marrow stem cells to differentiate into red blood cells and controls hemoglobin synthesis and red blood cell concentration. Human EPO is a 30,400-dalton molecule containing 165 amino acids and four carbohydrate chains that incorporate sialic acid residues. There are several forms of EPO, designated by Greek letters, that differ only in the carbohydrate content.

In infants, EPO is produced mostly in the liver, but the kidneys become the primary site of EPO synthesis shortly after birth. EPO production is stimulated by reduced oxygen content in arterial blood in the kidneys. Circulating EPO binds to receptors on the surface of erythroid progenitor cells that in turn mature into red blood cells…... *contnd*

Human EPO was first isolated and later purified from urine in the 1970s. Interest in developing clinical uses for EPO led to the discovery of the gene encoding EPO, and several groups devised recombinant DNA methods to produce EPO by the mid-1980s.

Recombinant EPO quickly made it to market to treat anemia resulting from a host of conditions, primarily kidney failure, HIV infection in patients treated with AZT, and cancer chemotherapy. Doses of EPO are given by injection one or more times per week to maintain a normal hematocrit level, the ratio of red blood cell volume to total blood volume. Generally, EPO might be prescribed for any condition where blood oxygen levels are depressed and to help eliminate the potential need for blood transfusions.

……

Enzyme immunoassays can provide a measure of serum EPO levels, but the tests can't determine **if the EPO is natural or produced recombinantly** and injected by unscrupulous athletes. The World Anti-Doping Agency has now developed combination urine and blood tests that can detect EPO abuse by athlet.

2005. szept. 14. idáig

Robert Boyle (1627–1691) was born at Lismore Castle, Munster, Ireland, the fourteenth child of the Earl of Cork. As a young man of means, he was tutored at home and on the Continent. He spent the later years of the English Civil Wars at Oxford, reading and experimenting with his assistants and colleagues. This group was committed to the New Philosophy, which valued observation and experiment at least as much as logical thinking in formulating accurate scientific understanding. At the time of the restoration of the British monarchy in 1660, Boyle played a key role in founding the Royal Society **to nurture this new view of science.**

Although Boyle's chief scientific interest was chemistry, his first published scientific work, *New Experiments Physico-Mechanicall, Touching the Spring of the Air and its Effects* (1660), concerned the physical nature of air, as displayed in a brilliant series of experiments in which he used an air pump to create a vacuum. The second edition of this work, published in 1662, delineated the quantitative relationship that Boyle derived from experimental values, later known as "Boyle's law": that the volume of a gas varies inversely with pressure.

Robert Boyle at the age of thirty-seven, with his air pump in the background.
François Diodati reengraved this image from an engraving by William Faithorne, *Opera varia* (1680). Courtesy Edgar Fahs Smith Memorial Collection, Department of Special Collections, University of Pennsylvania Library.

Boyle was an advocate of corpuscularism, a form of atomism that was slowly displacing Aristotelian and Paracelsian views of the world. Instead of defining physical reality and analyzing change in terms of Aristotelian substance and form and the classical four elements of earth, air, fire, and water—or the three Paracelsian elements of salt, sulfur, and mercury—corpuscularism discussed reality and change in terms of particles and their motion. Boyle believed that chemical experiments could demonstrate the truth of the corpuscularian philosophy. In this context he defined the term *element* in *Sceptical Chymist* (1661): " . . . certain primitive and simple, or perfectly unmingled bodies; which not being made of any other bodies, or of one another, are the ingredients of which all those called perfectly mixt bodies are immediately compounded, and into which they are ultimately resolved."

Robert Boyle:
*The **Skeptical** Chemist, 1661 (!)*

"Én megpróbáltam a kémiát más szempontok szerint művelni, nem úgy, ahogy az eddigi kémikusok tették, hanem ahogy egy tudóshoz illik." ....

"Bár viselnék az emberek inkább a tudományok előrehaladását szívükön, mint önző érdeküket, akkor könnyen belátnák, hogy nagyobb szolgálatot tennének a világnak, ha minden erejüket kísérletek végzésére és megfigyelések gyűjtésére fordítanák, ahelyett hogy kísérleti alapozás nélküli elméleteket állítanának fel. "

THE SCEPTICAL CHYMIST:

OR

CHYMICO-PHYSICAL

Doubts & Paradoxes,

Touching the

SPAGYRIST'S PRINCIPLES

Commonly call'd

HYPOSTATICAL;

As they are wont to be Propos'd and Defended by the Generality of

ALCHYMISTS.

Whereunto is præmis'd Part of another Discourse relating to the same Subject.

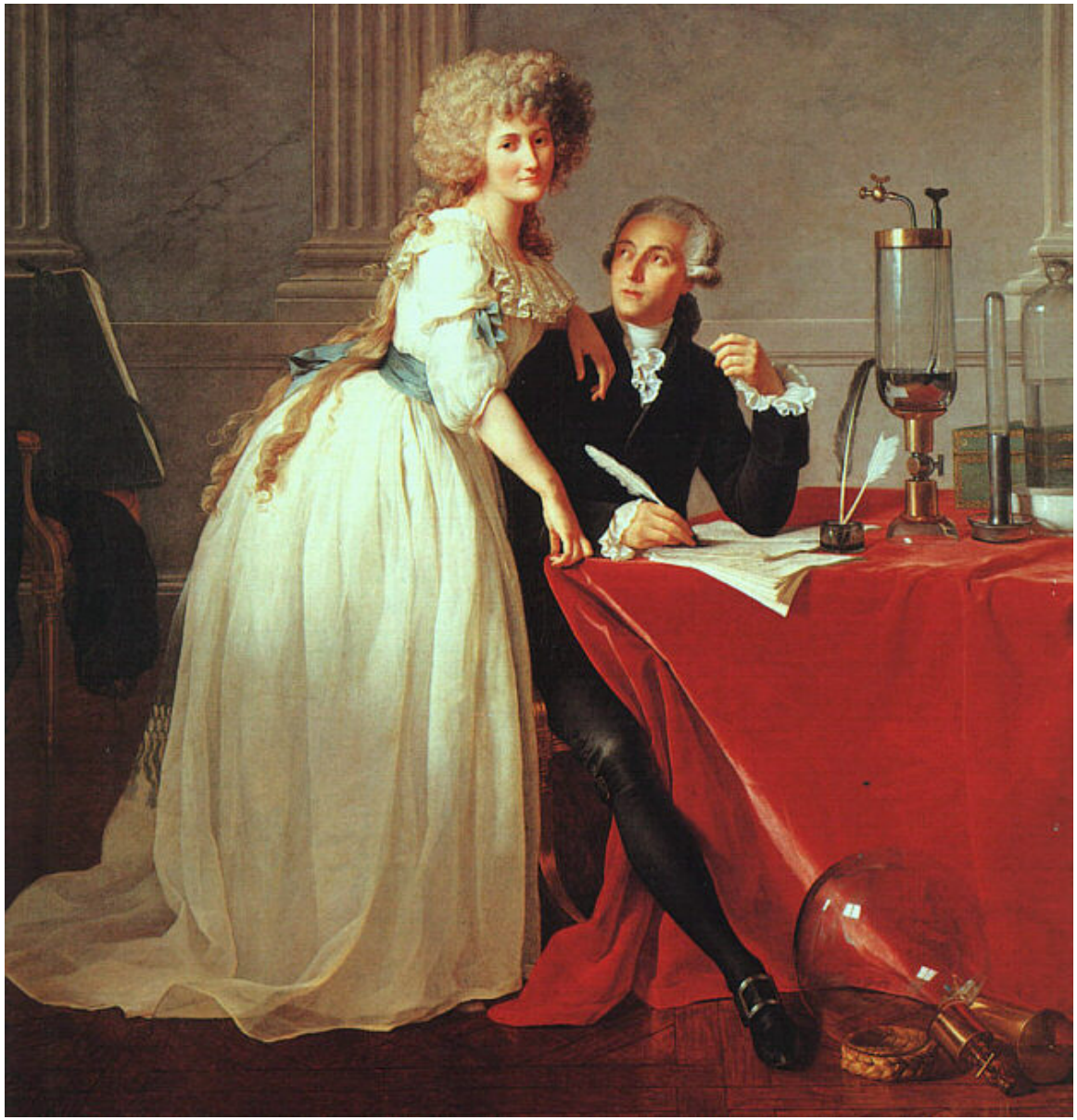
BY

The Honourable *ROBERT BOYLE*, Esq;

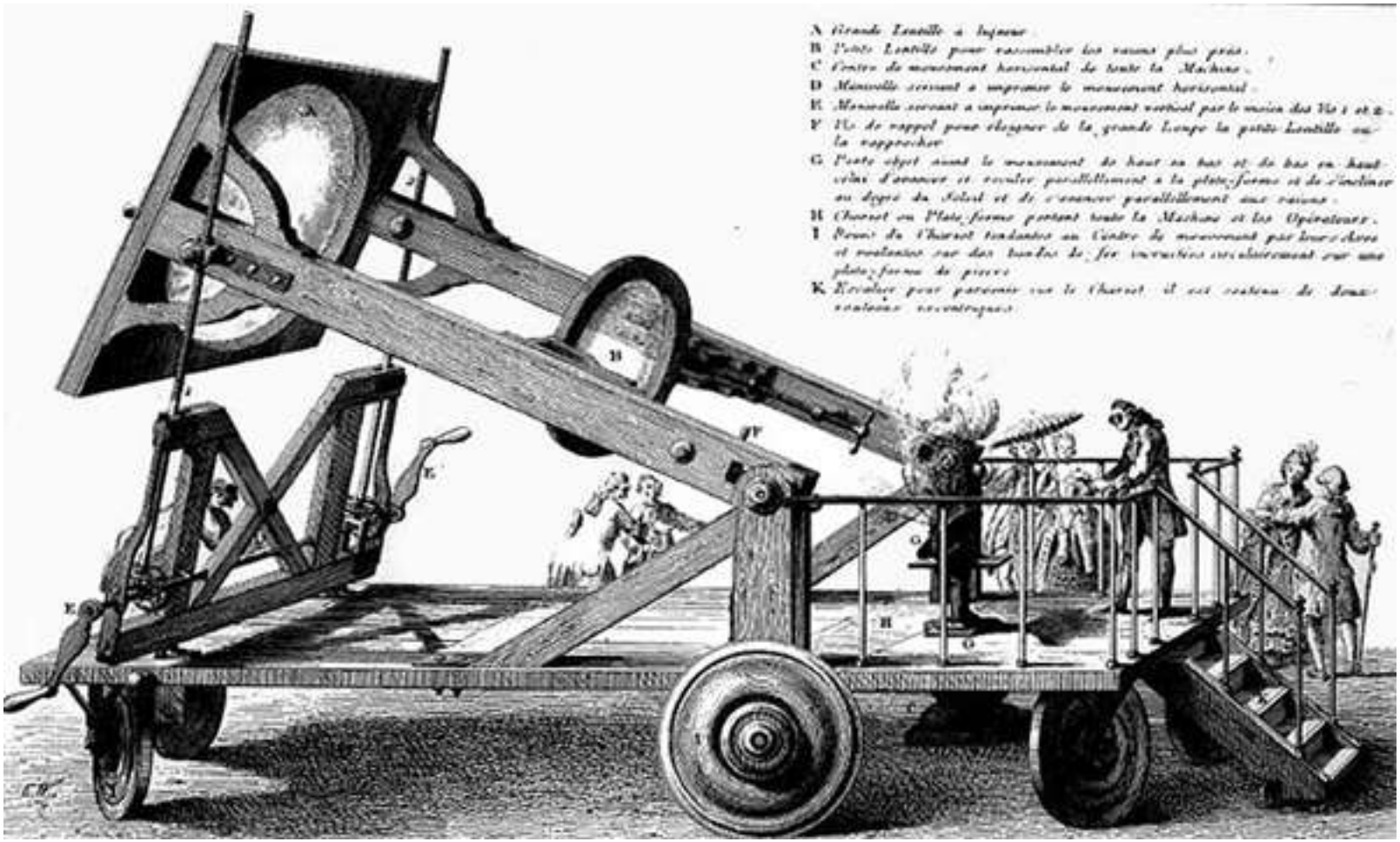
LONDON,

printed by *J. Cadwell* for *J. Crooke*, and are to be Sold at the *Ship* in St. *Paul's* Church-Yard.

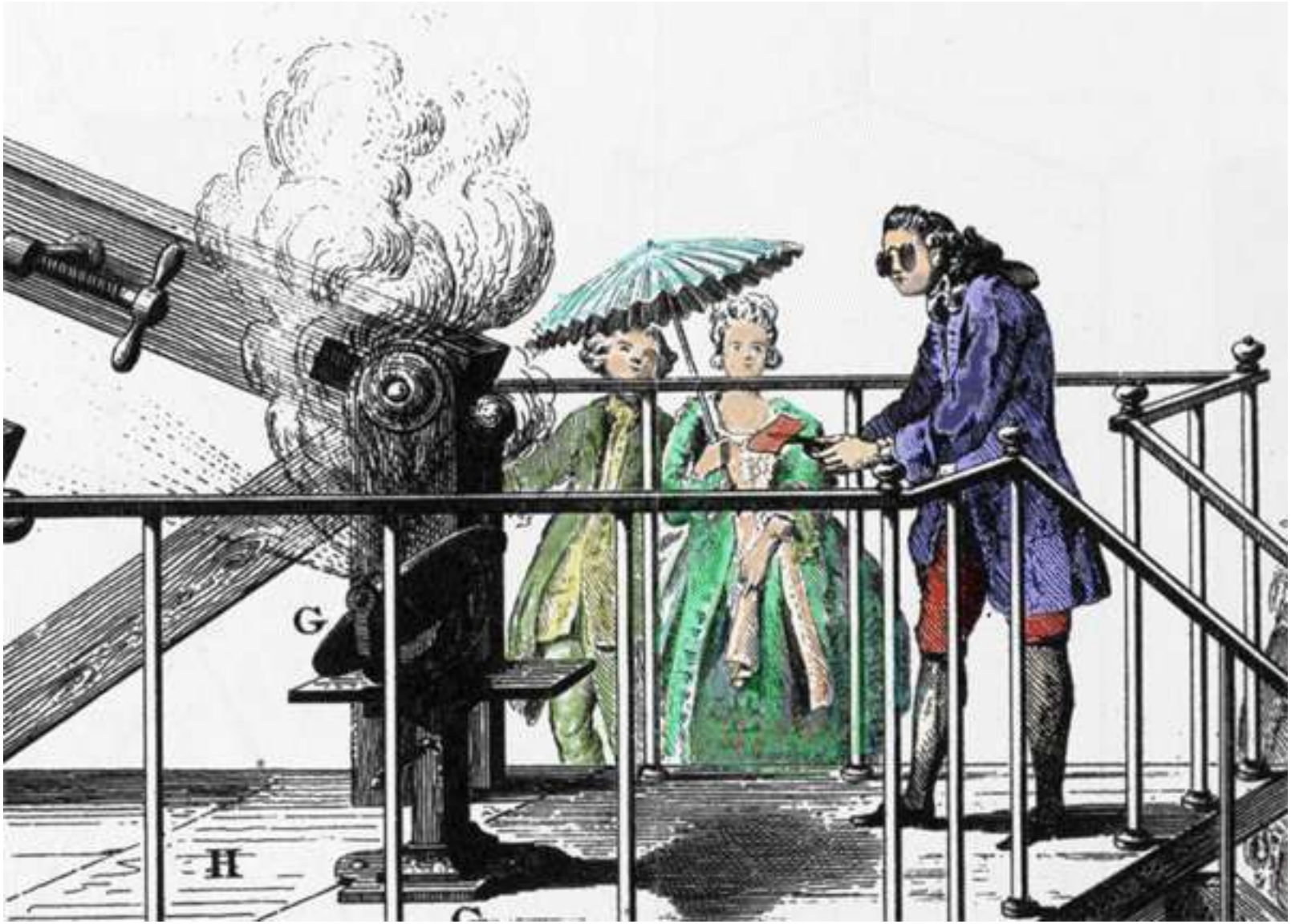
MDCLXI.



The Burning lenses



Calcination of a piece of metal with the burning lenses

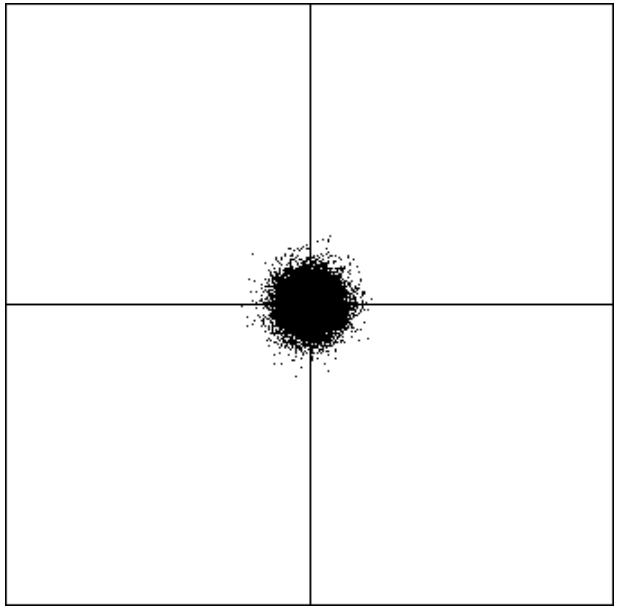


Maxwell, around 1875, describing atoms:

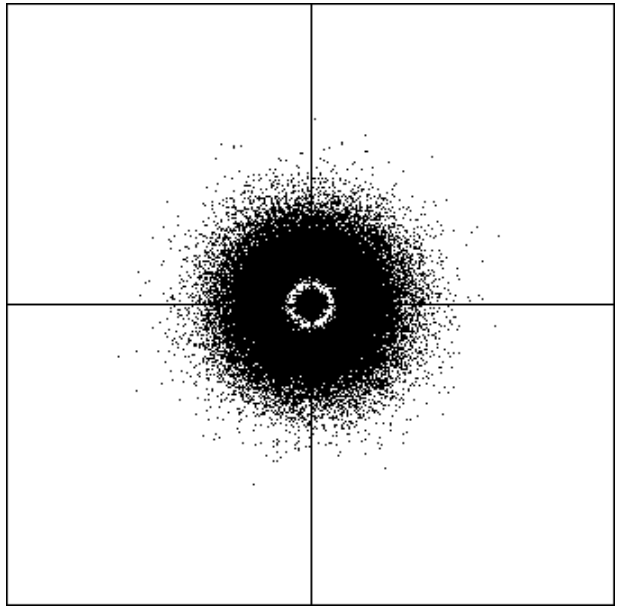
"foundation stones of the material universe ... unbroken and unworn. They continue to this day as they were created—perfect in number and measure and weigth."

(*Scientific American*, Aug. 1997, p. 73.)

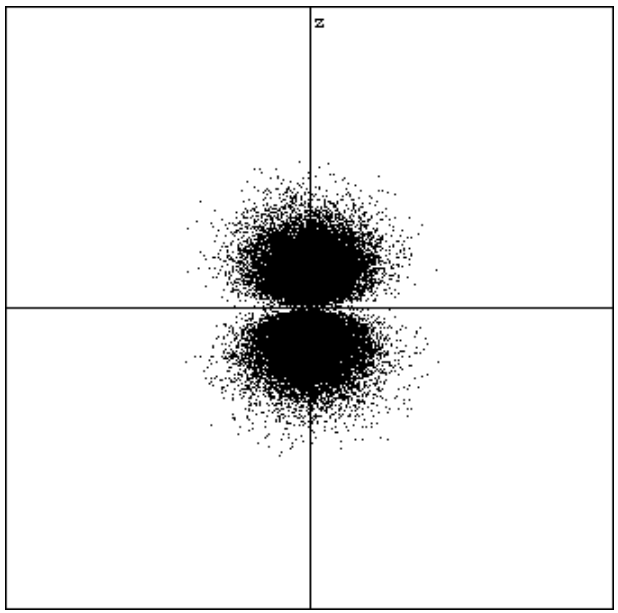
Elektron-
sűrűség
a H-atom-
ban



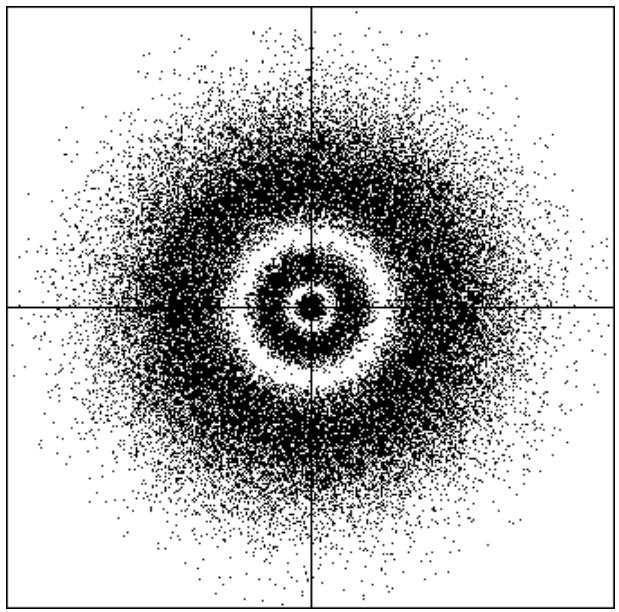
1s állapot



2s állapot

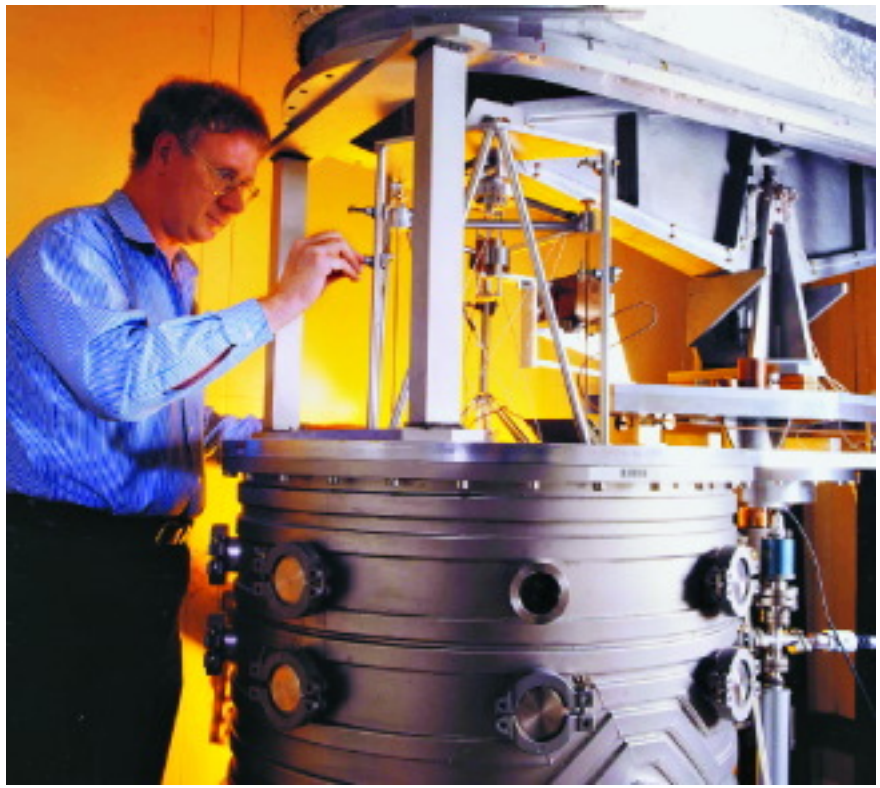


$2p_z$ állapot



3s állapot

PROTOTYPE **The mass of the international kilogram artifact in Paris may be changing.**



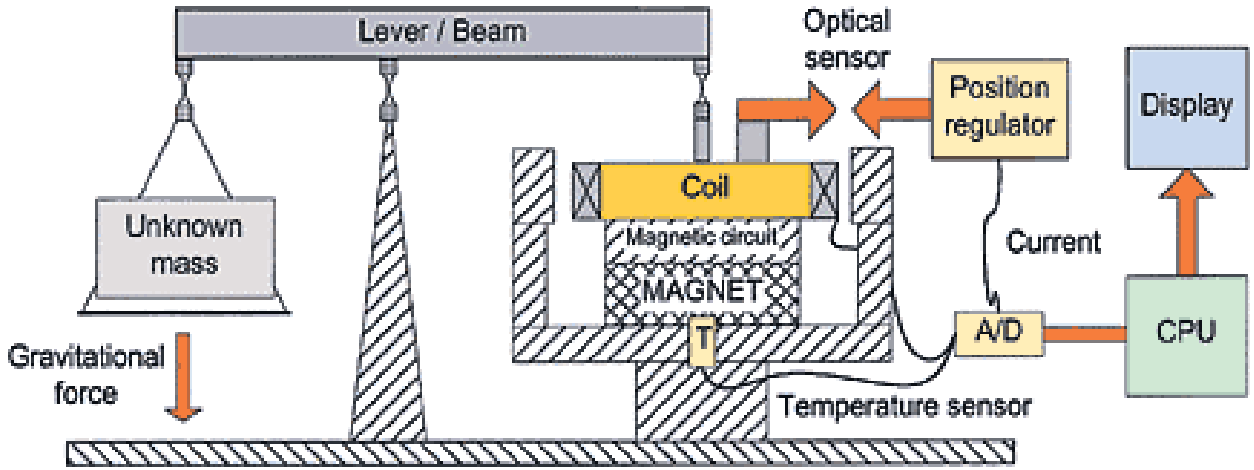
REDEFINITION Ian Robinson, a fellow in electrical metrology at the U.K.'s N
Laboratory, uses the watt balance to determine values for the Planck consta
Crown copyright 1999. Reproduced by permission of the Controller of HMSO
for Scotland)
NPL PHOTO

Electronic Balance

http://www.sensorsmag.com/articles/0602/27/pf_main.shtml

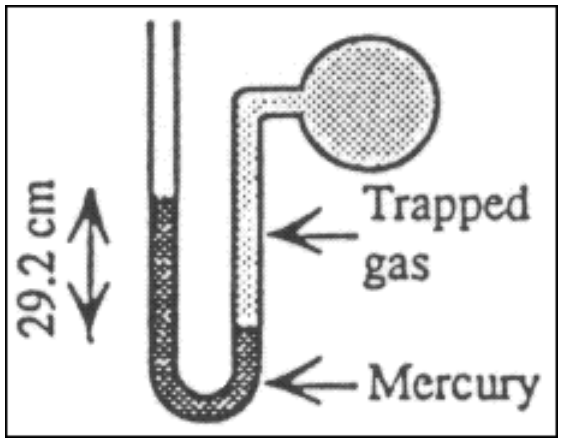
Jean-Christophe Emery, Mettler Toledo GmbH

The most accurate electronic balances are based on electromagnetic force restoration (EMFR), also called electromagnetic force compensation. ….., one or more levers, and **an electromagnetic system that assumes the role of the weights** in a two-pan scale balance. Equilibrium is maintained by a control system incorporating an optical position sensor.



When the coil's force compensates the gravitational force exerted by an unknown mass, an optical sensor detects a stable predefined zero position that indicates a state of equilibrium. Changing the ratio of the levers allows forces smaller than 1 N to balance much bigger ones. Today it is common to have a system with one, two, or even three levers, depending on the load range.

Higanyos **manométer**:



U.S. National Chemistry Olympiad

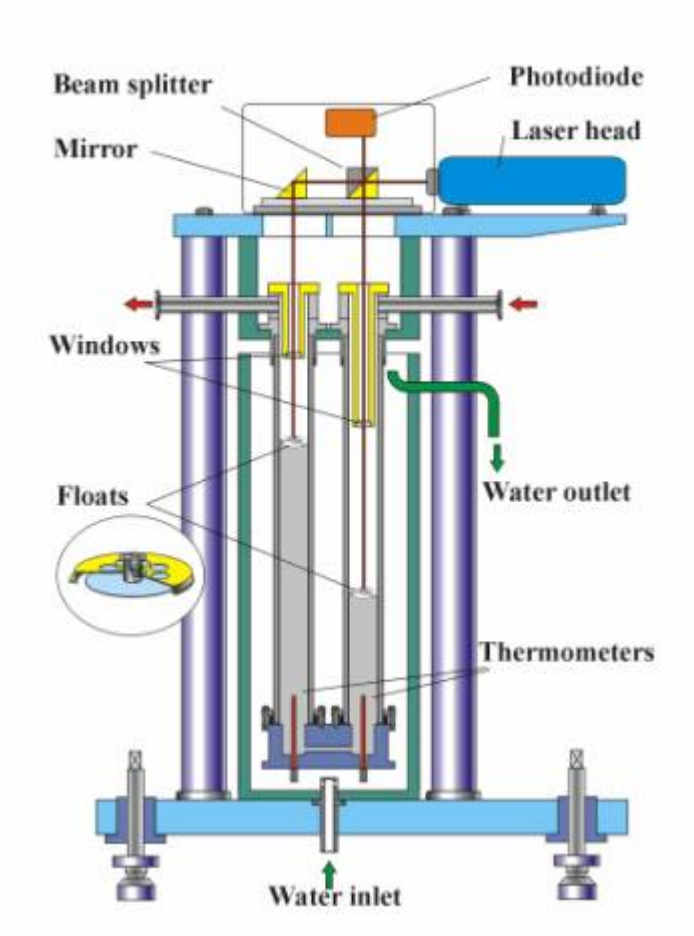
1995 National Test

An open-ended mercury manometer is used to measure the pressure exerted by a trapped gas as shown in the figure. Atmospheric pressure is 749 mmHg. What is the pressure of the trapped gas?

Egy mai kereskedelmi higanyos manométer (olasz cég hirdetése)

http://www.imgc.to.cnr.it/english/aboutimgc/department/manometro.htm

The HG5 mercury manometer



The HG5 manometer is the primary standard of IMGC for the barometric pressure (100 Pa to 120 kPa) both in absolute and gauge mode. Designed and built at IMGC after long experimentation, it is based on the old principle of measurement used by Torricelli, that is to say the atmospheric pressure is weighted by a mercury column whose height is measured.

HG5 is made by a glass U-tube, filled with mercury up to half height and immersed in a bath of termostated water, in which the temperature is maintained constant at 20 °C. The dimensions of the two columns of the U-tube are 1 m length , 60 mm internal diameter; the differential mercury displacement, (the column height) , from the initial equilibrium position, (that is the “zero position”, with the same pressure in both columns), is detected through a “single beam” differential interferometer.

Farm Toxins: Mercury Manometer Replacement"

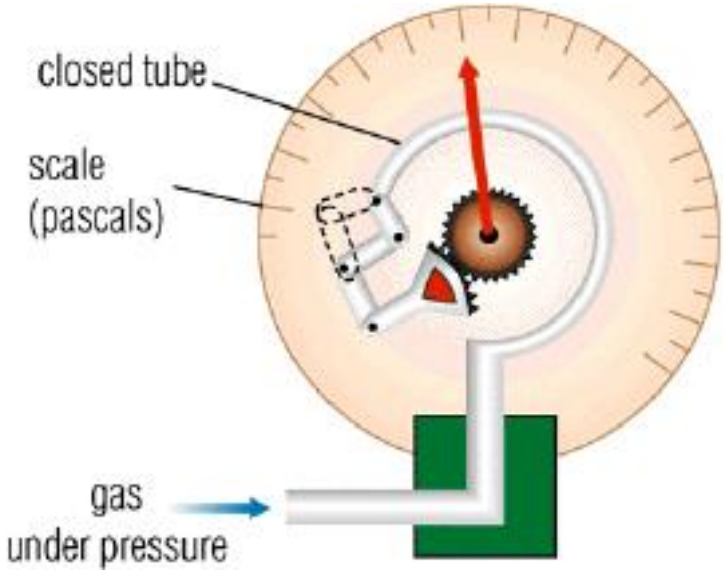
October 2, 2000 WPTZ NEWS CHANNEL 5

farms within the Vermont portion of the Lake Champlain Basin. Replacing mamometers will help prevent mercury pollution in the basin and help protect the health of humans and animals on dairy farms.

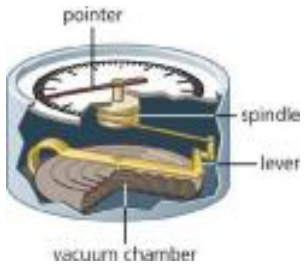
Manometers are used by farmers to measure the proper working pressure of milking systems. The Northwest Vermont Solid Waste Management District received $20,200 through the Lake Champlain Basin Program for this project. In partnership with the Vermont Department of Agriculture, 42 out of 84 known mercury manometers have been replaced with non-mercury manometers so far - at no cost to the farmers. Each manometer contains up to 1/2 pound of mercury. The mercury collected will be disposed by a certified mercury handler.

.....

Bourdon-cső:



A szobai barométer
aneroid b.

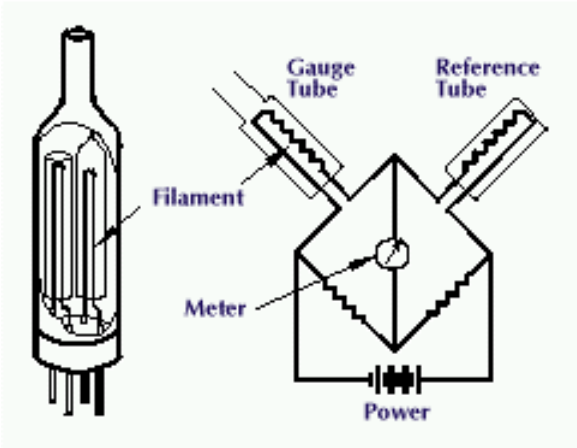


KIS NYOMÁSOK MÉRÉSE

Pirani-vákuummérő

Elv: a gáz hővezető képessége nyomásától fógg

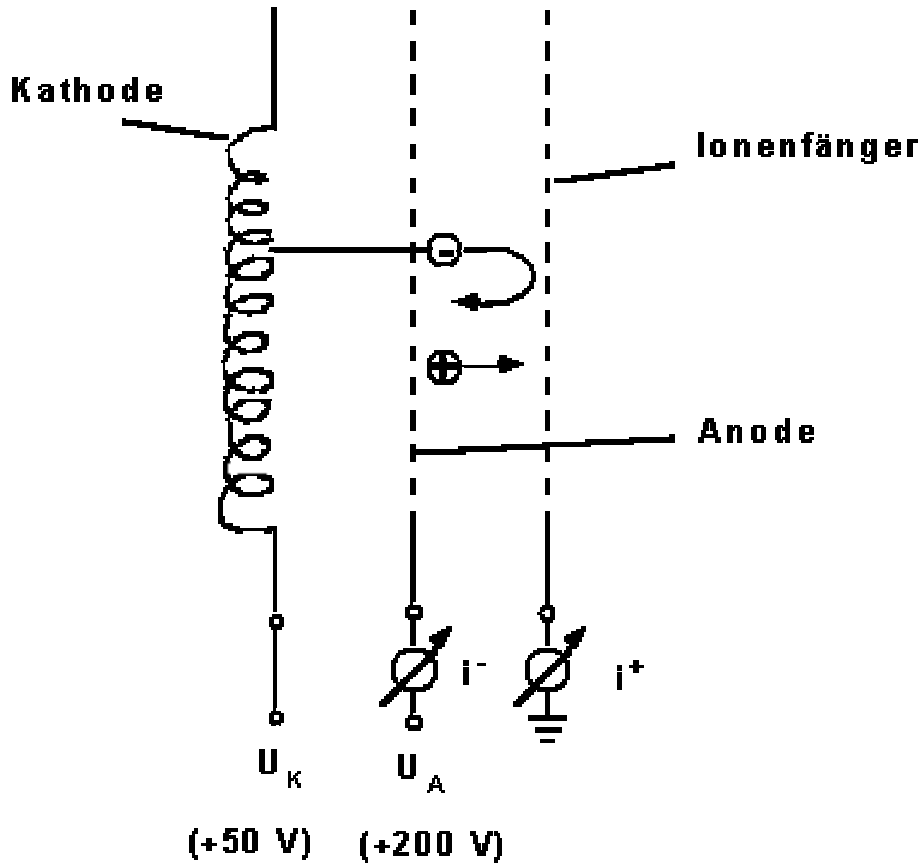
Pirani Gauges:



In a Pirani gauge (see above), two filaments (platinum alloy in the best gauges), act as resistances in two arms of a Wheatstone bridge. The reference filament is immersed in a fixed-gas pressure, while the measurement filament is exposed to the system gas

Még érzékenyebb az **Ionizációs Vákuummérő**

Ionisations-Vakuummeter bestehen im allgemeinen aus drei Elektroden (Glühkathode, Anode und Ionenfänger). Sie arbeiten bei niedrigen Spannungen und ohne äußeres Magnetfeld. Die Glühkathode ist eine sehr ergiebige Elektronenquelle. Die Elektronen werden im elektrischen Feld (s. Abb. 4) beschleunigt und nehmen aus dem Feld genügend Energie auf, um das Gas, in dem sich das Elektrodensystem befindet, zu ionisieren. Die gebildeten positiven Gasionen gelangen auf den bezüglich der Kathode negativen Ionenfänger und geben hier ihre Ladung ab. Der dadurch entstehende Ionenstrom ist ein Maß für die Gasdichte und damit für den Gasdruck



Sűrűségmérés

Az areométer (*hydrometer*) a borászatban

http://www.widdernet.de/saccharimeter.html

Saccharimeter, Brix Hydrometer

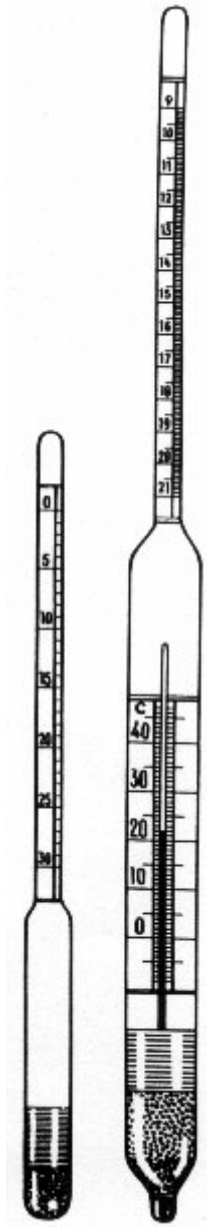
The saccharimeter measures the percentage of sugar content in a liquid.

The most common types of saccharimeter are according to: Brix %, Mas % at 20 C / 68 F or previously acc. to weight - gew.%

Breweries used to measure in Balling.

A weight % or gew.% scale is based on 1 kilogram out of 100. In case of a measurement of 50 Wt.%, 5o kilograms are pure sugar and the rest is water. In Brix or Mas it is the same and even in Balling in case of 20 C / 68 F !

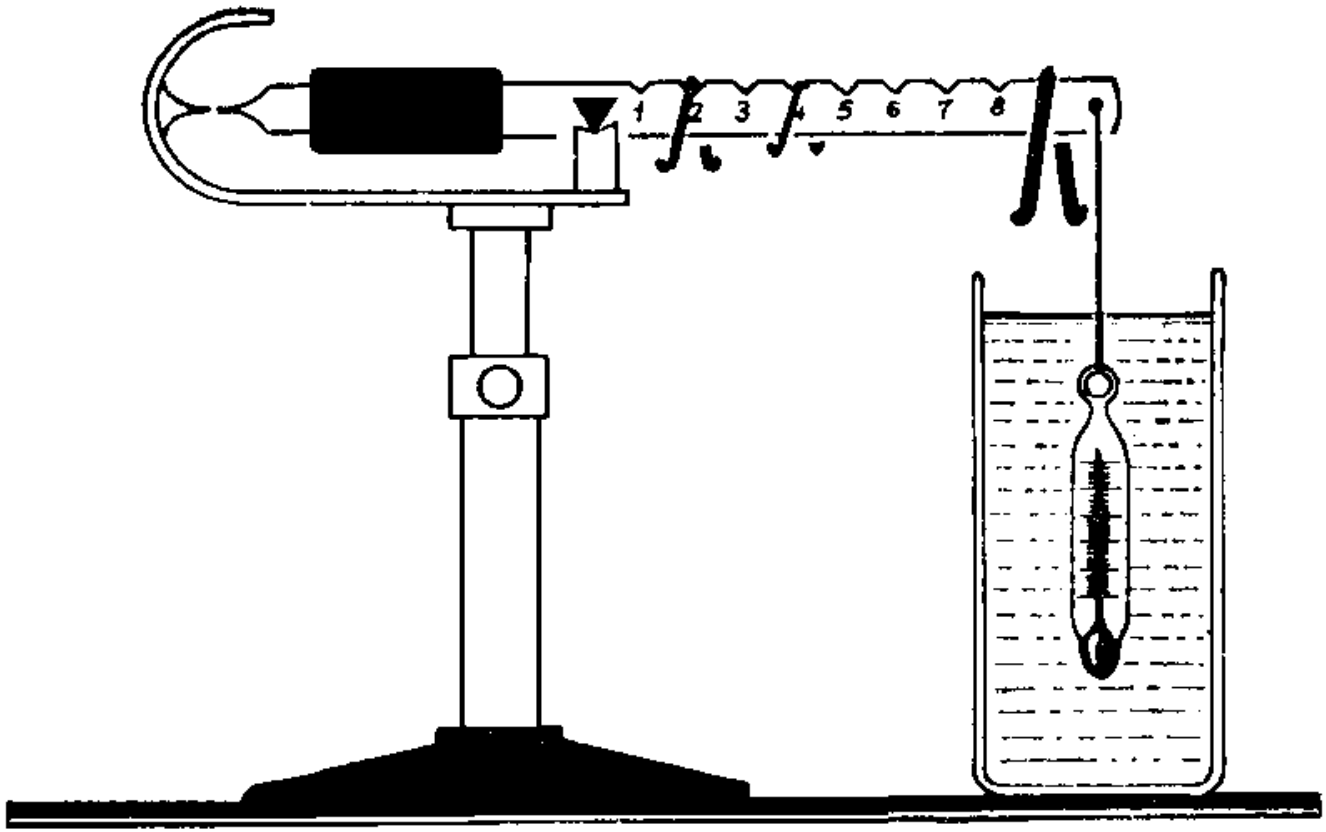
How to use: For using a saccharimeter you require a test jar to make an exact and easy reading! Before and after use clean the saccharimeter and test jar with warm water and dry before use. The saccharimeter should also be wiped dry with a linen cloth. After cleaning, the saccharimeter should be held only from the thin part above the paper scale. The clean liquid is first poured into the test jar, leaving at least 2" / 5 cm from the rim free. Close the test jar with a clean plastic foil and with the palm of the hand, shake 10 times! Be careful if acid or lye is in your testing liquid ! The **saccharimeter is now dipped slowly into the liquid until it floats freely.** The saccharimeter has to be free of bubbles! Do not let the saccharimeter fall into the test jar! The reading is taken at eye level at the spot where the thin part or stem intersects the liquid, i.e. at the level of the liquid surface. Record the temperature of the liquid. Take care of the temperature of room, liquid and instrument is the same. Store test jar, liquid, instrument about 4 hours in the same room you test!



Sűrűségmérés Mohr-Westphal-mérleggel

Mint ismeretes, Archimedes elve alapján a folyadékok sűrűsége meghatározható azáltal, hogy megmérjük egy üvegtest súlyveszteségét az illető folyadékban, majd 4C° hőmérsékletű vízbe mártva.

$$\rho = \frac{\text{súlyveszteség a mérendő folyadékban}}{\text{súlyveszteség a 4°-os vízben}} = \frac{G_1 - G_3}{G_1 - G_2}$$



MSU Gallery of Chemists' Photo-Portraits and Mini-Biographies

Svante August Arrhenius

1859-1927

Portrait: 3
Location - Floor: First - Zone: Room 138 - Wall: South - Sequence: 6
Source: Chemical Heritage Foundation
Sponsor: Kris A. Berglund

This Swedish physical chemist is best known for his theory of **electrolytic dissociation** in aqueous solution, first presented for his doctorate thesis at the University of Uppsala when he was 24. The idea that oppositely charged ions resulting from dissociation of molecules could be present in the same solution initially met a hostile reception, but with support from Ostwald, van't Hoff and others the theory was gradually accepted. He is also known for the **Arrhenius Equation** k = A exp -E/RT, which describes the effect of temperature on reaction rates. He was instrumental in establishing physical chemistry as a separate discipline. A man of eclectic scientific interests, he later published papers on immunology, cosmology and geology. He was awarded the **1903 Nobel Prize in Chemistry**. http://poohbah.cem.msu.edu/Portraits/PortraitsHH_Detail.asp?HH_LName=Arrhenius

Sav-bázis elméletekhez: **Szupersavak**

Oláh György, 1994-es Nobel-díj

Press Release: The 1994 Nobel Prize in Chemistry 12 October 1994

The Royal Swedish Academy of Sciences has decided to award the 1994 Nobel Prize in Chemistry to

Professor **George A. Olah**, University of Southern California, USA **for his contributions to carbocation chemistry.**

http://www.psc.edu/science/2000/klein/getting_jump_on_superacids.html

superacids as chemical superheroes. These fascinating compounds have, since the 1960s, become an essential tool of the chemical industry. Their powerful ability to react with and break down raw petroleum brings us such products as high-strength plastics and lead-free, high-octane gas. Exotic processes like coal gasification are unthinkable without superacids.
The strongest superacid is antimony pentafluoride in hydrogen fluoride (SbF_5/HF), and experiments have shown that these solutions conduct electricity better than can be accounted for by ionic diffusion,

SbF_5 - Lewis-sav; SbF_5/HF szupersav; mechanizmus bizonytalan;

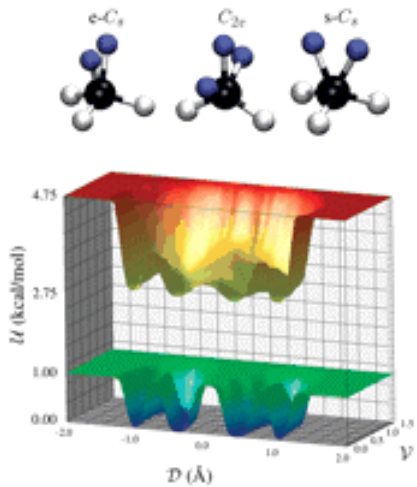
$SbF_5 + HF \rightarrow SbF_6^- + H^+$ nyilván fontos,

A fő kérdés az lehet, a proton milyen formában van jelen? (ionosnál jobb vezetés, HF..HF... láncon fut végig a protoncsere)

Superacids are so strong that they can protonate such extremely weak bases as the alkanes, as was shown by Olah and independently by H. Hogeveen. Thus, pentacoordinated carbonium ions have been obtained from methane higher alkanes and various cycloalkanes.

Methane gives the methionium ion CH_5^+

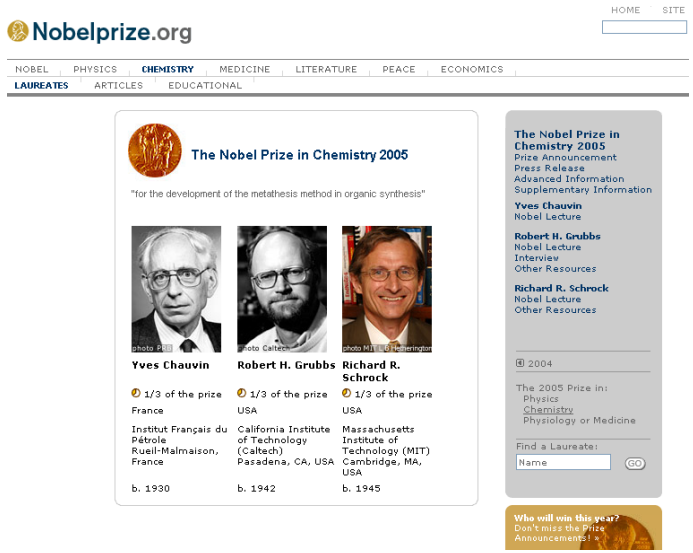
Understanding the Infrared Spectrum of Bare CH_5^+
Oskar Asvany,[1*] Padma Kumar P,[2*] Britta Redlich,[3] Ilka Hegemann,[2]
Stephan Schlemmer,[1,4] Dominik Marx[2]
Science, Vol 309, Issue 5738, 1219-1222, 19 August 2005



Call movie :

ProgramFiles/ch5+_8000

Mai hír: a 2005. évi kémiai Nobel-díj:



Metathesis – a change-your-partners dance

What is metathesis?

In chemical reactions the bonds between different atoms are broken and new bonds formed. The reaction in the focus of this year's Nobel Prize in Chemistry is *metathesis*, a word meaning 'change places'. In olefin metathesis (olefin is another name for alkene, a carbon chain with double bonding) the double-bonding atom groups will change places with one another (Fig. 1).

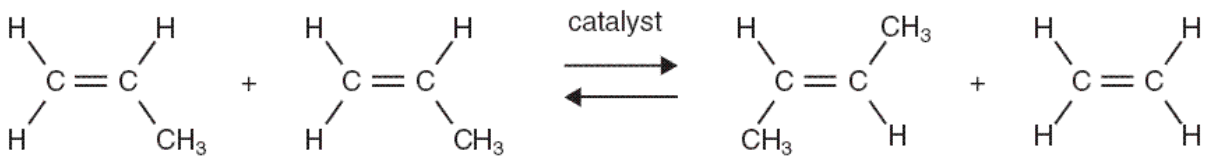


Figure 1. Two propene molecules undergo olefin metathesis with the help of a catalyst, producing two new alkenes, butene and ethene (ethylene).