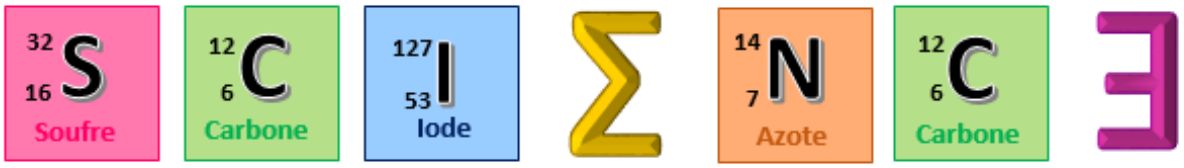


DNL physics

This article is a real guide, which allows you to discover everything about diamonds!
Diamonds are the source of many theories in about 35 countries. South Africa, Russia and Botswana are the main producers of rough diamonds. They are colourless, odourless. Diamonds can be worth much more than a stone... and many other

We create this revue during our DNL lessons. It's an option which proposes physics in English for one hour per week.

Marine pollution

Nuclear Bombs

Molecular Gastronomy

Superheroes

Chernobyl

The DNL classroom, first trimester of 2021-2022, December.

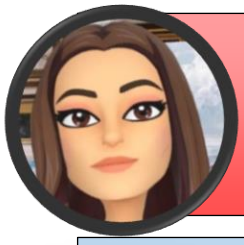
Who are we?

Zohra BERDAL

She chooses as specialties: art, philosophy and English. She is a great scientist who writes Chernobyl's

Cléore VANDENBERGHE

She chooses as specialties: economy, English and history. Interesting by cook methods, she writes molecular gastronomy article.

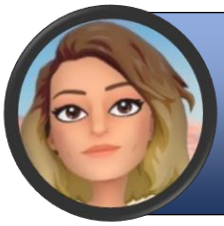


Sara DUQUENNE

She chooses as specialties: philosophy, history and economy. As invested woman, she talks about diamond and pollution.

Baptiste MELLIER

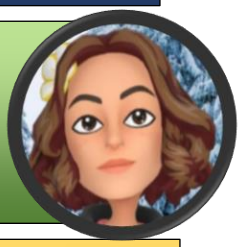
He chooses economy, philosophy and maths. As scientist coming from nowhere, he talks about diamonds and pollution.



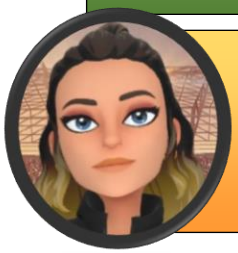
Engjellushe ZMAJLAJ

She chooses maths, physics and biology. As specialist, she wants to explain impact of marine pollution and diamonds formation.

Camille FRANCOIS--SNAUWAERT



She chooses maths, physics and biology. As Marvel's fan, she wants to understand superheroes power. She writes too about nuclear bombs.



Jeanne LATOUR-LEGUAY

She chooses history, physics and biology. As Batman's suit expert, she wants to share her knowledges. She writes too about nuclear bombs.

SUMMARY

MARINE POLLUTION

The marine pollution is a present of waste in oceans or result from release in to the environment by human activities on an excessive quantity of physical and chemical products.

Waste presents in oceans, waterways, waters table and rivers are plastic, glass, papers, cartoons, and other wastes like metals. The waste most present in ocean are micro-plastics, they are so much in water.

Plastics in ocean

Most pollutants come from human activities along the coastlines and far inland. One of the biggest sources of pollution is nonpoint source pollution. Source pollution can come from many sources, like septic, tanks, vehicles, farms, livestock ranches and timber harvest areas, especially micro-plastics.

It's very dangerous for animals because it's micro-plastics so is more perilous for them, the small tall allows them to ingest. All this has an impact in the aliment for animals because little animals eat micro-plastics. They are eaten by biggest animals and for the biggest again and again and all food chain is touched.

Or it can come from a single source, like chemical spill or an oil. Pollution events often have large impact. It's also concentration that determines if substance is a pollutant, for example the nutriments, nitrogen and phosphorus are essential elements for plant growth: if the chemical contamination have a large quantity, it will deplete marine environment.

While scientists are talking about a seventh floating continent made of plastic, political decisions are too long to come. The economic issue is a brake about the ecological one. Despite everything, everyone can act at his or her level between public policies and daily gestures. It's necessary being aware that plastic represents 95% of the sea's pollution.

Plastic and turtle

With the Earth's population, 7.5 billion people, humans are increasingly dependent on the ocean for resources and recreation and as a platform for the exchange of goods in a globalized world. To solve these problems, we can - for example – attend a really or marches, use social media, contact elected officials, recommend books and movies, be more accommodating and write article and create videos.

Not only is it healthier but making your own meals don't involve takeout containers or doggy bags. For those times when you do order in or eat out, tell the establishment you don't need any plastic cutlery or, for some serious extra credit, bring your own food-storage containers to restaurants for leftovers. when previously used. You'll save yourself a few bucks, too.

New toys and electronic gadgets, especially, come with all kinds of plastic packaging—from those frustrating hard-to-crack shells to twisty ties. Search the shelves of thrift stores, neighborhood garage sales, or online postings for items that are just as good

To conclude, marine pollution is a major problem which solutions have to be considered. The flora and fauna are in danger. It is necessary to act!

SOURCES :

https://www.nrdc.org/stories/10-ways-reduce-plastic-pollution

VOCABULARY

Waterways: voies navigables

Coastline: littoral

Perilous: perilleux

Spill an oil: un déversement de pétrole

Growth : croissance

To deplete: épuiser

Spite: dépit

Aware: conscient

Recreation: loisirs

Contact elected officials: contacter les élus

Healthier: plus sain

To involve takeout containers : impliquer les conteneurs à emporter

Leftovers: restes de repas

Hard-to-crack: difficile à casser

Shells : emballages

Neighborhood: le voisinage

Previously: précédemment

Written by Sara DUQUENNE, Engjellushe ZMAJLAJ, Baptiste MELLIER

BOMBS

Where does the bomb come from?

At first, a bomb is an explosive device fused to detonate under specified conditions.


Bomb.

The etymology probably from Latin « bombus » a deep, hollow noise, a luzzing or booming sound from Greek « bombos » deep and hallow sound, echo.

The atomic bomb and nuclear bomb are weapons that use nuclear reactions as source of explosive energy. Scientist-first development nuclear weapons technology was during World War II. Atomic bomb has been used only twice in war boing times.

Inside a bomb

The first instrument, developed by Andy Tyas and his team, consisted of a target plate and load cells connected to an array of Hopkinson pressure bars. These were mounted in a pair of reinforced concrete frames. Each pressure bar was fitted with a pair of strain gauges, and the researchers used oscilloscopes to record the results when an explosive was set off under the target plate.

In parallel, researchers from the University of Cape Town used high speed stereo video footage to measure how a nearby explosion affected a target plate using a device known as a blast pendulum. Engineers compared the footage from two cameras (located inside a protective steel beam) using digital image correlation to determine how the target plate deformed during the course of the explosion.

When a neutron striles the nucleus of an atom of the isotope uranium-235 or plutonium-230. It causes that nucleus to split into two fragments, each of which is a nucleus with about half the protons and neutrons of the original nucleus. In the process of splitting, a great amount of thermal energy, as well as gamma rays and two or more neutrons, is released. Under certain conditions, the escaping neutrons strike and thus fission more of the surrounding uranium nuclei, which then emit more neutrons that split still more nuclei.

Effect of the bomb

There are different types effects with the bomb. There are short term effects and long-term effects.

The short duration of the positive pulse results in many structures not having time to fail in that phase, while they are able to fail under the more extended, though weaker, negative pressure. But the duration of the positive pulse is approximately proportional to the 1/3 power of the size of the explosive charge. Thus, if the relation held true throughout the range in question, a 10-ton T.N.T.

explosion would have a positive pulse only about 1/14th as long as that of a 20,000-ton explosion. Consequently, the atomic explosions had positive pulses so much longer than those of ordinary explosives that nearly all failures probably occurred during this phase, and very little damage could be attributed to the suction which followed.

Large quantities of neutrons and gamma rays are also emitted; this lethal radiation decreases rapidly over 1.5 to 3 km (1 to 2 miles) from the burst. Materials vaporized in the fireball condense to fine particles, and this radioactive debris, referred to as fallout, is carried by the winds in the troposphere or stratosphere. The radioactive contaminants include such long-lived radioisotopes as strontium-90 and plutonium-239; even limited exposure to the fallout in the first few weeks after the explosion may be lethal, and any exposure increases the risk of developing cancer.

VOCABULARY

Device : un appareil

Deep: profond.

Split : diviser

weapons : armes.

Splitting : fission

nearly : défaillance

Sources:

https://www.britannica.com/technology/atomic-bomb

https://www.ready.gov/nuclear-explosion

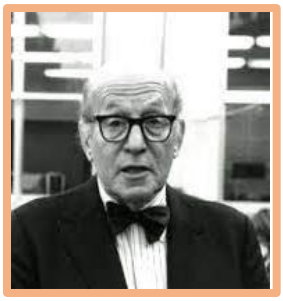
Written by Camille & Jeanne

MOLECULAR GASTRONOMY

Molecular Gastronomy has been developing since 1998, by Hervé THIS and Nicholas KURTI.

Hervé THIS is a physical chemist of French nationality

He was born on June 5, 1955.



Mr Kurti

Nicholas Kurti is former professor of physics at the university of Oxford. Born in Budapest, he went to high school at the Minta Gymnasium, but due to anti-Jewish laws he had to leave the country, gaining his master's degree at the Sorbonne in Paris.

The molecular gastronomy is a scientific discipline concerned with the physical and chemical transformations that occur during cooking. For example, the spherification, is a culinary process that employs sodium alginate and either calcium chloride glugate lactate to shape a liquid into squishy spheres which visually and texturally looks like caviar eggs. It also exists reverse spherification, for use with substances that contain calcium or have high acid content, requires dripping the substance into an alginate bath. It's a more recent technique. Basic and reverse spherification are methods give the same result: a sphere of liquid held by a thin gel membrane, texturally similar to caviar egg.

VOCABULARY

Occur: se produire

Alginate: molecule

Squishy: moulé

Dripping: goutte a goutte

Bath: bain

Spherification

The molecular gastronomy became popular in the 2010's.

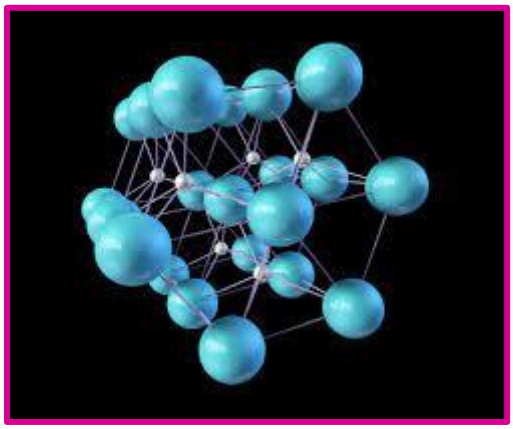
Sources : Wikipedia / Britannica / Sciences Direct

Written by Cléore Vandenberghe

THE DIAMONDS

To get started, diamond have for origin several theory like the ancient Greeks and romans believed the fascinating gemstone was a product of a falling star. Some even think that diamonds come from the tears of gods, other theories involved cupid walking around on earth with his arrow dipped with diamonds. To counterpoint this point of view Hindus strongly believed that the gorgeous gemstone was formed after a flash storm, but all this was just a theory.

Diamonds are formed approximately 3,3 billion years ago in a depth of 150 km to 200 km below the earth's crust in the melted roach of the mantle. The process started with carbon molecules being compressed under high pressure of 45 to 60 kilo has undergoing intense heat of 900 degrees to 1300 degrees. Diamonds comes from the Latin adamas, Adamantis. It is composed of pure crystallized carbon, very tard. Its chemical compositions are C pure Carbon. It had a density from 3,51 to 3,53, its index of refraction is from 2,417 to 2,419. Its structure is cubic face countered; this is what explains its hardness. Diamonds catch the light and capture our attention. We are pulled into the sparkle.



When you're talking about diamond types with a diamond expert, you're not necessarily on the same page; it's more complicated than this. There is first the technical classification system of "types of diamonds", we have to the types of diamonds names for casual shoppers and then we have The Four Cs (color, clarity, carat, cut). So, the technical "types of diamonds" classification system are:

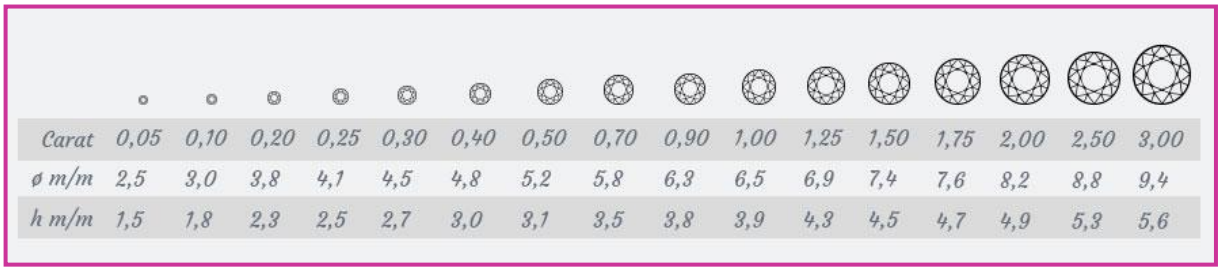
- Type I.a diamonds: nitrogen gathers in clusters in these stones, they have a yellowish tinge. This is the most common type of diamond
- Type II.a diamonds: these diamonds have no nitrogen impurities and differing fluorescent properties. They have strange shapes because of the high pressures they were formed under. They are the rarest and most valuable diamonds
- Type I.b diamonds: these are also quite rare, and their main feature is that individual nitrogen atoms are scattered throughout the stone. This produces an intense yellow, orange or brown color.
- Type II.b diamonds: it's another rare type of diamond with no nitrogen atoms. They contain boron in addition to carbon content.

First, we going to talk about the colors: Colorless, Near Colorless, slightly tinted, Very light yellow, Light yellow or brown. Most diamonds may appear "colorless" to the naked eye, but no. Yellow or brownish hues are the most common, due to the nitrogen content. Sometimes these hues are not visible to the naked eye, but in some cases the coloration is so strong that it is immediately apparent. Diamonds are graded by color in alphabetical order from D to Z, where D is colorless, and Z is strongly colored. In general, hues visible to the naked eye are graded K or higher, those graded N or higher will have visible hues, and from S or higher, the hue will be clearly visible. Some diamond colors are extremely rare and expensive. These include white, red, blue, and green diamonds.

Clarity refers to the amount and visibility of any defects in the diamond. It is used to characterize the "quality" of the diamond. The clarity grading system for a diamond is provided by the GIA (Gemological Institute of America) and includes the following categories: Flawless (FL) - no inclusions or imperfections are visible to a qualified grader using 10× magnification, Internally Flawless (IF) - no inclusions but only a few imperfections are visible to an expert using 10× magnification, Very, Very Slightly Included.

CARATS

Most people are familiar with the carat as a measure of the size of diamonds and other gemstones. Equivalent to 200 mg or 0.00643 troy oz, the larger the size of a diamond, the higher its value. In fact, the size of a diamond is not linear when it comes to its value. Market diamonds are less than one carat, they are more numerous, more popular and more affordable than large diamonds that can reach excessive prices. A one carat, colorless, very pure diamond can be worth much more than a stone. The carat is merely an indication of the weight/size of the diamond rather than an indication of its value.



Carat	0,05	0,10	0,20	0,25	0,30	0,40	0,50	0,70	0,90	1,00	1,25	1,50	1,75	2,00	2,50	3,00
ø m/m	2,5	3,0	3,8	4,1	4,5	4,8	5,2	5,8	6,3	6,5	6,9	7,4	7,6	8,2	8,8	9,4
h m/m	1,5	1,8	2,3	2,5	2,7	3,0	3,1	3,5	3,8	3,9	4,3	4,5	4,7	4,9	5,3	5,6

There are other visible characteristics of a diamond, such as: the proportions of the width and depth of the diamond, the finish, the symmetry, Polishing.

These affect the way light passes through the diamond due to the arrangement of its facets. The cutting process affects the diamond's brightness, brilliance, sparkle, scintillation and intensity. Some of these characteristics are generally considered more desirable than others by diamond buyers. But you can also find other types of cut of diamonds at shoppers: Round, Pear, Emerald, Radiant, Marquise, Heart, Baguette, Oval, Cushion, Princess.

Diamonds are found naturally in Kimberlite rocks. Kimberlite rocks are rocks occurring in old volcanic pipes and they are the main hosts. These rocks are carried by rivers, streams and waterfalls and then diamond crystals are deposited in the water. Diamonds are in about 35 countries. South Africa, Russia and Botswana are the main producers of gem diamonds. Australia produces most of the industrial diamonds. They are also found in India, Russia, Siberia, Brazil, China, Canada and the United States. They are few because the process of mining a diamond is quite difficult (the mines move several tons on earth for each carat of diamond they find) and quality diamond gems are very rare (only 1 million diamonds are one carat quality diamond gems). Moreover, it is inaccessible because it is necessary to dig deep in the ground to find it but it is impossible because of the costs, the technology of pressure and heat

VOCABULARY

gemstone: pierre précieuse

depth: profondeur

hardness: dureté

sparkle: étincelle

yellowish tinge: teinte jaunâtre

feature: fonctionnalité

scattered: dispersé

stone: pierre

hues: teinte

higher: plus haut

affordable: abordable

brightness: luminosité

dig deep: creuser profondément

Sources:

Cape Town Diamond Museum

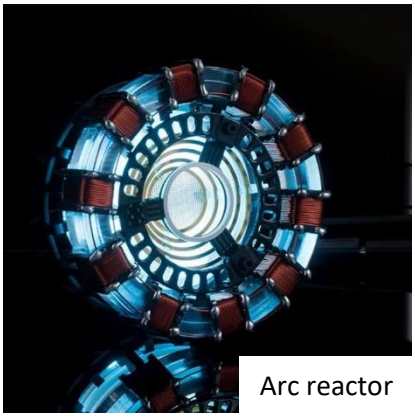
Written by Sara DUQUENNE, Engjellushe ZMAJLAJ and Baptiste MELLIER

SUPER HEROES

Tony Stark

Iron man alias Tony Stark is a superhero of the MCU (Marvel Cinematic Universe). Iron man haven't superpowers, but he does have that amazing Iron suit. It is powered by an arc reactor.

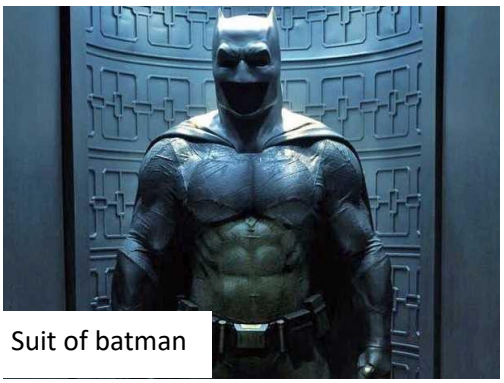
The Arc Reactor was a fusion type power source featuring a palladium core, and was the initial power source of the first Iron Man suits, and was later modified to an advanced level by Tony Stark to power his more advanced suits, as it kept on improving. During the events of *Iron Man 2*, Tony re-discovered and synthesized a new element theorized by Howard Stark, as a clean and safe core alternative to palladium core. This not only stopped palladium poisoning of Tony's body but also reversed its effects, saving his life.



Arc reactor

Batman

Bruce Wayne, alias Batman is a science superhero which belong to the universe of DC COMICS. He has the capacity to read quickly. Bruce focused on courses for his crime-fighting needs like chemistry, physics and kinesiology. He wears a protective suit to defend himself and she contains three critical materials. Kevlar is a synthetic giver who is five-times stronger than steel, it can be made into a fabric who exhibits a high-tensile strength and He can defend against some gunfire. Then, there is ceramic amour which is a protective material, made of boron carbide, which is heated to extreme temperature. To prevent ceramic shards from harming our Caped Crusader, this armor is equipped with a resin that helps prevent shattering. Nomex is an aramid polymer related to nylon and the Nomex fibers don't catch fire because they have built in flame resistance. The fibers carbonize, giving Batman the ability to literally walk through flames.



Suit of batman

Sources :

https://ironman.fandom.com/wiki/Arc_Reactor AND https://www.scienceworld.ca/stories/science-batman/

Written by Camille & Jeanne

CHERNOBYL

The construction of the powerplant

The plant was established in 1971 and commissioned in 1977, yet it was put into a permanent shutdown on 15 December 2000. It is in Ukraine in the city of Pripyat or less than 18km from the city of Pripyat.

From the end of its construction, many came to look for a job in this powerplant. About 9,000 people who went to work lived mostly in the new city of Pripyat built at the same time as the power plant. After 1986, a job in Chernobyl was attractive because of the exceptionally high wages and a pace of two weeks of work/two weeks of leave.

The Reactor No. 4 was the cause of the Chernobyl nuclear disaster in 1986, but the plant continued to operate with the other reactors until December 2000 when Chernobyl and Pripyat had become ghost towns.

The control room after the accident

Nuclear plant accident reported in Soviet Union

Path of radiation from accident

Signs indicate partial core meltdown

Many newspapers related the accident but Russian government decided to hide realty in order to protect its political power. This decision leads to many dies and an ecological disaster which could be less serious.

34 YEARS LATER…

34 years after Chernobyl's accident

34 years later, the explosion still scares some People Scientists noticed abnormal activity in the debris of the nuclear power plant, under the sarcophagus of reactor number 4. Cat yes even 34 years later, radioactivity is still present and intends to remain so for a while. The fission reactions seem to be accelerating under the rubble of reactor number 4, the one that exploded on April 26, 1986 during a safety test. Ukrainian scientists are seeing a slow but uninterrupted increase in the emission of neutrons.

VOCABULARY

Abnormal Activity: activité anormale

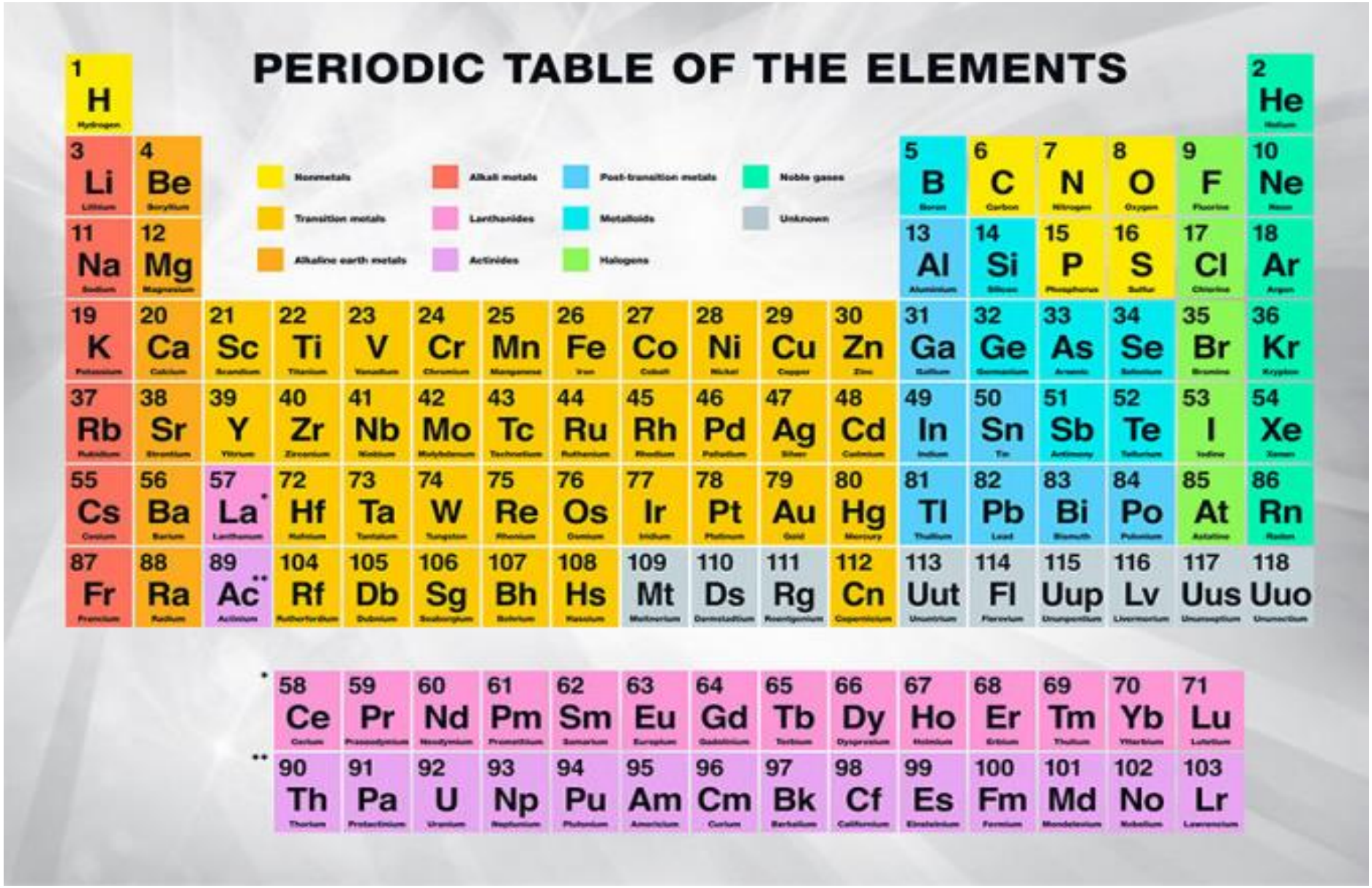
Sarcophagus: sarcophage

Nuclear ruins: Ruines nucléaires

Concretely, if the uncontrolled fission reactions are by no means new, they pose the threat of a new incident. The specter of so-called criticality fission, in nuclear ruins, has long haunted Chernobyl, underlines the review. "There remains a lot of uncertainties, but we cannot rule out the possibility of an accident," said Maxim Saveliev, of the Institute for Safety Problems in Nuclear Power Plants of the Ukrainian Academy of Sciences.

SOURCE :
www.britannica.com

WRITTEN BY ZOHRA BERDAL


PERIODIC TABLE OF THE ELEMENTS
Nonmetals
Transition metals
Alkaline earth metals
Alkali metals
Lanthanides
Actinides
Post-transition metals
Metalloids
Halogens
Noble gases
Unknown
1 H Hydrogen
2 He Helium
3 Li Lithium
4 Be Beryllium
5 B Boron
6 C Carbon
7 N Nitrogen
8 O Oxygen
9 F Fluorine
10 Ne Neon
11 Na Sodium
12 Mg Magnesium
13 Al Aluminium
14 Si Silicon
15 P Phosphorus
16 S Sulfur
17 Cl Chlorine
18 Ar Argon
19 K Potassium
20 Ca Calcium
21 Sc Scandium
22 Ti Titanium
23 V Vanadium
24 Cr Chromium
25 Mn Manganese
26 Fe Iron
27 Co Cobalt
28 Ni Nickel
29 Cu Copper
30 Zn Zinc
31 Ga Gallium
32 Ge Germanium
33 As Arsenic
34 Se Selenium
35 Br Bromine
36 Kr Krypton
37 Rb Rubidium
38 Sr Strontium
39 Y Yttrium
40 Zr Zirconium
41 Nb Niobium
42 Mo Molybdenum
43 Tc Technetium
44 Ru Ruthenium
45 Rh Rhodium
46 Pd Palladium
47 Ag Silver
48 Cd Cadmium
49 In Indium
50 Sn Tin
51 Sb Antimony
52 Te Tellurium
53 I Iodine
54 Xe Xenon
55 Cs Caesium
56 Ba Barium
57 La * Lanthanum
72 Hf Hafnium
73 Ta Tantalum
74 W Tungsten
75 Re Rhenium
76 Os Osmium
77 Ir Iridium
78 Pt Platinum
79 Au Gold
80 Hg Mercury
81 Tl Thallium
82 Pb Lead
83 Bi Bismuth
84 Po Polonium
85 At Astatine
86 Rn Radon
87 Fr Francium
88 Ra Radium
89 Ac ** Actinium
104 Rf Rutherfordium
105 Db Dubnium
106 Sg Seaborgium
107 Bh Bohrium
108 Hs Hassium
109 Mt Meitnerium
110 Ds Darmstadtium
111 Rg Roentgenium
112 Cn Copernicium
113 Uut Ununtrium
114 Fl Flerovium
115 Uup Ununpentium
116 Lv Livermorium
117 Uus Ununseptium
118 Uuo Ununoctium
* 58 Ce Cerium
59 Pr Praseodymium
60 Nd Neodymium
61 Pm Promethium
62 Sm Samarium
63 Eu Europium
64 Gd Gadolinium
65 Tb Terbium
66 Dy Dysprosium
67 Ho Holmium
68 Er Erbium
69 Tm Thulium
70 Yb Ytterbium
71 Lu Lutetium
** 90 Th Thorium
91 Pa Protactinium
92 U Uranium
93 Np Neptunium
94 Pu Plutonium
95 Am Americium
96 Cm Curium
97 Bk Berkelium
98 Cf Californium
99 Es Einsteinium
100 Fm Fermium
101 Md Mendelevium
102 No Nobelium
103 Lr Lawrencium

SCAN ME