

ALL ABOUT THE Periodic Table

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9 Compassion

SHORT HISTORY

Chemists, since the discovery of elements, have been trying to find a way to systematize them. Those involved tried to find a pattern and connections between the elements. Dmitri Mendeleev is recognized as the one who started the periodic table and was also able to predict undiscovered elements. His table was slightly inaccurate as he arranged the elements by atomic mass, whereas Henry Moseley arranged them by atomic number. Their breakthroughs and explorations led to today's periodic table of elements.

PARTS OF THE PERIODIC TABLE

Rows are called periods while columns are called groups or families.

Elements that have similar properties are often found in the same group.

Categorization Based On Physical Properties

Elements can be divided into three categories based on their physical properties. These categories are metals, non-metals and metalloids. Metals have a silver shine to them, are good conductors, malleable, and ductile. On the other hand, non-metals have a dull exterior and are poor conductors. Elements with characteristics belonging to these two categories are called metalloids. Metalloids have a metal-like look but are only average conductors of heat and electricity.

Categorization Based On Groups

Elements can also be divided through groups. As mentioned before, elements in the same group have similar properties so it's natural to separate them in this manner. There are three categories called main-group elements, transition metals, and inner transition metals. Groups 1-2 along with groups 13-18 are the main-group elements while groups 3-12 are the transition metals. As for the inner transition metals, these elements belong to the f block that's often separated from the other blocks. Some groups in the periodic table have special names such as groups 1-2, 13-18, and the ones under inner transition metals.

Group 1 – alkali metals

Alkali metals have a high reactivity even with a standard temperature and pressure. They're also shiny and soft.

Group 2 – alkaline earth metals

Alkaline earth metals possess a silver-white color and are fairly reactive metals at a standard temperature and pressure. Like the alkali metals, these metals are shiny as well.

Group 15 – pnictogens

Aside from the name pnictogens, this group is known as the nitrogen family. Most pnictogens are solid elements when exposed to standard temperature. However, one of them (nitrogen) is a gas.

Group 16 – chalcogens

If the pnictogens were known as the nitrogen family, the chalcogens are known as the oxygen family. They all possess six valence electrons and most of them form -2 anions. However, their oxidation states can differ from one another even if most form -2 anions.

Group 17 – halogens

If elements belonging to this group are exposed and react to metal, salt is formed. Unlike fluorine, chlorine, bromine, iodine, and astatine which are often found in minerals or salts, tennessine was created through artificial means.

Group 18 – noble gases

Noble gases are found in the rightmost side of the periodic table. These noble gases are what we use as shortcuts when writing an element's electron configuration. Under normal conditions, all noble gases are odorless, colorless, and monatomic with extremely low reactivity.



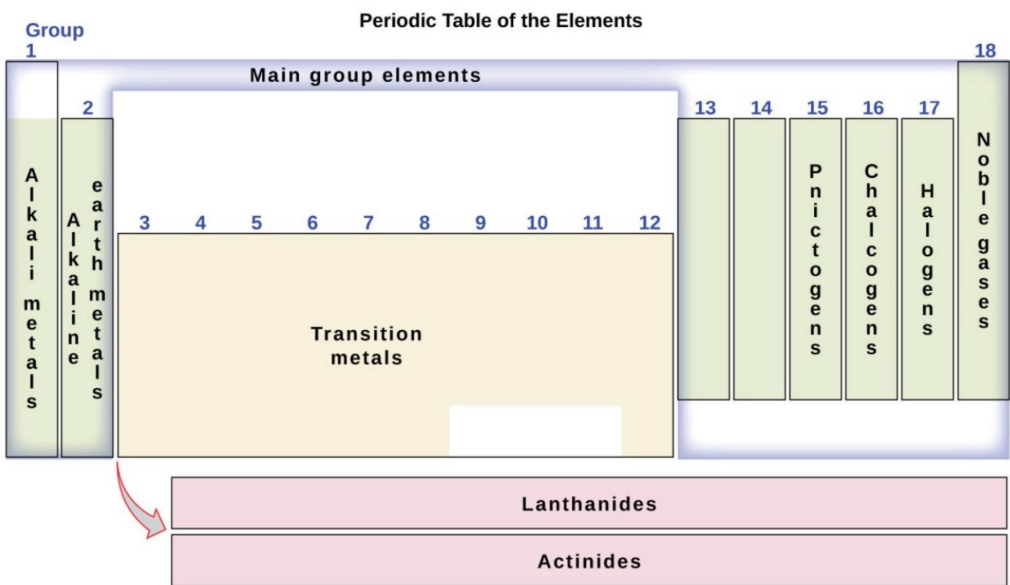
Lanthanides – atomic number 57-71

Lanthanides are also called rare-earth elements due to their rarity. They share a silver-white color that tarnishes once it’s in contact with air. They’re all comparatively soft metals with high boiling and melting points.

Actinides – atomic number 89-103

Like lanthanides, their color tarnishes once exposed to air and are most likely soft. Actinides are all radioactive elements with high electropositivity as well.

Parts of the Periodic Table



5 ELEMENTS IN THE PERIODIC TABLE AND HOW THEY WERE DISCOVERED



Sulfur

It was known as a brimstone as it's a “combustible stone”. It was discovered during prehistoric times and thought to be a compound element containing hydrogen and oxygen. But in 1809, French chemists Louis-Joseph Gay-Lussac and Louis-Jacques Thenard proved the elemental nature of sulfur and it became the tenth most abundant element.

Tungsten

It was first isolated by Juan Josè and Fausto Elhuyar who are Spanish chemists and mineralogists. They isolated it by charcoal reduction of the oxide derived from the mineral wolframite. Earlier, Carl Wilhelm Scheele, a Swedish chemist discovered tungstic acid in a mineral now known as scheelite. Him and his countryman Torbern Bergman concluded that a new metal could be made from the acid.



Plutonium

Dr. Glenn T. Seaborg, Edwin McMillan, Kennedy and Wahl discovered plutonium in 1941. It was by deuteron bombardment of uranium in 60-inch cyclotron of the Berkeley Radiation Laboratory at the University of California, Berkeley. The discovery was kept secret and named after Pluto since it was discovered after Neptunium.



Francium

Marguerite Perey discovered Francium in 1939 at the Curie Institute in Paris. She discovered it by purifying samples of lanthanum that contained actinium. The radioactivity of the purified actinium indicated that there was another element present which she deduced was francium.



Nickel

Baron Axel Frederick Cronstedt discovered nickel in 1751. He found nickel in a mineral called niccolite. When he experimented, he expected to see copper from niccolite but didn't get any, instead a white metal was extracted, which he called nickel after niccolite.

6 ELEMENTS IN THE PERIODIC TABLE AND THEIR USES IN REAL LIFE



The Periodic table consists of more than 100 elements and are discovered to influence surroundings. There are many ways applications to these elements. They are also used in everyday lives, influencing various aspects of living. Below are 5 elements and their uses to real life..

HELIUM (HE)

MRI Machine Production

Liquefied form of helium is consumed as a refrigerant coolant for the hyper conductivity magnetic that are crucial compounds in many of these medical tools.

Respiratory Field

Helium can generally be used for breathing observation technique. It is used for treating difficulty in breathing and other conditions affecting the lungs. The gas is usually consumed to treat diseases that affect the breathing of patients.

Cardiovascular System



Based on observations, human tissue can encounter oxygen restriction in blood supply. But by subjecting it to several inhalation of helium gases, they are able to reduce myocardial diseases. It has also been analyzed that helium inhalation increase widening of blood vessels that make a patients relaxed.

Production of Germanium and Silicon Crystals

Helium is also used in the production of both germanium and silicon crystals. With these crystals, they are able to make electronic semiconductor devices.

FLUORINE (F)

Fluorochemicals



Fluorine is used in Fluorochemicals, which includes solvents and high-temperature plastics, like teflon. Teflon is known for the non-stick properties it provides which is used in the frying pans.

Water Fluoridation

Water fluoridation is the process of adding fluoride to the water supply in cities and other establishments; approximately 0.7 ppm, or 0.7 milligrams of fluoride per liter of water, optimal level for preventing tooth decay.

Toothpaste

Many toothpastes contain fluoride as it has benefits in protecting tooth health. Too much of it causes health risks, but amounts contained in toothpaste are generally safe if a person uses the toothpaste as advised.

CFCs

Fluorine is present in CFC which stands for Chloro, Fluoro(Fluorine), and Carbon. CFCs can present in products like refrigerators, aerosol sprays, aircons etc.

CHLORINE (CL)

Disinfecting Water

Chlorine is used to disinfect water. It is part of the sanitation process for sewage and industrial wastes.

Household Cleaning Products

These household cleaning products such as household bleach, contains chlorine and used for cleaning various places and materials.

For swimming pools



Chlorine in swimming pools are used to remove germs and bacteria inside pools. They make it more safe and clean for the people and their swimming activities.

In Production of Paper

Chlorine is used as a bleaching agent, making paper a white color.

IRON (FE)

Vehicles

Iron is present in many vehicles such as cars, trucks, buses etc. A typical passenger car consists of about 65 percent steel and iron. They're either present in car bodies, or other machines containing iron parts.

Steel

Iron is used to create steel, which are often used in manufacturing and civil engineering.

Iron Supplement (Vitamins)

Iron is available in many multivitamin-mineral supplements and in supplements that contain only iron.

Hulls of Ships

Iron is present in the hulls of ships to possibly strengthen its said part, giving it a strong and safe structure.

CARBON (C)

Metal Cutters

Carbon is used for metal cutters. Medium or High carbon steel contains 1 – 1.5% carbon is used as tool material for general machining work.

Pencil Leads

The carbon in the charred wood may have been used to make dark lines for drawing.

Metal Smelting

Impure carbon in the form of charcoal (from wood) and coke (from coal) is used in metal smelting.

Freon

Contains carbon which is used in cooling systems and devices like refrigerators and air conditioners.

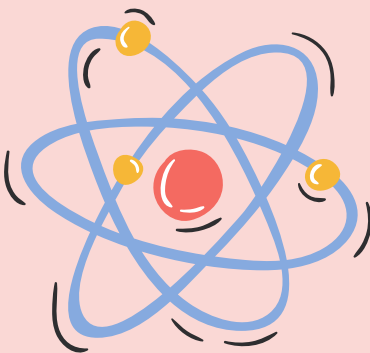
ZINC (ZN)

Galvanizing Iron and Steel

Zinc is used for galvanizing (process of covering) iron and steel. This serves as a coating in order to protect it from corrosion.

Batteries

Zinc (along with lithium and sodium) is present in batteries. People have used this for zinc is an ideal energy source.



H																	He	
Li	Be											B	C	N	O	F	Ne	
Na	Mg											Al	Si	P	S	Cl	Ar	
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn	
Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Nh	Fl	Mc	Lv	Ts	Og	
			Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu		
			Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr		



PERIODIC TABLE

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