

Lesson 1

Atomic Structure

Matter:-

Anything that has mass and volume.

- All matter is made up of molecules, molecules are made up of atoms .

Atom:-

It is the unit of construction and composition of materials

Structure of the atom:-

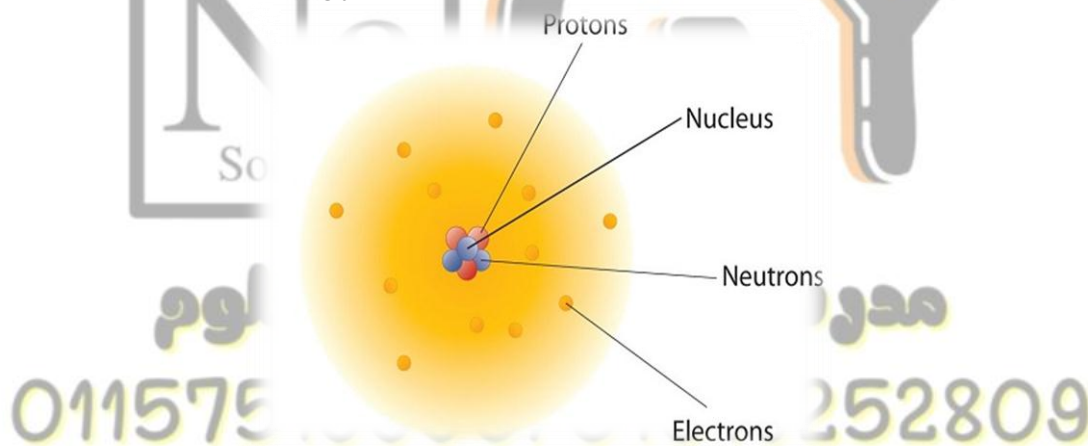
Scientists have made many attempts to understand the structure of the atom:

1) Scientists and philosophers gave the name of **the atom** to the part that became indivisible

2) In the early 19th century, **the scientist Dalton** developed a scientific theory about the atom in which he explained that it is indivisible

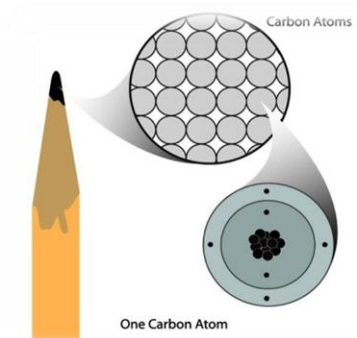
3) In 1909, **the scientist Rutherford** developed the first model of the atom on an experimental basis

Scientists have discovered that there is a **very, very small space in the atom** that contains two types of particles (protons and neutrons), and this space has never been **called the nucleus**, around which electrons revolve at high speeds in imaginary orbits called energy levels.



Atom :-

The smallest unit of matter that retains the properties of an element.



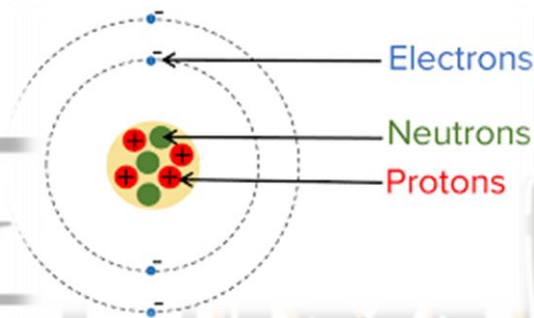
What is atomic structure ?

1) Nucleus:-

- The dense center of the atom containing protons and neutrons.
- It has a positive charge due to the protons.

2) Electron Shells:-

- Electrons move around the nucleus in specific energy levels or shells.
- The arrangement of electrons in these shells determines the chemical properties of the atom.



It consists of three main subatomic particles:-

Protons (p):-

These are positively charged particles found in the nucleus (center) of the atom.

Neutrons(n) :-

These particles have no charge (neutral) and are also located in the nucleus.

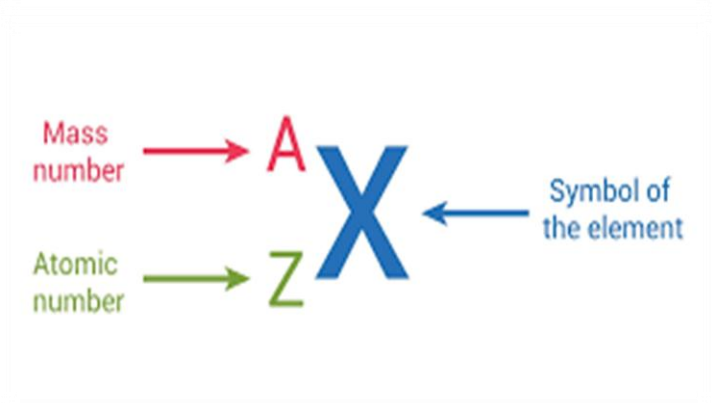
Electrons(e):-

These are negatively charged particles that orbit the nucleus in regions called electron shells or energy levels.

properties of protons neutrons and electrons:-

Properties of the proton, neutron, and electron

Particle	Symbol	Charge	Mass
Proton	p or p ⁺	+1	1 amu
Neutron	n or n ⁰	0	1 amu
Electron	e or e ⁻	-1	.00054 amu



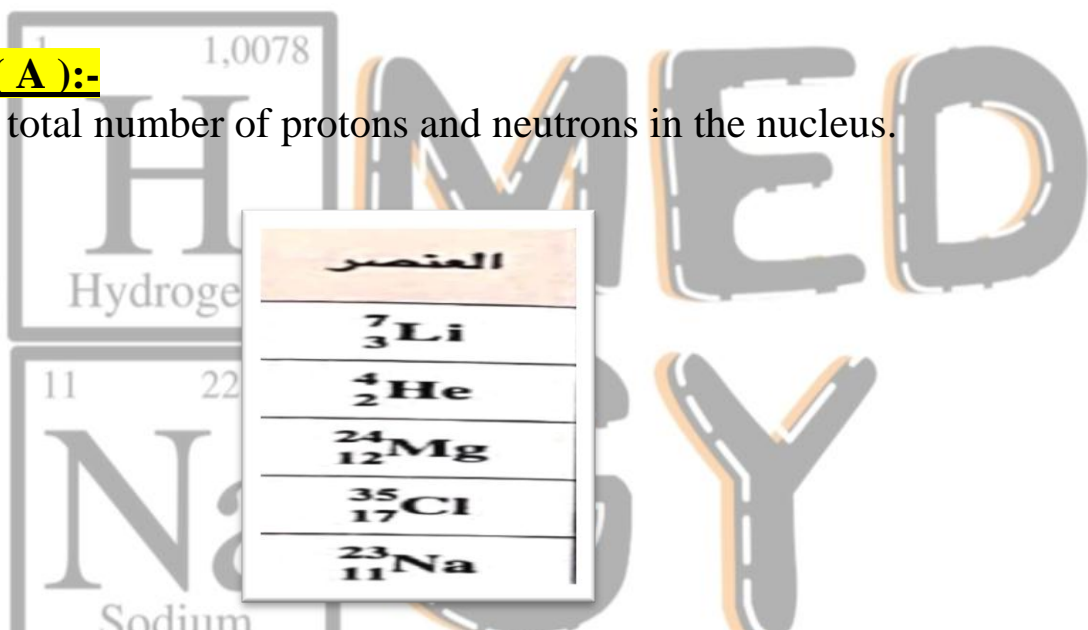
Atomic Number (Z):-

- This is the number of protons in the nucleus .

Mass Number (A):-

- This is the total number of protons and neutrons in the nucleus.

Exercises:-



<u>SYMPOL</u>	<u>Li</u>	<u>He</u>	<u>Mg</u>	<u>Cl</u>	<u>Na</u>
Atomic Numper					
MASS NUMBER					
NUM. PROTONS					
NUM.ELECTRON					
NUM.NEUTRON					

Rules for writing element symbols:-

- 1) The symbol for an element represents a single atom of it
- 2) The symbol is derived from the name of the element in Latin
- 3) The first letter is written as a capital letter... If some elements in the first letter are similar, another letter is taken from the Latin name and written as a Small letter.

رمز العنصر	الإنجليزية	اللاتينية	العربية
C	Carbon	Carbo	كربون
N	Nitrogen	Nitrogenium	نيتروجين
Cl	Chlorine	Chlorum	كلور
Cr	Chromium	Chromium	كروم

رمز العنصر	الإنجليزية	اللاتينية	العربية
Na	Sodium	Natrium	صوديوم
K	Potassium	Kalium	بوتاسيوم
Cu	Copper	Cuprum	نحاس
Fe	Iron	Ferrum	حديد

أمثلة لرموز بعض العناصر الشهيرة



الرمز	العنصر	الرمز	العنصر	الرمز	العنصر
I	اليود	K	البوتاسيوم	H	الهيدروجين
C	الكربون	Mg	الماغنسيوم	He	الهيليوم
Ca	الكالسيوم	Li	الليثيوم	Hg	الزئبق
Cl	الكلور	Zn	الخاصين (الزنك)	O	الأكسجين
Cu	النحاس	N	النيتروجين	F	الفلور
Cr	الكروم	Ne	النيون	Fe	الحديد
Ar	الأرجون	Na	الصوديوم	P	الفوسفور
Al	الألومنيوم	B	البورون	Pb	الرصاص
Au	الذهب	Be	البريليوم	S	الكبريت
Ag	الفضة	Br	البروم	Si	السيليكون

Exercises

- 1) ----- are positively charged particles
- 2) Neutrons are found in -----
- 3) Electrical charge of electrons -----
- 4) The atomic mass of protons ----- than electrons
- 5) The atomic number is equal to the number of ----- in the nucleus of the atom
- 6) The first letter of the item code is written -----
- 7)----- The total numbers of protons and neutrons in the nucleus of the atom
- 8) ----- He developed the first scientific theory about the atom
- 9) ----- Establishing an experimental model of the atom
- 10) All materials building unit -----
- 11) Atomic mass of protons ----- Atomic mass of neutrons
- 12) Helium symbol -----
- 13) Gold symbol -----
- 14) Copper symbol-----
- 15) Ar sympol of -----

مدرس الكيمياء - العلوم

01157513330/01016252809