

# CHEMISTRY

VIII

CH- 4

## THE STRUCTURE OF ATOMS

### BOOK WORK

#### Choose the correct option

1. Which of the following is an electrically neutral particle?  
C) The neutron
2. The particle with -1 unit of electric charge is  
a) The electron
3. which of the following will pass un deviated through an electric field?  
c) The neutron
4. The atoms of which of the following element has only one proton?  
a) hydrogen
5. which of the following atoms will have the same number of eletrons , protons and neutrons ?  
a)  $C_6^{12}$
6. Which of the following atoms has an odd no. of neutron?  
b)  $N_7^{14}$

#### Q FILL IN THE BLANKS

1. The mass of the cathode –ray particles is **fixed** .
2. The mass of the anode –ray particles is **fixed**
3. The mass of the ,except that of hydrogen ,**cannot** be explained without considering neutron .

4. An atom has the same no. of electron , proton and neutrons if the mass number is **double** the atomic no. of the element.

5. Complete the table

Element	Z	A	Electron	Proton	Neutron
Na	11	23	11	11	12
Al	13	27	13	13	14
Si	14	28	14	14	14
S	16	32	16	16	16
Ar	18	40	18	18	22

• **Write true or false**

1. An atom must contain the same number of protons as neutrons  
**false**
2. An electron is an extraordinary particles **true**
3. An alpha particles is positively charged **true**
4. Cathode rays are stream of electron **true**
5. Anode rays are stream of protons **true**

**Short answer questions**

1. What name was given by kanad to the tiny particles that matter is made up of?

**Paramanu**

2. Answer the following question on the basis of Dalton atomic theory

1. Are the atoms divisible? **No**
2. Do atoms of the same elements have the same weight? **Yes**
3. Do atoms of different elements have the same weight? **No**
4. What are the particles that take part in a chemical reaction?

**Electron**

3. Name the particles that constitute cathode rays.

**Electron**

4. What are anode rays made of ?

**Proton**

5. Give the word equation that led to the discovery of neutron.

**Beryllium + alpha particles → carbon + neutron**

6. What is the relative masses and unit charges of electron, proton and neutron?

Subatomic particles

Subatomic particle	Relative mass	Relative charge
Proton	1	+1
Neutron	1	0
Electron	Very small	-1

7. Who discovered the nucleus?

**Earnest Rutherford**

8. Which fundamental particles constitute the nucleus of an atom?

**Proton and neutron**

9. The nucleus of an atom of which element does not contain neutrons?

**Hydrogen**

10. Where are electrons placed in an atom? Are they stationary ?

**Electrons are placed in different shell, they revolve around the nucleus of an atom.**

11. What particles will be formed if an electron is transferred from a sodium atom to that of chlorine?

**Na<sup>+</sup> and Cl<sup>-</sup>**

12. Give the nucleoid symbol of sodium and phosphorous

**Na<sub>11</sub><sup>23</sup>**

**P<sub>15</sub><sup>31</sup>**

### **LONG ANSWER QUESTIONS**

1. DESCRIBE THE CATHODE RAY EXPERIMENT OF SIR J.J. THOMSON THAT LED HIM TO CONCLUDE THAT CATHODE RAYS ARE MADE UP OF NEGATIVELY CHARGED PARTICLES .

**We take discharge tube that is long glass tube , whose end are sealed with metal plate . These plate are connected to high volatage source called electrodes. The negative terminal is called cathode, and positive terminal is called anode , an exhaust pump is used for**

lowering the pressure of the gas inside discharge tube when a high voltage and low pressure is applied across the terminal, one end of tube start to glow this phenomenon is called fluorescence . As the rays start from cathode terminal known as cathode rays. As they move towards the positive terminal hence considered as made up of negative charged particles .

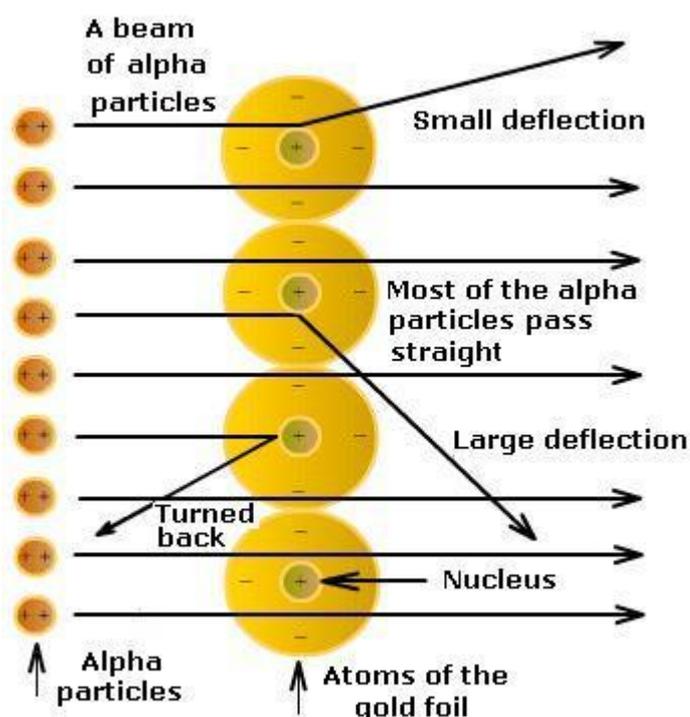
2. EXPLAIN HOW CATHODE RAYS AND ANODE RAYS ARE PRODUCED IN A DISCHARGE TUBE.

**Cathode and anode rays can be produced in discharge tube by filling discharge tube with gas**

**→ By lowering the pressure of discharge tube and**

**→ By applying high voltage across its electrodes.**

3. What observation did Rutherford make in his alpha particle scattering experiment? How did he interpret them to arrive at the nuclear model of the atom



### OBSERVATIONS

- Most of the alpha particles went straight through the gold foil
- Some of the alpha particles deviated slightly from their path
- Very few of alpha particles bounced back or retraced their path

## **CONCLUSION**

- a. Most of the space in an atom is empty**
- b. There is positive charge present in an atom**
- c. There is very small positive charge concentrated at the centre of an atom and that positive mass is nucleus .**