Fill in Fill in the Blanks – Atomic Models (With Answers)

1. The charge of an electron was determined by **Millikan's** oil drop experiment.
2. The charge on an electron is **1.602×10^{-19}** C.
3. In Thomson's model, electrons are embedded in a sphere of **positive** charge.
4. Thomson's atomic model is also called the **plum** pudding model.
5. X-rays were discovered by Wilhelm Röntgen.
6. The phenomenon in which elements emit radiations on their own is called **radioactivity**.
7. α-particles are actually **helium** nuclei.
8. In Rutherford's experiment, most α-particles passed through the gold foil because the atom is mostly **empty space**.
9. The central positively charged part of atom is called the **nucleus**.
10. According to Rutherford's model, electrons revolve around the nucleus in fixed circular **orbits**.

Short Questions Answers

1. Who proposed the plum pudding model of atom?

J. J. Thomson proposed the plum pudding model of atom.

2. What was the main aim of Millikan's oil drop experiment?

The main aim was to determine the charge of the electron.

3. What is the charge present on an electron?

The charge on an electron is:

-1.602×10^{-19} C

4. Why is Thomson's model called the plum pudding model?

Because electrons were considered embedded in a positively charged sphere like plums in a pudding.

5. Who discovered X-rays?

X-rays were discovered by Wilhelm Röntgen in 1895.

6. What are α-particles?

α-particles are helium nuclei carrying +2 charge.

7. What are β-rays?

β-rays are negatively charged particles similar to electrons.

8. What are γ-rays?

γ-rays are neutral electromagnetic radiations having very high penetrating power.

9. What did Rutherford conclude from α-particle scattering experiment?

Rutherford concluded that:

- Most of the atom is empty space.
- Positive charge is concentrated in a tiny nucleus.

10. What is nucleus?

The nucleus is the small, dense, positively charged central part of an atom containing most of its mass.

11. Why did most α-particles pass through the gold foil undeflected?

Because most of the space inside the atom is empty.

12. Why were a few α-particles deflected?

Because they came close to the positively charged nucleus and experienced repulsion.

13. What are the main postulates of Rutherford's atomic model?

- Positive charge is concentrated in nucleus.
- Electrons revolve around nucleus in circular orbits.

- Electrostatic attraction holds electrons and nucleus together.

14. What are the limitations of Rutherford's model?

- Could not explain stability of atom.
- Could not explain atomic spectra.

15. Name the three fundamental particles of atom.

The three fundamental particles are:

- Electron
- Proton
- Neutron

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1. The charge of electron was determined by:

A) Rutherford
B) Millikan
C) Chadwick
D) Bohr

Answer: B) Millikan

Explanation: Millikan determined the charge of electron using the oil drop experiment.

2. Thomson's atomic model is also known as:

A) Nuclear model
B) Planetary model
C) Plum pudding model
D) Quantum model

Answer: C) Plum pudding model

Explanation: In Thomson's model, electrons were embedded in a positively charged sphere like plums in a pudding.

3. The positively charged part of atom is called:

A) Electron
B) Orbit
C) Nucleus
D) Shell

Answer: C) Nucleus

Explanation: Rutherford discovered that positive charge is concentrated in the nucleus.

4. X-rays were discovered by:

A) Rutherford
B) J. J. Thomson
C) Wilhelm Röntgen
D) Chadwick

Answer: C) Wilhelm Röntgen

Explanation: Wilhelm Röntgen discovered X-rays in 1895.

5. α-particles are:

A) Electrons
B) Helium nuclei
C) Neutrons
D) Gamma rays

Answer: B) Helium nuclei

Explanation: α-particles consist of two protons and two neutrons, same as helium nucleus.

6. Most of the space inside an atom is:

A) Filled with electrons
B) Filled with protons
C) Empty
D) Filled with neutrons

Answer: C) Empty

Explanation: Rutherford concluded this because most α-particles passed undeflected through gold foil.

7. The charge on proton is:

A) –1
B) 0
C) +1
D) +2

Answer: C) +1

Explanation: Proton carries one unit positive charge.

8. Which particle has no charge?

A) Electron
B) Proton
C) Neutron
D) Alpha particle

Answer: C) Neutron

Explanation: Neutron is electrically neutral.

9. In Rutherford's experiment, a few α-particles were deflected because:

A) Atom is empty
B) Electrons attracted them
C) Positive charge is concentrated in nucleus
D) Gold foil absorbed them

Answer: C) Positive charge is concentrated in nucleus

Explanation: Positively charged α-particles were repelled by the positively charged nucleus.

10. Which radiation has maximum penetrating power?

A) α-rays
B) β-rays
C) γ-rays
D) Cathode rays

Answer: C) γ-rays

Explanation: γ-rays have the highest penetrating power among radioactive radiations.

11. According to Rutherford's model, electrons revolve around the nucleus in:

A) Waves
B) Circular orbits
C) Straight lines
D) Random paths

Answer: B) Circular orbits

Explanation: Rutherford compared atom to the solar system where electrons revolve around nucleus.

12. The approximate radius of nucleus is:

A) 10^{-10} m
B) 10^{-12}
C) 10^{-15} m
D) 10^{-8} m

Answer: C) 10^{-15} m

Explanation: The nucleus is extremely small compared to the atom.

13. Radioactivity was discovered by:

A) Bohr
B) Henri Becquerel
C) Thomson
D) Dalton

Answer: B) Henri Becquerel

Explanation: Becquerel discovered spontaneous emission of radiations from certain elements.

14. Which particle is negatively charged?

A) Proton
B) Neutron
C) Electron
D) Alpha particle

Answer: C) Electron

Explanation: Electron carries negative charge.

15. Rutherford used which metal foil in his scattering experiment?

A) Silver
B) Copper
C) Platinum
D) Gold

Answer: D) Gold

Explanation: Rutherford bombarded thin gold foil with α-particles.