

What Are Protons, Neutrons, and Electrons?

Worksheet

Protons carry positive charge, neutrons carry no charge, and electrons carry negative charge. Protons and neutrons cluster in the nucleus; electrons orbit at large distances.

Questions

1. A neutral atom has 6 protons. How many electrons?

- A) 3
- B) 6
- C) 12
- D) 0

2. Which particle is in the nucleus?

- A) Electron
- B) Proton
- C) Photon
- D) None of these

3. Electrons are much lighter than protons. How much lighter?

- A) 2
- B) 100
- C) 1836
- D) Same mass

4. Which particles define the element?

- A) Neutrons
- B) Electrons
- C) Protons
- D) All equally

5. A hydrogen atom has 1 proton. How many neutrons and electrons does it have?

6. An oxygen atom has 8 protons. How many electrons does a neutral oxygen atom have?

7. A helium nucleus contains 2 protons and 2 neutrons. How many electrons orbit it?

8. Define: What is a proton?

9. Define: What is a neutron?

10. Define: What is an electron?

Answer Key

1. B) 6 - In neutral atoms, # electrons = # protons.
2. B) Proton - Both protons and neutrons are in the nucleus.
3. C) 1836 - Electron mass $1/1836$ of proton mass.
4. C) Protons - Atomic number = # protons, which identifies the element.
5. Hydrogen-1: 1 proton, 0 neutrons, 1 electron (to balance charge)
6. Neutral atoms have equal protons and electrons. Oxygen: 8 protons, 8 electrons, 8 neutrons (Oxygen-16)
7. A neutral helium atom has 2 electrons to balance the 2 protons.
8. A positively charged particle in the nucleus; carries charge $+1e$; mass 1 amu.
9. A neutral particle in the nucleus; carries no electric charge; mass 1 amu.
10. A negatively charged particle orbiting the nucleus; carries charge $1e$; mass $1/1836$ amu.

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