Protons Electrons And Neutrons Worksheet Answer Key PDF

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Part 1: Foundational Knowledge

What is the charge of a proton?

undefined. A) Positive ✓

undefined. B) Negative

undefined. C) Neutral

undefined. D) Variable

A proton has a positive charge.

Which of the following particles are found in the nucleus of an atom?

undefined. A) Protons ✓

undefined. B) Electrons

undefined. C) Neutrons ✓

undefined. D) Photons

Protons and neutrons are found in the nucleus.

Describe the role of electrons in an atom.

Electrons are negatively charged particles that orbit the nucleus and are involved in chemical bonding.

List the three main subatomic particles and their respective charges.

1. Protons

Positive

2. Neutrons

Neutral

3. Electrons

Negative

The three main subatomic particles are protons (positive), neutrons (neutral), and electrons (negative).

How does the number of protons in an atom affect its identity?

undefined. A) It determines the atom's mass.

undefined. B) It determines the atom's charge.

undefined. C) It determines the element's identity. ✓

undefined. D) It determines the atom's stability.

The number of protons determines the element's identity.

Part 2: Understanding Atomic Concepts

Which statements are true about isotopes?

undefined. A) They have the same number of protons. ✓

undefined. B) They have different numbers of neutrons. ✓

undefined. C) They have different atomic numbers.

undefined. D) They have the same chemical properties. ✓

Isotopes have the same number of protons but different numbers of neutrons.

Explain why electrons are considered to have negligible mass compared to protons and neutrons.

Electrons have a much smaller mass than protons and neutrons, making their contribution to atomic mass negligible.

What is the primary difference between the atomic number and the atomic mass of an element?

undefined. A) Atomic number includes electrons, atomic mass does not.

undefined. B) Atomic number is the sum of protons and neutrons, atomic mass is just protons.

undefined. C) Atomic number is the number of protons, atomic mass is the sum of protons and neutrons. ✓

undefined. D) Atomic number is variable, atomic mass is constant.

The atomic number is the number of protons, while the atomic mass is the sum of protons and neutrons.

Part 3: Applying Knowledge

If an atom has 6 protons, 6 neutrons, and 6 electrons, what is its atomic mass?

undefined. A) 6
undefined. B) 12 ✓
undefined. C) 18
undefined. D) 24

The atomic mass is the sum of protons and neutrons, which is 12.

Calculate the number of neutrons in an isotope of carbon with an atomic mass of 14.

The number of neutrons is 8 (14 - 6 protons).

Which of the following elements is represented by an atom with 8 protons?

undefined. A) Carbon
undefined. B) Oxygen ✓
undefined. C) Nitrogen
undefined. D) Hydrogen

An atom with 8 protons is oxygen.

Part 4: Analyzing Relationships

Analyze the following scenario: An atom has 17 protons and 18 electrons. Which of the following statements are true?

undefined. A) The atom is a cation.
undefined. B) The atom is an an ion. ✓
undefined. C) The atom is neutral.
undefined. D) The atom has a positive charge.

The atom is an anionic species due to having more electrons than protons.

Compare and contrast the roles of protons and neutrons in the nucleus of an atom.

Protons determine the atomic number and identity, while neutrons contribute to atomic mass and stability.

Which of the following changes would result in the formation of an isotope?

undefined. A) Adding an electron
undefined. B) Removing a proton
undefined. C) Adding a neutron ✓
undefined. D) Removing an electron

Adding a neutron would create an isotope.

Part 5: Synthesis and Reflection

Evaluate the impact of changing the number of neutrons in an atom on its chemical properties and stability.

Changing the number of neutrons can create isotopes, which may have different stability and chemical properties.

Propose a model for an atom with 11 protons, 12 neutrons, and 10 electrons. Describe its charge and identify the element.

1. Element

Sodium

2. Charge

+1

The atom is sodium (Na) with a +1 charge due to having more protons than electrons.

Which of the following would be the best method to determine the identity of an unknown element?

undefined. A) Counting the number of electrons

undefined. B) Measuring the atomic mass

undefined. C) Determining the number of protons ✓

undefined. D) Calculating the number of neutrons

Determining the number of protons is the best method to identify an element.