Parts Of An Atom Worksheet Answer Key PDF

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Part 1: Building a Foundation

What is the charge of a proton?

undefined. Neutral

undefined. Positive ✓

undefined. Negative

undefined. No charge

A proton has a positive charge.

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

undefined. Electrons

undefined. Protons ✓

undefined. Neutrons ✓

undefined. Valence Electrons

Protons and neutrons are found in the nucleus.

Explain 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 charges.

1. Proton

Positive

2. Neutron

Neutral

3. Electron

Negative

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

What determines the atomic number of an element?

undefined. Number of electrons
undefined. Number of neutrons
undefined. Number of protons ✓
undefined. Number of valence electrons

The atomic number is determined by the number of protons in the nucleus.

Part 2: comprehension and Application

Which part of the atom accounts for most of its volume?

undefined. Nucleus
undefined. Electron cloud ✓
undefined. Protons
undefined. Neutrons

The electron cloud accounts for most of the atom's volume.

Which statements are true about isotopes?

undefined. They have the same number of protons. ✓
undefined. They have different numbers of neutrons. ✓
undefined. They have different atomic numbers.
undefined. They have the same atomic mass.

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

Describe how the atomic mass of an element is calculated.

Atomic mass is calculated by adding the number of protons and neutrons in the nucleus.

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

undefined. 6
undefined. 12 ✓
undefined. 18
undefined. 24

The atomic mass is 12, as it is the sum of 6 protons and 6 neutrons.

An atom has 7 electrons in its outer shell. Which of the following are likely properties of this atom?

undefined. Highly reactive ✓
undefined. Stable
undefined. Likely to gain an electron ✓
undefined. Likely to lose an electron

Atoms with 7 outer shell electrons are typically highly reactive and likely to gain an electron.

Predict what happens to the atomic number and mass number when a neutron is added to an atom.

The atomic number remains the same, but the mass number increases by one.

Part 3: Analysis, Evaluation, and Creation

Which of the following best explains why isotopes of the same element have different physical properties?

undefined. Different numbers of protons
undefined. Different numbers of electrons
undefined. Different numbers of neutrons ✓
undefined. Different electron configurations

Isotopes have different numbers of neutrons, which affects their physical properties.

Analyze the following statements and identify which are true regarding electron configuration:

undefined. Electrons fill the lowest energy levels first. ✓

undefined. Valence electrons determine chemical reactivity. ✓

undefined. Electrons in the same shell have the same energy.

undefined. Electrons are shared between atoms in ionic bonds.

Electrons fill the lowest energy levels first, and valence electrons determine chemical reactivity.

Analyze how the arrangement of electrons affects the chemical properties of an element.

The arrangement of electrons, particularly valence electrons, determines how an element interacts and bonds with other elements.

Which element is most likely to form a stable ion by losing one electron?

undefined. Helium

undefined. Sodium ✓

undefined. Chlorine

undefined. Neon

Sodium is most likely to form a stable ion by losing one electron.

Evaluate the following scenarios and select which would result in a stable atom:

undefined. An atom with a full outer electron shell. ✓

undefined. An atom with one electron in its outer shell.

undefined. An atom with eight electrons in its outer shell. ✓

undefined. An atom with seven electrons in its outer shell.

An atom is stable if it has a full outer electron shell or eight electrons in its outer shell.

Design an experiment to determine the isotope composition of a sample of carbon. Describe the steps and the expected outcomes.

An experiment could involve mass spectrometry to analyze the isotopic ratios of carbon in the sample.

Propose two real-world applications of isotopes and explain their significance.

1. Medical imaging

Isotopes are used in PET scans.

2. Carbon dating

Isotopes help determine the age of artifacts.

Isotopes are used in medicine for imaging and treatment, and in archaeology for dating artifacts.