

Structure Of An Atom Worksheet Answer Key PDF

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Part 1: Foundational Knowledge

What is the charge of a proton?

undefined. -1

undefined. 0

undefined. +1 ✓

undefined. +2

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. Photons

Protons and neutrons are found in the nucleus.

Define the term "atomic number" and explain its significance in identifying an element.

The atomic number is the number of protons in an atom, which determines the element's identity.

List the three subatomic particles of an atom and provide their respective charges.

1. Proton

+1

2. Neutron

0

3. Electron

-1

The three subatomic particles are protons (+1), neutrons (0), and electrons (-1).

Which model of the atom describes electrons orbiting the nucleus in fixed paths?

undefined. Quantum Mechanical Model

undefined. Rutherford Model

undefined. Bohr Model ✓

undefined. Thomson Model

The Bohr Model describes electrons in fixed orbits around the nucleus.

Part 2: Comprehension and Application

Which of the following statements about isotopes is true?

undefined. Isotopes have the same number of protons. ✓

undefined. Isotopes have different numbers of neutrons. ✓

undefined. Isotopes have different chemical properties.

undefined. Isotopes have the same mass number.

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

Explain how the periodic table is organized in terms of atomic structure and periodic trends.

The periodic table is organized by increasing atomic number, with elements in the same group having similar properties.

If an atom loses two electrons, what type of ion does it become?

undefined. Neutral

undefined. An ion

undefined. Cation ✓

undefined. Isotope

If an atom loses electrons, it becomes a cation.

An element has an atomic number of 6 and a mass number of 14. Which of the following statements are true?

undefined. It has 6 protons. ✓

undefined. It has 8 neutrons. ✓

undefined. It has 14 electrons.

undefined. It is an isotope of carbon. ✓

The element has 6 protons and 8 neutrons, and it is an isotope of carbon.

Describe how the concept of electron configuration can be used to predict the chemical behavior of an element.

Electron configuration determines how an element interacts with others, influencing its reactivity and bonding.

Part 3: Analysis, Evaluation, and Creation

Which of the following best explains why isotopes of the same element have similar chemical properties?

undefined. They have the same number of neutrons.

undefined. They have the same number of protons. ✓

undefined. They have the same mass number.

undefined. They have different electron configurations.

Isotopes have the same number of protons, which determines their chemical properties.

Analyze the following scenario: An atom has an electron configuration of $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$. Which statements are correct?

undefined. The atom is in its ground state. ✓

undefined. The atom is likely to lose one electron to form a cation. ✓

undefined. The atom has a full outer shell.

undefined. The atom is a noble gas.

The atom is likely to lose one electron to form a cation and is in its ground state.

Compare and contrast the Bohr Model and the Quantum Mechanical Model of the atom, focusing on their descriptions of electron behavior.

The Bohr Model describes electrons in fixed orbits, while the Quantum Mechanical Model describes electron behavior in terms of probabilities.

Which of the following would be the best method to determine the relative abundance of isotopes in a sample?

undefined. Mass spectrometry ✓

undefined. X-ray diffraction

undefined. Electron microscopy

undefined. Infrared spectroscopy

Mass spectrometry is the best method for determining isotope abundance.

Evaluate the following statements about atomic mass and select the correct ones:

undefined. Atomic mass is the sum of protons and neutrons.

undefined. Atomic mass is a weighted average of all isotopes. ✓

undefined. Atomic mass is always a whole number.

undefined. Atomic mass can be found on the periodic table. ✓

Atomic mass is a weighted average of all isotopes and is not always a whole number.

Design an experiment to investigate the effect of changing the number of neutrons in an atom on its stability and properties. Describe the steps and the expected outcomes.

The experiment would involve creating isotopes with varying neutron numbers and observing their stability and properties.