

1. In the Rutherford gold foil experiment, the fact that most of the alpha particles were not deflected as they passed through the gold foil indicates that

- a) the nucleus is positively charged.
- b) the atom is mostly empty space.
- c) atoms are solid spheres touching each other in the solid state.
- d) gold is very dense.
- e) none of the above is correct.

2. Which of the following particles has the smallest mass?

- a) an electron
- b) a proton
- c) a neutron
- d) a hydrogen atom
- e) a hydrogen nucleus

3. The mass number of an atom is the number of _____ in the atom.

- a) protons
- b) neutrons
- c) protons plus the number of electrons
- d) protons plus the number of neutrons
- e) electrons plus the number of neutrons

4. Isotopes are atoms of the same element that

- a) have different numbers of electrons.
- b) have different numbers of protons.
- c) have different atomic numbers.
- d) have different numbers of neutrons.
- e) have different nuclear charges.

5. The atomic number of a certain element is 19, and its atomic weight is 39. An atom of the element contains 19 protons, 20 neutrons, and the chemical symbol for the element is K.

6. Give the number of protons, neutrons, and electrons in the ${}_{21}^{41}\text{Sc}^{3+}$ ion.

21 protons, 20 neutrons, $21 - 3 = 18 e^{-}$

7. Consider the ${}_{17}^{35}\text{Cl}$ isotope. An atom of this isotope contains

18 neutrons.

8. A hypothetical element consists of the following naturally occurring isotopes. What is the atomic weight of the element?

Isotopes	Mass	Abundance
1	46.041 amu	26.00%
2	47.038 amu	58.00%
3	49.034 amu	16.00%

$$46.041 \times 0.2600 = 11.97066$$

$$47.038 \times 0.5800 = 27.28204$$

$$49.034 \times 0.1600 = 7.84544$$

$$47.09814$$

$$47.10$$