

1. Positively charged protons experience intense electrostatic repulsion when packed tightly inside the nucleus. Name and define the fundamental force that overcomes this repulsion to maintain nuclear stability:

2. A neutral atom of Aluminum has Mass number 27 and atomic number 13. Determine the exact count of each subatomic particle:

Protons : _____

Neutrons : _____

Electrons: _____

3. (I) A neutral Fluorine atom has 9 protons. Write number of electrons and its electronic configuration. Also identify its valence electrons.

(II) Also draw its structure according to Bohr's atomic model.

4. Carbon-12 and Carbon-14 are two naturally occurring isotopes.

Explain how their atomic structure differs.

State the exact number of neutrons in Carbon-14 (atomic number of carbon is 6).

5.(I) Write the name of scientist who discovered the following subatomic particles:- protons, electrons and neutrons.

(II) Also state the charge on them and their location inside the atom.

6. An unknown Element X consists of two isotopes with the following natural abundances:

1st Isotope of X has Mass = 10 amu and Abundance = 20%

2nd Isotope of X has Mass = 11 amu and Abundance = 80%

Calculate the weighted average atomic mass of Element X.

7. Explain Thomson's plum pudding model. Also write its limitations.

8. Write the observation and features of Rutherford's alpha scattering experiment.

9. Define isotopes and isobars. Give two examples of each.

10. Write four uses of isotopes.

11. Write the electronic configuration of the elements having atomic numbers 13, 15 and 17. Also identify the number of electrons in the outermost shell of the given elements.