

The Atom : Test - 80

1) Insert one of the following names into the blanks below: Becquerel, Bohr, Chadwick, Crookes, Dalton, Millikan, Rutherford, Thomson.

- a) He invented the cathode ray tube. _____
- b) He found the charge on an electron. _____
- c) He proposed the planetary model of the atom. _____
- d) He found that the atom contains a heavy positively charged nucleus. _____
- e) He discovered radioactivity. _____
- f) He discovered the electron. _____
- g) He suggested that atoms are small, indivisible particles which can combine in simple ratios to form compounds.

- h) He discovered the neutron. _____

- 2) For $^{35}\text{Cl}_{17}$:
- the mass number is _____
 - the atomic number is _____
 - the atomic weight is _____ a.m.u.
 - the number of protons is _____
 - the number of electrons is _____
 - the number of neutrons is _____

3)a) Element X has two main isotopes with mass numbers 69.0 (60.2%) and 71.0 (39.8%). Find the atomic mass. Which element is X?

b) Chlorine has two main isotopes; chlorine-35 and chlorine-37. Which is more common? Find the percentage abundance of each isotope.

4)a) Write down the electronic configuration for aluminum.

b) What is the usual charge on an aluminum ion?

5)a) Give the number of orbitals in the fourth energy level.

b) Give the maximum number of electrons in the 4th energy level.

c) Give the maximum number of electrons in the 4d orbital.

6) How many valence electrons are in a sulfur atom?

7) What is the octet rule?

8) Draw the Lewis-Dot representation for the following atoms;

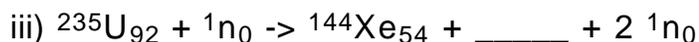
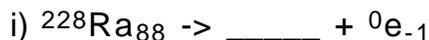
a) lithium

b) silicon

c) fluorine

9) Draw a picture of the $^{31}\text{P}_{15}$ atom. Show the nucleus. Give the number of protons and neutrons. Show the shells (not orbitals) with the correct number of electrons in each.

10)a) Complete the nuclear reactions below:



b) State the type of each reaction shown above. (fission, fusion, radioactivity, or transmutation)

Answers: 1)a) Crookes, b) Millikan, c) Bohr, d) Rutherford, e) Becquerel, f) Thomson, g) Dalton, h) Chadwick, 2) 35, 17, 35, 17, 17, 18, 3)a) 69.8 a.m.u., Ga, b) chlorine-35, chlorine-35 (77.5%), chlorine-37 (22.5%), 4)a) $1s^2 2s^2 2p^6 3s^2 3p^1$, b) +3, 5)a) 4, b) 32, c) 10, 6) 6, 7) Atoms want eight electrons in their outermost shell. It is a stable arrangement., 8)

lithium



silicon

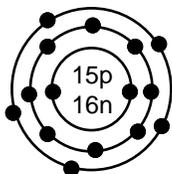


fluorine



9)

Phosphorus -31



10)a)i) $^{228}\text{Ac}_{89}$, ii) $6\ ^1_0\text{n}$, iii) $^{90}\text{Sr}_{38}$, iv) $^4\text{He}_2$, b) radioactivity, transmutation, fission, fusion.