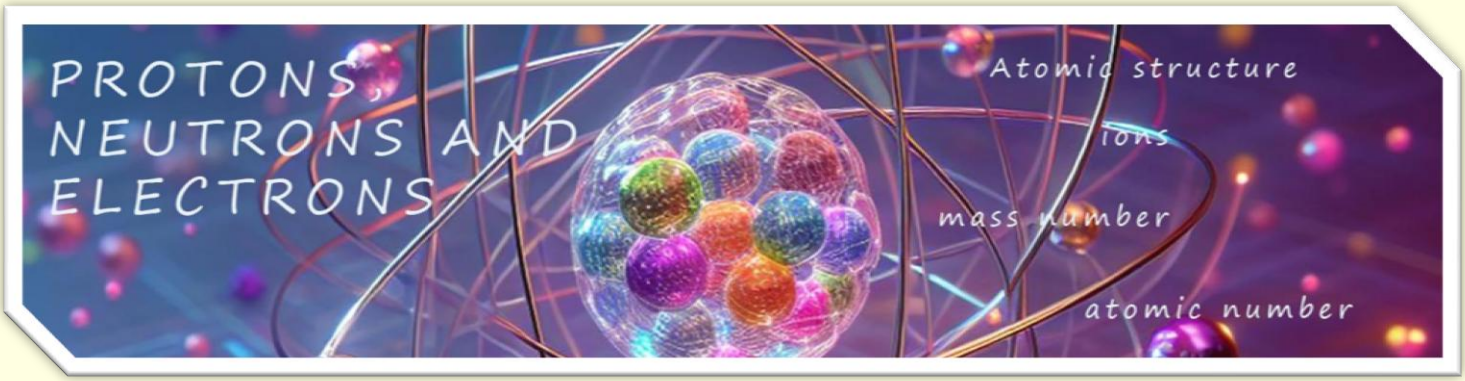


Answer all the questions below as fully as you can then check your answers

1. Name the three sub- atomic particles that make up atoms and describe where they are found inside the atom.

2. How many protons, neutrons and electrons are in each of the following atoms and ions?

a. $^{28}_{14}Si$ b. $^{197}_{79}Au^{+}$ c. $^{19}_{9}F^{-}$ d. $^{56}_{26}Fe^{2+}$ e. $^{91}_{40}Zr$ f. $^{131}_{54}Xe$

g. $^{59}_{28}Ni^{2+}$ h. $^{32}_{16}S^{2-}$

b. Write the symbol (similar to the ones above) for the following atoms and ions:
   i. an atom with 21 protons, 19 electrons and 24 neutrons.
   ii. an ion with 13 protons, 10 electrons and 14 neutrons.
   iii. an ion with 25 protons, 30 neutrons and 23 electrons

c. What can you say about the numbers of protons and electrons inside an atom?

d. Where is most of the mass in an atom found? Explain your answer.

4. What is the charge on the nucleus in the following atoms?

a. nitrogen (Z=7) b. Argon (z=18) c. Chlorine (z=17)

5. Draw atomic structure diagrams for each of the following atoms:

a. $^{13}_{6}C$ b. $^{20}_{10}Ne$ c. $^{39}_{19}K$ d. $^{7}_{3}Li$ e. $^{35}_{17}Cl$ f. $^{27}_{13}Al$

6. Explain what is meant by:

a. the atomic number of an element

b. The mass number of an element

7. The atomic number of an element is 10. What information does this give you? How reactive is this element?

Answers

1. Name the three sub- atomic particles that make up atoms and describe where they are found inside the atom. Protons and neutrons inside the nucleus, electrons in the electron shells/energy levels

2. How many protons, neutrons and electrons are in each of the following atoms and ions:

a. $^{28}_{14}Si$	b. $^{197}_{79}Au^{+}$	c. $^{19}_{9}F^{-}$	d. $^{56}_{26}Fe^{2+}$	e. $^{91}_{40}Zr$	f. $^{131}_{54}Xe$
14p	79p	9p	26p	40p	54p
14e	78e	10e	24e	40e	54e
14n	118n	10n	30n	51n	77n

g. $^{59}_{28}Ni$	h. $^{32}_{16}S^{2-}$
28p	16p
28e	18e
31n	16n

Note ions are charged atoms. If the ion has a + charge, this means it has lost 1 electron. If the charge on the ion is 2+ this means it has lost 2e, and if charge is 3+ then it has lost 3 electrons. If the ion has a negative charge then it has gained 1 electron, 2- means it has gained 2e, 3- means it has gained 3 electrons etc

b. Write the symbol (similar to the ones above) for the following atoms and ions:

i. an atom with 21 protons, 19 electrons and 24 neutrons. $^{45}_{21}Sc^{2+}$

ii. an ion with 13 protons, 10 electrons and 14 neutrons. $^{27}_{13}Al^{3+}$

iii. an ion with 25 protons, 30 neutrons and 23 electrons $^{55}_{25}Mn^{2+}$

b. What can you say about the numbers of protons and electrons inside an atom?

They are the same

c. Where is most of the mass in an atom found? Explain your answer.

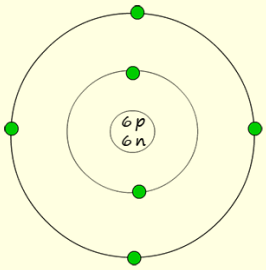
Most of the mass of an atom is found in the nucleus. The protons and neutrons make up most of the mass of an atom. The mass of the electron is very very small in comparison to the mass of the nucleons.

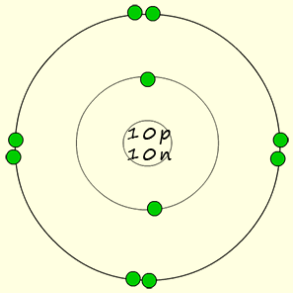
4. What is the charge on the nucleus in the following atoms?

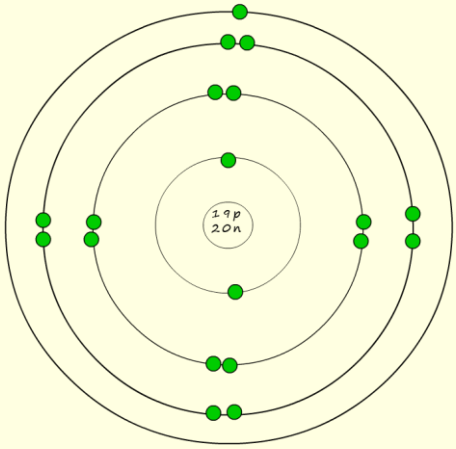
a. nitrogen (Z=7) +7 b. Argon (z=18) +18 c. Chlorine (z=17) +17

5. Draw atomic structure diagrams for each of the following atoms:

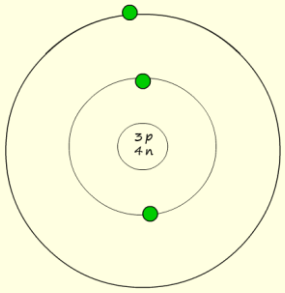
a. $^{13}_{6}C$ b. $^{20}_{10}Ne$ c. $^{39}_{19}K$

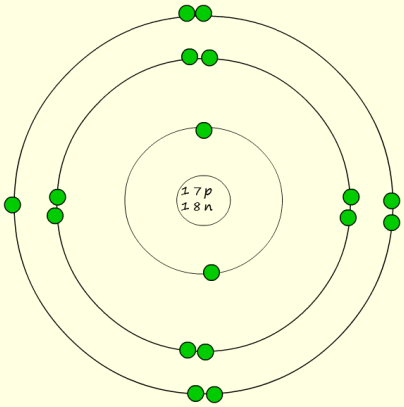


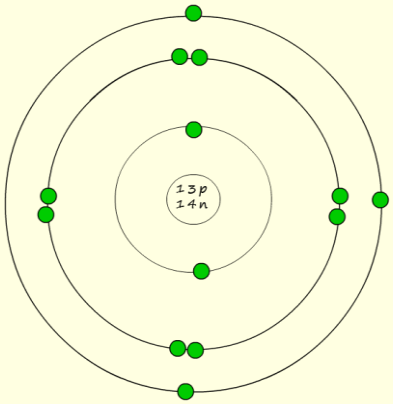




a. $^{7}_{3}Li$ e. $^{35}_{17}Cl$ f. $^{27}_{13}Al$







6. Explain what is meant by:

a the atomic number of an element: number of protons

b The mass number of an element : number of protons and neutrons added together

7. The atomic number of an element is 10. What information does this give you? How reactive is this element? The element is neon; it has 10p, 10e, 10n. It is a noble gas and is unreactive