

1. Define each of the following terms:

a. Alkaline earth metals = elements in group 2 of the periodic table

b. Chemistry = the study of the properties and changes in matter

c. Matter = anything that has mass and takes up space

d. Group = the columns in the periodic table

e. Period = the rows in the periodic table

f. Hydrocarbon = a chemical compound that consists of carbon and hydrogen

g. Alkali metals = found in group 1 of the periodic table

h. Covalent bond = the bond that is created between two non-metals, electrons are shared

i. Proton = the positive charged subatomic particle found in the nucleus of the atom

j. Neutron = the neutral (no charge) subatomic particle found in the nucleus of the atom

k. Molecular compound = composed of two non-metals sharing electrons in a covalent bond

l. Ionic compound = composed of a metal and a non-metal transferring electrons

m. Polyatomic ion = ion composed of many atoms
i.e. PO_4 , SO_4

n. Chemical property = a property that describes the behavior of a substance

o. Physical property = a property that describes the appearance of a substance

p. Electron = a negatively charged subatomic particle found in the orbits of an atom

q. Polymers = long chain of molecules

r. Subatomic particles = consist of protons, neutrons and electrons

s. Pure substance = a substance that only contains one thing

t. Organic compound = compounds composed of carbon

2. What is the atomic number of the following elements?

- i. Cadmium 48
- ii. Aluminum 13
- iii. Carbon 6

3 a. Where are valence electrons located? In the outermost orbit of atoms

b. How many valence electrons do each of the following have:

- i. Oxygen 8
- ii. Carbon 4
- iii. Nitrogen 5
- iv. Phosphorous 5
- v. Neon 8
- vi. Lithium 1
- vii. Magnesium 2

4. What two subatomic particles are found in the nucleus and what are their charges? **Protons and neutrons are found in the nucleus. Protons are positive, neutrons are neutral (no charge)**

5. How many electrons are found around the nucleus of the following atoms?

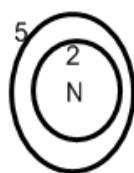
a. Oxygen **orbit 1 = 2 orbit 2 = 6**

b. Copper **orbit 1 = 2 orbit 2 = 8 orbit 3 = 8 orbit 4 = 11**

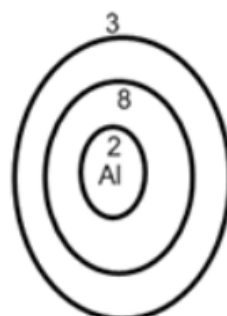
c. Barium **orbit 1 = 2 orbit 2 = 8 orbit 3 = 8 etc**

6 Draw Bohr diagrams of the following atoms:

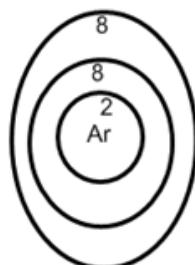
a. Nitrogen



b. Aluminum



c. Argon



7. Write the symbols of the following atoms as ions:

- a. Gallium Ga^{3+} b. Iron Fe^{2+} or Fe^{3+}
c. Niobium Nb^{3-} d. Gold Au^{1+}
e. Bismuth Bi^{3+} or Bi^{5+}

8. Identify the following elements based on their position on the periodic table:

- a. Period 4, group 5 **V (vanadium)**
b. Period 7, group 8 **F (fluorine)**
c. Period 2, group 17 **Rb (rubidium)**

9. What are the three states that non-metals can be found in?

Soild, liquid or gas