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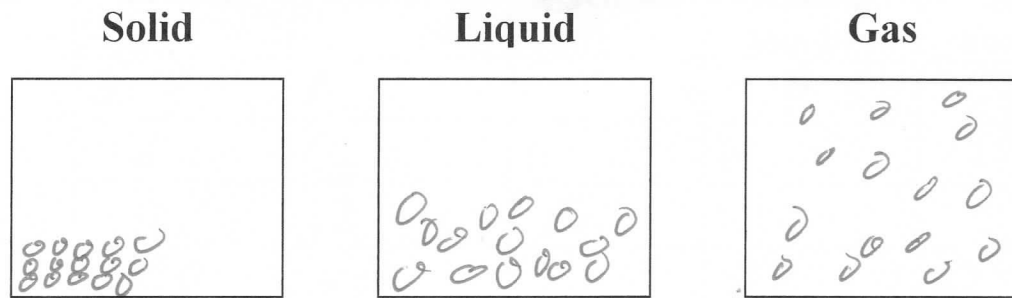
Answers

# Year 12 Chemistry Foundation Knowledge Test

1.) What do you understand by the following terms

- a) Atom the smallest particle that maintains the properties of an element, consists of proton(s), neutrons, electrons.
- b) Ion an atom or molecule that has gained or lost one or more electrons resulting in a net charge.
- c) Element pure substance made of only one type of atom
- d) Molecule more than one atom, chemically bonded together, electrically neutral
- e) Metal elements on the left 3/4 of the periodic table good conductors of heat + electricity
- f) Non-metal elements on the right of the periodic table poor conductors

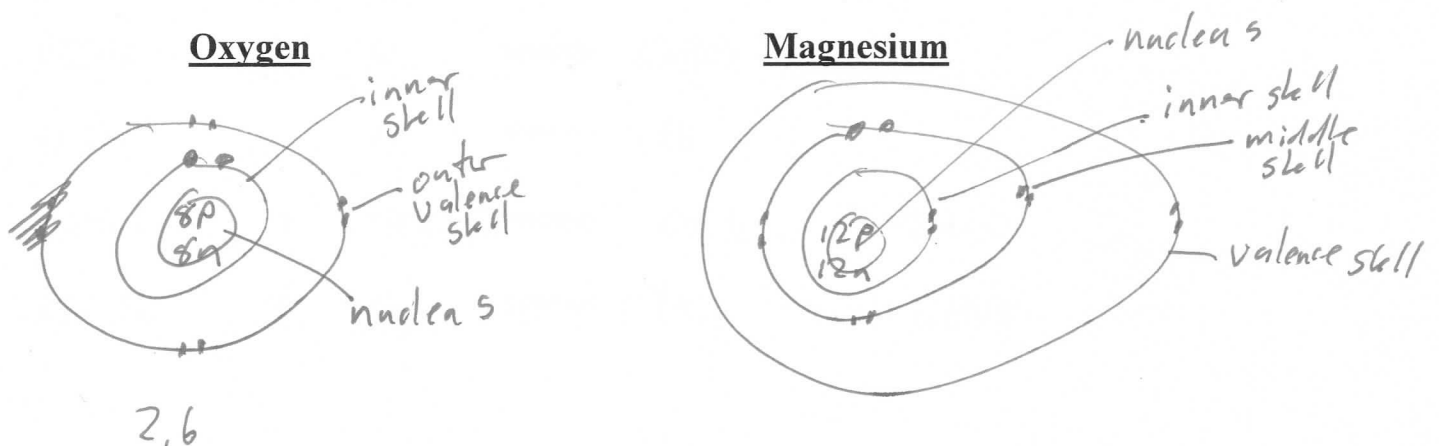
2.) Draw the arrangement of the particles in the three different phases below.



3.) Complete the following table

Particle	mass	charge	location
proton	1 amu	+1	nucleus
neutron	1 amu	0	nucleus
electron	$\frac{1}{1840}$ amu	-1	shell

4.) Draw labeled diagrams of the following atoms (1pt each)



- 5.) The box on the right is copied from the periodic table of the elements. Boron commonly occurs as two isotopes,  $^{10}\text{B}$  and  $^{11}\text{B}$ . Explain the difference in atomic structure between these atoms.

5
<b>B</b>
10.8

Both have 5 protons,  
 $^{10}\text{B}$  has 5 neutrons,  $^{11}\text{B}$  has 6 neutrons

- 6.) Give the type and number of each atom in each of the following. (The first one has been done for you)

a)  $\text{H}_2\text{O}$  H: Hydrogen - 2, O: Oxygen - 1

b)  $\text{Ca}(\text{OH})_2$  Ca: Calcium - 1 O: oxygen - 2 H: hydrogen - 2

c)  $\text{C}_6\text{H}_{12}\text{O}_6$  C: carbon - 6 H: Hydrogen - 12 O: oxygen - 6

d)  $\text{CoCl}_2$  Co: cobalt - 1 Cl: chlorine - 2

- 7.) Write the electron configuration for the following atoms and ions

a) K 2, 8, 8, 1      b) C 2, 4      c)  $\text{O}^{2-}$  2, 8      d)  $\text{Na}^+$  2, 8

- 8.) Write names for the following ionic compounds

a)  $\text{Ca}(\text{OH})_2$  calcium hydroxide      c) AgCl silver chloride

b)  $(\text{NH}_4)_2\text{SO}_4$  ammonium sulphate      d)  $\text{H}_2\text{SO}_4$  salphuric acid

- 9.) Explain why Ca and F form a 1:2 ratio when they form a compound whereas K and F form a 1:1 ratio.

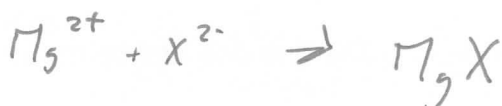
F has 7 valence electrons so forms an ion with a -1 charge:  $\text{F}^-$  K has only one valence electron so forms an ~~ion~~ ion with a +1 charge  $\text{K}^+$  when they react in a 1:1 ratio their charges cancel.

Ca has a +2 charge so two  $\text{F}^-$  required to balance charge

10.) Write balanced molecular formula for the following compounds.

- a) Oxygen O<sub>2</sub> d) Magnesium hydroxide Mg(OH)<sub>2</sub>  
 b) Copper chloride CuCl<sub>2</sub> e) Nitric acid HNO<sub>3</sub>  
 c) Magnesium sulphate MgSO<sub>4</sub> f) Ammonium bromide NH<sub>4</sub>Br

11.) If Al forms the compound Al<sub>2</sub>X<sub>3</sub> with an unknown element, what is the formula of the compound Mg would form with X?



12.) Complete the following table

Symbol	Protons	Neutrons	Electrons	Atomic number	Mass number
Li	3	4	3	<del>3</del> 3	7
C	6	6	6	6	12
Na <sup>+</sup>	11	12	10	11	23
Ca	20			20	42
Cl	17	18	17	17	35
Cl <sup>-</sup>	17	20	18	17	37

13.) Balance the following chemical equations

