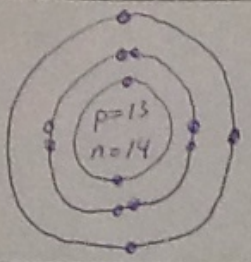
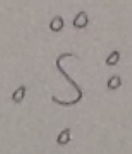
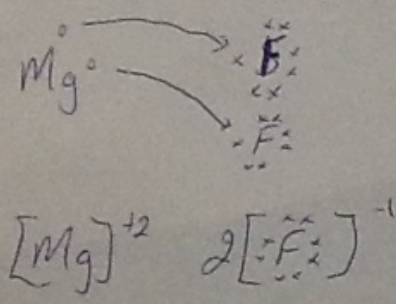
Part B : Short Answer

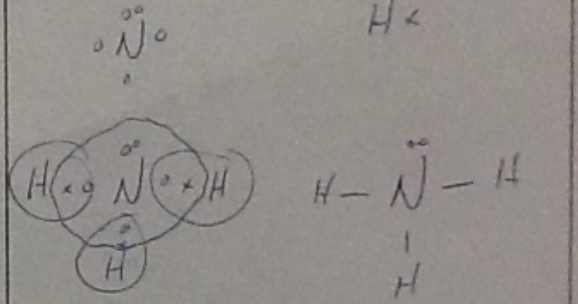
1. Draw the Bohr Rutherford diagram for aluminum Draw the Lewis Diagram of **sulphur**.





2. Demonstrate the ionic or covalent bonding:
   a. between magnesium and fluorine. b. between nitrogen and hydrogen





3. Name or write the formula for the following compounds

(a) K_2S potassium sulphide

(b) sodium nitride Na_3N

(c) $CaCl_2$ calcium chloride

(d) ammonium sulfide $(NH_4)_2S$

(e) Al_2O_3 aluminum oxide

(f) lead(IV) bromide $PbBr_4$

(g) Na_2CO_3 sodium carbonate

(h) copper(II) sulfate $Cu(SO_4)$

(i) NBr_3 nitrogen tribromide

(j) trisulfur difluoride S_3F_2

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4. Balance the following equations

$\frac{1}{2}$ PbS + $\frac{1.5}{3}$ O_2 → $\frac{1}{2}$ PbO + $\frac{1}{2}$ SO_2

___ MnO_2 + 4 HCl → ___ $MnCl_2$ + 2 H_2O + ___ Cl_2

8

___ Al_4C_3 + 12 H_2O → 4 $Al(OH)_3$ + 3 CH_4

___ C_9H_{16} + 13 O_2 → 8 H_2O + 9 CO_2

5 Write the balanced chemical equations for the following reactions and include states. [9 marks]

Magnesium metal reacts with a solution of iron (III) sulphate to produce iron metal and a solution of magnesium sulfate

$3Mg_{(s)} + Fe_2(SO_4)_{3(aq)} \rightarrow 2Fe_{(s)} + 3MgSO_{4(aq)}$

sodium hydrogen carbonate was heated and it decomposed into sodium oxide, water and carbon dioxide

$2NaHCO_{3(s)} \longrightarrow Na_2O_{(s)} + H_2O_{(\ell)} + 2CO_{2(g)}$

An explosion occurred when a mixture of hydrogen gas and oxygen gas was ignited to produce water

$2H_{2(g)} + O_{2(g)} \rightarrow 2H_2O_{(g)}$

6. Identify the reaction type and predict one of the products of each reaction [8 marks]

Sodium metal reacts with chlorine gas → Sodium chloride

Type: Synthesis

Aluminum metal was placed in a solution of copper(II) nitrate → copper or Aluminum nitrate

Type: single Displacement

Iron (III) oxide was heated and it broke down into elements → iron or oxygen

Type: decomposition

Calcium hydroxide was neutralized by hydrobromic acid → water or calcium bromide

Type: double displacement (neutralization)