

REVISION ASSIGNMENT – ATOMS, FORMULAE AND BONDING

NAME: _____ /60 _____ %

1. Two different atoms are isolated and their atomic and mass numbers are identified.

If the atoms can be represented as ${}^{86}_{37}\text{X}$ and ${}^{32}_{16}\text{D}$

Determine (using a Periodic Table where necessary):

- (a) Number of **protons** in each atom

X: 37

D: 16

- (b) Number of **valence electrons** in each atom

X 1

D 6

- (c) the **ion** that each atom would be expected to produce if they reacted together.

X^{+1} D^{2-}

- (d) the **formula of the compound** made by reacting X and D together.

X_2D

2. What is the difference between a MONATOMIC ION and a POLYATOMIC ION?

Monatomic ion consists of 1 atom only eg Na^+
polyatomic ion consists of 2 or more atoms eg CO_3^{2-}

3. Complete the table by putting in the **formulas**. The first one has been done for you.

Positive Ions	Negative Ions				
	Chloride	Sulfide	Hydroxide	Nitrate	Sulfate
Ammonium	NH_4Cl	$(\text{NH}_4)_2\text{S}$	NH_4OH	NH_4NO_3	$(\text{NH}_4)_2\text{SO}_4$
Magnesium	MgCl_2	MgS	$\text{Mg}(\text{OH})_2$	$\text{Mg}(\text{NO}_3)_2$	MgSO_4
Iron (III)	FeCl_3	Fe_2S_3	$\text{Fe}(\text{OH})_3$	$\text{Fe}(\text{NO}_3)_3$	$\text{Fe}_2(\text{SO}_4)_3$

4. **Correct** the following formulae **if necessary**

Iron II carbonate	$\text{Fe}_2(\text{CO}_3)_3$	<u>FeCO_3</u>
Potassium iodide	KI_2	<u>KI</u>
Tin II oxide	Sn_2O	<u>SnO</u>
Calcium hydroxide	CaOH_2	<u>$\text{Ca}(\text{OH})_2$</u>
Sodium hydrogencarbonate	NaHCO_3	<u>NaHCO_3</u>
Silver carbonate	AgCO_3	<u>Ag_2CO_3</u>

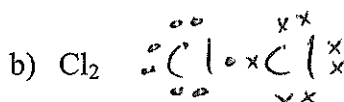
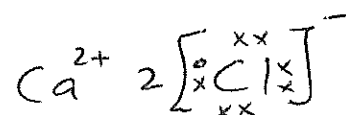
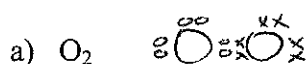
5. Give the **chemical names** for the following formulae.

FORMULA	NAME
ZnSO_4	<u>Zinc Sulfate</u>
NH_4Br	<u>Ammonium Bromide</u>
$\text{Cu}(\text{HCO}_3)_2$	<u>Copper hydrogen Carbonate</u>
BaCO_3	<u>Barium Carbonate</u>

6. Classify the following as having ionic, covalent or metallic bonds

a) NaCl	<u>ionic</u>
b) Ag	<u>metallic</u>
c) CO_2	<u>covalent</u>
d) N_2	<u>covalent</u>
e) Lead Iodide	<u>ionic</u>
f) Oxygen gas	<u>covalent</u>
g) Magnesium Bromide	<u>ionic</u>
h) Brass	<u>metallic</u>

7. Draw electron dot diagrams for the following:



8. Complete the following table by placing a tick where the listed characteristics are applicable for each of the chemicals on the left hand side.

Substance	Conducts electricity	Ductile and malleable	Low melting point	Brittle
Iron Fe	✓	✓		
Phosphorus P ₄			✓	✓
Distilled water H ₂ O			✓	
Potassium Iodide Solution KI(aq)	✓			
Calcium Carbonate Solid CaCO ₃ (s)				✓

9. Use the solubility table to help write an **IONIC** equation if a chemical reaction takes place when the following solutions are combined. If no precipitate forms write **NR**.

(a) silver nitrate + sodium Bromide AgBr + NaNO₃

(b) $Ag^+_{(aq)} + Br^-_{(aq)} \rightarrow AgBr(s)$
 potassium Bromide + lead nitrate KNO₃ + PbBr₂

(c) $Pb^{2+}_{(aq)} + 2Br^-_{(aq)} \rightarrow PbBr_2(s)$
 Iron sulfate + potassium phosphate K₂SO₄ + Fe₃(PO₄)₂

$3Fe^{3+}_{(aq)} + 2PO_4^{3-}_{(aq)} \rightarrow Fe_3(PO_4)_2(s)$

10. Place the following under the appropriate column.

Copper chlorine sodium oxide sulfide hydrogen gas
 manganese Ammonium oxygen gas silver ammonium chloride

ATOM	ION	MOLECULE	COMPOUND
Cu Mn Ag	S^{2-} NH_4^+	Cl_2 O_2 H_2	Na_2O NH_4Cl

11. Complete the following table.

Substance	Formula	Type of Bonding
Chlorine	Cl_2	covalent
Copper	Cu	metallic
Sodium hydroxide	NaOH	ionic
Carbon tetrabromide	CBr_4	covalent
Iron(III) fluoride	FeF_3	ionic