

CHEMISTRY SEMESTER 1 REVIEW

①

PART 1

1. MASS # = 31 AMU

ATOMIC # = 15

CHARGE = NEUTRAL

ELEMENT = PHOSPHORUS = P

2. COVALENT BOND INVOLVES SHARING ELECTRONS & IONIC BOND INVOLVES ELECTRONS MOVING FROM ATOM TO ATOM CAUSING CHARGED ATOMS (IONS) TO FORM. THE RESULTING OPPOSITE CHARGES CAUSE ATTRACTIONS WHICH ARE IONIC BONDS.

3. Mn = 54.94 g/mol

4. O₂ = 32 g/mol

5. HALOGENS = -1 CHARGE WHEN AN ION

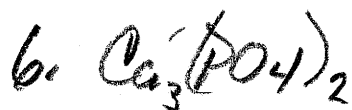
ALKALI METALS = +1

ALKALINE

EARTH METALS = +2

Al = +3

Cr(III) = +3



8. 2 mol C = 24.02 g

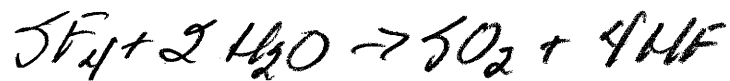
9. (1.5 mol NaCl) (58.44 g/mol) = 87.66 g NaCl

10. (15 mol CF₄) (88.01 g/mol) = 1320.15 g CF₄

11. (7.2 mol Al₂O₃) (101.96 g/mol) = 734.11 g Al₂O₃

PART 2

(2)



$$1. \frac{(2.5 \text{ mol } 5\text{Fe}) \times (2 \text{ mol } \text{H}_2\text{O})}{(1 \text{ mol } 5\text{Fe})} = \underline{5 \text{ mol } \text{H}_2\text{O} \text{ NEEDED}}$$

$$2. \frac{(.034 \text{ mol } 5\text{Fe}) \times (1 \text{ mol } 5\text{O}_2)}{(1 \text{ mol } 5\text{Fe})} = .034 \text{ mol } 5\text{O}_2$$

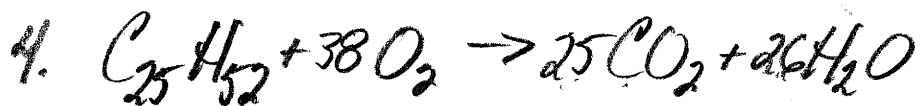
$$\frac{(.034 \text{ mol } 5\text{O}_2) \times (64.06 \text{ g})}{(1 \text{ mol } 5\text{O}_2)} = \underline{2.18 \text{ g } 5\text{O}_2}$$

$$3. \frac{(36 \text{ g } \text{H}_2\text{O}) \times (1 \text{ mol})}{(18.02 \text{ g})} = 2.0 \text{ mol } \text{H}_2\text{O}$$

$$\frac{(2 \text{ mol } \text{H}_2\text{O}) \times (1 \text{ mol } 5\text{O}_2)}{(2 \text{ mol } \text{H}_2\text{O})} = 1 \text{ mol } 5\text{O}_2$$

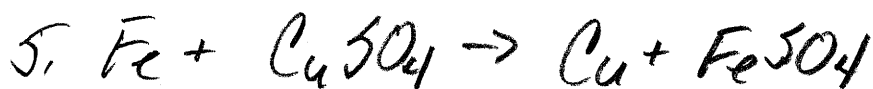
$$\frac{(1 \text{ mol } 5\text{O}_2) \times (64.06 \text{ g})}{(1 \text{ mol } 5\text{O}_2)} = \underline{64.06 \text{ g } 5\text{O}_2}$$

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$$\frac{(5 \text{ mol } \text{C}_{25}\text{H}_{52}) \times (25 \text{ mol } \text{CO}_2)}{(1 \text{ mol } \text{C}_{25}\text{H}_{52})} = \underline{125 \text{ mol } \text{CO}_2}$$

$$\frac{(5 \text{ mol } \text{C}_{25}\text{H}_{52}) \times (26 \text{ mol } \text{H}_2\text{O})}{(1 \text{ mol } \text{C}_{25}\text{H}_{52})} = \underline{130 \text{ mol } \text{H}_2\text{O}}$$



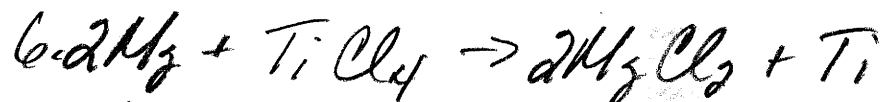
$$\frac{(2.45 \text{ g } \text{Fe}) \times (1 \text{ mol } \text{Fe})}{(55.85 \text{ g})} = .044 \text{ mol } \text{Fe}$$

$$\frac{(.044 \text{ mol } \text{Fe}) \times (1 \text{ mol } \text{Cu})}{(1 \text{ mol } \text{Fe})} = .044 \text{ mol } \text{Cu}$$

$$\frac{(.044 \text{ mol } \text{Cu}) \times (63.55 \text{ g})}{(1 \text{ mol } \text{Cu})} = \underline{2.8 \text{ g } \text{Cu}}$$

PART 2 (CONT.)

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$$(100\text{g Ti}) \left(\frac{1 \text{ mol Ti}}{47.90\text{g}} \right) = 2.09 \text{ mol Ti}$$

$$(2.09 \text{ mol Ti}) \left(\frac{2 \text{ mol Mg}}{1 \text{ mol Ti}} \right) = 4.18 \text{ mol Mg}$$

$$(4.18 \text{ mol Mg}) \left(\frac{24.31\text{g}}{1 \text{ mol Mg}} \right) = \underline{101.62\text{g Mg}}$$



$$(2\text{kg NaCl}) \left(\frac{1000\text{g}}{1\text{kg}} \right) = 2000\text{g NaCl}$$

$$(2000\text{g NaCl}) \left(\frac{1 \text{ mol}}{58.44\text{g}} \right) = 34.22 \text{ mol NaCl}$$

$$(34.22 \text{ mol NaCl}) \left(\frac{1 \text{ mol Na}_2\text{CO}_3}{2 \text{ mol NaCl}} \right) = 17.11 \text{ mol Na}_2\text{CO}_3$$

$$(17.11 \text{ mol Na}_2\text{CO}_3) \left(\frac{105.99\text{g}}{1 \text{ mol Na}_2\text{CO}_3} \right) = \underline{1813.49\text{g Na}_2\text{CO}_3}$$

$$(34.22 \text{ mol NaCl}) \left(\frac{1 \text{ mol CaCl}_2}{2 \text{ mol NaCl}} \right) = 17.11 \text{ mol CaCl}_2$$

$$(17.11 \text{ mol CaCl}_2) \left(\frac{110.98\text{g}}{1 \text{ mol CaCl}_2} \right) = \underline{1898.87\text{g CaCl}_2}$$

PART 3

(6)

$$1. D = M/V = \frac{5g}{2 \text{ cm}^3} = \underline{2.5 \text{ g/cm}^3}$$

$$2. H_2 = 13.53 \text{ g/cm}^3 \quad 25 \text{ ml} = 2.5$$

$$\frac{(25 \text{ ml}) \times (1 \text{ cm}^3)}{(1 \text{ ml})} = 25 \text{ cm}^3$$

$$M = D/V = \frac{13.53 \text{ g/cm}^3}{25 \text{ cm}^3} = \underline{.5412}$$

$$3. 28g \text{ CO in } 22.4 \text{ L} = 1$$

$$D = M/V = \frac{28g}{22.4 \text{ L}} = \underline{1.25 \text{ g/L}}$$

$$4. 1 \text{ mol CO}_2 \text{ in } 22.4 \text{ L}$$

$$\frac{(1 \text{ mol CO}_2 \times 44.01g)}{1 \text{ mol}} = 44.01g$$

$$\frac{44.01g}{22.4 \text{ L}} = \underline{1.96 \text{ g/L CO}_2}$$

$$5. 1 \text{ mol O}_2 = 32g$$

$$\frac{32g}{22.4 \text{ L}} = \underline{1.43 \text{ g/L O}_2}$$