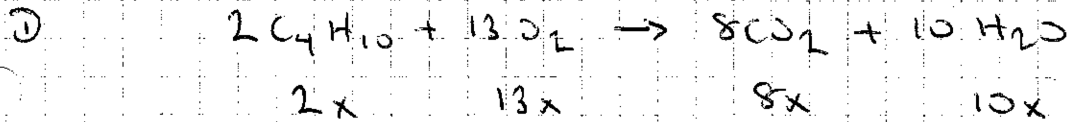


Stoichiometry WS #3



$$\text{a) } \text{H}_2\text{O} : \frac{2.46 \text{ g}}{18.02 \text{ g/mol}} = \boxed{0.137 \text{ mol}}$$

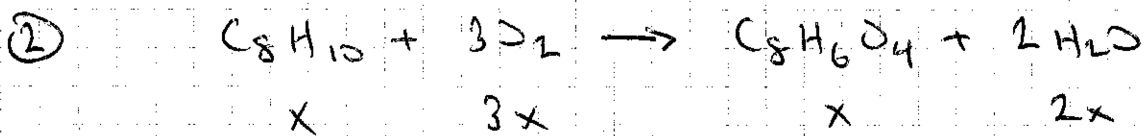
$$\begin{aligned}
 \text{b) } \text{H}_2\text{O} &= 10x = 0.137 \text{ mol} \\
 x &= 0.0137 \text{ mol}
 \end{aligned}$$

$$\text{C}_4\text{H}_{10} = 2x = 2(0.0137) = \boxed{0.0273 \text{ mol}}$$

$$\text{c) } \text{C}_4\text{H}_{10} : 0.0273 \text{ mol} \times 58.1 \text{ g/mol} = \boxed{1.59 \text{ g}}$$

$$\text{d) } \text{O}_2 = 13x = 13(0.0137) = \boxed{0.177 \text{ mol}}$$

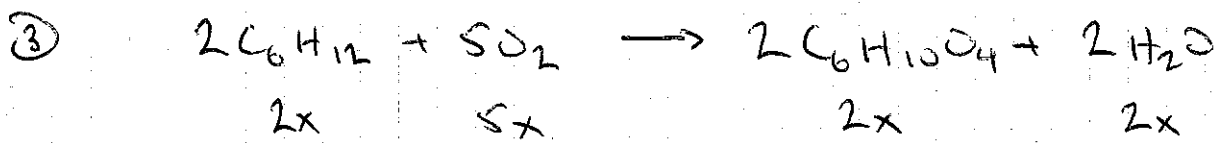
$$0.177 \text{ mol} \times 32 \text{ g/mol} = \boxed{5.68 \text{ g}}$$



$$\text{C}_8\text{H}_{10} : \frac{154 \text{ g}}{106.1 \text{ g/mol}} = 1.451 \text{ mol} = x$$

$$\text{C}_8\text{H}_6\text{O}_4 = x = \boxed{1.451 \text{ mol}}$$

$$1.451 \text{ mol} \times 166.06 \text{ g/mol} = \boxed{241 \text{ g}}$$



a) $\text{C}_6\text{H}_{10}\text{O}_4 = 2x = 40 \text{ mol}$

$$x = \frac{40}{2} = 20 \text{ mol}$$

$$\text{O}_2 = 5x = 5(20) = \boxed{100 \text{ mol}}$$

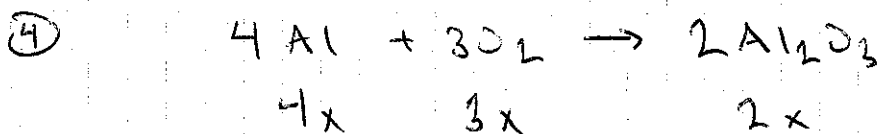
b) $\text{C}_6\text{H}_{12}: \frac{164 \text{ g}}{84.12 \text{ g/mol}} = 1.95 \text{ mol}$

$$2x = 1.95 \text{ mol}$$

$$x = \frac{1.95}{2} = 0.975 \text{ mol}$$

$$\text{C}_6\text{H}_{10}\text{O}_4 = 2x = 2(0.975) = \boxed{1.95 \text{ mol}}$$

$$1.95 \text{ mol} \times 146.1 \text{ g/mol} = \boxed{284.8 \text{ g}}$$



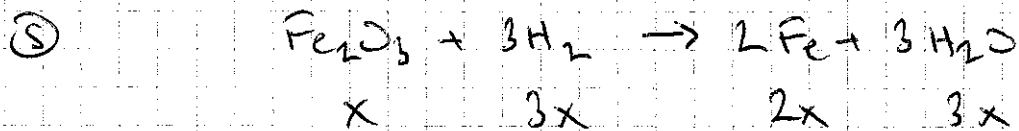
$$\text{Al}: \frac{5 \text{ g}}{27 \text{ g/mol}} = 0.185 \text{ mol}$$

$$4x = 0.185$$

$$x = 0.0463 \text{ mol}$$

$$\text{O}_2 = 3x = 3(0.0463) = \boxed{0.139 \text{ mol}}$$

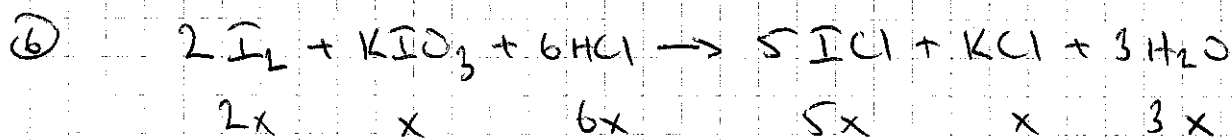
$$0.139 \text{ mol} \times 32 \text{ g/mol} = \boxed{4.44 \text{ g}}$$



$$\text{Fe}_2\text{O}_3: \frac{16.5 \text{ g}}{159.6 \text{ g/mol}} = 0.103 \text{ mol} = x$$

$$\text{Fe} = 2x = 2(0.103) = 0.207 \text{ mol}$$

$$0.207 \text{ mol} \times 55.8 \text{ g/mol} = \boxed{11.5 \text{ g}}$$



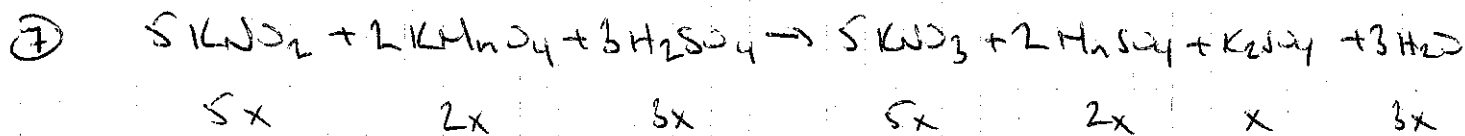
$$\text{ICl}: \frac{28.6 \text{ g}}{162.4 \text{ g/mol}} = 0.176 \text{ mol}$$

$$5x = 0.176 \text{ mol}$$

$$x = \frac{0.176}{5} = 0.0352 \text{ mol}$$

$$\text{I}_2 = 2x = 2(0.0352) = 0.0704 \text{ mol}$$

$$0.0704 \text{ mol} \times 253.8 \text{ g/mol} = \boxed{17.9 \text{ g}}$$



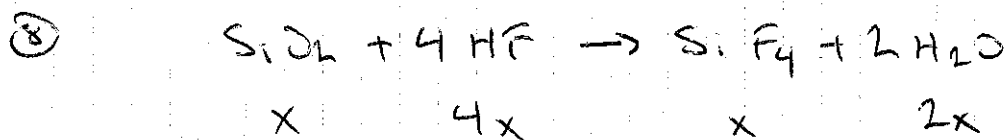
$$\text{KNO}_2: \frac{11.4 \text{ g}}{85.1 \text{ g/mol}} = 0.134 \text{ mol}$$

$$5x = 0.134$$

$$x = 0.0268 \text{ mol}$$

$$\text{KMnO}_4 = 2x = 2(0.0268) = \boxed{0.0536 \text{ mol}}$$

$$0.0536 \times 158 \text{ g/mol} = \boxed{8.47 \text{ g}}$$



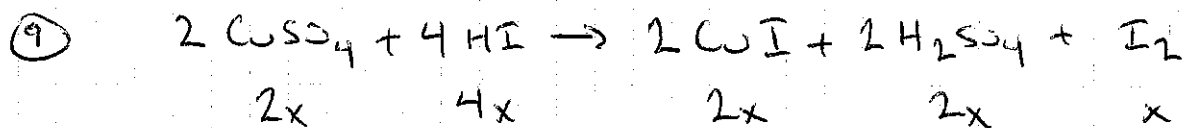
$$\text{HF}: \frac{63.4 \text{ g}}{20.01 \text{ g/mol}} = 3.17 \text{ mol}$$

$$4x = 3.17$$

$$x = 0.792 \text{ mol}$$

$$\text{SiF}_4 = x = \boxed{0.792 \text{ mol}}$$

$$0.792 \text{ mol} \times 104.1 \text{ g/mol} = \boxed{82.5 \text{ g}}$$



$$a) \text{CuSO}_4 = \frac{10.4 \text{ g}}{159.6 \text{ g/mol}} = 0.0652 \text{ mol}$$

$$2x = 0.0652$$

$$x = 0.0326 \text{ mol}$$

$$\text{HI} = 4x = 4(0.0326) = 0.130 \text{ mol}$$

$$\text{CuI} = 2x = 2(0.0326) = 0.0652 \text{ mol}$$

$$\text{H}_2\text{SO}_4 = 2x = 2(0.0326) = 0.0652 \text{ mol}$$

$$\text{I}_2 = x = 0.0326 \text{ mol}$$

$$\text{HI}: 0.130 \text{ mol} \times 127.91 = 16.6 \text{ g}$$

$$\text{CuI}: 0.0652 \text{ mol} \times 190.4 = 12.4 \text{ g}$$

$$\text{H}_2\text{SO}_4: 0.0652 \text{ mol} \times 98.12 = 6.4 \text{ g}$$

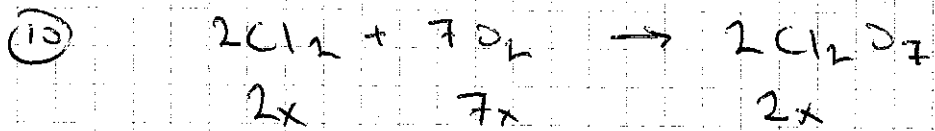
$$\text{I}_2: 0.0326 \text{ mol} \times 253.8 = 8.3 \text{ g}$$

b)

$$10.4 \text{ g} + 16.6 \text{ g} \rightarrow 12.4 \text{ g} + 6.4 \text{ g} + 8.3 \text{ g}$$

$$27 \text{ g} \rightarrow 27.1 \text{ g}$$

(rounding error)



$$\text{Cl}_2: \frac{2.56 \text{ g}}{71 \text{ g/mol}} = 0.0361 \text{ mol}$$

$$2x = 0.0361$$

$$x = 0.0180 \text{ mol}$$

$$\text{O}_2 = 7x = 7(0.0180) = \boxed{0.126 \text{ mol}}$$

$$0.126 \text{ mol} \times 32 \text{ g/mol} = \boxed{4.0 \text{ g}}$$



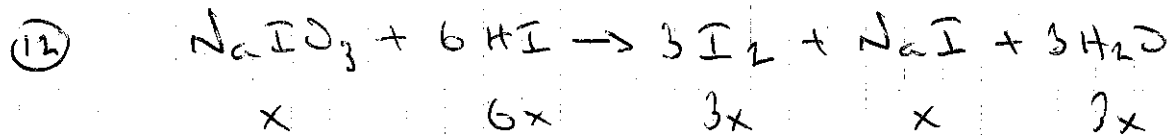
$$\text{NH}_3: \frac{56.8 \text{ g}}{17.03 \text{ g/mol}} = 3.335 \text{ mol}$$

$$4x = 3.335$$

$$x = 0.834 \text{ mol}$$

$$\text{O}_2 = 5x = 5(0.834) = \boxed{4.17 \text{ mol}}$$

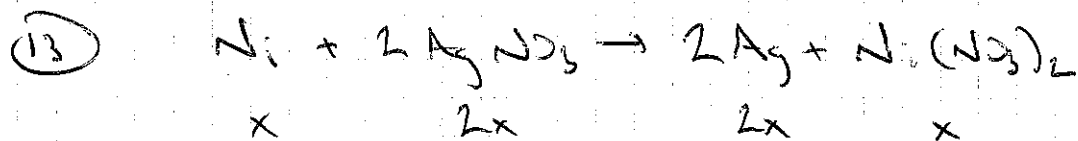
$$4.17 \text{ mol} \times 32 \text{ g/mol} = \boxed{133.4 \text{ g}}$$



$$\text{NaIO}_3: \frac{16.4 \text{ g}}{197.9 \text{ g/mol}} = 0.0829 \text{ mol} = x$$

$$\text{I}_2 = 3x = 3(0.0829) = \boxed{0.249 \text{ mol}}$$

$$0.249 \text{ mol} \times 253.8 \text{ g/mol} = \boxed{63 \text{ g}}$$

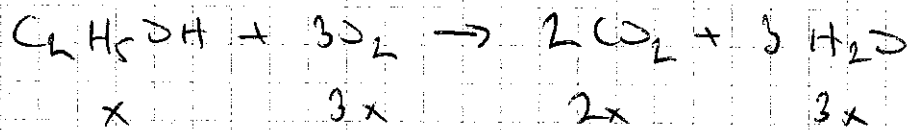


$$\text{Ni}: \frac{15.32 \text{ g}}{58.7 \text{ g/mol}} = 0.261 \text{ mol} = x$$

$$\text{Ag} = 2x = 2(0.261) = 0.522 \text{ mol}$$

$$0.522 \text{ mol} \times 107.9 \text{ g/mol} = \boxed{56.3 \text{ g}}$$

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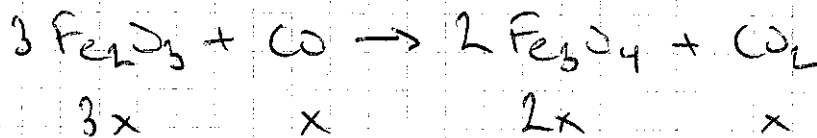


$$\text{C}_2\text{H}_5\text{OH} : \frac{23 \text{ g}}{46.06 \text{ g/mol}} = 0.499 \text{ mol}$$

$$\text{CO}_2 = 2x = 2(0.499) = 0.999 \text{ mol}$$

$$0.999 \text{ mol} \times 44 \text{ g/mol} = \boxed{43.9 \text{ g}}$$

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$$\text{CO} : \frac{14 \text{ g}}{28 \text{ g/mol}} = 0.5 \text{ mol} = x$$

$$\text{Fe}_2\text{O}_3 = 3x = 3(0.5) = 1.5 \text{ mol}$$

$$1.5 \text{ mol} \times 159.6 \text{ g/mol} = \boxed{239.4 \text{ g}}$$