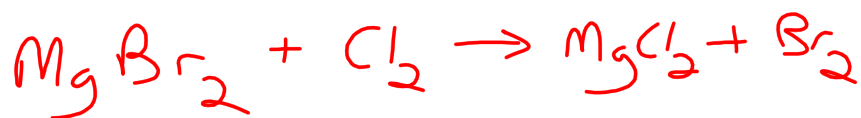


45.2 g of magnesium bromide reacts with 32.7 g of chlorine in a single replacement reaction. Determine the mass of the products.



$$\frac{45.2 \text{ g MgBr}_2}{184.1 \text{ g/mol}} = 0.246 \text{ mol MgBr}_2$$

$$\frac{32.7 \text{ g Cl}_2}{71.0 \text{ g/mol}} = 0.461 \text{ mol Cl}_2$$

$$\frac{\text{MgBr}_2}{\text{Cl}_2} = \frac{1}{1} = \frac{0.246 \text{ mol}}{x}$$

$x = 0.246 \text{ mol Cl}_2 \text{ needed}$

MgBr₂ is LR

$$\frac{\text{MgBr}_2}{\text{MgCl}_2} = \frac{1}{1} = \frac{0.246 \text{ mol}}{x}$$

$\rightarrow 0.246 \text{ mol MgCl}_2$
 $(0.246 \text{ mol MgCl}_2)(95.3 \text{ g/mol})$
 $\boxed{23.4 \text{ g MgCl}_2}$

$\rightarrow \text{Br}_2 = 0.246 \text{ mol}$
 $(0.246 \text{ mol Br}_2)(159.8 \text{ g/mol})$
 $\boxed{39.3 \text{ g Br}_2}$

40.0 g of ammonia burns in excess oxygen to form nitrogen monoxide and water. Determine the mass of the products.



$$\frac{40.0\text{g NH}_3}{17.0\text{g/mol}} = 2.35\text{mol NH}_3$$

$$1 \frac{\text{NH}_3}{\text{NO}} = \frac{4}{4} = \frac{1}{1} = \frac{2.35\text{mol}}{x}$$

$$\rightarrow x = 2.35\text{mol NO}$$

$$(2.35\text{mol NO})(30.0\text{g/mol})$$

$$\boxed{70.5\text{g NO}}$$

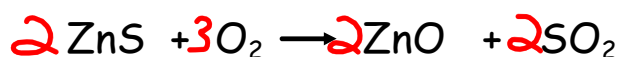
$$\frac{\text{NH}_3}{\text{H}_2\text{O}} = \frac{4}{6} = \frac{2}{3} = \frac{2.35\text{mol}}{x}$$

$$\rightarrow x = 3.53\text{mol H}_2\text{O}$$

$$(3.53\text{mol H}_2\text{O})(18.0\text{g/mol})$$

$$\boxed{63.5\text{g H}_2\text{O}}$$

How many grams of zinc sulfide is needed to form 50.0 g of ZnO



$$\frac{50.0\text{g ZnO}}{81.4\text{g/mol}} = 0.614\text{mol ZnO}$$

$$\frac{\text{ZnO}}{\text{ZnS}} = \frac{2}{2} = \frac{1}{1} = \frac{0.614\text{mol}}{x}$$

→ 0.614mol ZnS

$$(0.614\text{mol ZnS})(97.5\text{g/mol})$$

59.9g ZnS

How much hydrochloric acid would it take to completely dissolve 212 grams of zinc? How much zinc chloride and how much hydrogen gas would be formed (in mass)?

