Homework - Worksheet

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$$2Al_{(s)} + 3H_2SO_{4(aq)} \rightarrow 3H_{2(g)} + Al_2(SO_4)_{3(aq)}$$

$m = 2.73\,g$ $m = ?$

Step 1: Moles Known

$$2.73\,g\ Al \times \frac{1\ mol\ Al}{26.98\ g\ Al} = 0.1012\ mol\ Al$$

Step 2: Moles Unknown

$$0.1012\ mol\ Al \times \frac{3\ mol\ H_2}{2\ mol\ Al} = 0.1518\ mol\ H_2$$

Step 3: Mass Unknown

$$0.1518\ mol\ H_2 \times \frac{2.02\ g\ H_2}{1\ mol\ H_2} = \boxed{0.307\,g\ H_2}$$

Try This

Find the mass of copper produced if 14.00 g of aluminum reacts with copper (II) sulfate.

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$2Al_{(s)} + 3CuSO_{4(aq)} \longrightarrow 3Cu_{(s)} + Al_2(SO_4)_3$

$m = 14.00g$ $m = ?$

$14.00\text{g Al} \times \frac{1\text{ mol Al}}{26.98\text{g Al}} \times \frac{3\text{ mol Cu}}{2\text{ mol Al}} \times \frac{63.54\text{g Cu}}{1\text{ mol Cu}} = 49.46\text{g Cu}$

Worksheet

1) $Zn_{(s)} + S_{8(s)} \Rightarrow ZnS_{(s)}$

2) $Al_2O_{3(s)} \Rightarrow Al_{(s)} + O_{2(g)}$

3) $C_3H_{8(l)} + O_{2(g)} \Rightarrow CO_{2(g)} + H_2O_{(g)}$

4) $NaCl_{(aq)} + Pb(NO_3)_{2(aq)} \Rightarrow NaNO_{3(aq)} + PbCl_{2(s)}$

5) $Al_{(s)} + H_2SO_{4(aq)} \Rightarrow H_{2(g)} + Al_2(SO_4)_{3(aq)}$

6) $KOH_{(aq)} + Cu(NO_3)_{2(aq)} \Rightarrow KNO_{3(aq)} + Cu(OH)_{2(s)}$