



If 5.79 g of iron is burned in excess oxygen and 6.10 g of iron(III) oxide is recovered, what is the percent yield?

To find percent yield, we need to calculate theoretical yield of iron(III) oxide.

$$\% = \frac{\text{actual yield} \leftarrow 6.10\text{g Fe}_2\text{O}_3}{\text{theoretical yield}} \times 100\%$$

- 1 - Change 5.79 g of iron to moles. Use formula weight of iron
- 2 - Change moles iron to moles iron(III) oxide using chemical equation
- 3 - Change moles iron(III) oxide to grams. Use formula weight of iron(III) oxide

Fe<sub>2</sub>O<sub>3</sub>:

$$\text{Fe}: 2 \times 55.85$$

$$\text{O}: 3 \times 16.00$$

$$\hline 159.70$$

$$55.85\text{ g Fe} = \text{mol Fe} \quad | \quad 4\text{ mol Fe} = 2\text{ mol Fe}_2\text{O}_3 \quad | \quad 159.70\text{ g Fe}_2\text{O}_3 = \text{mol Fe}_2\text{O}_3$$

$$5.79\text{ g Fe} \times \frac{\text{mol Fe}}{55.85\text{ g Fe}} \times \frac{2\text{ mol Fe}_2\text{O}_3}{4\text{ mol Fe}} \times \frac{159.70\text{ g Fe}_2\text{O}_3}{\text{mol Fe}_2\text{O}_3} = 8.28\text{ g Fe}_2\text{O}_3$$

①
②
③

$$\% = \frac{\text{actual yield}}{\text{theoretical yield}} = \frac{6.10\text{ g Fe}_2\text{O}_3}{8.28\text{ g Fe}_2\text{O}_3} \times 100\% = \boxed{73.7\%}$$