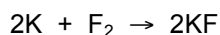




- 1 a What is the maximum mass of potassium fluoride that can be formed when 1.56 g of potassium reacts with fluorine?



$$\text{moles K} = \frac{\text{mass}}{M_r} = \frac{1.56}{39} = 0.04 \text{ moles}$$

$$\text{moles KF} = 0.04 \text{ moles}$$

$$\text{mass KF} = M_r \times \text{moles} = 58 \times 0.04 = 2.32 \text{ g}$$

- b In an experiment, a student reacted 1.56 g of potassium with fluorine and made 1.48 g of potassium fluoride. Calculate the percentage yield.

$$\% \text{ yield} = 100 \times \frac{\text{mass formed}}{\text{maximum mass possible}} = 100 \times \frac{1.48}{2.32} = 63.8\%$$

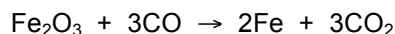
- c Give two reasons why the percentage yield is less than 100%.

incomplete reaction

some products escape / left on apparatus

reaction may be reversible

- 2 Calculate the percentage yield in a reaction where 1.0 kg of iron is made from 1.6 kg of iron(III) oxide.



$$\text{moles Fe}_2\text{O}_3 = \frac{\text{mass}}{M_r} = \frac{1600}{160} = 10 \text{ moles}$$

$$\text{moles Fe} = 20 \text{ moles}$$

$$\text{mass Fe} = M_r \times \text{moles} = 56 \times 20 = 1120 \text{ g}$$

$$\% \text{ yield} = 100 \times \frac{\text{mass formed}}{\text{maximum mass possible}} = 100 \times \frac{1000}{1120} = 89.3\%$$