

Purity of a sample: exercises

1. The purity of a sample of aluminum is 85 %. Calculate the amount of aluminum sulfate $\text{Al}_2(\text{SO}_4)_3$ that can be formed from 250 g of that sample.

Atomic weights: Al=27; S=32; O=16

SOL: 1345.8 g

2. The purity of a sample of magnesium is of 80 %. Calculate the amount of that sample needed to get 405 g of magnesium chloride.

Atomic weights: Mg=24; Cl=35.5

SOL: 127.9 g sample

3. From 540 g of a sample of calcium, we get 250 g of $\text{Ca}(\text{OH})_2$. Calculate the purity of that sample.

Atomic weights: Ca=40; O=16; H=1

SOL: 25 %

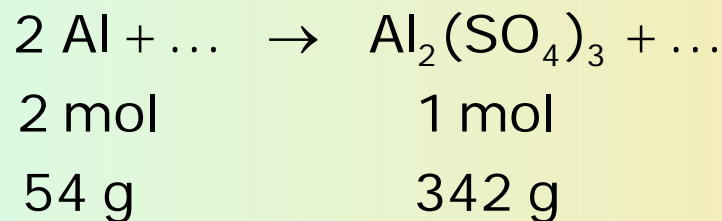
Purity of a sample: exercises

1. The purity of a sample of aluminum is 85 %. Calculate the amount of aluminum sulfate $\text{Al}_2(\text{SO}_4)_3$ that can be formed from 250 g of that sample.

Atomic weights: Al=27; S=32; O=16

SOL: 1345.8 g

The (partial) chemical equation is:



Now, we are going to calculate

- 1) the amount of aluminum in that sample
- 2) The amount of the product formed, based on the amount of calcium in the sample

$$m(\text{Al}) = 250 \text{ g sample} \times \frac{85 \text{ g Al}}{100 \text{ g sample}} = 212.5 \text{ g Al}$$

$$m(\text{product}) = 212.5 \text{ g Al} \times \frac{342 \text{ g product}}{54 \text{ g Al}} = 1345.8 \text{ g product}$$

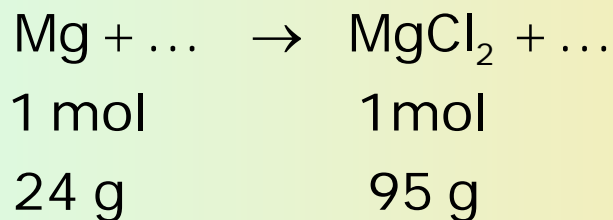
Purity of a sample: exercises

2. The purity of a sample of magnesium is of 80 %. Calculate the amount of that sample needed to get 405 g of magnesium chloride.

Atomic weights: Mg=24; Cl=35.5

SOL: 127.9 g sample

The (partial) chemical equation is:



Now, we are going to calculate

- 1) the amount of magnesium in the product
- 2) The amount of the sample, based on the amount of magnesium needed

$$m(\text{Mg}) = 405 \text{ g MgCl}_2 \times \frac{24 \text{ g Mg}}{95 \text{ g MgCl}_2} = 102.3 \text{ g Mg}$$

$$m(\text{sample}) = 102.3 \text{ g Mg} \times \frac{100 \text{ g sample}}{80 \text{ g Mg}} = 127.9 \text{ g sample}$$

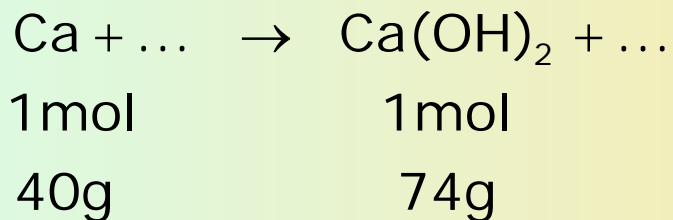
Purity of a sample: exercises

3. From 540 g of a sample of calcium, we get 250 g of Ca(OH)_2 . Calculate the purity of that sample.

Atomic weights: Ca=40; O=16; H=1

SOL: 25 %

The (partial) chemical equation is:



Now, we are going to calculate

- 1) the amount of calcium element in the product
- 2) the purity of that sample, based on the amount of calcium in the product

$$m(\text{Ca}) = 250 \text{ g Ca(OH)}_2 \times \frac{40 \text{ g Ca}}{74 \text{ g Ca(OH)}_2} = 135.1 \text{ g Ca}$$

$$\text{purity (sample)} = 100 \times \frac{135.1 \text{ g Ca}}{540 \text{ g sample}} = 25 \%$$