

1. **Mole:** the amount of any substance that contains 6.02×10^{23} particles

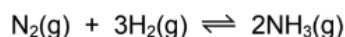
NOTE: concentration in g/dm³ = mass of that many number of moles/dm³

Eg. Calculate the concentration of 0.0400 mol/dm³ NaOH in g/dm³

$$0.04 \times 40 = 1.6\text{g/dm}^3$$

2.

The Haber process is a reversible reaction.



The reaction has a 30% yield of ammonia.

Which volume of ammonia gas, NH₃, measured at room temperature and pressure, is obtained by reacting 0.75 moles of hydrogen with excess nitrogen?

A 3600 cm³ **B** 5400 cm³ **C** 12000 cm³ **D** 18000 cm³

Answer: A

NOTE: In calculations, explicitly show that Mr = (calculated value). Do not directly add up relative atomic masses.

3. Fluorine reacts with sulphur to form a compound which has 25.2% sulphur by mass and a relative molecular mass of 254. Determine the molecular formula of this compound.

Method 1

M1 S 25.2 / 32 or 0.78/0.79 ...

and

F 74.8 / 19 or 3.93 / 3.94...

M2 ÷ both by 0.7875 = 1 : 5 or SF₅

M3 (254 ÷ 127 = 2 and) S₂F₁₀

Method 2

M1 254 × 25.2/100 and 254 × 74.8 / 100 OR '64' and '190'

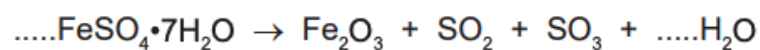
M2 64 / 32 and 190 / 19

M3 (2 and 10) to give S₂F₁₀

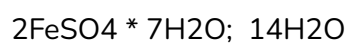
4. Naturally occurring atoms of silver are ¹⁰⁷Ag and ¹⁰⁹Ag. A sample of silver has a relative atomic mass of 108.0. Deduce the percentage of ¹⁰⁷Ag present in this sample.
50%

5.

Complete the equation for the decomposition of hydrated iron(II) sulfate.

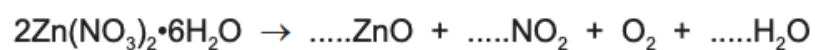


Answer:



6.

Complete the equation for the decomposition of hydrated zinc nitrate.



Answer:

