

Concentration Calculations

Answer the following questions. Show your working

Remember: $1 \text{ dm}^3 = 1000 \text{ cm}^3$

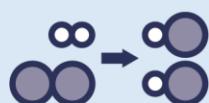
1. State the formula used to calculate concentration using mass and volume.

Concentration = mass ÷ volume

2. Calculate the concentration (in g/dm³) of:
 - a. 40 g solute in 350 dm³ **0.11 g/dm³**
 - b. 100 g solute in 77 dm³ **1.29 g/dm³**
 - c. 0.08 g solute in 20 cm³ **4 g/dm³**
 - d. 90g solute in 780 cm³ **115.38 g/dm³**
3. The mass of H₂SO₄ is 32.5 g and the volume of the solution is 0.400 dm³. Calculate the concentration of the solution formed in g/dm³. **81.25 dm³**
4. Explain what would happen to the concentration in question 2 if more water was added to the solution. **The concentration would decrease, because the volume of the solution would increase but the mass of solute would stay the same.**
5. A 750 cm³ solution of sodium chloride contains 25 g of solute. Calculate the concentration of the solution. **33.33 g/dm³**
6. What is the concentration of 2 g of copper chloride in 1.5 dm³ of solution? **1.33 g/dm³**
7. State the formula used to calculate mass using concentration and volume.

Mass = concentration x volume

8. Calculate the mass of solute in:
 - a. 25 cm³ of a 2.3 g/dm³ solution (remember to convert to dm³) **0.058 g**
 - b. 250 cm³ of a 71 g/dm³ solution **17.75 g**
 - c. 2.3 dm³ of a 61 g/dm³ solution **140.3 g**
9. A solution of sodium chloride has a concentration of 400 g/dm³. Calculate the mass of sodium chloride in 0.8 dm³ of solution. **320 g**
10. Explain what would happen to the mass of solute in question 6 if more water was added to the solution. **It would not change, because more water does not affect the total mass of any particles in the solution, it will only affect the concentration.**





11. A solution of sodium chloride has a concentration of 400 g/dm^3 . Calculate the mass of sodium chloride in 400 cm^3 of solution. **160 g**
12. A student pours 0.2 dm^3 of hydrochloric acid into a beaker. The acid had a concentration of 75 g/dm^3 . Calculate the mass of hydrochloric acid in the solution. **15 g**
13. Using 83 g of solute, how much water is needed to:
- Make a 34 g/dm^3 solution? **2.44 dm³**
 - Make a 0.1 g/dm^3 solution? **830 dm³**
 - Make a 83 g/dm^3 solution? **1 dm³**
 - Make a 79 g/dm^3 solution? **1.05 dm³**

