



N5 Chemistry: Whole Course REVISION

Lesson 18 - Moles and Concentration

Learning Outcomes

By the end of this lesson, you should have revised:

1. How to carry out calculations using the mole.
2. How to use the mole calculation to find the volume or concentration of a substance.
3. How to carry out calculations from equation.
4. How to use the two mole calculations together.

Success Criteria

You will have been successful in this lesson if you:

1. Watch the links provided
2. Complete revision questions provided
3. Complete and submit homework assigned

There is also a further reading section to help you gain more depth of understanding for this section.

If you have any questions about the content of this lesson, you should ask your class teacher either through your class MS team or via email. MS Teams will be monitored throughout the week by a chemistry teacher. If you need help or clarification with either the task or the content of the lesson, just ask.

Links to Prior Knowledge

You may wish to revise the following to help you understand this lesson:

- N5 Unit 1: Calculations involving the mole and balanced equations.

You do not need to copy any notes as this is all revision, but you should complete all questions and tasks as outlined in this document.



Calculations

Calculations can be worked out for many different types of reactions that you have experienced throughout the National 5 course.

For solutions, the mass of solute (grams), the number of moles of solute (moles), the volume of solution (litres) or the concentration of the solution (moles per litre) can be calculated from the data provided.

Watch this video first:

Lesson 18: Moles and Concentration -

<https://youtu.be/PPLEtRW6YM0>

You should also consult your Unit 2 Notes and printed notes to help further consolidate your knowledge. A digital copy of the printed notes can be found on the S4 Chemistry Team.

Further Reading

To learn more about chemical analysis, try the following online resources:

BBC Bitesize: <https://www.bbc.co.uk/bitesize/guides/z7c6fg8/revision/3>

Scholar: Log in through GLOW

*National 5 Chemistry → Chemical changes and structure → Topic 6
Calculations involving the mole and balanced equations
→ 6.5 solutions
→ 6.6 calculations involving mass and volume*

Evans2 chem web: <https://www.evans2chemweb.co.uk/>

Username: snhs password: giffnock

Select any teacher → revision → National 5 → Unit 1 → Formulae and Reaction Quantities

Extension Questions:

Yellow/Purple book

Calculations

page 42-43

Qu 8-12



*Complete the following questions in your class work jotter.
The answers will be posted on Teams on Wednesday.*

Practice Questions – Moles and Concentration

Complete the following questions from the **SNHS Nat 5 Chemistry Calculations Booklet** (access via S4 Chemistry team or use your paper copy)

7. Concentrations of Solutions:

- Test Yourself 7 (6)
- Test Yourself 8 (6)
- Test Yourself 9 (6)

Total: 18 marks

Past-Paper Questions – Moles and Concentration

1. Which of the following solutions contains the **least** number of moles of solute?

- A 100 cm³ of 0.4 mol l⁻¹ solution
- B 200 cm³ of 0.3 mol l⁻¹ solution
- C 300 cm³ of 1.0 mol l⁻¹ solution
- D 400 cm³ of 0.5 mol l⁻¹ solution (1)



(questions continued on the next page)

2. 0.1 mol of sodium hydroxide was dissolved in water and solution made up to 250 cm³.

What is the concentration, in mol l⁻¹, of the sodium hydroxide solution?

- A 0.0004
 - B 0.025
 - C 0.4
 - D 2.5
- (1)

3. A student was asked to carry out an experiment to determine the concentration of a copper(II) sulfate solution.

The student found that the 100 cm³ solution contained 3.19 g of copper (II) sulfate, CuSO₄.

Calculate the concentration of the solution in mol l⁻¹. (2)

Show your working clearly.

4. A student carried out a titration experiment to calculate the concentration of a solution of hydrochloric acid.

Before the titration was carried out the student prepared a 200 cm³ solution of sodium carbonate. The solution had an accurate concentration of 1.0 mol l⁻¹.

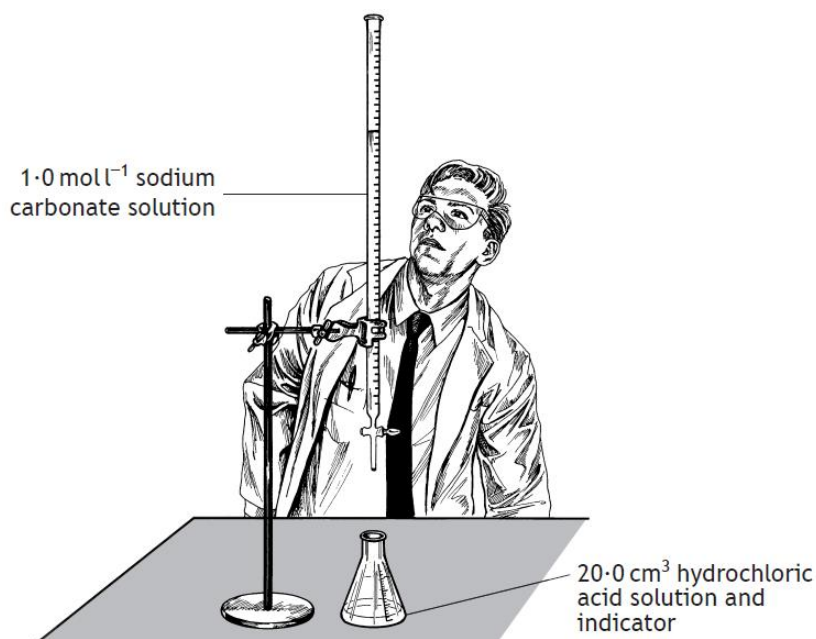
- a. Calculate the mass, in grams, of sodium carbonate, Na₂CO₃, required to prepare 200 cm³ of 1.0 mol l⁻¹ solution. (3)

Show your working clearly.



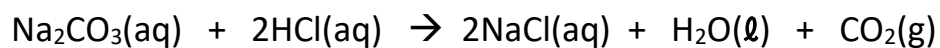
(questions continued on the next page)

b. The student performed the titration as shown.



The average volume of sodium carbonate used was 15.0 cm^3 .

The equation for the reaction is



Calculate the concentration, in mol l^{-1} , of the hydrochloric acid. (3)

Show your working clearly.

Total: 10 marks