CHEMISTRY YEAR 12 - MODULE 6 - LESSON 18

Back Titration & Conductometric Titration

Use this worksheet after reading the lesson to practise the key ideas and prove you can meet the success criteria.

Name _____

Date _____

Class _____

1. Key Ideas

A pharmaceutical manufacturer needs to verify that each antacid tablet contains exactly the stated amount of calcium carbonate — but $CaCO_3$ is insoluble and reacts too slowly with weak acid for a direct titration. Back titration solves both problems simultaneously, and it is used in quality control laboratories processing thousands of tablets per day.

- The four-step calculation method for back titrations
- Why direct titration fails for insoluble or slow-reacting analytes

2. Success Criteria

By the end, you should be able to:

- The four-step calculation method for back titrations
- The three situations that require a back titration
- The principle of conductometric titration and molar conductivities of ions

3. Key Terms

excess
Greater than the total, an error has occurred in the calculation — this is physically impossible (you cannot have more a.

Brønsted-Lowry acid
A proton (H^+) donor in an acid-base reaction.

Brønsted-Lowry base
A proton (H^+) acceptor in an acid-base reaction.

Conjugate acid-base pair
Two species differing by one H^+ that interconvert.

pH
The negative logarithm of hydronium ion concentration.

Buffer
A solution resisting pH change upon addition of small amounts of acid or base.

4. Activity: Build the Lesson Map

Use the lesson to complete the table. Keep answers brief but specific.

Prompt	Your answer
Main concept	
Important example	
Common mistake to avoid	
How this links to the next lesson	

5. Short Answer Questions

1. Explain this lesson goal in your own words: "The four-step calculation method for back titrations". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "The three situations that require a back titration". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Back Titration & Conductometric Titration: "The principle of conductometric titration and molar conductivities of ions".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Back Titration & Conductometric Titration but does not use evidence or reasoning.

Improve the answer by writing a stronger response that uses accurate terminology, a relevant example and a clear explanation.

7. Multiple Choice

1. What is the best first step when answering a question about Back Titration & Conductometric Titration?

☐ A. Identify the key concept being tested

☐ B. Write every fact from memory

☐ C. Ignore the command word

☐ D. Skip examples and evidence

2. Which answer would show stronger understanding of Back Titration & Conductometric Titration?

☐ A. An answer with accurate terms and reasoning

☐ B. A copied definition only

☐ C. A single-word response

☐ D. An answer with no example

3. What should you do if a question asks you to explain?

☐ A. Link the idea to a reason or cause

☐ B. List unrelated facts

☐ C. Only draw a diagram

☐ D. Write the shortest possible answer

8. Success Criteria Proof

Finish with evidence that you can do each success criterion.

SUCCESS CRITERION 1

Prove that you can: The four-step calculation method for back titrations

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: The three situations that require a back titration

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: The principle of conductometric titration and molar conductivities of ions

BAND 5 4 MARKS

One thing I still need help with: