CHEMISTRY YEAR 12 - MODULE 7 - LESSON 18

Organic Acids & Bases — pKa, Strength & Reactions

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

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- pKa values for carboxylic acids (~5), phenols (~10), alcohols (~16)
- How resonance stabilisation of conjugate base determines pKa

2. Success Criteria

By the end, you should be able to:

- pKa values for carboxylic acids (~5), phenols (~10), alcohols (~16)
- Kb values for alkylamines, arylamines, amides
- Diagnostic reactions: $NaHCO_3$, Na_2CO_3, NaOH, Na metal

3. Key Terms

lower pKa = stronger acid
A substance that donates protons (H^+) or accepts electron pairs, according to context.

Principle
If a system at equilibrium is disturbed, it will shift to minimise the disturbance.

Hydrocarbon
An organic compound containing only carbon and hydrogen atoms.

Functional group
A specific atom arrangement determining characteristic chemical reactions.

Homologous series
A family of compounds with the same functional group, differing by CH_2.

Addition polymer
A polymer formed by monomers adding together without loss of atoms.

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: "pKa values for carboxylic acids (~5), phenols (~10), alcohols (~16)". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "Kb values for alkylamines, arylamines, amides". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Organic Acids & Bases — pKa, Strength & Reactions: "Diagnostic reactions: $NaHCO_3$, Na_2CO_3, NaOH, Na metal".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Organic Acids & Bases — pKa, Strength & Reactions 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 Organic Acids & Bases — pKa, Strength & Reactions?

- [ ] 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 Organic Acids & Bases — pKa, Strength & Reactions?

- [ ] 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: pKa values for carboxylic acids (~5), phenols (~10), alcohols (~16)

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: Kb values for alkylamines, arylamines, amides

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: Diagnostic reactions: $NaHCO_3$, Na_2CO_3, NaOH, Na metal

BAND 5 4 MARKS

One thing I still need help with: