InkChemistry

QUESTION WORKBOOK

Acylation: acyl chlorides and acid anhydrides

Carbonyls and carboxylic acids · Unit C20

AQA 3.3.9.2 · OCR A 6.1.3

18 questions · 59 marks

PRINT EDITION

Every question in this book has a code beside its number.
Type inklearning.co.uk/q/ followed by the code to open that question online.
© 2026 Ink Learning Ltd. All rights reserved.
inklearning.co.uk/chemistry/

SECTION A · Short, 1 to 2 marks

A1 AA-Q8
Explain why two moles of ammonia are needed for each mole of ethanoyl chloride in the preparation of ethanamide. [2]

A2 AA-Q9
Explain why an acid anhydride reacts more slowly with nucleophiles than an acyl chloride does. [2]

A3 AA-Q16
Suggest why aspirin is made from 2-hydroxybenzoic acid and ethanoic anhydride rather than by heating 2-hydroxybenzoic acid with ethanoic acid. [2]

A4 AA-Q18
Suggest why $SOCl_2$ is often preferred to PCl_5 for converting a carboxylic acid into an acyl chloride. [2]

SECTION B · Standard, 3 to 5 marks

© 2026 Ink Learning Ltd. All rights reserved.

B1 AA-Q6 Outline the mechanism for the reaction of ethanoyl chloride with ethanol, and name the type of mechanism. [5]

B2 AA-Q1 Name the compounds CH_3CH_2COCl and $(CH_3CO)_2O$, and name the organic products formed when ethanoyl chloride reacts with methanol and with ethylamine. [4]

B3 AA-Q2 Give equations for the reactions of ethanoyl chloride with water and with excess ammonia, an observation for the reaction with water, and the name of the organic product with ammonia. [4]

© 2026 Ink Learning Ltd. All rights reserved.

B4 AA-Q5 Outline the mechanism for the reaction of ethanoyl chloride with methylamine. [4]

B5 AA-Q20 Give an equation for the hydrolysis of ethanamide, CH_3CONH_2, when it is heated under reflux with dilute hydrochloric acid, and another for its hydrolysis with aqueous sodium hydroxide, naming the organic product of each. [4]

B6 AA-Q7 Explain why ethanoyl chloride reacts with ethanol much faster than ethanoic acid does. [3]

B7 AA-Q10 Calculate the atom economy for making ethyl ethanoate, Mr 88.0, from ethanoyl chloride, Mr 78.5, and ethanol, Mr 46.0. [3]

© 2026 Ink Learning Ltd. All rights reserved.

B8 AA-Q13 Compare the reactions of ethanoyl chloride and ethanoic anhydride with ethanol. [3]

B9 AA-Q14 Suggest what is seen when a few drops of ethanoyl chloride and of 1-chlorobutane are added to separate tubes of aqueous silver nitrate, and explain the difference. [3]

B10 AA-Q15 Suggest the products formed when propanoic anhydride reacts with excess ammonia, and give an equation for the reaction. [3]

B11 AA-Q17 Describe how the melting point of a sample of aspirin shows whether it is pure, and a chemical test for unreacted 2-hydroxybenzoic acid in it. [3]

© 2026 Ink Learning Ltd. All rights reserved.

B12 AA-Q19 Explain why ethanoyl chloride is hydrolysed by water at room temperature, 1-chlorobutane only slowly on warming, and chlorobenzene not at all on boiling. [3]

B13 AA-Q21 Give an equation for the reaction of phenol with benzoyl chloride, name the organic product, and give the reason phenol is first dissolved in sodium hydroxide. [3]

SECTION C · Long, 6 marks or more

C1 AA-Q12 Evaluate the use of ethanoic anhydride rather than ethanoyl chloride for the industrial manufacture of aspirin from 2-hydroxybenzoic acid. [6]

© 2026 Ink Learning Ltd. All rights reserved.

THIS BOOK ONLINE



Scan the code, or type the address, to open the questions in this book online:

inklearning.co.uk/chemistry/practise/questions/acylation/

© 2026 Ink Learning Ltd. All rights reserved.