

Alcohols, acids, esters and polymers explained

Chemistry grades 9-10 (GCSE · IGCSE · O Level · Class 9-10) · Test answers (mark scheme)

Use this guide to mark your paper out of 20. Give the marks for correct formulae, balanced equations and clear explanation. Accept any other correct wording and either British or American spelling.

Level: Chemistry grades 9-10 (GCSE · IGCSE · O Level · Class 9-10) · **Curriculum:** GCSE C7

Question 1 Functional groups (2 marks)

- a. **Hydroxyl (-OH).**
- b. **-COOH.**

Marking: 1 mark each.

Question 2 Fermentation conditions (3 marks)

- a. **$C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$.**
- b. Above 60 °C the enzymes in the yeast are denatured and fermentation stops.

Marking: a. 1 mark for correct formulae, 1 for balancing. b. 1 mark for denatured enzymes.

Question 3 Making an ester (3 marks)

- a. **Propyl ethanoate.**
- b. **Water.**
- c. **Concentrated sulfuric acid.**

Marking: 1 mark each.

Question 4 Glucose calculation (3 marks)

- a. $n = 18 \div 180 = \mathbf{0.10 \text{ mol}}$.
- b. Ethanol = $0.20 \text{ mol} \times 46 = \mathbf{9.2 \text{ g}}$.
- c. $CO_2 = 0.20 \text{ mol} \times 44 = \mathbf{8.8 \text{ g}}$.

Marking: 1 mark each. Check: $9.2 + 8.8 = 18.0 \text{ g}$.

Question 5 Addition polymer (3 marks)

- a. **Addition polymerisation.**
- b. **$-CH_2-CH(CH_3)-$.**
- c. It does **not**, because the C=C bonds have been used up in forming the chain.

Marking: 1 mark each.

Question 6 Condensation polymer (3 marks)

- a. The **ester link**.
- b. **Water**.
- c. Condensation polymerisation needs two functional groups per monomer and loses a small molecule; addition polymerisation uses a C=C bond and loses nothing.

Marking: 1 mark each.

Question 7 Weak acid (2 marks)

A weak acid ionises only partially in water. With sodium carbonate it fizzes because carbon dioxide gas is released.

Marking: 1 mark for partial ionisation, 1 mark for fizzing and CO₂.

Question 8 Plastic waste (1 mark)

They are unreactive and not biodegradable, so they stay in the environment for a very long time.

Marking: 1 mark.