

Naming organic compounds and their isomers

Chemistry grades 11-12 (A Level · IB · Class 11-12) · Test

Name: _____ Date: _____ Class: _____ Mark: ____ / 20

This test covers naming, structural isomers, E/Z isomerism and optical isomerism. Answer every question, show working for calculations and name compounds fully. You have 45 minutes and 20 marks are available.

Level: Chemistry grades 11-12 (A Level · IB · Class 11-12) · **Curriculum:** IB S3.2

Time: 45 minutes · 8 questions · Total: 20 marks · Calculator allowed

Question 1 Naming (3 marks)

- Name $\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_3$. (1 mark)
- Name $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO}$. (1 mark)
- Name $\text{CH}_3\text{CHBrCH}_3$. (1 mark)

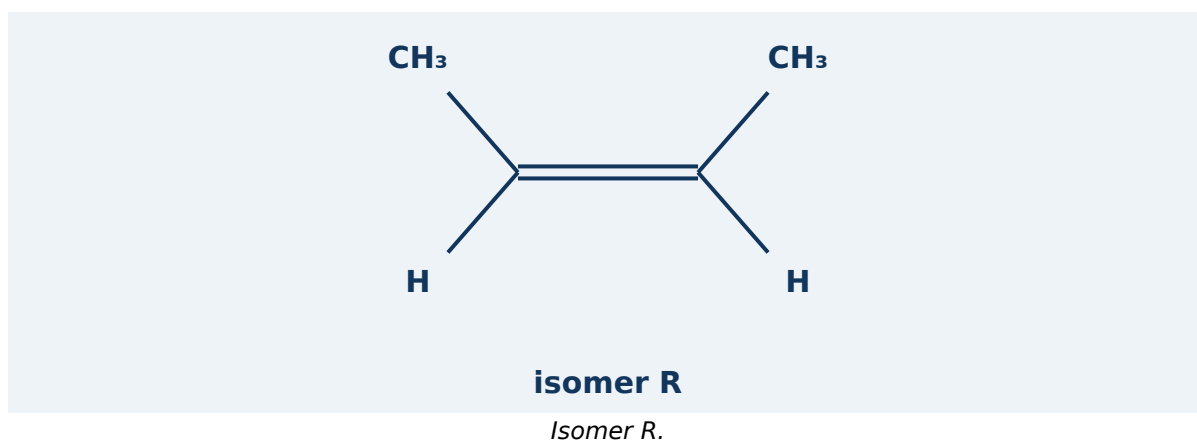
Question 2 Structural isomers (2 marks)

- Define structural isomers. (1 mark)
- State the type of isomerism between propan-1-ol and propan-2-ol. (1 mark)

Question 3 Alcohols $\text{C}_4\text{H}_{10}\text{O}$ (3 marks)

- Name the four alcohol isomers of $\text{C}_4\text{H}_{10}\text{O}$. (2 marks)
- Identify the tertiary alcohol. (1 mark)

Question 4 E/Z isomerism (3 marks)



- a. State whether isomer R is E or Z, giving a reason. (2 marks)
- b. Explain why E/Z isomers exist. (1 mark)

Question 5 Chiral centre (2 marks)

- a. Explain why butan-2-ol is chiral. (2 marks)

Question 6 Optical rotation (3 marks)

- a. A pure (+) enantiomer rotates light by $+30.0^\circ$. A mixture rotates it by $+12.0^\circ$. Calculate the enantiomeric excess. (1 mark)
- b. Calculate the percentage of (+) in the mixture. (2 marks)

Question 7 Name an alcohol (2 marks)

- a. Name $\text{CH}_3\text{CH}(\text{CH}_3)\text{CH}(\text{OH})\text{CH}_3$. (2 marks)

Question 8 Same formula, different properties (2 marks)

- a. Ethanol (boiling point 78°C) and methoxymethane (-24°C) share the formula $\text{C}_2\text{H}_6\text{O}$. Explain the difference in boiling points. (2 marks)