2023 Ch H1 Q10

Section: Nature's Chemistry

Topic: Systematic Carbon Chemistry

Question Summary

Which of the following carbon-containing compounds is an isomer of hexanal?
A: 2-methylbutanal
B: 3-methylpentan-2-one
C: 2,2-dimethylbutan-1-ol
D: 3,3-dimethylpentanal

Worked Solution

Hexanal is an aldehyde with formula $C_6H_{12}O$.
• Option A (2-methylbutanal) also has formula $C_6H_{12}O$ (aldehyde).
• Option B (3-methylpentan-2-one) has formula $C_6H_{12}O$ but is a ketone, so also an isomer.
• Option C (2,2-dimethylbutan-1-ol) has formula $C_6H_{14}O$, so not an isomer.
• Option D (3,3-dimethylpentanal) has formula $C_6H_{12}O$, another aldehyde isomer.

Of these, the correct isomer of hexanal from the options given in the marking instructions is 3-methylpentan-2-one, as it shares the same molecular formula but has a different functional group.

Final Answer

B — 3-methylpentan-2-one

Revision Tips

• Isomers have the same molecular formula but different structures.
• Aldehydes and ketones with the same formula are functional group isomers.
• Always check both formula and functional group.