

2023 Ch H1 Q7

Section: Chemistry in Society

Topic: Chemical Energy

Question Summary

The enthalpy of combustion of methanol (GFM = 32.0 g) is -726 kJ mol^{-1} . What mass of methanol must be burned to release 145.2 kJ of energy?

A: 3.2 g

B: 6.4 g

C: 32.0 g

D: 160.0 g

Worked Solution

Step 1: Energy per mole = 726 kJ (released when 32.0 g methanol burns).

Step 2: Ratio = required energy / energy per mole = $145.2 \div 726 = 0.20 \text{ mol}$.

Step 3: Mass = moles \times GFM = $0.20 \times 32.0 = 6.4 \text{ g}$.

Final Answer

B — 6.4 g

Revision Tips

- Always link energy released to the number of moles.
- ΔH values are per mole, so scale by the required energy.
- $\text{GFM} \times \text{moles} = \text{mass}$.