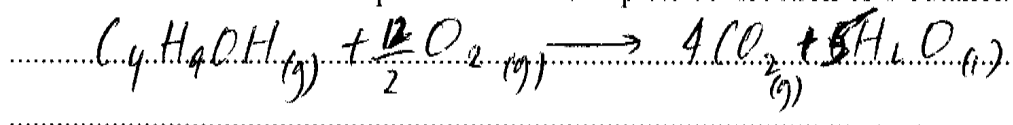


Question 23 (3 marks)

- (a) Write a balanced chemical equation for the complete combustion of 1-butanol. 1



- (b) A student measured the heat of combustion of three different fuels. The results are shown in the table. 2

Fuel	Heat of combustion (kJ g ⁻¹)
A	-48
B	-38
C	-28

MM = 74.08

x 74.08 = 3555.84 kJ

x 74.08 = 2815.04

x 74.08 = 2074.24

The published value for the heat of combustion of 1-butanol is 2676 kJ mol⁻¹.

Which fuel from the table is likely to be 1-butanol? Justify your answer.

fuel C is 1-butanol. $\Delta H = \frac{\text{kJ}}{\text{m}}$

$n = \frac{m}{\text{MM}}$ to change to kJ/mol.

$$\frac{\text{kJ}}{\text{m}} \times \text{MM} = -28 \times 74.08 = 2074.24 \text{ kJ/mol}$$

To change from kJ/g to kJ/mol
time kJ/g by molar mass to get
kJ/mol ΔH (heat of combustion).