

Question	Marking guidance	Mark	AO	Comments
02.1	$\text{C}_6\text{H}_{11}\text{OH} + 8\frac{1}{2}\text{O}_2 \longrightarrow 6\text{CO}_2 + 6\text{H}_2\text{O}$	1	AO2a	
02.2	Temperature rise = 20.1 $q = 50.0 \times 4.18 \times 20.1 = 4201 \text{ (J)}$ Mass of alcohol burned = 0.54 g and $M_r$ alcohol = 100.0 $\therefore$ mol of alcohol = $n = 0.54/100 = 0.0054$ Heat change per mole = $q/1000n$ <b>OR</b> $q/n$ $= 778 \text{ kJ mol}^{-1}$ <b>OR</b> $778\,000 \text{ J mol}^{-1}$ $\Delta H = -778 \text{ kJ mol}^{-1}$ <b>OR</b> $-778\,000 \text{ J mol}^{-1}$	1 1 1 1	AO2h AO2h AO2h AO1a	M4 is for answer with negative sign for exothermic reaction Units are tied to the final answer and must match
02.3	Less negative than the reference Heat loss <b>OR</b> incomplete combustion <b>OR</b> evaporation of alcohol <b>OR</b> heat transferred to beaker not taken into account	1 1	AO3 1b AO3 1b	
02.4	Water has a known density (of $1.0 \text{ g cm}^{-3}$ ) Therefore, a volume of $50.0 \text{ cm}^3$ could be measured out	1 1	AO3 2a AO3 2a	