

# Thermochemistry (2017 VCE)

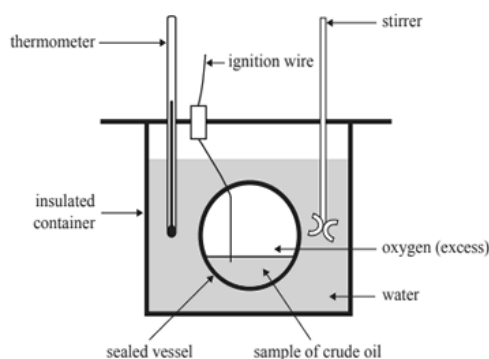
What is the total energy released, in kilojoules, when 100 g of butane and 200 g of octane undergo combustion in the presence of excess oxygen?

- A. 9760
- B. 14 600
- C. 17 300
- D. 19 500

Solution will appear here

[Solution](#)

2) The heat of combustion of a sample of crude oil is to be determined using a bomb calorimeter. All of the students in a class are given the same method to follow. The apparatus used by the students is shown below.



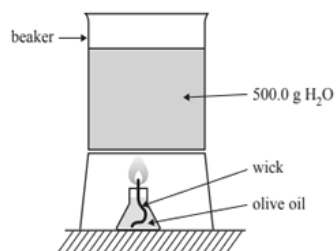
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For this experiment, the students could maximise

- A. precision by using a digital thermometer  $\pm 0.2$  °C.
- B. validity by calculating the heat of combustion per mole.
- C. accuracy by taking samples from three different sources.
- D. uncertainty by having all students closely follow the same experimental procedure

[Solution](#)

3) A sample of olive oil with a wick in a jar is ignited and used to heat a beaker containing 500.0 g of water, H<sub>2</sub>O. The relevant data for the experiment is included in the table below.



Data	
initial temperature (H <sub>2</sub> O)	21.0 °C
$\Delta H$ (olive oil)	41.0 kJ g <sup>-1</sup>
total energy lost to the environment	28.0 kJ

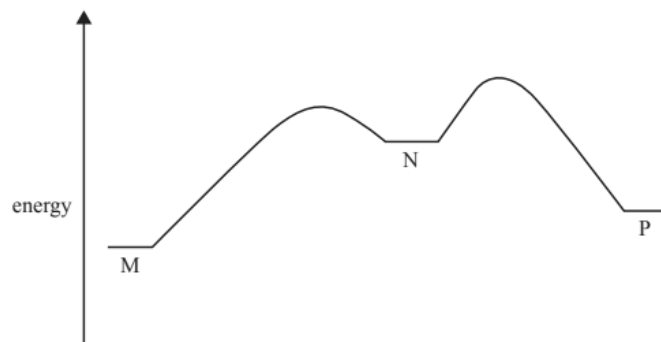
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After complete combustion of 2.97 g of olive oil, the final temperature of the water, in degrees Celsius, would be

- A. 44.9
- B. 58.0
- C. 65.9
- D. 79.3

[Solution](#)

4) The following energy profile shows the results obtained during an enzyme-catalysed reaction. Each stage of the reaction is labelled: M represents the initial reactants, N represents a stable intermediate and P represents the final products.



Solution will appear here

Which one of the following statements is correct?

- A. The energy change from M to N is exothermic and the energy change from N to P is exothermic.
- B. The energy change from M to P is exothermic and the energy change from N to P is endothermic.
- C. The energy change from M to N is endothermic and the energy change from N to P is endothermic.
- D. The energy change from M to N is endothermic and the energy change from M to P is endothermic.

[Solution](#)