**Calorimetry**

***In your exam you will be provided with the SHC (Specific Heat Capacity) if needed:*** *specific heat capacity of water = 4.18 J g–1 °C–1*)

**2019**

The enthalpy of combustion of liquid hexane, Δc*H*(C6H14(l)), can be determined by burning a known mass

of hexane and measuring the temperature change in a known mass of water above the burning hexane.

(i) If 5.22 g of hexane is burned, the temperature of 400 g of water increases from 20.5°C to 36.7°C.

Using these results, calculate an experimental value of Δc*H*(C6H14(l)). *M*(C6H14) = 86.0 g mol–1

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(ii) Explain why the experimental value obtained in part (c)(i) is less negative than the theoretical value of

– 4163 kJ mol–1

**2018**

When 10.6 g of ammonium chloride, NH4Cl, is dissolved in 65.0 mL of water, the temperature of the water

changes from 20.9°C to 11.5°C. The mass of the final solution is 75.6 g *M*(NH4Cl) = 53.5 g mol–1

Calculate the enthalpy change, Δr*H*°, for dissolving ammonium chloride in water.

**2016**

The enthalpy of combustion of liquid methanol, Δc*H* °(CH3OH(l)), can also be determined by burning a

known mass of methanol and measuring the temperature change in a known mass of water above the

burning methanol.



If 2.56 g of methanol is burned, the temperature of 500 g water increases from 21.2°C to 34.5°C.

(i) Using these results, calculate the experimental value of Δc*H* °(CH3OH(l)). *M*(CH3OH) = 32.0 g mol–1

(ii) Why is the experimental value obtained in part (b)(i) less negative than the theoretical value of –726 kJ mol-1

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