**ANSWERS: Calorimetry**

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| **2019** | **Evidence** | **Achievement** | **Merit** | **Excellence** |
|  |  | Up to TWO of:  • correct *q* calculation  • correct mol calculation  • correct Δr*H* calculation. | Correct process to determine Δc*H*, but one error. | Correct answer, with units and 3 s.f. |

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| **2018** | **Evidence** | **Achievement** | **Merit** | **Excellence** |
| (i)  (ii) |  | • ONE step of calculation correct. | • Correct process for calculation with minor error or omission, e.g. incorrect sign, using 65 g mass, answer of  15 000 kJ mol–1 | • Correct Δr*H*°, including unit, sign and significant figures. |

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| **2016** | **Evidence** | **Achievement** | **Merit** | **Excellence** |
| (i)  (ii) | *q* = *mc*Δ*T*  *q* = 500 g × 4.18 J ºC–1 g–1 × (34.5ºC – 21.2ºC)  *q* = 27 797 J = 27.797 kJ  *n*(CH3OH) =  = 0.08 mol  Δc*H* =  = –347 kJ mol–1  Heat loss to surroundings / incomplete combustion which means the temperature of the water doesn’t increase as much leading to a less negative enthalpy / the experiment wasn’t insulated. | * Calculates energy correctly.   OR  Calculates number of moles correctly.   * A valid reason is stated. | * Correct answer. May have poor rounding / incorrect units / incorrect sign. * Links the reason to why it is a less negative enthalpy. | * Calculation correct with correct units, sign, and an appropriate number of sig. figs. |

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