

Name of the Student: \_\_\_\_\_

Max. Marks : 10 Marks

Time : 10 Minutes

## Mark Schemes

Q1.

(a) **M1**  $Q = (mc \Delta T = 60 \times 4.18 \times 52.1) = 13066.68 \text{ J}$

**M2** moles  $= (\frac{1.31}{136}) = 0.00963 \text{ mol}$

**M3**  $\frac{Q}{n} = \frac{13066.68}{0.00963} = 1356541 \text{ (J mol}^{-1}\text{)}$

$M3 = M1 / M2$

**M4**  $\Delta H = -1360 \text{ kJ mol}^{-1}$

$M4 = - M3 / 1000$

Allow range -1355 to -1362

4

(b) Any 5 from the following:

**M1** Value from calorimetry less exothermic/lower/smaller (than method 1 value)

*M1 Allow both are less (than method 1)*

**M2** (Calorimetry = ) because of heat/energy loss

*M2 Copper absorbs some heat energy*

**M3** (Calorimetry = ) incomplete combustion

**M4** (Calorimetry = ) some liquid hydrocarbon could have evaporated

**M5** Mean bond enthalpies values use enthalpies taken across a range of compounds

**M6** Value from bond enthalpy data ignores energy changes in vaporisation of the fuel or condensing the water

*M6 Allow value from mean bond enthalpies does not include changes of state.*

*M6 Allow value from mean bond enthalpies use gaseous states*

5

[9]

Q2.

A

The boiling point of HX increases.

[1]