

Calorimetry

Chemistry

Measuring enthalpy change, and correcting for heat loss.

Heat energy transferred equals mass times specific heat capacity times temperature change.

$$q = mc\Delta T \quad \Delta H = -q \div n$$

50 cm³ water, $\Delta T = 8.0^\circ\text{C}$

m in grams.

$$q = 50 \times 4.18 \times 8.0 = 1672 \text{ J}$$

0.02 mol reacted

Negative because exothermic.

$$\Delta H = -83.6 \text{ kJ/mol}$$

Heat loss

Extrapolate a cooling curve back to mixing

THE COMMON MISTAKE

✗ **Using the mass of the reactant**

✓ **Using the mass of the solution being heated**

It is the water that changes temperature; $c = 4.18 \text{ J g}^{-1} \text{ K}^{-1}$ applies to it.

The main systematic error is heat loss to the surroundings, which makes measured exothermic values too small.