

Year 12 Chemistry  
Quick Quiz: Using and Controlling Reactions

1.

(a)  $\Delta m = 14.62 - 14.25 = 0.37 \text{ g}$

$$\Delta T = 25^\circ\text{C}$$

$$m = 50 \text{ g}$$

$$M = 352.67 \text{ g mol}^{-1}$$

$$E = mc_p \Delta T$$

$$= 50 \times 4.18 \times 25$$

$$= 5225 \text{ J}$$

$$n = \frac{\Delta m}{M} = \frac{0.37}{352.67} = 0.00104 \text{ mol}$$

$$\Delta H = \frac{E}{n} = \frac{5225}{0.00104} = 4.98 \times 10^6 \text{ J mol}^{-1}$$

$$\therefore \Delta H = -5.0 \times 10^3 \text{ kJ mol}^{-1}$$

- (b) Not all the heat released by the combustion was absorbed by the water (some was lost to surroundings and not measured as temperature change) therefore the measured temperature change will be lower than it should, leading to an inaccurate calculated energy value.

2.

(a)

- production of energy
- feedstock for chemical reactions

(b)

- fossil fuels: easily obtained but not renewable
- biofuels: renewable but more expensive than fossil fuels to produce

3. Charging regenerates reactants, using up electrical energy  
Discharging uses up reactants, producing electrical energy

4. The line of best fit would be a straight line passing through the origin.