

Year 12 Chemistry
Quick Quiz: Using and Controlling Reactions

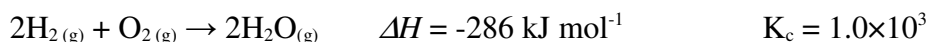
1. The enthalpy of combustion of methanol (CH_3OH) is $-7.2 \times 10^2 \text{ kJ mol}^{-1}$.
 - (a) Write a thermochemical equation for the complete combustion of methanol.

 - (b) Methanol has a density of 0.79 g mL^{-1} . Determine the energy volume of methane in kJ L^{-1} .

2. The enthalpy of neutralisation of H_2SO_4 solution with NaOH solution is $-57.1 \text{ kJ mol}^{-1}$.
 - (a) Write a thermochemical equation for the neutralisation of H_2SO_4 with NaOH .

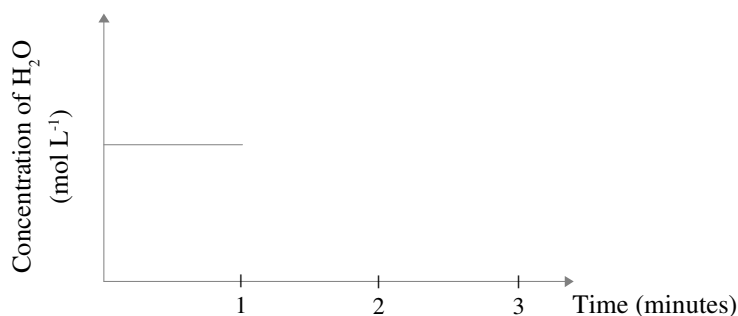
 - (b) State which quantity the 'per mole' of the enthalpy of neutralisation refers to.

3. Consider the reaction below in a sealed vessel at a fixed temperature.



For the first minute, the system is at equilibrium. At one minute, the concentration of H_2O is increased, and equilibrium is re-established at 2 minutes. At two minutes, the volume of the container is doubled, and equilibrium is re-established at 3 minutes.

- (a) On the axes below, show the concentration of H_2O over the three minutes (estimate the concentrations using Le Chatelier's Principle).



- (b) Explain, with reference to the K_c value, the effect each of the following would have on the yield and the rate of reaction:
 - (i) Increasing the temperature

 - (ii) Increasing the pressure