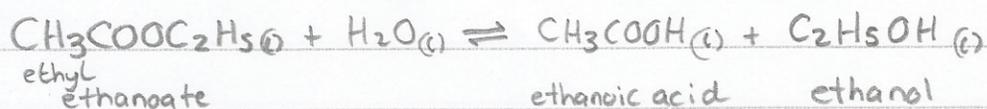


The Equilibrium Constant K_c

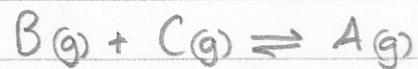
① When equilibrium had been established at 764K, the mixture was found to contain hydrogen $2.484 \times 10^{-3} \text{ mol dm}^{-3}$; iodine $2.514 \times 10^{-3} \text{ mol dm}^{-3}$; hydrogen iodide $1.695 \times 10^{-2} \text{ mol dm}^{-3}$. Calculate a value for K_c at this temperature.

② If an ester like ethyl ethanoate reacts with water in the presence of an acid catalyst, the following equilibrium is established:



Exactly 1 mole of ethyl ethanoate was mixed with exactly one mole of water (from dilute hydrochloric acid) and allowed to reach equilibrium. The equilibrium mixture was analysed and found to contain 0.300 moles of ethanoic acid. Calculate a value for K_c at the temperature of the reaction.

③ This problem relates to the gaseous equilibrium:



0.500 mole of B and 0.300 mole of C were mixed in a container of volume 10.0 dm^3 at a temperature of 400 K . At equilibrium there was found to be 0.100 moles of A present. Calculate the value for K_c at this temperature.

④ The question refers to the gaseous equilibrium:



4.00 moles of A was placed in a 20.0 dm³ container and heated to 320 K until equilibrium had been established. The equilibrium mixture was found to contain 1.50 moles of A. Calculate the value for K_c at this temperature.

5) 24.0g of ethanoic acid and 23.0g of ethanol were mixed in a stoppered bottle and left for several days to reach equilibrium at room temperature. At the end of that time, the mixture was poured into pure water and made up to a total volume of 250cm³. A 25.0cm³ sample of this needed 26.5cm³ of 0.400mol dm⁻³ sodium hydroxide to neutralise the remaining ethanoic acid. Calculate a value for K_c for the reaction:



the neutralisation reaction is:



⑥ This example is about a simple equilibrium



If 1.00 mole of A was allowed to reach equilibrium, how many moles of B would be formed if K_c had a value of 0.0200 at the temperature of the reaction?

⑦ if K_c for the following reaction is 36 at a particular temperature, calculate the fraction of P converted into Q and R at equilibrium:



⑧ The equilibrium constant, K_c , for the following reaction is 4.0 at 20°C .



If 2.0 moles of E and 1.0 mole of F were mixed and allowed to reach equilibrium at 20°C , calculate the number of moles of H formed.