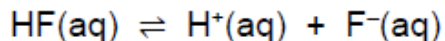


AQA – Chemical equilibria, Le Chatelier's principle and Kc – A2 2023 Chemistry P3**1. No.13**

When HF is added to water at 298 K, this equilibrium is established.



At equilibrium, $[\text{HF}] = 7.70 \times 10^{-3} \text{ mol dm}^{-3}$ and $[\text{F}^{-}] = 2.30 \times 10^{-3} \text{ mol dm}^{-3}$

What is the value of the equilibrium constant, in mol dm^{-3} , at 298 K?

[1 mark]**A** 1.45×10^3 ☐**B** 3.35☐**C** 2.99×10^{-1} ☐**D** 6.87×10^{-4} ☐**2. No.17**

Which change causes the pH of 10 cm^3 of 1.0 mol dm^{-3} NaOH to be halved at 298 K?

$K_w = 1.0 \times 10^{-14}$ at 298 K

[1 mark]**A** adding 10 cm^3 of water☐**B** adding 10 dm^3 of water☐**C** adding 5 cm^3 of 1.0 mol dm^{-3} HCl☐**D** adding 10 cm^3 of 1.0 mol dm^{-3} HCl☐

3. No.18

A $0.100 \text{ mol dm}^{-3}$ solution of a weak acid has $\text{pH} = 2.50$

What is the value of K_a for this acid, in mol dm^{-3} ?

[1 mark]

A 3.16×10^{-2} ☐B 3.16×10^{-3} ☐C 1.00×10^{-4} ☐D 1.00×10^{-5} ☐

4. No.25

Which statement about catalysts used in reactions at equilibrium, at a constant temperature, is correct?

[1 mark]

A They are always used in the solid state.

☐

B They increase the rate of the forward reaction but decrease the rate of the reverse reaction.

☐

C They have no effect on the value of the equilibrium constant.

☐

D They make the forward reaction more exothermic.

☐