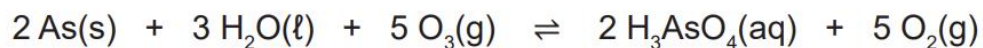


Question 31**(6 marks)**

Arsenic acid, $\text{H}_3\text{AsO}_4(\text{aq})$, is a weak, triprotic acid that can be produced from the element directly through the reaction with water and ozone, $\text{O}_3(\text{g})$. This reaction can be represented by the equation below.



- (a) Write the equilibrium constant expression for this reaction. (2 marks)

(b) The arsenate ion, $\text{HAsO}_4^{2-}(\text{aq})$, is amphoteric, meaning it can act as an acid and as a base.

(i) With the aid of equations, describe the amphoteric nature of HAsO_4^{2-} in this aqueous solution. (3 marks)

(ii) State why an aqueous solution containing HAsO_4^{2-} is found to have a $\text{pH} > 7$ at 25°C . (1 mark)
