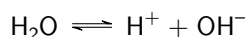


# 1 Ionic Equilibria

## 1.1 Ionic Product of Water



Definition 1.1: Ionic Product of Water  $K_w$

The product of concentrations of  $\text{H}^+$  and  $\text{OH}^-$  are always  $K_w = 1 \times 10^{-14} \text{ mol}^2 \text{ dm}^{-6}$  at 298 K.

As a result of this property of the equilibrium between disassociating  $\text{H}_2\text{O}$ , the concentration of one ion can be calculated once the concentration of the other is known.

## 1.2 pH and pOH

Definition 1.2: p Function

For some quantity  $X$ :

$$pX = \log_{10} X$$

Definition 1.3: pH

pH is a measure of the concentration of  $\text{H}^+$  in a solution, calculated as:

$$pH = \log_{10} [\text{H}^+]$$

Definition 1.4: pOH

pOH is a measure of the concentration of  $\text{OH}^-$  in a solution, calculated as:

$$pOH = \log_{10} [\text{OH}^-]$$

Note that at 298 K,  $pH + pOH = pK_w$ )

## 1.3 Types of Acids and Bases

## 1.4 Strength of Acids and Bases

## 1.5 Weak Acids and Bases

## 1.6 Salt Hydrolysis

## 1.7 Buffer Solutions