Question #47788, Chemistry, Inorganic Chemistry

Why does a buffer solution resist the change in pH? Please provide three examples.

Answer:

Buffer solutions - solutions that this little change pH by dilution with water or addition of small amounts of strong acids or bases .

Buffering properties of the solution mixture are weak acids or weak bases and their salts and mixtures of two acid salts or acid salts and secondary polybasic acids.

For example:

1) acetate buffer(CH3COOH + CH3COONa)

$$\text{CH}_3\text{COOH}+\text{CH}_3\text{COO}^- \xrightarrow{H^+} \text{CH}_3\text{COO}- + \text{H}+ \leftrightarrow \text{CH}_3\text{COOH}$$
;

$$\mathsf{CH}_3\mathsf{COOH} + \mathsf{CH}_3\mathsf{COO} \xrightarrow{\mathit{OH}^-} \mathsf{CH}_3\mathsf{COOH} + \mathsf{OH}^- \leftrightarrow \mathsf{CH}_3\mathsf{COO}^- + \mathsf{H}_2\mathsf{O}$$

2) $(Na_2CO_3 + NaHCO_3)$

$$CO_3^{2-} + HCO_3^{-} \xrightarrow{H^+} CO_3^{2-} + H^+ \leftrightarrow HCO_3^{-}$$
 $CO_3^{2-} + HCO_3^{-} \xrightarrow{OH^-} HCO_3^{-} + OH^- \leftrightarrow CO_3^{2-} + H_2O_3^{-}$

3) $Na_2HPO_4 + Na_2HPO_4$

$$HPO_4^{2-} + H_2PO_4^{2-} \xrightarrow{H^+} HPO_4^{2-} + H^+ \leftrightarrow H_2PO_4^{2-}$$

$$HPO_4^{2-} + H_2PO_4^{2-} \xrightarrow{OH^-} H_2PO_4^{2-} + OH^- \leftrightarrow H_2PO_4^{2-} + H_2O$$