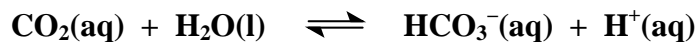
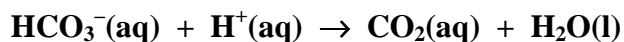


- Both $\text{HCO}_3^-(\text{aq})$ and $\text{CO}_2(\text{aq})$ are present in human blood. How does their presence ensure that the pH of blood is maintained at ~ 7.2 , even if $\text{H}^+(\text{aq})$ or $\text{OH}^-(\text{aq})$ are produced by processes in the body?

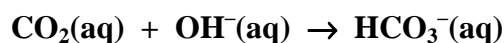
$\text{CO}_2(\text{aq})$ and $\text{HCO}_3^-(\text{aq})$ constitute a buffer system:



Excess H^+ is removed by:



Excess OH^- is removed by:



How does hyperventilation (very rapid breathing) interfere with this balance? What is the effect?

Hyperventilation removes CO_2 from the blood. This shifts the above buffer equilibrium to the left (Le Chatelier's principle), $[\text{H}^+(\text{aq})]$ decreases and the blood pH increases.