pH Review for BI 233

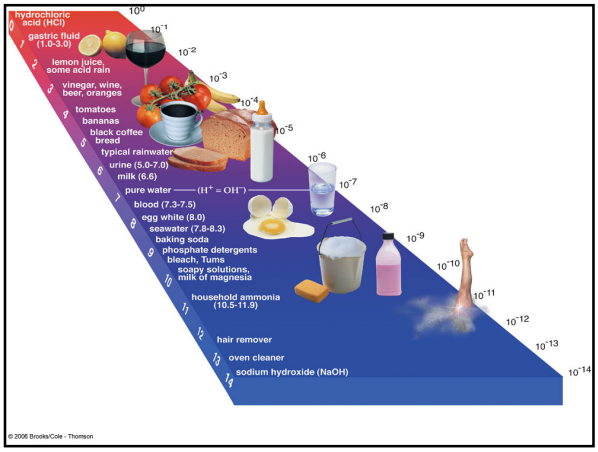
pH

A measure of the **negative logarithm** of the hydrogen ion concentration. [H^+]
Unit is in moles/liter (understood)

pH of:

< 7 = Acidic i.e. 0 - 6.9 → high [H^+]
> 7 = Basic* i.e. 7.1 – 14 → low [H^+]
7 = Neutral → [H^+] = [OH^-]

*Basic solutions have more OH^- than H^+ ions.



The difference between Acids & Bases

Acids : ***release hydrogen ions*** when dissolved in water. e.g. HCl → $H^+ + Cl^-$

Bases* are ***substances that absorb H^+ ions***, thereby reducing the number of hydrogen ions. e.g. NaOH.
Base ≈ Alkalinity

pH Scale

Each unit on the scale represents a tenfold change in pH (because it is a log scale).

pH of 6 is 10 x's more acidic than pH of 7
pH of 5 is 100 x's more acidic than pH of 7

pH of 3 = _____ x's more acidic than 7

Respiratory Equation

$CO_2 + H_20 \leftrightarrow H_2CO_3 \leftrightarrow H^+ + HCO_3^-$

Carbon Dioxide + Water

↔ Carbonic Acid

↔ Hydrogen ion (acid)
+ Bicarbonate ion (base)

Correlations

Direct between CO_2 & H^+
i.e. if $[CO_2]$ ↑ then $[H^+]$ ↑

Indirect between CO_2 & pH
i.e. if $[CO_2]$ ↑ then pH ↓
if $[CO_2]$ ↓ then pH ↑

Acidemia – ↑ pCO_2, but ↓ HCO_3^-
too much acid in the blood

Alkalemia - ↓ pCO_2 then ↑ HCO_3^-
too much base in the blood