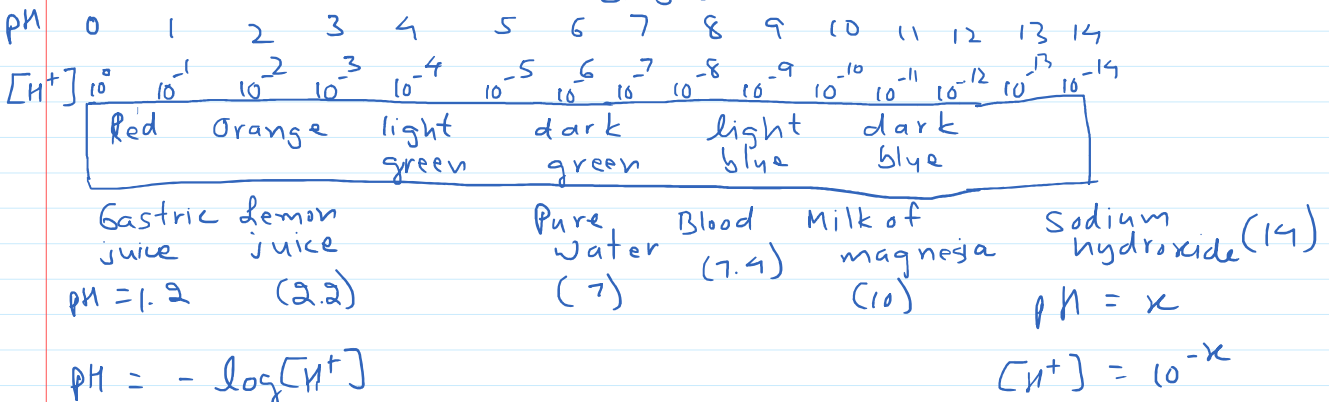
How strong are acid or base solution?

Universal indicator

It is a mixture of several indicators. It shows different colour at different concentration of hydrogen ions in a solution.



pH = 1.2 (2.2) (7) (7.4) (10)

pH = x

$pH = -\log[H^+]$

$[H^+] = 10^{-x}$

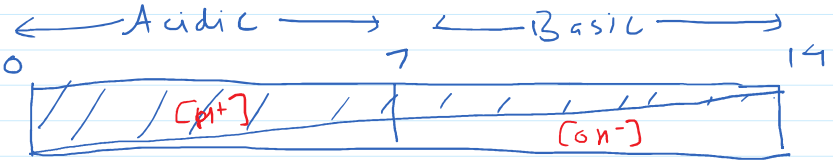
$[H^+] = 10^{-ph}$

pH scale

pH means power of hydrogen (p → potenz, in German means power)

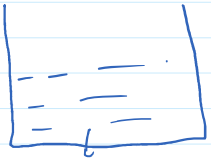
pH is a scale used to measure hydrogen ion concentration in a solution.

On pH scale we can meause pH from 0 (very acidic) to 14 (very alkaline). Neutral solution has pH = 7 (at 25°C)



[H+] increase

[OH-] decrease



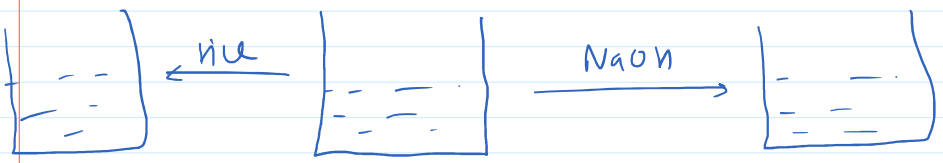
NaCl solution

$[H^+][OH^-]$ = constant in an aqueous solution at a given temperature.

$HCl(aq)$

species present : $H^+(aq) + Cl^- + H_2O + OH^-$

$H_2O \rightleftharpoons H^+ + OH^-$



acidic
$[H^+] > [OH^-]$
acidic

Pure water
$[H^+] = [OH^-]$

Basic
$[OH^-] > [H^+]$
Basic

Lower is value of pH, more is concentration of H^+ and more acidic is solution.

Higher is value of pH, less is concentration of H^+, more is concentration of OH^-, more basic is solution.

Generally paper impregnated with the universal indicator is used for measuring pH

Strong acid

Acids that give more H^+ ions in solution are strong acids.

eg: H_2SO_4, HNO_3, HCl

$HCl \rightarrow H^+ + Cl^-$
1000 molecules → aaq molecules

Weak acid

Acids that give less H^+ ions in solutions are weak acids.

eg! oxalic acid, acetic.

$CH_3COOH \rightleftharpoons CH_3COO^- + H^+$

200000 molecules.

Strong base

Bases that give more OH^- ions in solution are called

strong bases.

eg: $NaOH$, KOH

Weak base

Bases that give less OH^- ions in solution are called weak bases

eg: NH_4OH