

neutralization reaction
 acid + base $\rightarrow$ water + salt
 $\text{HCl} + \text{NaOH} \rightarrow \text{H}_2\text{O} + \text{NaCl}$

$\text{HA} \rightleftharpoons \text{H}^+ + \text{A}^-$
 HCl
 $\text{pH} = -\log[\text{H}^+]$
 More H^+ , stronger acid

base
 $\text{NaOH} \rightarrow \text{Na}^+ + \text{OH}^-$ ✓
 $\text{Ca(OH)}_2 \rightarrow \text{Ca}^{2+} + 2\text{OH}^-$ ✓

$\text{HCl} \rightarrow \text{H}^+ + \text{Cl}^-$
 H_3O^+ - kind of like H^+ , but is combined with water
 $\text{NH}_3 \rightarrow \text{NH}_4^+$

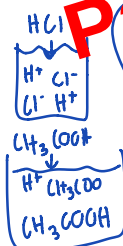
Acid
 proton donor

pH is a measure of acidity

$\text{pH} = -\log[\text{H}^+]$

Strong acids dissociate completely in water

Weak acids partially dissociate in water



Base

proton acceptor

pOH is a measure of basicity

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

Strong bases dissociate completely

Weak do not

$\text{pX} = -\log[\text{X}]$

$\text{pH} = -\log[\text{H}^+]$

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

$\text{pH} + \text{pOH} = 14.00$

$-\log[\text{H}^+] + (-\log[\text{OH}^-]) = 14.00$

$-\log[\text{H}^+][\text{OH}^-] = 14.00$

$K_w = [\text{H}^+][\text{OH}^-] = 1.0 \times 10^{-14}$

