Salts Reference Sheet

- Strong Acid $\xrightarrow{turns\ into\ a}$ Weak Conjugate Base
  (not much effect on pH)
- Weak Acid $\xrightarrow{turns\ into\ a}$ Strong Conjugate Base
  (potential effect on pH)
- Strong Base $\xrightarrow{turns\ into\ a}$ Weak Conjugate Acid
  (not much effect on pH)
- Weak Base $\xrightarrow{turns\ into\ a}$ Strong Conjugate Acid
  (potential effect on pH)

- Ion from a Strong Acid $\xrightarrow{makes\ the\ soln}$ Neutral
  (*is a weak conj. base*)
- Ion from a Weak Acid $\xrightarrow{makes\ the\ soln}$ Basic
  (*is a strong conj. base*)
- Ion from a Strong Base $\xrightarrow{makes\ the\ soln}$ Neutral
  (*is a weak conj. acid*)
- Ion from a Weak Base $\xrightarrow{makes\ the\ soln}$ Acidic
  (*is a strong conj. acid*)
- Cation is a charged metal ion, and anion is from a strong acid $\xrightarrow{makes\ a}$ Acidic metal hydrate + Neutral anion - salt is acidic

- Neutral + Acidic = Acidic
- Neutral + Basic = Basic
- Neutral + Neutral = Neutral
- Acidic + Basic = ?
  Use Ka and Kb to determine
  Ka > Kb → Acidic
  Ka < Kb → Basic
  Ka = Kb → Neutral
- Kw = Ka x Kb Kw = 1.0×10^{-14} (*if at 25 °C, may be different if not at 25°C*)

If you are looking for the Ka of an acidic conjugate ion, use Kw and the Kb of the base it came from

$$K_{acidic\ conj.\ ion} = \frac{K_w}{K_{b\ (of\ the\ base\ that\ the\ ion\ came\ from)}}$$

If you are looking for the Kb of a basic conjugate ion, use Kw and the Ka of the acid it came from

$$K_{basic\ conj.\ ion} = \frac{K_w}{K_{a\ (of\ the\ acid\ that\ the\ ion\ came\ from)}}$$

Salts Reference Sheet

7 Strong Acids (H^+) All other acids are weak			8 Strong Bases (OH^-) All other bases are weak	
Hydrochloric acid	HCl		Lithium hydroxide	$LiOH$
Hydrobromic acid	HBr		Sodium hydroxide	$NaOH$
Hydroiodic	HI		Potassium hydroxide	KOH
Perchloric acid	$HClO_4$		Rubidium hydroxide	$RbOH$
Chloric acid	$HClO_3$		Cesium hydroxide	$CsOH$
Nitric acid	HNO_3		Calcium hydroxide	$Ca(OH)_2$
Sulfuric acid	H_2SO_4		Strontium hydroxide	$Sr(OH)_2$
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Dougherty Valley High School Chemistry — Weak Acid/Base Reference Sheet

Acid Dissociation Constant (K_a) Values for Some Weak Acids

Weak Acid	Chemical Formula	K_a
acetic	$HC_2H_3O_2$	1.8×10^{-5}
arsenic	H_3AsO_4	5.6×10^{-3}
arsenous	$HAsO_2$	6×10^{-10}
ascorbic	$H_2C_6H_6O_6$	8.0×10^{-5}
benzoic	C_6H_5COOH	6.5×10^{-5}
boric	H_3BO_3	5.8×10^{-10}
carbonic	H_2CO_3	4.3×10^{-7}
chloroacetic	$CH_2ClCOOH$	1.4×10^{-3}
citric	$H_3C_6H_5O_7$	7.4×10^{-4}
formic	$HCOOH$	1.8×10^{-4}
hydrazoic	HN_3	1.9×10^{-5}
hydrocyanic	HCN	4.9×10^{-10}
hydrofluoric	HF	6.8×10^{-4}
hydrosulfuric	H_2S	5.7×10^{-8}
hypobromous	$HBrO$	2×10^{-9}
hypochlorous	$HClO$	3.0×10^{-8}
hydrogen peroxide	H_2O_2	2.4×10^{-12}
iodic	HIO_3	1.7×10^{-1}
malonic	$H_2C_3H_2O_4$	1.5×10^{-3}
nitrous	HNO_2	4.5×10^{-4}
oxalic	$H_2C_2O_4$	5.9×10^{-2}
phosphoric	H_3PO_4	7.5×10^{-3}
selenous	H_2SeO_3	5.3×10^{-9}
sulfurous	H_2SO_3	1.7×10^{-2}
tartaric	$H_2C_4H_4O_6$	1.0×10^{-3}

Base Dissociation Constant (K_b) Values for Some Weak Bases

Weak Base	Chemical Formula	K_b
ammonia	NH_3	1.8×10^{-5}
aniline	$C_6H_5NH_2$	4.3×10^{-10}
dimethylamine	$(CH_3)_2NH$	5.4×10^{-4}
ethylamine	$C_2H_5NH_2$	6.4×10^{-4}
hydrazine	N_2H_4	1.3×10^{-6}
hydroxylamine	$HONH_2$	1.1×10^{-8}
methylamine	CH_3NH_2	4.4×10^{-4}
pyridine	C_5H_5N	1.7×10^{-9}
trimethylamine	$(CH_3)_3N$	6.4×10^{-5}