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Acids & Bases

Students ask what acids and bases are strong or weak. I made this list with brief comments to assist students. Students need to be able to identify strong and weak acids and bases.

Strong Acids

Many inorganic acids are strong.
Strong acids have high K_a and small pK_a values.

HCl hydrochloric acid
HNO_3 nitric acid
H_2SO_4 sulfuric acid (*HSO_4^- is a weak acid)*
HBr hydrobromic acid
HI hydroiodic acid
$HClO_4$ perchloric acid
$HClO_3$ chloric acid

Weak Acids

Many organic acids are weak.
Weak acids have very small K_a values and large pK_a values.

$HO_2C_2O_2H$ oxalic acid
H_2SO_3 sulfurous acid
HSO_4^- hydrogen sulfate ion
H_3PO_4 phosphoric acid
HNO_2 nitrous acid
HF hydrofluoric acid
HCO_2H methanoic acid
C_6H_5COOH benzoic acid
CH_3COOH acetic acid
HCOOH formic acid

Strong Bases

Many strong bases are metal hydroxides and metal oxides.
Strong bases have high K_b and small pK_b values.

LiOH lithium hydroxide	Li_2O lithium oxide
NaOH sodium hydroxide	Na_2O sodium oxide
KOH potassium hydroxide	K_2O potassium oxide
RbOH rubidium hydroxide	Rb_2O rubidium oxide
CsOH cesium hydroxide	Cs_2O cesium oxide
$Ca(OH)_2$ calcium hydroxide	CaO calcium oxide
$Sr(OH)_2$ strontium hydroxide	SrO strontium oxide
$Ba(OH)_2$ barium hydroxide	BaO barium oxide

Weak Bases

Many weak bases have a N atom with a lone pair.
Weak bases have very small K_b values and large pK_b values.

NH_3 ammonia
CH_3NH_2 methylamine
C_5H_5N pyridine