

8.1 Understanding Acids and Bases

Definitions:

- Base
- Dissociation
- Acid
- Ionization
- Strong acid
- Percentage ionization
- Weak acid

What is an Acid?

- Definition of acids has changed:
 - A substance that forms hydrogen gas when reacted with a metal
 - A substance that contains oxygen and reacts with limestone to form carbon dioxide
 - An ionic substance as per the Arrhenius definition
 - $\text{H}_2\text{O}_{(l)} \rightarrow \text{H}^+_{(aq)} + \text{OH}^-_{(aq)}$
 - If a substance releases $\text{H}^+_{(aq)}$ it is considered an acid.
 - If a substance releases $\text{OH}^-_{(aq)}$ it is considered a base.
 - The breaking an aqueous compound into ions is called ionization.
 - Dissolving a solid to form ions is called dissociation.
 - Percent ionization will determine the amount of ionization.
- Review definitions on page 364,

Strong Acids

- A strong acid is an acid that ionizes completely in water to form hydrogen ions.
- E.g. $\text{HCl}_{(g)} \xrightarrow[100\%]{\text{H}_2\text{O}_{(l)}} \text{H}^+_{(aq)} + \text{Cl}^-_{(aq)}$
- Strong acids: hydrochloric, hydrobromic, sulfuric, nitric, and phosphoric.

Strong Bases

- A strong base is an ionic substance that (according to Arrhenius) disassociates completely in water to release hydroxide ions.
- E.g. $\text{NaOH}_{(s)} \xrightarrow[100\%]{\text{H}_2\text{O}_{(l)}} \text{Na}^+_{(aq)} + \text{OH}^-_{(aq)}$
- Strong bases: group 1 and 2 hydroxides.

Weak Acids and Bases

- Weak acids and bases are similar to strong acids and bases but they do not ionize very much.
- Eg. $\text{CH}_3\text{COOH}_{(aq)} \rightarrow \text{H}^+_{(aq)} + \text{CH}_3\text{COO}^-_{(aq)}$ but it stays mostly as $\text{CH}_3\text{COOH}_{(aq)}$.

Homework

- Practice Q's: 1-7