

# Acids & Bases

## Properties

### Acids

- taste sour
- electrolytes - conduct electricity
- react w/ metals to produce  $H_2(g)$   
ex)  $Fe(s) + HCl(aq) \rightarrow H_2(g) + FeCl_2(aq)$
- reacts w/ bases to produce  $H_2O$  & a salt (ionic compd)
- turns blue litmus paper red

### Bases

- taste bitter
- electrolytes
- react w/ acids to produce a salt &  $H_2O$
- turn red litmus paper blue

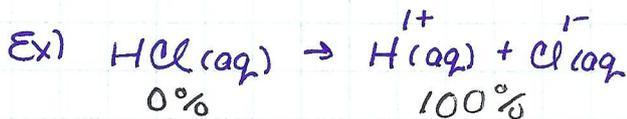


## % Dissociation & Strength

↳ how much an acid or base breaks apart into ions in  $H_2O$

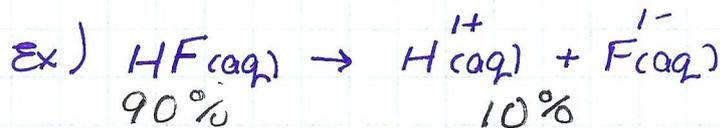
### Strong Acids/Bases

completely (100%) dissociates in  $H_2O$



### Weak Acids/Bases

only 10% or less dissociate in  $H_2O$



### 7 strong acids

- |             |               |
|-------------|---------------|
| (1) $HCl$   | (5) $HClO_3$  |
| (2) $HBr$   | (6) $HClO_4$  |
| (3) $HI$    | (7) $H_2SO_4$ |
| (4) $HNO_3$ |               |

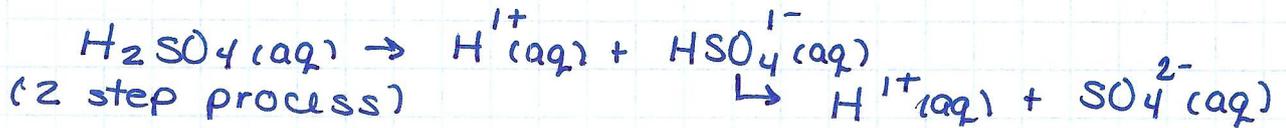
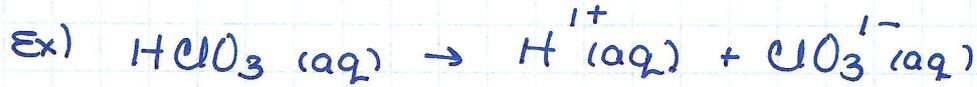
### 8 strong bases

- |            |                |
|------------|----------------|
| (1) $LiOH$ | (5) $Ca(OH)_2$ |
| (2) $NaOH$ | (6) $Sr(OH)_2$ |
| (3) $KOH$  | (7) $Ba(OH)_2$ |
| (4) $RbOH$ | (8) $Ca(OH)_2$ |

# Acid / Base Theories

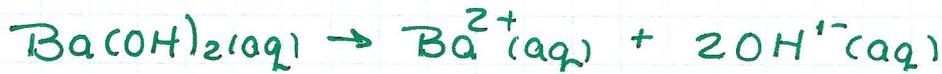
## (1) Arrhenius theory

Acids - substances that release  $H^{1+}$  ions in solution



Bases

- substances that release  $OH^{1-}$  ions in solution



## (2) Brønsted-Lowry theory

Acid - substance that donates  $H^{1+}$  ions

Every acid has a...

conjugate Base - the substance left over after the acid donates a  $H^{1+}$  ion

Base - substance that accepts  $H^{1+}$  ions

Every base has...

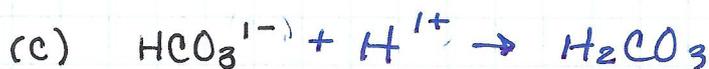
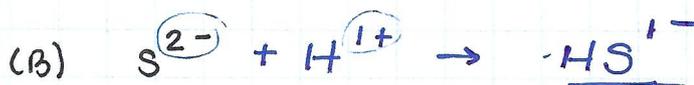
conjugate Acid - the substance the base becomes after gaining 1  $H^{1+}$  ion.

## Examples & Practice

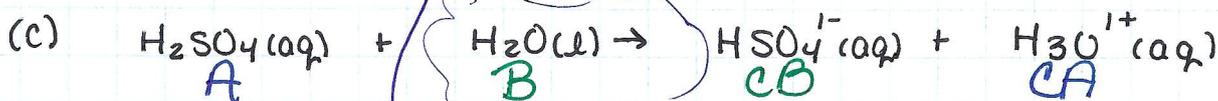
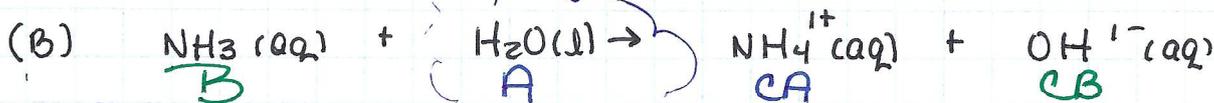
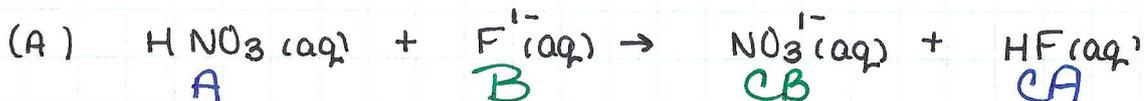
(1) Write the conjugate base for each acid.



(2) Write the conjugate acid for each base.



(3) Determine the acid, base, conjugate acid, & conjugate base for these reactions.



An amphoteric substance is one that can act as an acid or a base depending on who it is interacting with. because it self ionizes.

