

Acid-Base, gas evolution rxns

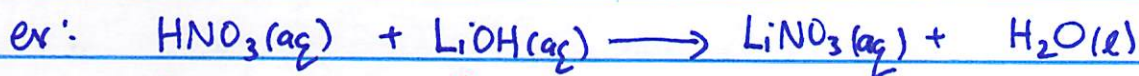
Arrhenius definition: acids dissolve in H_2O + form H^+ ions.

bases "—————" OH^- ions.

in general: acid + base \rightarrow "salt" + water

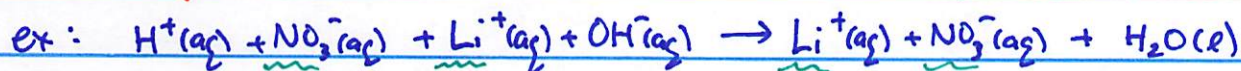
↑ ionic cpd.

MOLECULAR EQ:



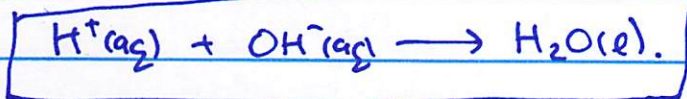
do not break apart molecules / ppt

COMPLETE/FULL-IONIC EQ: (break down sol. ionic cpds to naked ions!)



Spectator ions:

NET-IONIC EQ:



Carbonates + bicarbonates are weak bases + react w/ acids:

bicarb/carb + acid \rightarrow salt + water + $\text{CO}_2(\text{g}) \uparrow$


$$2:1$$


stable @
high
pressure



Carbonic acid

pp 168-174 ... lot more details + examples!

Acid-Base Titrations

- used to measure the molar conc. of an unknown solution.
- take a specific amount of the acid/base w/ unknown conc
- add base/acid of known conc. to the sample, until the unknown has been neutralized.

(equivalence point: $\# \text{mol H}^+ = \# \text{mol OH}^-$)

- calculate unknown's conc!

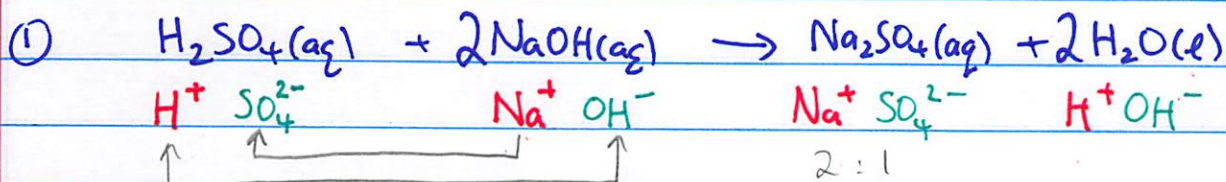
Ex: 10.00 mL of $\text{H}_2\text{SO}_4(\text{aq})$ w/ unknown conc.
requires 12.54 mL of 0.100 M NaOH to
fully neutralize. What is conc of H_2SO_4 ?

$[\text{H}_2\text{SO}_4]$?

Plan: ① Write balanced chem eq

② Using stoichiometry, solve for $\# \text{mol H}_2\text{SO}_4$

③ Using definition of molarity, solve for $[\text{H}_2\text{SO}_4]$.



② $12.54 \text{ mL} \times \frac{1 \text{ L}}{1000 \text{ mL}} \times \frac{0.100 \text{ mol NaOH}}{1 \text{ L}} \times \frac{1 \text{ mol H}_2\text{SO}_4}{2 \text{ mol NaOH}} = 6.27 \times 10^{-4} \text{ mol H}_2\text{SO}_4$

③ $[\text{H}_2\text{SO}_4] = \frac{\# \text{mol H}_2\text{SO}_4}{\# \text{L H}_2\text{SO}_4} = \frac{6.27 \times 10^{-4} \text{ mol}}{10.00 \text{ mL} \times \frac{1 \text{ L}}{1000 \text{ mL}}} = 0.0627 \text{ M H}_2\text{SO}_4$