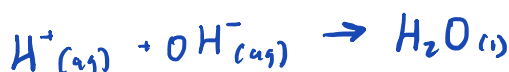
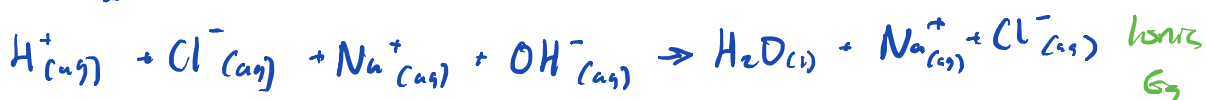


ACID-BASE REACTIONS

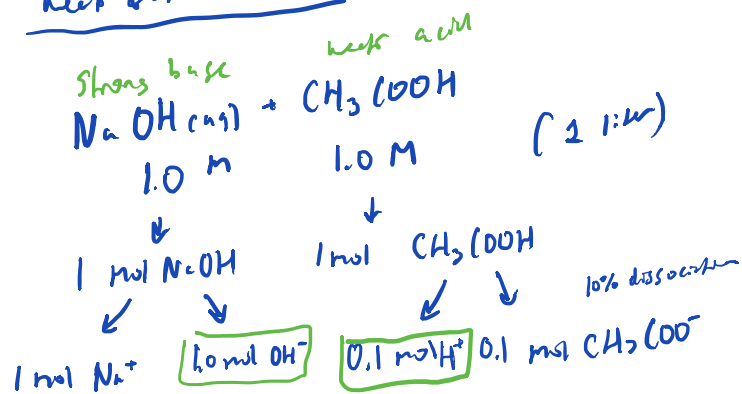
Proton (H^+) Donor

Proton Acceptor

according to defn.



Weak & Strong Acids/Bases



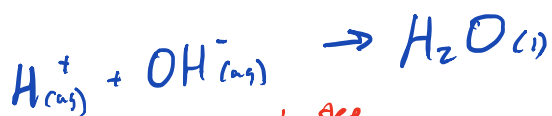
Instead of 0.1 mol H_2O , 1.0 mol of H_2O will be produced!!

OH^- is such a strong base, that it will rip off the un-dissociated CH_3COOH .

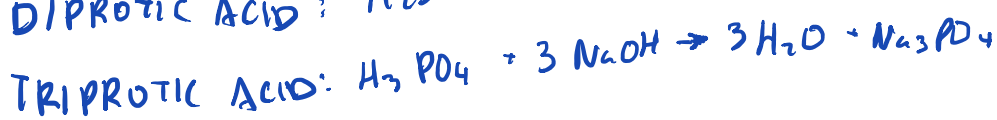
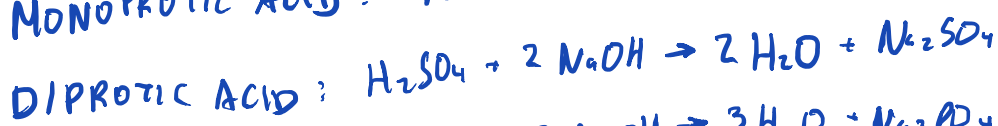
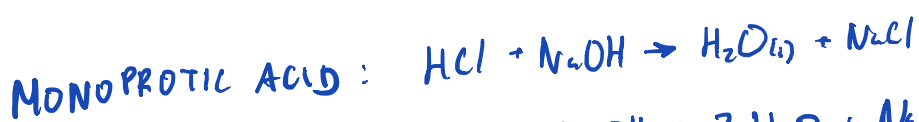
∴ The CH_3COOH will start acting like a strong acid in presence strong base

STRONG BASE FORCES A WEAK ACID
INTO COMPLETE DISSOCIATION!!

ex. What volume of 0.100 M HCl sol'n is needed to neutralize 25.0 mL of 0.350 M NaOH sol'n?



$$\underbrace{\frac{0.350 \text{ mol NaOH}}{\text{L}} \times \frac{1 \text{ mol OH}^-}{1 \text{ mol NaOH}} \times 0.025 \text{ L}}_{\text{mol OH}^-} \times \frac{1 \text{ mol H}^+}{1 \text{ mol OH}^-} \times \frac{1 \text{ mol HCl}}{1 \text{ mol H}^+} \times \frac{1.0 \text{ L}}{0.10 \text{ mol HCl}} = 8.75 \times 10^{-2} \text{ L}$$



↑ of acidic hydrogens

TITRATION

- Titrant (conc. already known)
- Sol'n (unknown conc.)
- equivalence point (can be determined with dye)

A KOH sol'n is standardized by titrating against sulfamic acid, HSO_3NH_2 . If 34.20 mL of the base are needed to neutralize 0.395 g of the acid, find the molarity of KOH.



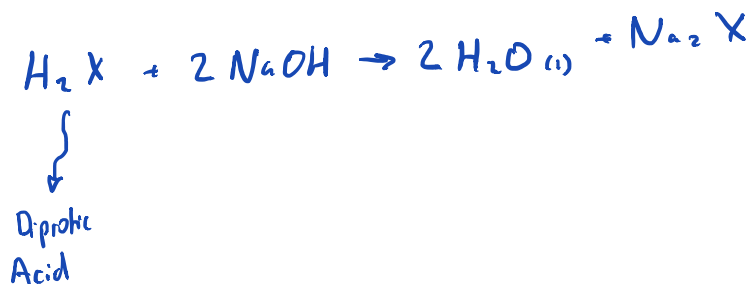
$$0.395 \text{ g } \text{HSO}_3\text{NH}_2 \times \frac{1 \text{ mol}}{97.0 \text{ g}} \times \frac{1 \text{ mol KOH}}{1 \text{ mol } \text{HSO}_3\text{NH}_2} = 4.07 \times 10^{-3} \text{ mol KOH}$$

$$[\text{KOH}] = \frac{4.07 \times 10^{-3} \text{ mol}}{0.0342 \text{ L}} = 0.119 \text{ M KOH} \quad (\text{well known} = \text{standard sol'n})$$

*Titration: reach 1st transition
from colorless to pink*

September 16, 2016

- ex. Titration of 6.50-g sample of a diprotic acid requires 137.5 mL of a 0.750 M NaOH sol'n for complete neutralization. Determine the molar mass of the acid.



$$\frac{0.750 \text{ mol NaOH}}{\cancel{\text{L}}} \times 0.1375\cancel{\text{L}} \times \frac{1 \text{ mol H}_2\text{X}}{2 \text{ mol NaOH}} = 5.156 \times 10^{-2} \text{ mol H}_2\text{X}$$

$$M.M. = \frac{6.50 \text{ g}}{5.156 \times 10^{-2} \text{ mol}} = 126 \text{ g/mol}$$

- ex. A sol'n is prepared by dissolving 15.0 g of NaOH in 150.0 mL of 0.25 M nitric acid.

Will the final sol'n be acidic, basic or neutral?

8 try at home if you want

Calculate the conc. of all of the ions present in the sol'n after the rxn has occurred.

$$15.0 \text{ g NaOH} \times \frac{1 \text{ mol NaOH}}{40.0 \text{ g}} = 0.38 \text{ mol NaOH} \quad \text{In excess}$$

$$0.150 \text{ L} \times \frac{0.25 \text{ mol HNO}_3}{\text{L}} = 0.038 \text{ mol HNO}_3$$

Basic