

Name: _____

Determination of the Molar Mass of a Monoprotic Acid
Back Titration - SCH 4U

Part I - Standardization of 0.1 M NaOH

Sodium hydroxide does not maintain an accurate concentration and must therefore be standardized against an acid of known concentration before use.

The HCl concentration used is: _____ M

Trial #	Volume HCl	Volume NaOH	[NaOH]
1			
2			
3			
4			
Average Concentration →			

Using the above data perform a **separate calculation** for each trial. **Average your answers.** Exclude Bad Results! **Show your work!**

Concentration of NaOH = _____ M

Part II - Determination of Solid Acid Molar Mass UNKNOWN = ___

Trial #	Mass of Solid Acid (2 g approx)	Volume NaOH Used	Volume HCl Required	Amount of Solid Acid	Molar Mass of Solid Acid
1		25 mL			
2		25 mL			
3		25 mL			
4		25 mL			
Average Molar Mass →					

Using the above data and the concentration that for NaOH from part one, **determine amount of solid MONOPROTIC acid for each trial.** Use this amount and your "mass of solid acid" to **determine the molar mass** of your solid acid. Show a **separate calculation** for each trial. **Average your molar mass.** Exclude Bad Results! **Show your NICE work!**

Concluding Questions:

1. What is the difference between an equivalence point and an endpoint?
2. What is the structure of phenolphthalein? Show both the acid form and the base form. Comment on what has happened with respect to the "chemical formula" of the phenolphthalein.
3. What is the advantage of a back titration for a determination of solid "weak" acids?
4. Common monoprotic solid acids are:

potassium binoxalate
potassium biphthalate
potassium bisulphate
sodium bisulphite
potassium bitartrate

Determine the molar mass of each acid. Show your work. Compare this with the molar mass you have obtained for your unknown. Decide which acid you think you had from this list. Perform a percent error calculation based on the molar mass values (experimental vs actual).