Titration of Acetic Acid in Vinegar Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Minneapolis Community and Technical College Section\_\_\_\_\_\_\_

**NaOH Standardization**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **KHP Trial 1** | **KHP Trial 2** | **KHP Trial 3** |
| **Mass: Beaker**  | *grams* |  |  |  |
| **Mass: Beaker + KHP**  | *grams* |  |  |  |
| **Mass: KHP**  | *grams* |  |  |  |
| **Molar Mass: KHP**  | *g/mol* |  |  |  |
| **Moles: KHP**  | *mol* |  |  |  |
| **Initial Burette: NaOH**  | *mL* |  |  |  |
| **Final Burette: NaOH**  | *mL* |  |  |  |
| **Volume: NaOH**  | *mL* |  |  |  |
| **Moles: NaOH**  | *mol* |  |  |  |
| **Concentration: NaOH**  | *M* | 8 decimal digits | 8 decimal digits | 8 decimal digits |
| **Average Concentration: NaOH**  | *(mol/L)* | 1. decimal digits
 |

**Vinegar Titration Calculations: (Refer to picture above)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  | **Vinegar Trial 1(Rough)** | **Vinegar Trial 2****(Careful)** | **Vinegar Trial 3****(Careful)** |
| **Average Concentration: NaOH** |  | *(mol/L)* |  |  |  |
| **Initial Burette: NaOH**  |  | *mL* |  |  |  |
| **Final Burette: NaOH**  |  | *mL* |  |  |  |
| **Volume: NaOH**  |  | *mL* |  |  |  |
| **Moles: NaOH**  |  | *mol* |  |  |  |
| **Moles: CH3COOH Beaker** |  | *mol* |  |  |  |
|  |  |  |  |  |  |
| **Pipette 2: Moles CH3COOH** |  | *mol* |  |  |  |
| **Pipette 2: Volume** |  | *mL* |  |  |  |
| **Pipette 2: CH3COOH Conc.** |  | *M* |  |  |  |
|  |  |  |  |  |  |
| **Volumetric Flask: Moles CH3COOH** |  | *mol* |  |  |  |
| **Volumetric Flask: Volume** |  | *mL* |  |  |  |
| **Volumetric Flask: CH3COOH Conc.** |  | *M* |  |  |  |
|  |  |  |  |  |  |
| **Pipette 1: Moles CH3COOH** |  | *mol* |  |  |  |
| **Pipette 1: Volume** |  | *mL* |  |  |  |
| **Pipette 1: CH3COOH Conc.** |  | *M* |  |  |  |
|  |  |  |  |  |  |
| **CH3COOH Concentration Vinegar** |  | *M* |  | 8 decimal digits | 8 decimal digits |
| **Average CH3COOH Concentration in Vinegar** |  | *M* |  | ***(With CORRECT significant figures)*** |

Questions:

1. For each standardization trial determine the following: molesKHP, molesNaOH, volumeNaOH and concentrationNaOH. Record your results in the data table with at least 8 decimal digits. Show all calculations below
2. Determine the average NaOH concentration with at least 8 decimal digits. Record this value in your data table.
Show all calculations below
3. Use the average standardized NaOH concentration and vinegar titration measurements to determine the number of moles of acetic acid ( beaker) in both of the “careful” vinegar titrations. Show all calculations below.

1. Determine the acetic acid concentration pipette 2. Show all calculations below.
2. Determine the acetic acid concentration in the 250 mL volumetric flask. Show all calculations below. 😊
3. Determine the UNDILUTED acetic acid concentration in the 20 mL pipette 1.
4. Determine the acetic acid concentration in the original store-bought vinegar. Show all calculations below. 😊
5. Convert the average acetic acid concentration in store-bought vinegar into mass percent. Show all calculations below.

 **Convert...** Molarity = **mol CH3COOH** /**L*solution***   **INTO** Mass % = **g CH3COOH**/ **g*solution*****x 100%**(**Densityvinegar = 1.005 g/mL**) .