Lab

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11/3/2021

Trial #1

Moles of NaOH

- $23 + 16 + 1.01 = 40.01$ g/mol
- $0.533M = \frac{x}{41.63mL}$
- $x = (0.533M) \cdot 0.04163L$
- $x = 0.022\text{mol NaOH}$

Mass of CH_3COOH

- Molar mass $= (12.01 * 2) + (1.01 * 4) + (16 * 2) = 60.06g/mol$
- $0.022\,\text{mol}\,CH_3COOH \cdot 60.06\,\text{g/mol} = 1.32\,g\,CH_3COOH$

Mass % of CH_3COOH

- $1.32\,g\,CH_3COOH\,/\,25.048\,g\,\text{vinegar} = 0.053 = 5.3\,\%\,CH_3COOH$

Relative Percent Error

- $\frac{5.3-5}{5} = 0.06 = 6\%$

Molarity of CH_3COOH

- $\text{M} = \frac{0.022\,\text{mol}\,CH_3COOH}{0.025\,\text{L Vinegar}} = 0.88\,\text{M}$

Trial #2

Moles of NaOH

- $23 + 16 + 1.01 = 40.01$ g/mol
- $0.533M = \frac{x}{42.25mL}$
- $x = (0.533M) \cdot 0.04225L$
- $x = 0.023\text{mol NaOH}$

Mass of CH_3COOH

- Molar mass $= (12.01 * 2) + (1.01 * 4) + (16 * 2) = 60.06 g/mol$
- $0.023\,\text{mol}\,CH_3COOH \cdot 60.06\,\text{g/mol} = 1.38\,g\,CH_3COOH$

Mass % of CH_3COOH

- $1.38\,g\,CH_3COOH\,/\,25.519\,g\,\text{vinegar} = 0.054 = 5.4\,\%\,CH_3COOH$

Relative Percent Error

- $\frac{5.4-5}{5} = 0.08 = 8\%$

Molarity of CH_3COOH

- $\text{M} = \frac{0.023\,\text{mol}\,CH_3COOH}{0.025\,\text{L Vinegar}} = 0.92\,x\,\text{M}$

Averages

Average Mass %

- $5.3 + 5.4/2 = 5.35\%$

Average Percent Error

- $\frac{6+8}{2} = 7\%$