

1. What is the % w/w of acetic acid in a vinegar solution? The amount of acetic acid ( $\text{HC}_2\text{H}_3\text{O}_2$ ) was determined by titrating 25.00 mL of vinegar (density = 1.01g/mL) with 1.102 M sodium hydroxide. The endpoint was reached when 20.78 mL of 1.1012M sodium hydroxide had been added. Phenolphthalein was the indicator.

- a. What color is the solution at the end point?
- b. Write the balanced equation.
  
- c. What how many moles of acetic acid are in 25.00 mL of vinegar?
  
- d. What is the mass of the moles of acetic acid?
  
- e. What is the mass of 25.00 mL of vinegar?
  
- f. What is the % (w/w) of acetic acid in vinegar?

2. How many micrograms of lead are in 20.00 mL of a solution that has 23ppb of lead?

3. If a bottle of wine is 11.2% ethanol (v/v) how many grams of ethanol are in 200 mL? The density of ethanol is 0.789g/mL. If there are 4 Cal/g of ethanol, how many calories are due to the ethanol?

4. Write the balance net ionic equation for the following reactions. If no reaction occurs, explain why.

- a. Sodium chloride + silver nitrate
  
- b. Barium nitrate + potassium chromate
  
- c. lithium chlorate + iron(II) acetate
  
- d. copper(I) phosphate + magnesium nitrate