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# VOLATILE ACIDITY (BY CASH STILL)

## WITH CORRECTION FOR SO<sub>2</sub>

### Equipment

- ☪ Cash Still apparatus, self-evacuating
- ☪ 10mL Volumetric Pipet, Class A
- ☪ 250mL Erlenmeyer Flask(s)
- ☪ 2 10mL Burets (25 mL can be used)
- ☪ 5 mL serological pipet or dispenser for Sulfuric acid
- ☪ Safety bulb

### Reagents

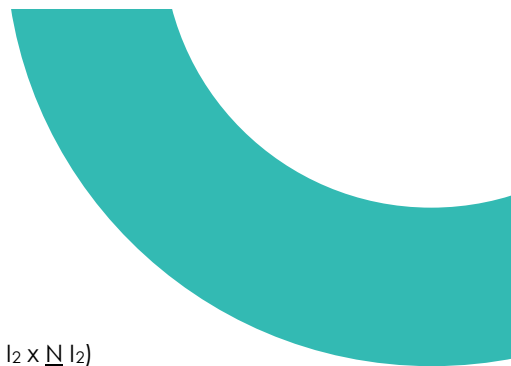
- ☪ 0.1N Sodium Hydroxide
- ☪ 1+3 Sulfuric Acid CAUTION: CORROSIVE
- ☪ 0.02N Iodine
- ☪ 1% Phenolphthalein Indicator
- ☪ 1% Starch Indicator
- ☪ Antifoam B

### Procedure

- ☪ Place approximately 500mL purified water in the outer chamber of the Cash still. Start cold water flow through the condenser. Rinse the inner chamber. Place exactly 10 mL of sample in the inner chamber. Add 2 drops of Antifoam B and rinse the funnel into the inner chamber with a few mL of water. Place an Erlenmeyer flask under the condenser to collect the distillate.
- ☪ Set the 3 way valve to vent the outer chamber and apply power to the heating element. When steam begins to escape, close the 3 way valve. Collect 125mL of distillate.
- ☪ Open the 3 way valve to vent the outer chamber and turn off the heating element power. Refill the outer chamber with water. Open the 2 way valve to remove the contents of the inner chamber. Rinse the inner chamber twice with water before introducing additional samples.
- ☪ Add 3 drops of phenolphthalein indicator and titrate the distillate with 0.1N NaOH to a durable pink color. Add 1mL starch indicator, 5mL sulfuric acid and titrate with 0.02N Iodine to a faint blue color.



Inspiring innovation.



## Calculations

$$\begin{aligned} \text{Volatile acidity (gm/100mL Acetic acid)} &= (0.60 \text{ mL NaOH} \times \underline{N} \text{ NaOH}) - (0.60 \text{ mL I}_2 \times \underline{N} \text{ I}_2) \\ &= 0.60 \times [(\text{mL NaOH} \times \underline{N} \text{ NaOH}) - (\text{mL I}_2 \times \underline{N} \text{ I}_2)] \end{aligned}$$

$$\text{If NaOH is } 0.10 \underline{N} \text{ and Iodine is } 0.02 \underline{N} \quad = (\text{mL NaOH} \times 0.06) - (\text{mL I}_2 \times 0.012)$$

## Notes

- Boiling with a dilute solution of sodium hydroxide should clean the inner chamber of the still. Boil with distilled water to remove all traces of sodium hydroxide
- Samples must be degassed prior to analysis.
- A blank may be run with DI water as a QC check.

## Disposal

Neutralize with Kolorsafe neutralizer and discard in sink.