

ORGANIC LAB 04b: Preparation of alcohol (fermentation)

Aim To make “wine”, distill the alcohol and proof the product

Apparatus 1.00 L plastic bottle with cap, 100. mL graduated cylinder, balance, distillation apparatus.

Chemicals Fruit juice (use conc. to avoid preservatives), water, sugar, dry baker's yeast

Method

1. Add fruit juice to the bottle; fill to approx. $\frac{1}{4}$ level.
2. Warm about 30.0 mL of water in a beaker on a hot plate add a spatula full of sugar to the warm water and 0.50 grams of yeast. Stir the mixture.
3. Add the yeast mixture to the juice, cap and shake.
4. Observe daily for pressure build up as CO_2 evolves. On a daily basis, release the pressure by loosening the cap and then re-sealing. In about a week most activity will have tapered off. The wine is ready to distill.
5. Carefully decant some of the mixture and distill wine in the usual manner. Try to maintain a temperature about 80°C near the side arm inside the distilling flask (this is not always possible). Collect distillate.
6. Let the distillate cool to room temp and find its density.
7. Obtain 100. mL of 95-100 % ethanol. Determine its density at room temp by weighing 100. mL of it.
8. Perform a serial dilution* of the ethanol, determine the densities of the resulting dilutions as you go.

*Serial dilution instructions

- A. Take 75.0 mL of ethanol and 25.0 mL of water and determine the density of this solution (A)
 - B. Take 75.0 mL of the solution (A) and add 25.0 mL of water, determine the density of this solution (B)
 - C. Take 75.0 mL of the solution (B) and add 25.0 mL of water, determine the density of this solution (C)
 - D. Take 75.0 mL of the solution (C) and add 25.0 mL of water, determine the density of this solution (D)
 - E. Take 75.0 mL of the solution (D) and add 25.0 mL of water, determine the density of this solution (E)
9. Plot a graph of % alcohol (x-axis) and density (y-axis). Use the graph to determine the % of the distillate you have made.

Results

% ethanol	Density (g/ml)
100	
75	
56	
42	
32	
24	
18	



Conclusion/Calculations

Use the % alcohol you have determined for your sample to calculate its proof.

