

DISTILLATION OF ETHANOL

LAB OVERVIEW

Level: Grades 9-16

Estimated Time to Completion: 90 Minutes

Prior Knowledge: Background Provided

In this lab investigation, students will become familiar with the distillation process using a simple distillation column under the context of ethanol purification.

A fermentation broth will be created or sampled from a previous lab. The broth will then undergo distillation in a simple distillation column. You will then analyze the purity of the product in terms of ethanol concentration.

Upon completion, students will be able to:

- Understand the relations of volatility and boiling points of substances.
- Purify a compound by separating its components based on their volatility.
- Apply the practice of distillation in the context of ethanol production.
- Identify and discuss the costs and benefits of ethanol distillation as a method of biofuel production.

MATERIALS REQUIRED

Yeast	Round Bottom Flask, 500mL (distillation flask)
Glucose	Round Bottom Flask, 250mL (receiving flask)
Ethanol	3-Way Adapter (distilling adapter, distillation head)
Beaker, 250mL	Water-Jacketed Condenser
Weigh Boats	Receiving Adapter
Pipet, 10mL	Keck Clips
Graduated Cylinder, 100mL	Stand and Clamps
Brix RI Meter	
Ethanol Probe	

NOTES TO INSTRUCTOR

- It is recommended that several batches of fermentation broth are prepared ahead of time and distributed to students so the solution is consistent among groups. A fermentation broth may be produced by following the same procedure as the fermentation lab. Alternatively, students may prepare the broth during the “down time” of the fermentation lab.
- A distillation glassware kit may be purchased alternatively to the above materials.
- A detailed description of the distillation apparatus can be found in the “Supporting Materials” folder of the downloadable lab package.
- Additionally, a movie tutorial of recommended procedure can also be found at:
<http://youtu.be/K8jXmOvNA9Q>