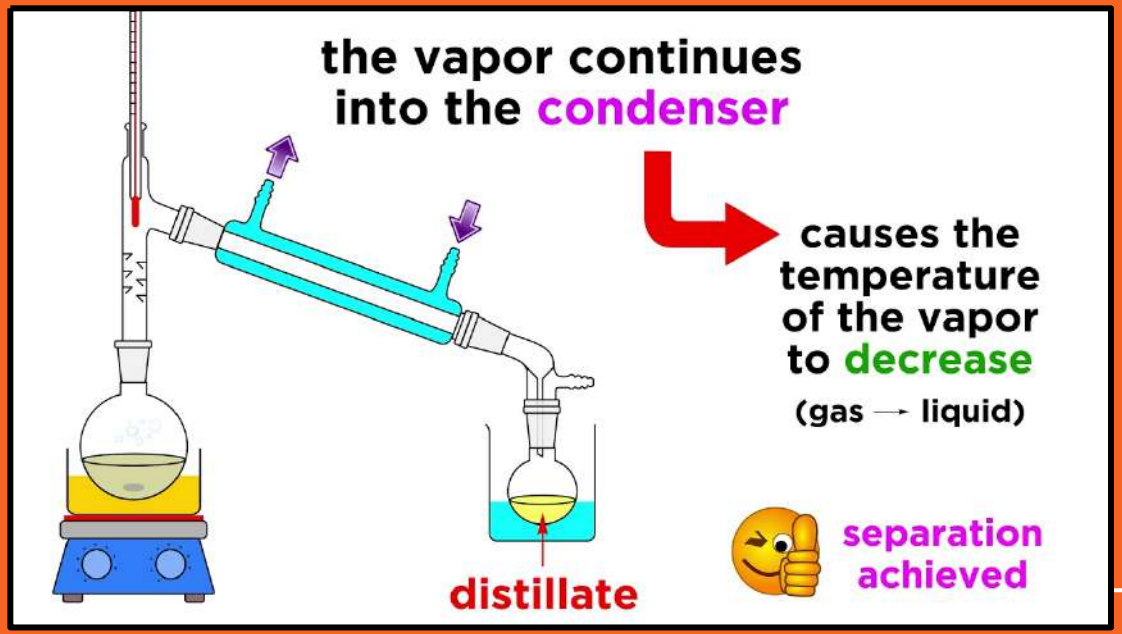
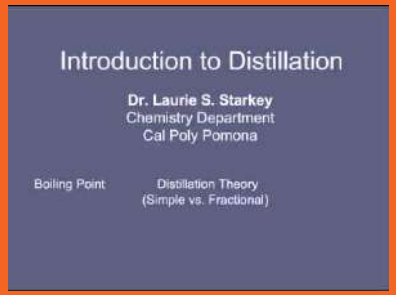
Introduction to Organic Distillation Techniques





As you watch the video on each slide, answer the questions on the other! When finished, please submit your slides to google classroom. Click on your first video above to see concepts you will learn about!

Video credits to Dr. Laura Starkey and MERLOT of the California State University System

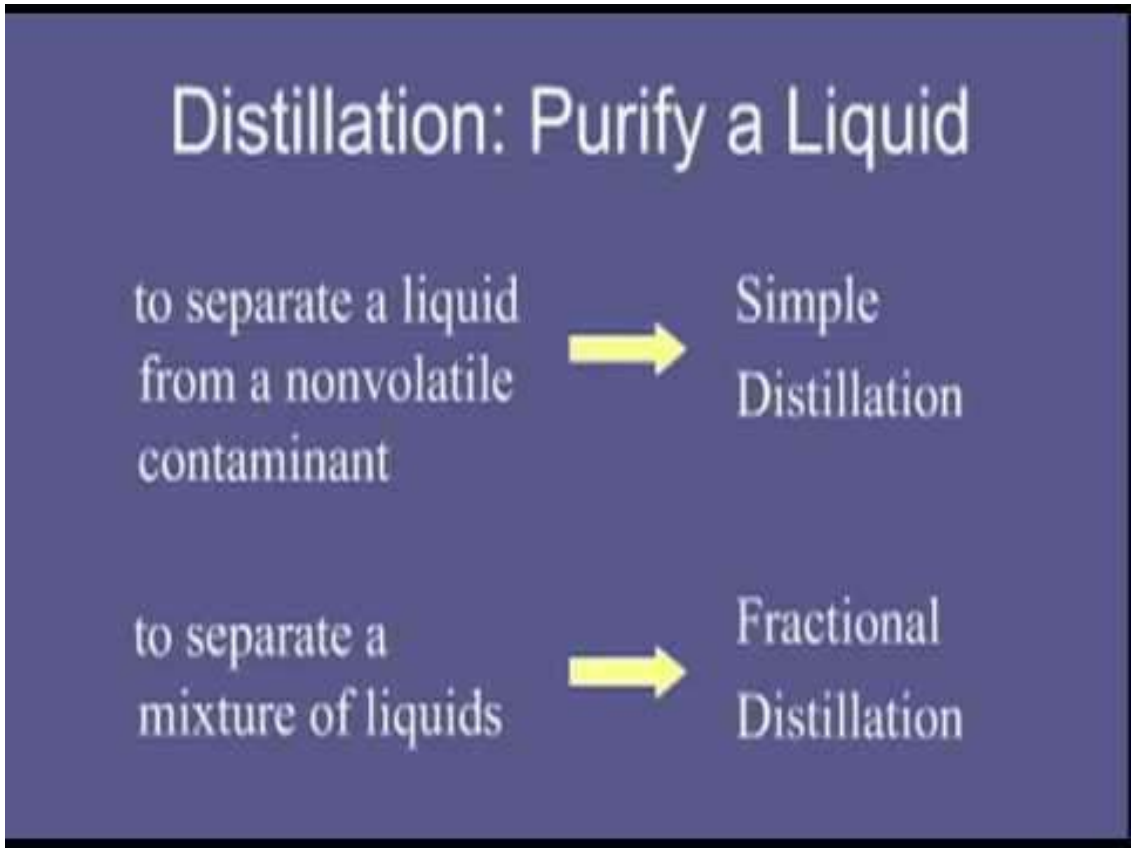
Types of Distillation

1. What is the purpose of distillation?

Answer

1. List the 2 types of distillation and give an example of each

Answer



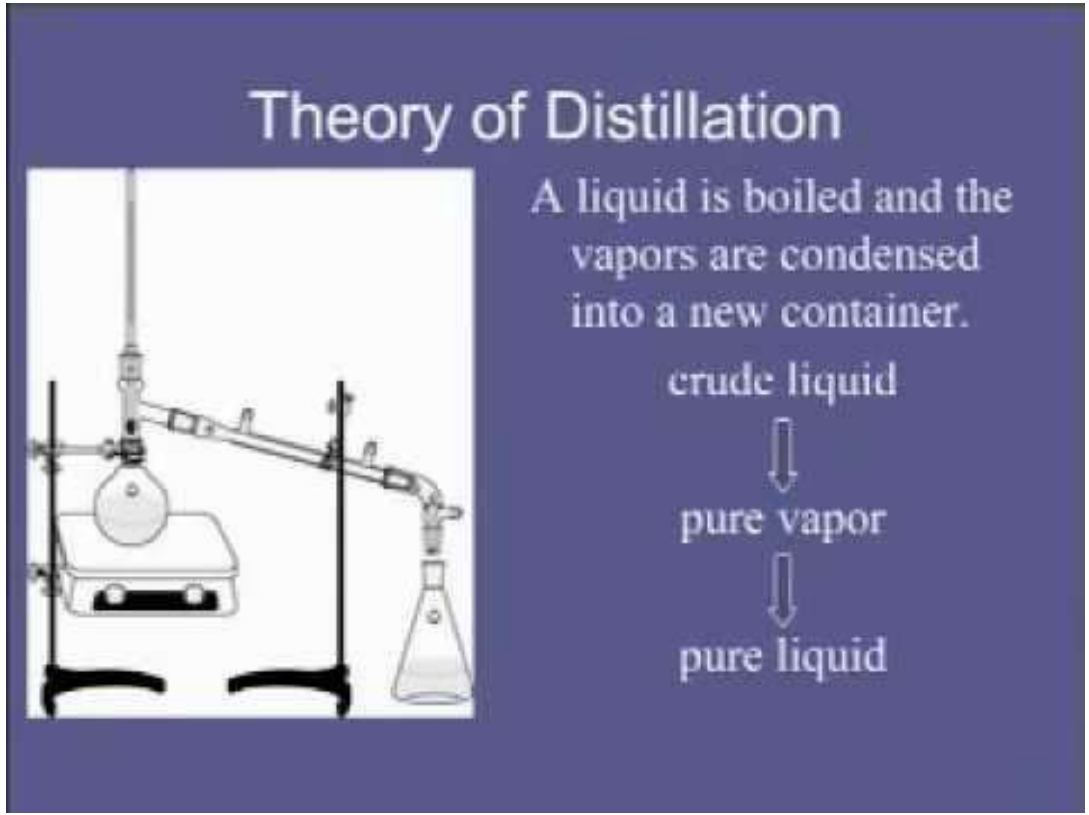
Theory of Distillation

Organize the THREE basic steps by dragging the boxes and arrows where they need to be after watching the video clip

Pure vapor

Crude liquid

Pure Liquid



Simple Distillation

1. What liquid is used to cool the condenser?

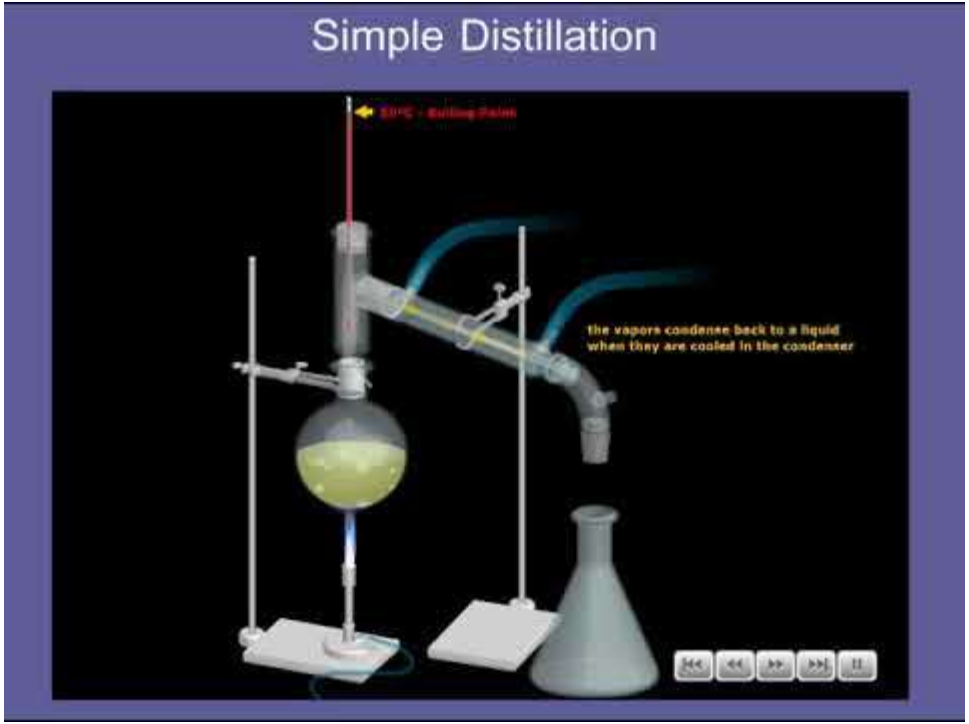
Answer

1. How do we know if the vapor is pure?

Answer

1. What are the collected droplets called?

Answer



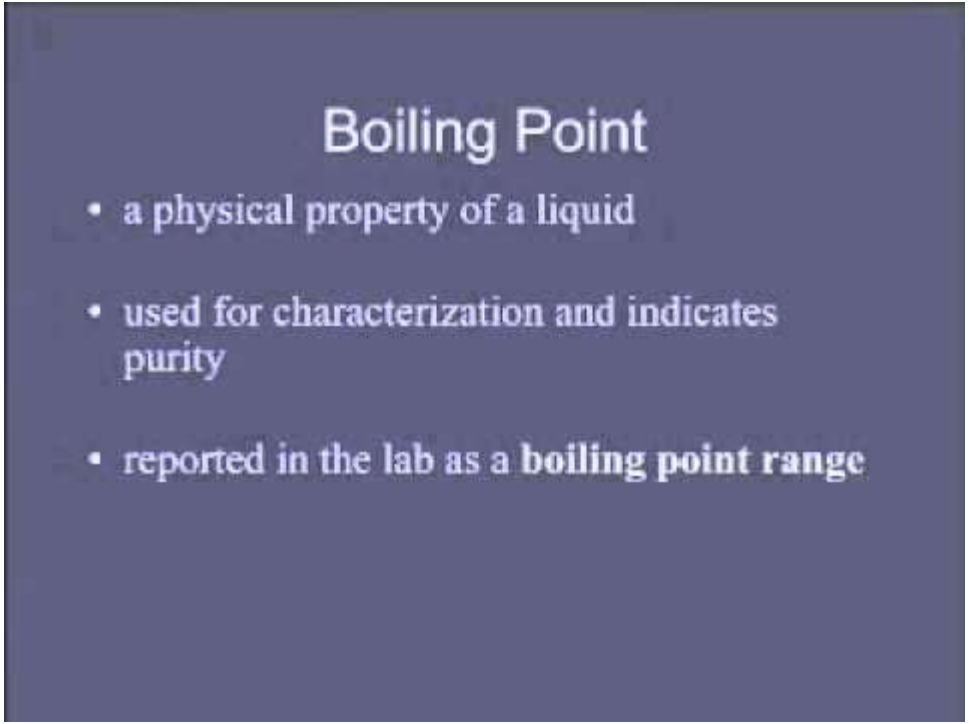
Boiling Point

1. Is “boiling point” a singular value?

Answer

1. What is a good indication of a pure liquid?

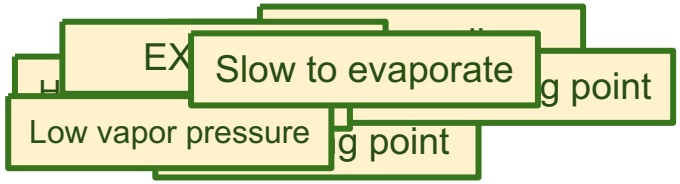
Answer

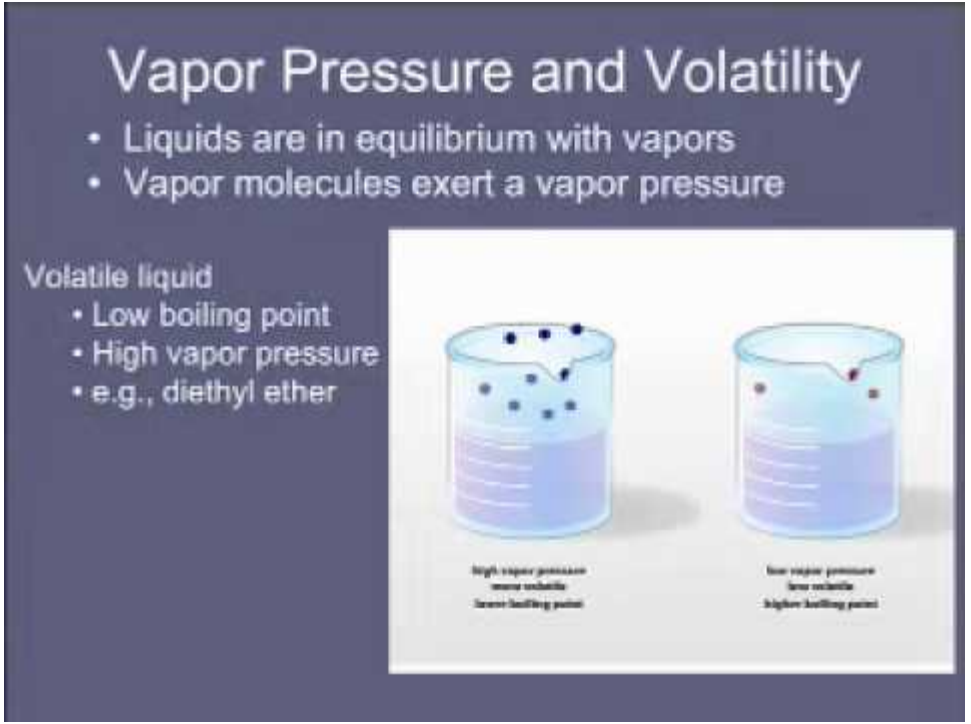


Vapor Pressure and Volatility

Drag the properties to the proper column that describe each term

Volatile Liquid	Non-Volatile Liquid

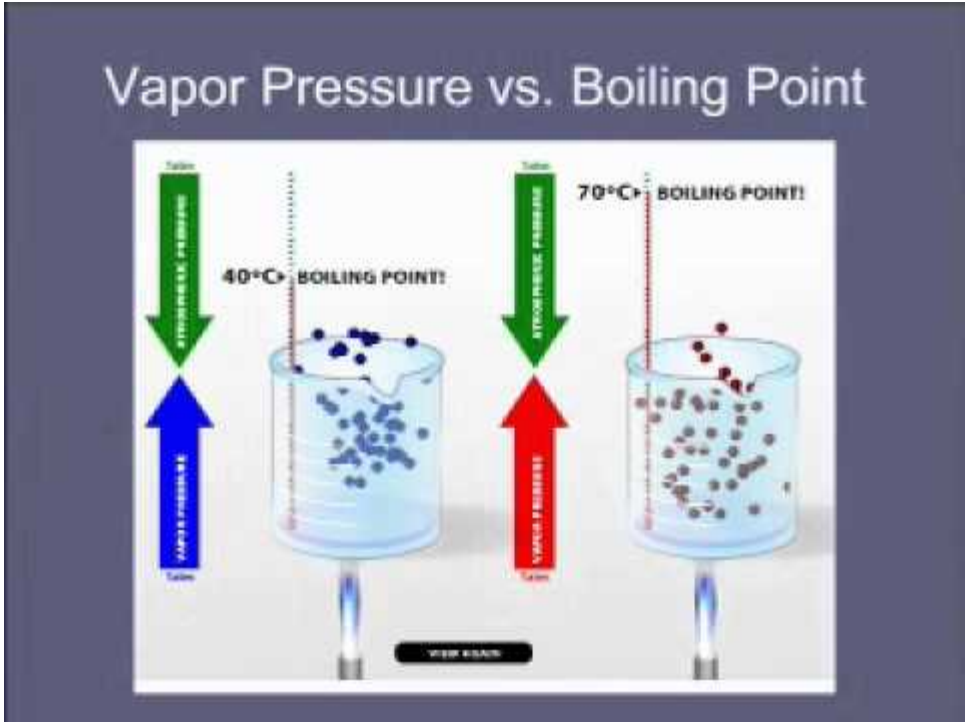




Vapor Pressure Vs. Boiling Point

Explain why volatile substances boil at low temperatures - what is going on with the different pressures?

Answer



The Purpose of Boiling Chips

1. What is a superheated liquid?

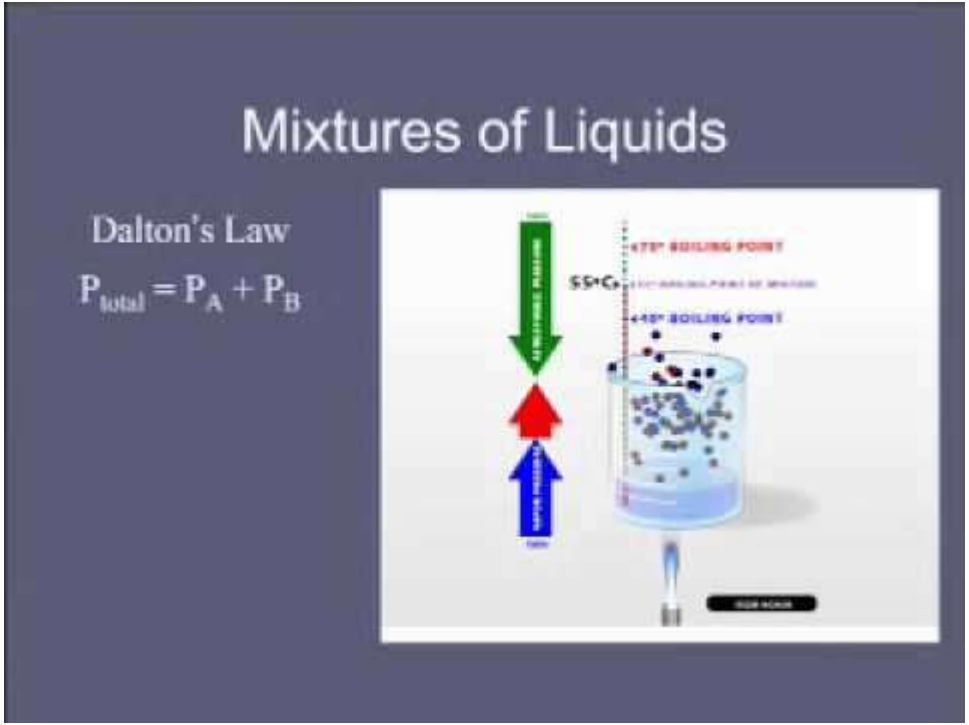
Answer

1. What are 2 ways to prevent a superheated liquid
    a. Answer
    b. Answer

Mixtures of Liquids

Fill in the blanks:

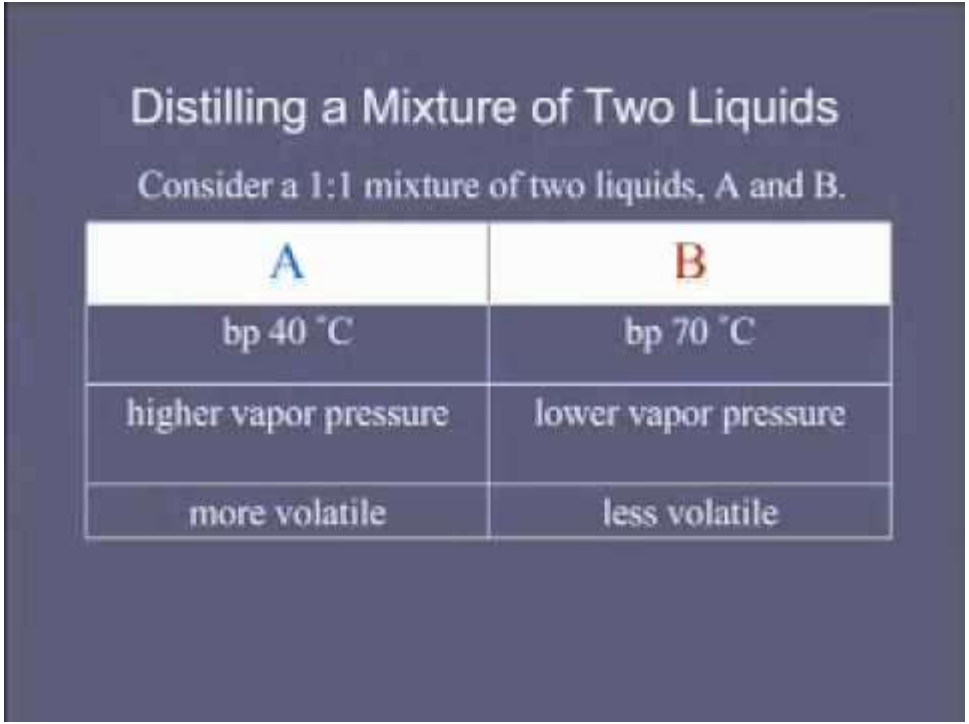
1. A mixture of liquids will have a mixture of ___ above the surface.
2. Dalton's law states that the total pressure above the liquid will be the ___ of both of the partial pressures.
3. Because both liquids contribute to the total vapor pressure, the boiling temperature will be ___ the boiling points of both liquids.
4. Even with a 1:1 ratio, the vapor pressure will have a greater concentration of the gas with the ___ boiling point.
5. If there is a large amount of A in the liquid mixture, there will be a ___ amount of A in the vapor mixture.



Distilling a Mixture of Two Liquids

What do you predict the mixture of the vapors to be like?

Answer



Simple Distillation: Changing Vapor Compsition

Distillation Process	Temperature	Composition of Vapors
Beginning		
Middle		
End		

Lowest

Highest

Mostly A

Mostly B

Middle

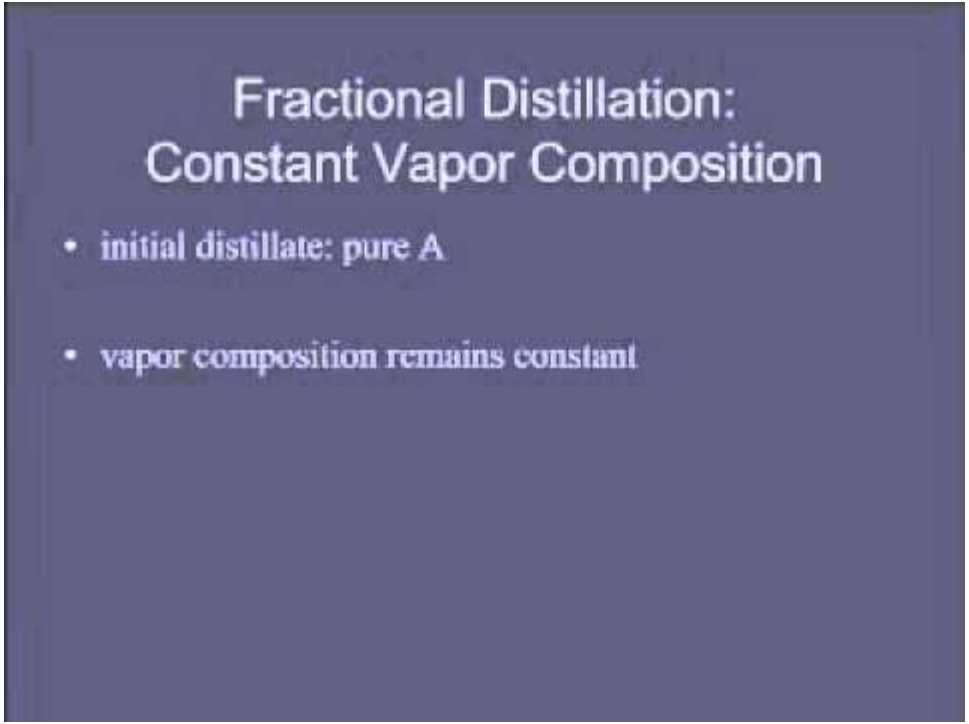
Slightly more B

Drag and drop the terms into the chart after watching the clip!

Fractional Distillation: Constant Vapor Composition

1. List 2 Things that can be “packed” into a fractional distillation column:
   a. Answer
   b. Answer
2. How is fractional distillation different than simple distillation?

   Answer



Greasing Ground-Glass Joints

1. What are ground-glass joints?
    a. Answer
2. How can you tell if a ground-glass joint is greased?
    a. Answer
3. What are 2 solvents you could use to clean off the excess grease?
    a. Answer
    b. Answer

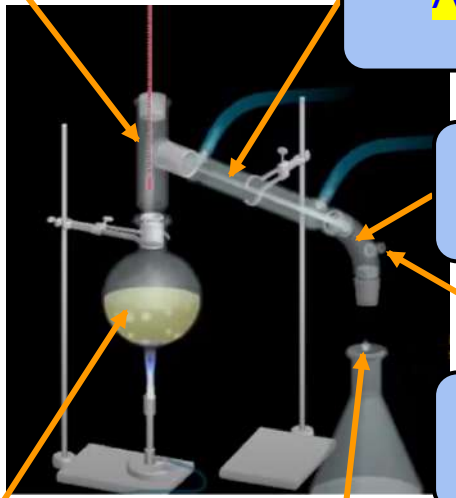
Heat Sources

Fill out the table:

Heat Source	Pro	Con

Setting up a Simple Distillation Apparatus

Name the things the arrows are pointing to.



Answer

Answer

Answer

Answer

Answer

Answer

Fractional Distillation Apparatus

1. What “changes” do need to make to your “simple” set-up for fractional distillation?
    a. Answer
    b. Answer
2. What is “reflux”?
    a. Answer

Running a Distillation

Drag/drop the steps from the video in order.

1. Record the temperature
2. Set up your fractional distillation
3. Double check fittings and clamps
4. Monitor the appearance of vapor
5. Monitor thermometer temperature
6. Wrap the column in a “jacket”
7. Gently turn on the water (enters bottom, exits top)
8. Begin heating your solution

.

Dismantling a Distillation

True or False

You should wait until the round bottom flask has completely cooled before you remove the heating mantel.

(Drag the oval around the correct answer)

Common Mistakes

Provide the solutions for the common mistakes to avoid from the video clip:

1. Condenser isn't filling with water
   a. Answer
2. Glass fittings not tight
   a. Answer
3. Thermometer not registering correctly
   a. Answer
4. Experiencing reflux
   a. Answer
5. Heating mantle plugged directly into the outlet
   a. Answer

Congratulations you are almost done with chemistry for today!

Click the flask below to complete your exit ticket! Don't forget to "turn in" your edited slides!