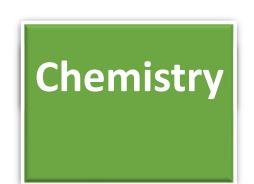
42.1 Forming & Separating Solutions



Summarize main points from each video.

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Topic Introduction



Summarize your understanding of each paragraph.

In chemistry, a solution is a homogeneous mixture composed of two

or more substances. In such a mixture, a solute is a substance dissolved in another substance, known as a solvent.
Body fluids are examples for complex liquid solutions, containing many solutes. Many of these are electrolytes, since they contain solute ions, such as potassium. Furthermore, they contain solute molecules like sugar and urea.
Distillation is the process of separating the components or substances from a liquid mixture by selective boiling and condensation. Distillation may result in essentially complete separation, or it may be a partial separation that increases the concentration of components.
Fractional distillation is the separation of a mixture into its component parts, or fractions. Chemical compounds are separated by heating them to a temperature at which one or more fractions of the mixture will vaporize.

Read/Summarize Text



- 1. Read the passage.
- 2. Underline key expressions in each sentence.
- 3. Re-write each word (or expression) you underlined.
- 4. Summarize the passage.

Re-write words you underlined

Chromatography – A "Separation Technique"

Chromatography is a laboratory technique for the separation of a mixture. The mixture is dissolved in a fluid called the mobile phase, which carries it through a structure holding another material called the stationary phase.

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The various constituents of the mixture travel at different speeds, causing them to separate. The separation is based on differential partitioning between the mobile and stationary phases. Subtle differences in a compound's partition coefficient result in differential retention on the stationary phase and thus affect the separation.

https://en.wikipedia.org/wiki/Chromatography

					3
Using a complete	sentence, sun	nmarize or rep	ohrase the pas	sage	
					4

Read Text for Comprehension

Read this article for deeper understanding. No summary is required, although you may want to circle, underline, or mark key ideas and words.

Fractional Distillation – Petroleum Refineries

Fractional distillation is the most common form of separation technology used in petroleum refineries, petrochemical and chemical plants, natural gas processing and cryogenic air separation plants. In most cases, the distillation is operated at a continuous steady state. New feed is always being added to the distillation column and products are always being removed. Unless the process is disturbed due to changes in feed, heat, ambient temperature, or condensing, the amount of feed being added and the amount of product being removed are normally equal. This is known as continuous, steady-state fractional distillation.

Industrial distillation is typically performed in large, vertical cylindrical columns known as "distillation or fractionation towers" or "distillation columns" with diameters ranging from about 65 centimeters to 6 meters and heights ranging from about 6 meters to 60 meters or more. The distillation towers have liquid outlets at intervals up the column which allow for the withdrawal of different fractions or products having different boiling points or boiling ranges. By increasing the temperature of the product inside the columns, the different hydrocarbons are separated. The "lightest" products (those with the lowest boiling point) exit from the top of the columns and the "heaviest" products (those with the highest boiling point) exit from the bottom of the column.

In the United States, for various complex economic and political reasons, the construction of new refineries came to a virtual stop in about the 1980s. However, many of the existing refineries in the United States have revamped many of their units and/or constructed add-on units in order to: increase their crude oil processing capacity, increase the octane rating of their product gasoline, lower the sulfur content of their diesel fuel and home heating fuels to comply with environmental regulations and comply with environmental air pollution and water pollution requirements.

Create an Illustration



Using your notes and understanding of the distillation process and the fractional distillation process, draw a "conceptual design" of a set-up to separate gasoline and diesel fuel that were accidentally mixed together.

Create Graphs

Assume kerosene (10%), gasoline (25%), and diesel fuel (remaining amount) were mixed together before shipping in steel barrel containers.

The mixture from the barrels needs to be separated into the component parts before being useful.

Create a matrix/table with the volumes (percentage amount) of each component. Then draw two graphs illustrating and comparing the volumes of each component. Draw a bar graph and a pie chart.

Show-Off Your Smarts!



Instructions

- Use critical thinking skills to respond to each question posed.
- Write complete sentences.
- Write 30 or more words for each response.

Q1. How can this information be applied to a young-person's life?
Q2. How does this information apply to (or impact) communities?
Q3. How does this topic connect to other science topics or math?

Make a Poster

In the space provided here, create/draw a poster which conveys the concepts you have learned on this topic. Use a process, hierarchy, relationship diagram, and one additional sketch of any kind.

Telationship diagram, and one add	
Process	Hierarchy
Dolationship	
Relationship	Sketch