Experiment 24: Dehydration

Explore the properties and reactivities of olefins. Prepare an olefin from an alcohol by dehydration. Apply the techniques of separation, distillation and boiling point determination.

Preparations

Read: Experiment 24 - Preparation of 4-methyl cyclohexene (page 209)
Reactions and properties of olefins in your lecture text

Do: Prepare your lab notebook:
- State experiment objectives (for each part assigned)
- List materials used w/ properties (solvents used in previous experiments do not need to be repeated)
- Make a procedures bullet list (for each part assigned)

Intended Learning Outcomes

* Know an unsaturation is a double or triple bond (two carbons less than saturated with hydrogen).
* Know olefins are hydrocarbons containing an unsaturation.
* Know burning olefins produces less heat than alkanes, but produces a hotter flame.
* Identify cis or trans isomers of an olefin.
* Know alcohols are hydrocarbons substituted with a hydroxy group.
* Identify primary, secondary, and tertiary alcohols.
* Know a dehydration reaction is a chemical reaction that eliminates water.
* Show the E1 mechanism for dehydration of an an alcohol.
* Use that mechanism to explain why dehydration reactivity is greater for tertiary than secondary than primary alcohols.
* Predict the product of the dehydration of an alcohol.
* Apply Zaitsev's rule to predict which dehydration product is favored among regio-isomeric products.
* Know thermodynamically trans olefins are favored over cis in dehydration reactions.

Report

Prepare a report for this experiment according to this experiments report description for the parts we accomplished. Include the questions with answers for this experiment, except any your instructor tells you to omit.