

## Reactions of Alcohols

Name \_\_\_\_\_

1. These six molecules include alkanes, alkenes and alcohols.

a) State which molecules belong to which group.

Write your answer underneath each molecular structure.

$\begin{array}{c} \text{H} & & \text{H} \\ & \diagdown & / \\ & \text{C}=\text{C} \\ & / & \diagdown \\ \text{H} & & \text{H} \end{array}$	$\begin{array}{c} \text{H} \\   \\ \text{H}-\text{C}-\text{H} \\   \\ \text{H} \end{array}$	$\begin{array}{c} \text{H} & \text{H} \\   &   \\ \text{H}-\text{C} & -\text{C}-\text{O}-\text{H} \\   &   \\ \text{H} & \text{H} \end{array}$

$\begin{array}{c} \text{H} \\   \\ \text{H}-\text{C}-\text{OH} \\   \\ \text{H} \end{array}$	$\begin{array}{c} & & \text{H} \\ & &   \\ \text{H} & & \text{C}-\text{H} \\ & \diagdown & / \\ & \text{C}=\text{C} \\ & / & \diagdown \\ \text{H} & & \text{H} \end{array}$	$\begin{array}{c} \text{H} & \text{H} & \text{H} & \text{H} \\   &   &   &   \\ \text{H}-\text{C} & -\text{C} & -\text{C} & -\text{C}-\text{H} \\   &   &   &   \\ \text{H} & \text{H} & \text{H} & \text{H} \end{array}$

b) Name each of the substances in part a).

Write your answer in the same boxes.

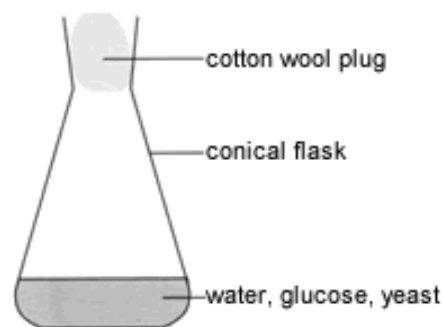
c) Using one of the molecules shown, circle the alcohol functional group.

2. Janice and Matt set up this equipment then waited for one week.

A chemical reaction takes place in which new substances are made.

a) Complete the word equation for this reaction:

Glucose  $\square$  \_\_\_\_\_ + carbon dioxide



b) Complete the symbol equation for the reaction.



c) What is the name given to the type of reaction taking place?

\_\_\_\_\_

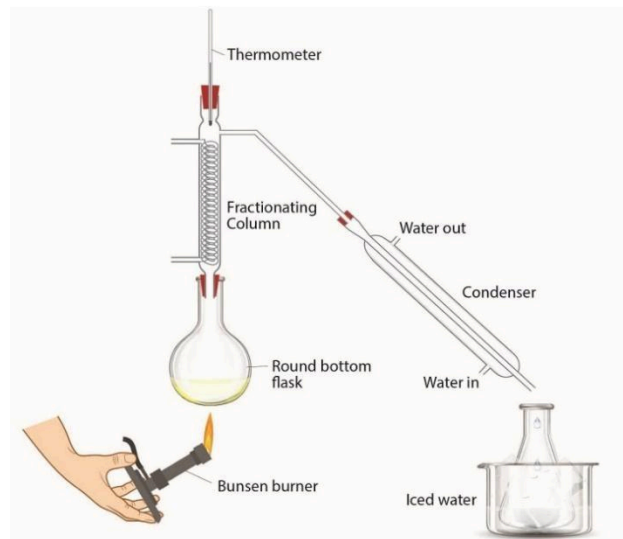
d) Explain why yeast is used in the experiment.

\_\_\_\_\_

Janice and Matt then add the mixture from the conical flask to the round-bottom flask in a different experiment.

e) What is the purpose of this new experiment?

\_\_\_\_\_



Source: Royal Society of Chemistry

f) Explain how this experiment works.

\_\_\_\_\_

g) What is the name of this technique or experiment?

\_\_\_\_\_

h) Give two uses of alcohols.

\_\_\_\_\_

3. Ravi carries out an experiment with a mixture of ethanol dissolved in water.

He leaves the ethanol open to the air for two weeks.  
He notices that a very slow chemical reaction takes place.  
He removes a few drops of his new mixture and adds some universal indicator solution.  
He notices that the indicator turns orange.

a) **What type of substance has formed?**

b) **What is the name of the new organic product formed?**

c) **State the name of the chemical substance that reacts with ethanol in this reaction.**

d) **What type of reaction has taken place?**

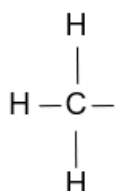
e) **Ravi knows that a different chemical substance could be added to ethanol to make the same product, but a lot faster.**

State the name of this substance.

f) **Complete the chemical equation that shows the reaction taking place:**



g) **Complete the diagram to show the structure of the new organic product made.**



3. **Complete and balance the following reactions. Name the ester produced.**

a) **butanoic acid + ethanol**

- b) **propanoic acid + methanol**
  
- c) **butanoic acid + 1-butanol**
  
- d) **benzoic acid + methanol**
  
- e) **benzoic acid + 3-methyl-1-butanol**
  
- f) **butanoic acid + phenol**