1. These six molecules include alkanes, alkenes and alcohols.
2. State which molecules belong to which group.

Write your answer underneath each molecular structure.

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| Answer: Alkene: ethene. | Answer: Alkane: methane. | Answer: Alcohol: ethanol. |

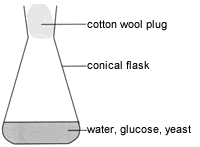
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| Answer: Alcohol: methanol. | Answer: Alkene: propene. | Answer: Alkane: butane. |

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

Answer: See answers above.

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

Answer: See diagram of ethanol in which the O-H (hydroxyl) group is circled.

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

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

1. Complete the word equation for this reaction:

Glucose 🡪 ethanol + carbon dioxide

1. Complete the symbol equation for the reaction.

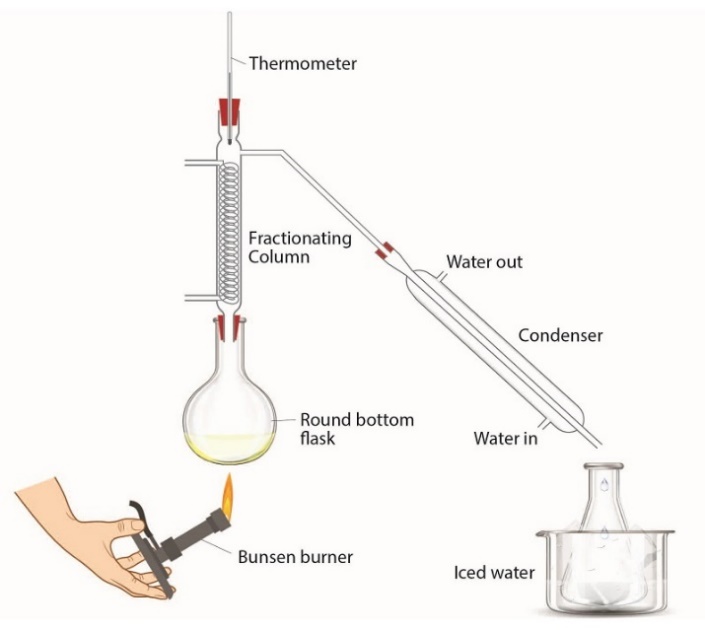
C6H12O6(aq) 🡪 2C2H5OH(aq) + 2CO2(g)

1. What is the name given to the type of reaction taking place?

Answer: Fermentation.

1. Explain why yeast is used in the experiment.

Answer: Yeast contains an enzyme that makes the fermentation happen at a faster rate.

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

1. Why is this new experiment needed?

Answer: To separate the ethanol from the aqueous

solution.

1. Explain how this experiment works.

Answer: Ethanol has a lower boiling point than water, so is able to form a vapour that can be removed and condensed.

Source: Royal Society of Chemistry

Source: Royal Society of Chemistry

1. What is the name of this technique or experiment?

Answer: Fractional distillation.

1. Give two uses of alcohols.

Answer: Solvent, fuel.

1. 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.

1. What type of substance has formed?

Answer: A weak acid.

1. What is the name of the new organic product formed?

Answer: Ethanoic acid.

1. State the name of the chemical substance that reacts with ethanol in this reaction.

Answer: Oxygen, from the air (in the presence of certain bacteria).

1. What type of reaction has taken place?

Answer: Oxidation.

1. 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.

Answer: Acidified potassium manganate(VII) [OCR] or acidified potassium or sodium dichromate(VI) [AQA].

1. Complete the chemical equation that shows the reaction taking place:

C2H5OH + 2[O] 🡪 CH3COOH + H2O

1. Complete the diagram to show the structure of the new organic product made.

