Alcohols and their reactions

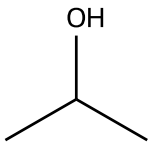
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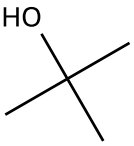
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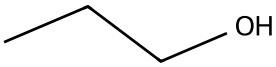
Name _____ Date _____

1. Classify three structures

Classify structures A, B and C as primary, secondary or tertiary alcohols. Explain your rule.

A 

B 

C 

2. Explain the boiling point

Propan-1-ol boils at 97 °C. Butane has a similar molar mass but boils at about −1 °C. Explain the large difference.

3. Collect the distillate

A student adds acidified potassium dichromate(VI) to butan-1-ol and distils the organic product as it forms. Identify the intended product, write an equation using [O] and explain the choice of distillation.

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4. Predict the reflux product

A second student heats 2-methylpropan-1-ol under reflux with excess acidified potassium dichromate(VI). Identify the organic product. Write the equation using [O] and explain how the conditions favour that product.

5. Compare two test results

Butan-2-ol and 2-methylpropan-2-ol are warmed separately with acidified potassium dichromate(VI). Give the usual colour change or lack of change and name any organic product.

6. Predict two structures

Butan-2-ol is heated in the presence of concentrated phosphoric acid. Write condensed formulae for the two structural alkene products and name the reaction type.

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7. Build a two-stage route

Suggest a two-stage route from ethene to ethanal. Identify the intermediate, the reagent or reagents for each step, and how you collect the ethanal.

8. Prepare a haloalkane from an alcohol

A student heats propan-1-ol with sodium bromide and sulfuric acid. Give the name of the organic product and an equation using HBr to represent the reacting species. Name the reaction type.

9. Extra challenge · Identify the alcohol and plan two routes

An alcohol has formula $C_4H_{10}O$. Heating it with acidified dichromate turns the mixture green and gives a ketone. Identify the alcohol and write the oxidation equation using [O].

Use the same starting alcohol to make a haloalkane and, in a separate reaction, two structural alkene products. Give the reagents or conditions, name the types of reaction and draw the organic products.

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