

# Dehydration reactions of alcohols

Answer all the questions below then check your answers

1. What is formed when alcohols are heated with concentrated sulfuric or phosphoric acids?
  - a. What type of reaction is this?
2. Draw the mechanism to show how propan-2-ol can be dehydrated with concentrated sulfuric acid to form propene.
  - a. Write an equation for this reaction.
3. Cyclohexanol can be dehydrated with concentrated phosphoric acid to form cyclohexane.
  - a. Draw the mechanism for this reaction.
  - b. Write an equation to show this dehydration reaction.
4. 3-methylbutan-2-ol can be dehydrated with concentrated sulfuric acid to form two isomers.
  - a. Draw the displayed formula for 3-methylbutan-2-ol.
  - b. Draw the structure of each of the two isomers that are formed when 3-methylbutan-2-ol is dehydrated.

## Answers

1. What is formed when alcohols are heated with concentrated sulfuric or phosphoric acids?

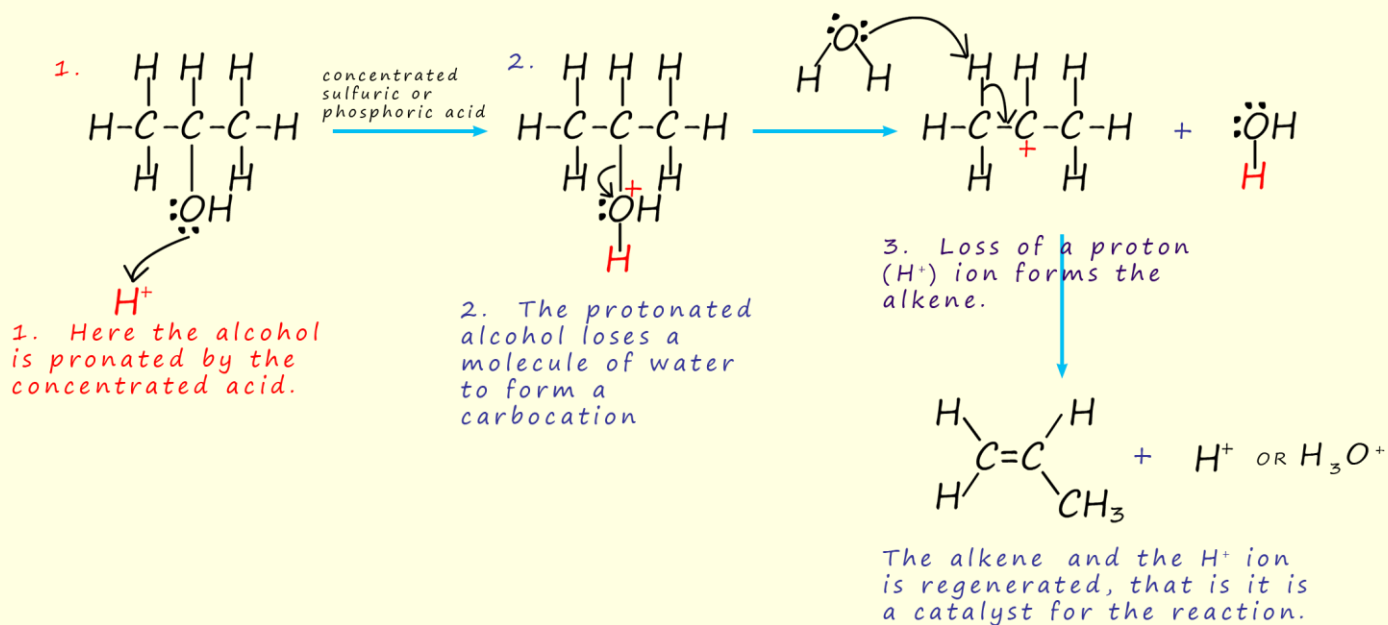


- a. What type of reaction is this?

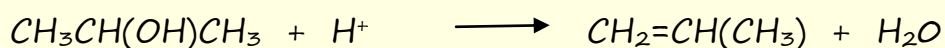
Elimination reaction.

2. Draw the mechanism to show how propan-2-ol can be dehydrated with concentrated sulfuric acid to form propene.

The mechanism is shown on the webpage, it is also copied below:

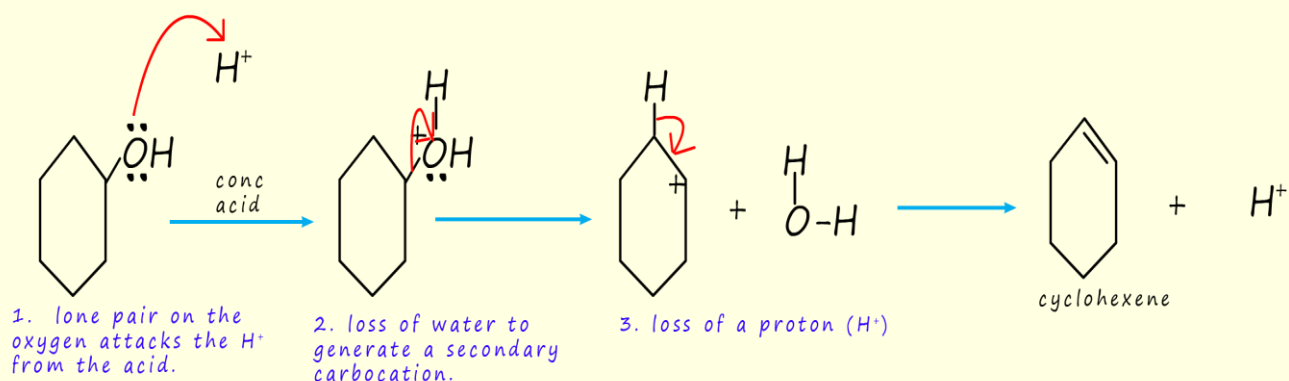


- a. Write an equation for this reaction.

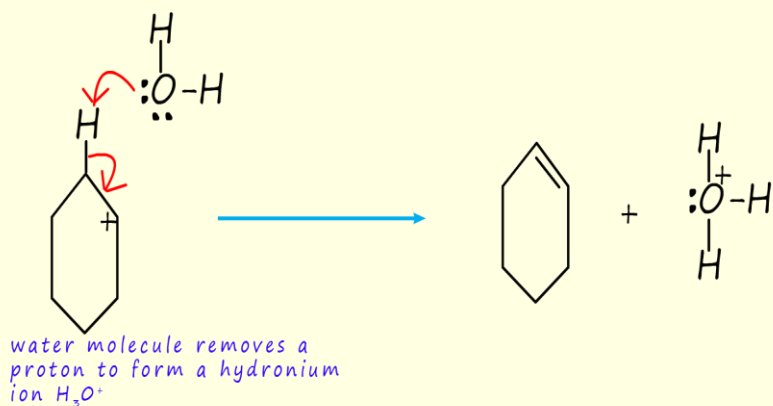


3. Cyclohexanol can be dehydrated with concentrated phosphoric acid to form cyclohexene.

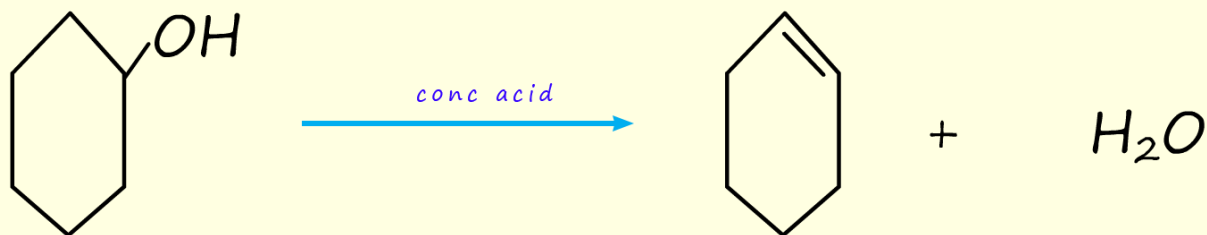
a. Draw the mechanism for this reaction.



OR



b. Write an equation to show this dehydration reaction.

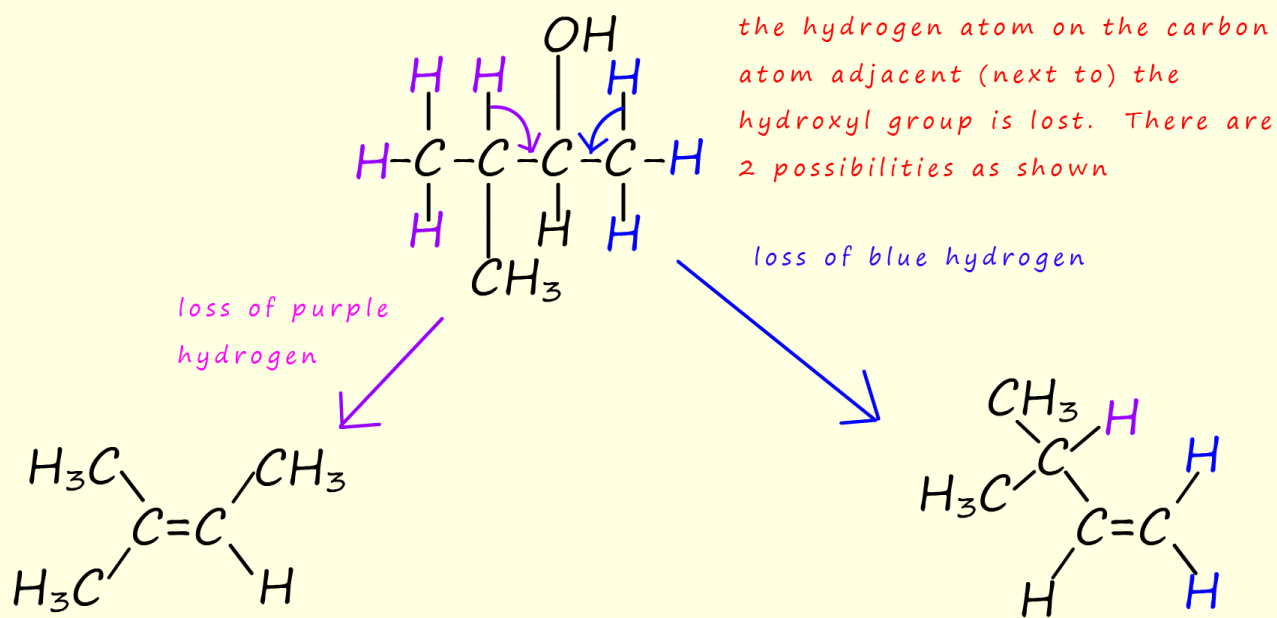


4. 3-methylbutan-2-ol can be dehydrated with concentrated sulfuric acid to form two isomers.

a. Draw the displayed formula for 3-methylbutan-2-ol.

Shown below

b. Draw the structure of each of the two isomers that are formed when 3-methylbutan-2-ol is dehydrated.



The table below shows the formula and structure for the first 4 alcohols.

a. sodium + ethanol  $\longrightarrow$

ii Na + C<sub>2</sub>H<sub>5</sub>OH  $\longrightarrow$

b. sodium + propanol  $\longrightarrow$

ii Na + C<sub>3</sub>H<sub>7</sub>OH  $\longrightarrow$

