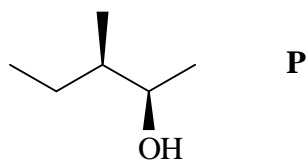
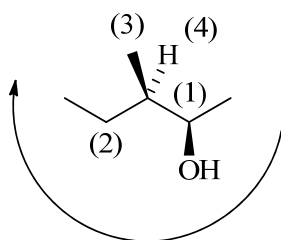


Marks
8

- The structure of a chiral molecule, **P**, is shown below. **P** has a specific optical rotation of $+26^\circ$.

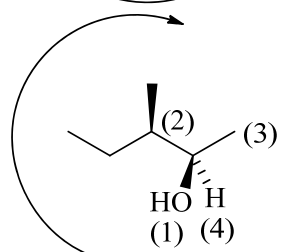


Assign the stereochemistry at the two stereogenic centres, showing your working.



The priorities around the first stereogenic centre are shown.

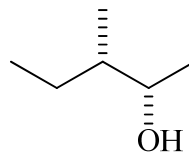
With the lowest priority group at the back, the other groups are related in a clockwise manner: (*R*)



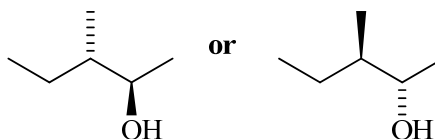
The priorities around the second stereogenic centre are shown.

With the lowest priority group at the back, the other groups are related in a clockwise manner: (*R*)

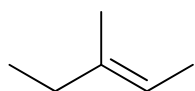
Draw the structure of a molecule that will have a specific optical rotation of -26° .



Draw a diastereoisomer of **P**.

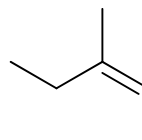


The addition of hot concentrated sulfuric acid causes **P** to transform into another molecule, **Q** (C_6H_{12}) that is optically inactive. What is the structure of molecule **Q** and why is it optically inactive?



(*E*)-3-methyl-2-pentene

or



(*Z*)-3-methyl-2-pentene

Neither compound has a stereogenic centre, so neither is optically active.

Name molecule **Q**.

See above.