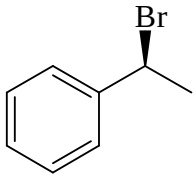
Marks
8

- Consider compound **F** shown below.



F

Assign the stereocentre in compound **F** as (*R*) or (*S*), explaining your reasoning.

Draw the enantiomer of compound **F**.

When compound **F** is reacted with hot KOH solution, a product (**G**) is formed that shows three peaks in the ^{1}H NMR spectrum in the region 7-8 ppm and three peaks in the region 5-6 ppm. Draw the structure of this product.

When **G** is reacted with dilute sulfuric acid, a further product, **H**, is formed. **H** has a peak at 3300 cm^{-1} in its IR spectrum. Draw the structure of product **H**.

Is **H** formed as a single enantiomer, as a racemate, or is **H** achiral?

Assuming an S_N2 mechanism, draw the product of the substitution reaction between **F** and $(CH_3)_2NH$, indicating stereochemistry where appropriate.