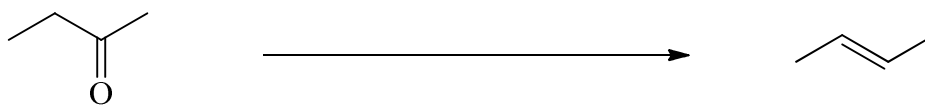


Marks
8

- Show clearly the reagents you would use to carry out the following chemical conversion. Two steps are required. Give the structure of the intermediate compound.

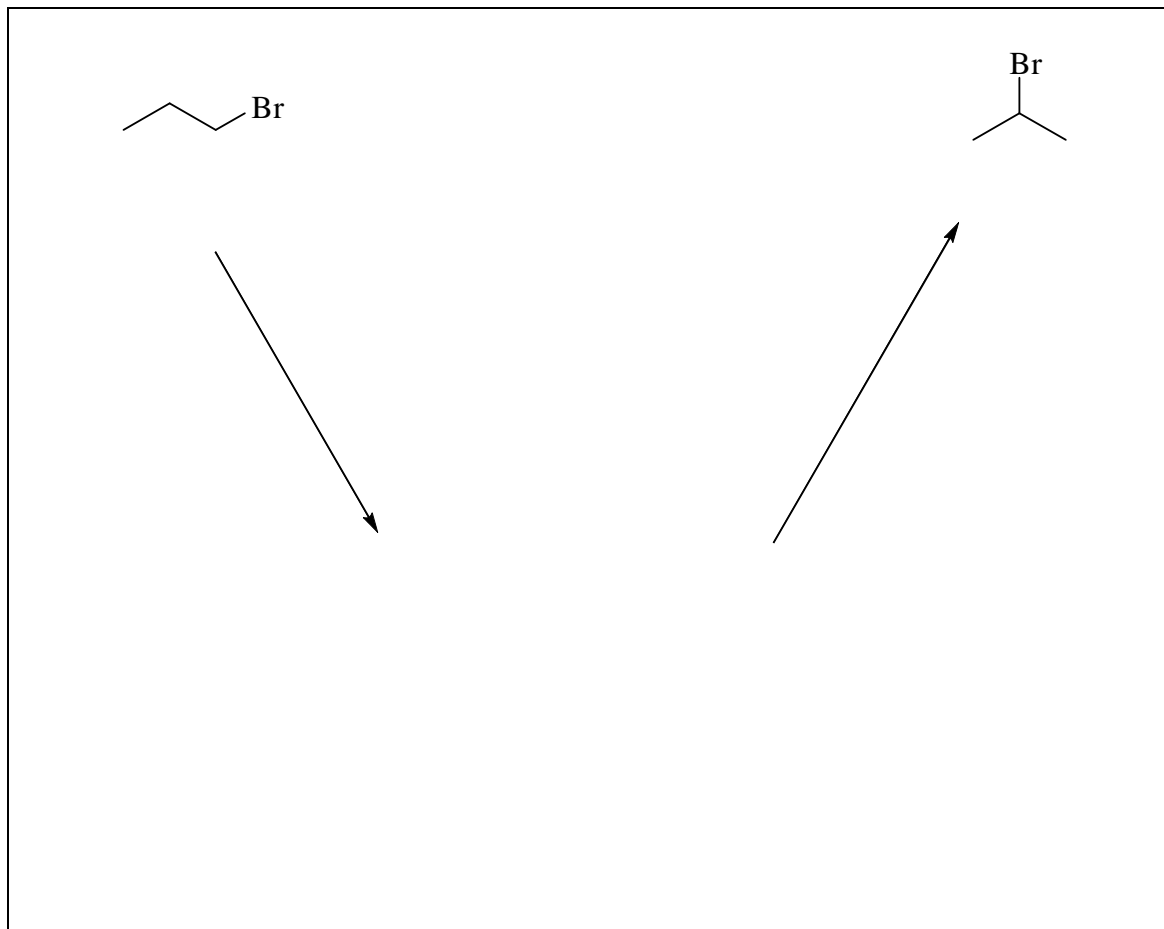


How can IR spectroscopy distinguish between the starting material, the intermediate and the product?

How can ^{13}C NMR spectroscopy distinguish between the starting material, the intermediate and the product?

Marks
5

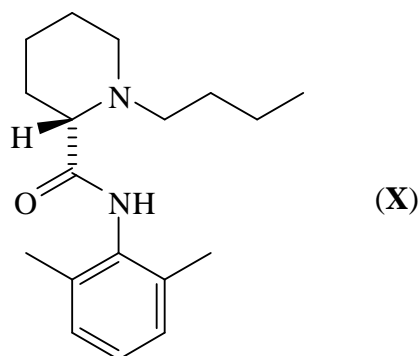
- Show clearly the reagents you would use to carry out the following chemical conversion. Two steps are required. Give the structure of the intermediate compound.



How could you distinguish between the starting material and the product by ^{13}C NMR spectroscopy?

Marks
7

- Bupivacaine is the active molecule in some local anaesthetics. Of the two enantiomers, the one shown below (**X**) is the more effective.



What is the molecular formula of (**X**)?

Calculate the m/z value for the major peak you would expect to see for the molecular ion in the high resolution mass spectrum.

[Atomic masses: $^1\text{H} = 1.0078$; $^{12}\text{C} = 12.0000$; $^{16}\text{O} = 15.9949$; $^{14}\text{N} = 14.0031$]

Answer:

List the substituents attached to the stereogenic centre in descending order of priority according to the sequence rule.

highest priority

lowest priority

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What is the absolute stereochemistry of (**X**)? Write (*R*) or (*S*).

Name the functional groups present in (**X**).