Solutions

Each answer shows the steps, then the **result**.

2.1

- chain; positional; functional group isomerism

2.2

- a carbon atom bonded to four different groups

2.3

- **positional** isomerism

2.4

- **functional group** isomerism

3.1 B

- The π bond in the C=C prevents rotation

3.2 B

- The second carbon in $CH_3CHBrCH_2CH_3$ has four different groups

3.3

(a)

- cis – both CH_3 groups on the same side of the C=C; trans – on opposite sides

(b)

- but-2-ene has a different group (H and CH_3) on each double-bond carbon, so cis/trans is possible; but-1-ene has two H atoms on the end carbon, so the groups can be swapped without making a new isomer

3.4

- yes; the second carbon is bonded to four different groups (CH_3, OH, H, COOH), so it is a chiral centre

3.5

- $CH_3CH(CH_3)CH_2CH_3$, **2-methylbutane**
- $C(CH_3)_4$, **2,2-dimethylpropane**

3.6

(a)

- they rotate the plane of plane-polarised light
- by equal amounts in opposite directions

(b)

- it is a racemic mixture, with equal amounts of the two isomers, so their rotations cancel