13. An introduction to AS Level organic chemistry

Starter Quiz ·

A-Level Chemistry Name: _____ Score: _____

1. A functional group is:

   ☐ the carbon skeleton only

   ☐ the molecule's mass

   ☐ the reactive part of a molecule that decides its properties

   ☐ the number of atoms

2. Homolytic fission of a covalent bond produces:

   ☐ two ions

   ☐ no products

   ☐ two free radicals (one electron to each atom)

   ☐ one molecule

3. In an addition reaction:

   ☐ a molecule is split by water

   ☐ a group is swapped

   ☐ two molecules join to make one

   ☐ a small molecule is lost

4. An sp^3 carbon (four single bonds) is:

   ☐ tetrahedral, 109.5°

   ☐ planar, 120°

   ☐ linear, 180°

   ☐ bent, 104.5°

5. Isomers are compounds with:

   ☐ no functional group

   ☐ different molecular formulas

   ☐ the same molecular formula but a different arrangement of atoms

   ☐ the same arrangement of atoms

6. E/Z (cis-trans) isomerism arises because there is no rotation about a C=C double bond.

   ☐ True ☐ False

7. A group of atoms that gives an organic molecule its characteristic reactions is a _____ group.

   _____

8. Breaking a bond so each atom keeps one electron is _____ fission.

   _____

9. A carbon atom forming four single bonds is trigonal planar with bond angles of 120°.

   ☐ True ☐ False

10. Compounds with the same molecular formula but different structures are structural _____.

    _____

A-Level Chemistry

1. **the reactive part of a molecule that decides its properties**

   Molecules with the same functional group behave alike, because the group is the reactive part.

2. **two free radicals (one electron to each atom)**

   Homolytic = even split, one electron each → two radicals; heterolytic = uneven → two ions.

3. **two molecules join to make one**

   Addition combines two molecules into a single product (e.g. across a C=C bond).

4. **tetrahedral, 109.5°**

   Four single bonds (sp^3) give a tetrahedral shape at 109.5°.

5. **the same molecular formula but a different arrangement of atoms**

   Isomers share a molecular formula but differ in how the atoms are arranged.

6. **True**

   The restricted rotation fixes the groups' positions.

7. **functional**

   e.g. –OH, –COOH.

8. **homolytic**

   It forms free radicals.

9. **False**

   False. Four bonding pairs repel equally and point to the corners of a tetrahedron, giving bond angles of about 109.5°. Trigonal planar (120°) needs three electron pairs.

10. **isomers**

    Chain, position and functional-group isomerism.