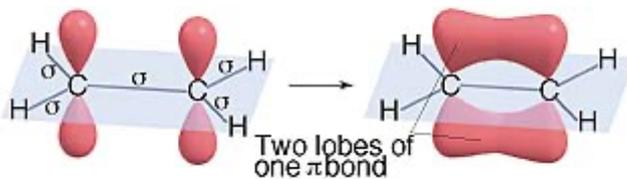




E-Z ISOMERISM

The π bond

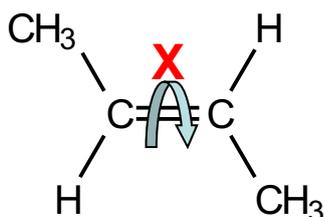
- There are two covalent bonds between the two C atoms.
 - Bond 1 = σ covalent bond (electrons are between the two C atoms)
 - Bond 2 = π covalent bond (electrons above and below the plane of the 6 central atoms – formed from overlap of p orbitals on the C atoms)



Types of isomerism

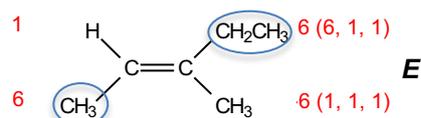
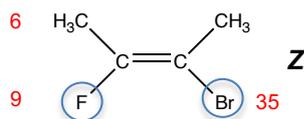
Type	Structural isomerism	Stereoisomerism
Definition	Molecules with the same molecular formula but a different structural formula	Molecules with the same molecular and structural formulas but a different arrangement of the atoms in space
Examples	<ol style="list-style-type: none">1 Chain isomers - caused by having a different carbon chain2 Position isomers – caused by the functional group being in a different position3 Functional group isomers – caused by having a different functional group	<ol style="list-style-type: none">1 E-Z isomers - caused by molecules with a C=C with two different groups attached to each C of the C=C2 Optical isomers – caused by C with atoms having four different groups attached leading to molecules that are non superimposable mirror images of each other

E-Z Stereoisomerism



CANNOT ROTATE AROUND C=C

- Would have to break the C=C double bond to rotate around it.
- If both C of the C=C have two different groups attached, the molecule has E-Z isomers.
- The Cahn-Ingold-Prelog (CIP) priority rules are used to determine which is the E and which is the Z isomer.
 - E = entgegen (highest priority opposite)
 - Z = zusammen (highest priority together) “zame zide”
 - Assigned by priority of groups attached to C=C – the higher the atomic number of the group attached to the C's, the higher the priority (if they are the same, look at the atoms attached to those atoms)



TASK - Decide which of the following alkenes exhibit E-Z isomerism. For those that do, sketch the Z stereoisomer.

Name	Structure	E-Z isomers (✓✗)	Z isomer if stereoisomers exist
methylpropene			
1-chloropropene			
2-methylpent-2-ene			
2-ethylpent-1-ene			
3-methylpent-2-ene			
but-1-ene			
3,4-dimethylhex-3-ene			
2-bromo-3-chlorobut-2-ene			