

Chemguide – questions

BONDING IN ETHENE

- Write the electronic structure (using s and p notation) of the carbon atom in its ground (unexcited) state.
 - When carbon forms its bonds in ethene, an electron on each carbon atom has to be promoted. Explain what this means, using a diagram if you wish.
 - The electrons in the carbon atoms now hybridise. Describe, using diagrams as necessary, what happens in this case, naming the type of hybrid orbitals formed.
 - With the help of diagrams, describe the formation of the various bonds in ethene, making clear the difference between sigma and pi bonds.
- Explain why ethene is a planar molecule with all the bond angles 120° .
 - In ethane, there is free rotation around the bond between the two carbon atoms, but in ethene the carbon-carbon bond can't rotate unless you raise the temperature quite a lot. Explain why there is a difference.