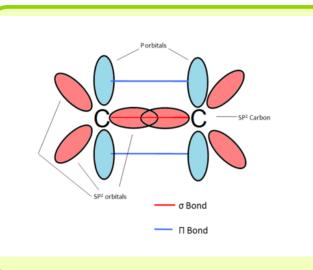
made up of sigma bond  $(\sigma)$  and a pi bond  $(\pi)$ 

see alkanes and their properties mindmap

is formed when two p oribitals overlap sideways

two parts above and below

p orbitals whoi overlap are dumb-bell shaped



pi bonds are weaker than sigma bonds because the electron density is spread out above and below the nuclei

this means that a double bond (pi + sigma) is not twice as strong as a single bond (sigma)

Sigma <sub>bong</sub>

Structure of a double bond

contain a C=C bond (unsaturated)

Alkenes and their properties

carbon atoms in a C=C double bond and the atoms bonded to these carbons all lie in the same plane (they're planar)

the three bonds repel each other as much as possible and arrange themselves into a trigonal planar shap

the atoms can't rotate around the C=C bond because the p orbitals have to stay in the same position to overlap and form a pi bond

there are two pairs of electrons in the bond (C=C) it has a really high electron density thus highly reactive

the pi bond sticks out above and below the rest of the molecule thus more likely to be attacked by particles with low electon density (electrophiles).

e/ectrophiles

low electron densisty

accepts pair of electrons

low bond enpthalpy of the pi bond

Pi bond

Cactivity.

Double bond rotation