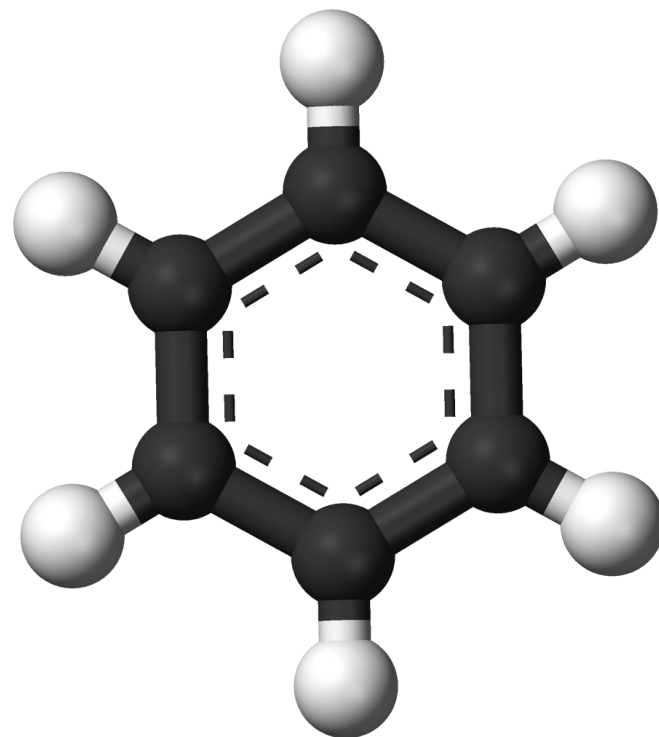
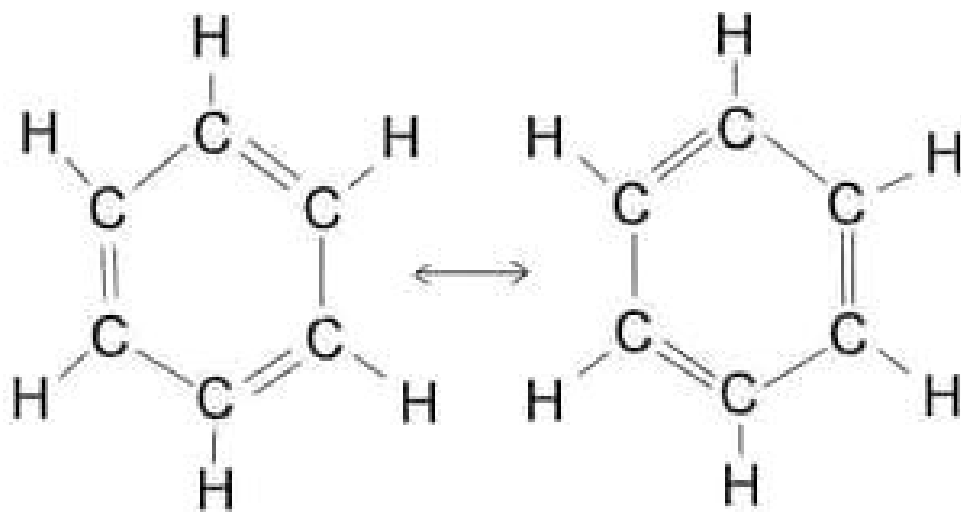


AROMATIC HYDROCARBONS

AROMATIC HYDROCARBONS

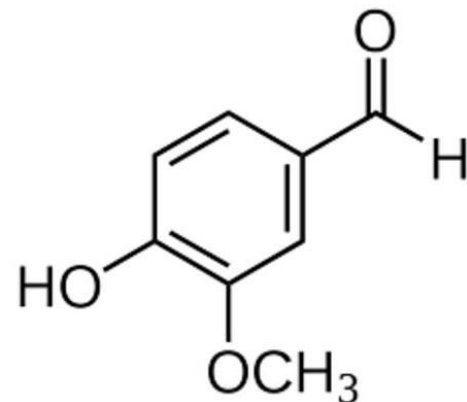
Aromatic hydrocarbons contain a **benzene** ring, C_6H_6 , as a base



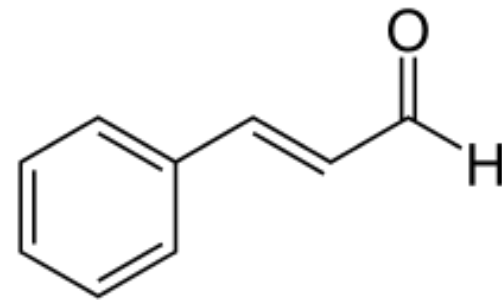
Michael Faraday first isolated benzene from the oily residue that had collected in gas lines in London, England

AROMATIC HYDROCARBONS

Most of these compounds are **volatile** (easily vaporized) and are associated with a distinct aroma (good or bad)



Vanillin



Cinnamaldehyde

• THE AROMA OF FRYING BACON •

WHY DOES BACON SMELL SO GOOD?

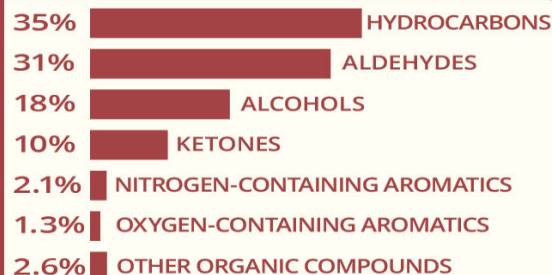
150

The approximate number of volatile organic compounds detected in the analysis of the aroma of fried bacon. These were mainly hydrocarbons, aldehydes, ketones and alcohols, but nitrogen-containing compounds such as pyridines and pyrazines, and oxygen-containing furans were also present.

WHEN HEATED, SUGARS IN BACON REACT WITH AMINO ACIDS, KNOWN AS THE **MAILLARD REACTION**. THIS, ALONG WITH **THERMAL BREAKDOWN OF FATS**, LEADS TO THE PRODUCTION OF THE COMPOUNDS THAT IN TURN CAUSE COOKING BACON'S AROMA. THESE COMPOUNDS CAN BE DETECTED USING **GAS CHROMATOGRAPHY** COMBINED WITH **MASS SPECTROMETRY**.

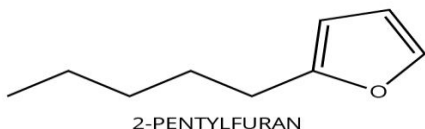
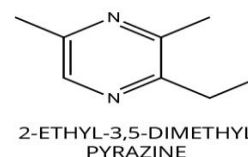
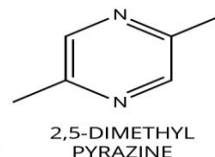


VOLATILES



NITROGEN-CONTAINING COMPOUNDS

Nitrogen containing aromatic compounds such as pyridines & pyrazines have a differing odour independently, but their presence in combination with other compounds is likely to be a major contributor to the characteristic odour of bacon.

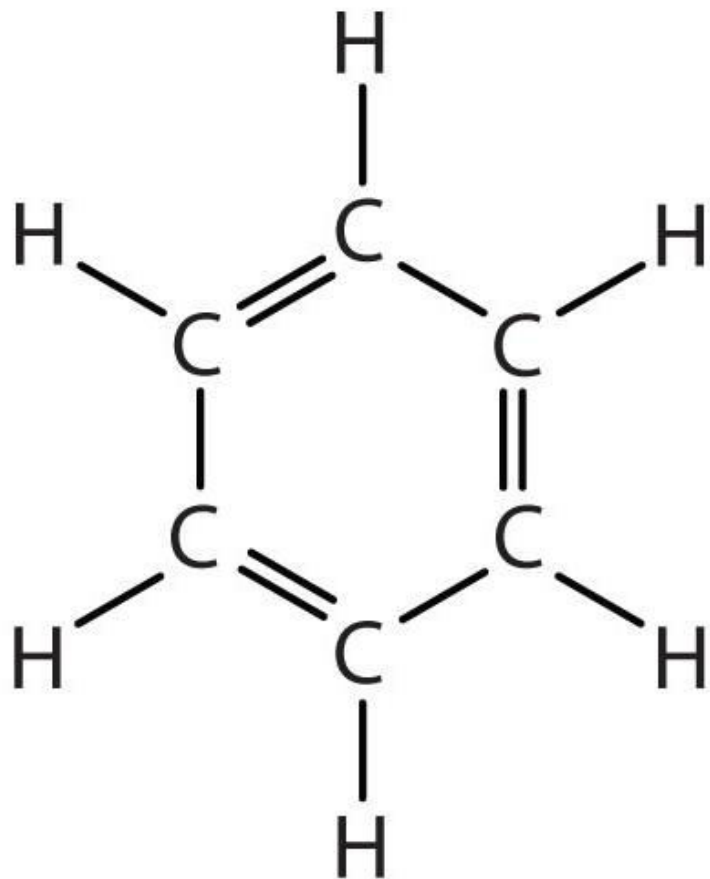


OTHER COMPOUNDS

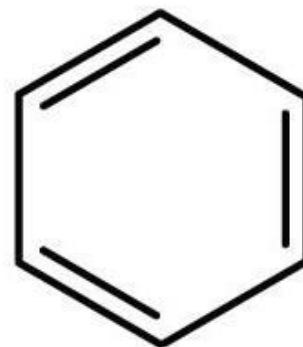
Compounds such as furans and pyridines, which have already been isolated as causing meaty aromas in other meats, are also present in bacon, and also contribute to its smell.

STRUCTURE OF BENZENE

- Molecular formula: C_6H_6
- Structural formula consists of a 6-member carbon ring with 3 C=C double bonds
- Benzene is a planar molecule

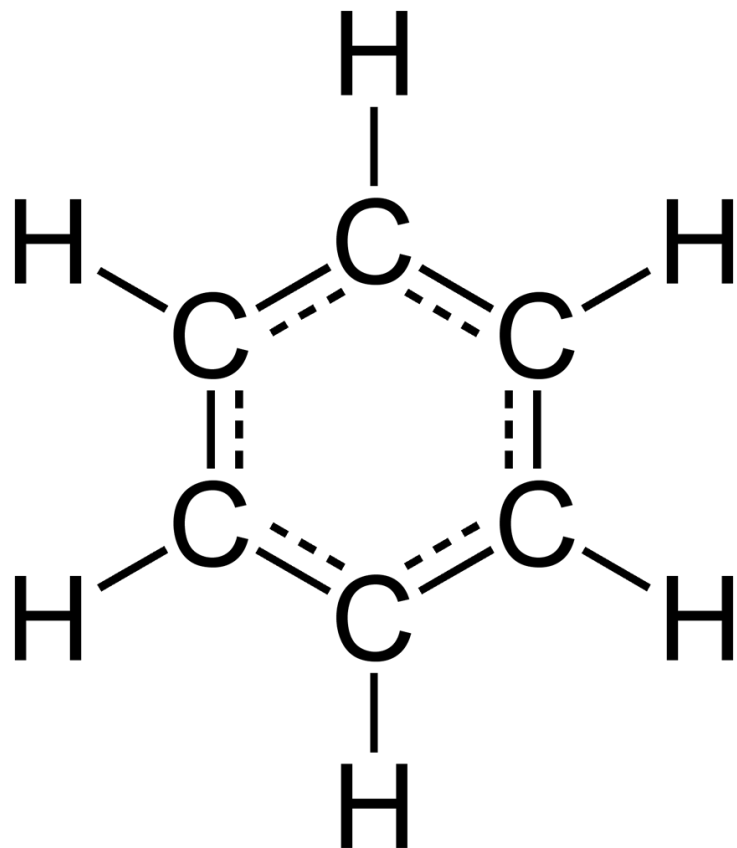


or



BONDING IN BENZENE

The carbon-carbon bonds in benzene are all the same length which is evidence that the bonds are **not true** double & single bonds.

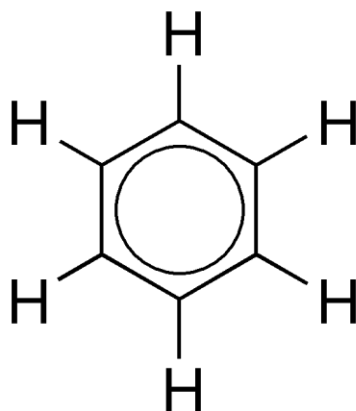
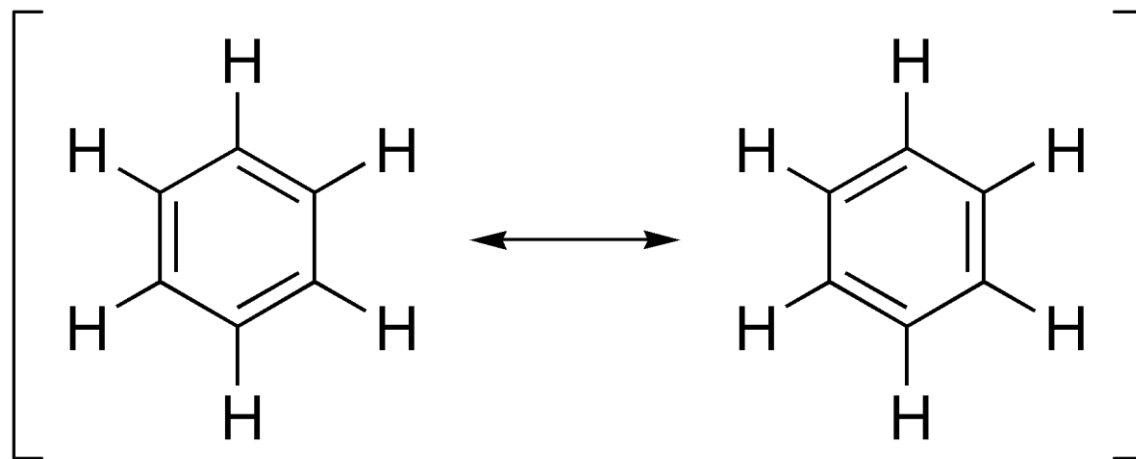


BOND TYPE	COVLENT BOND LENGTH (PM)
C-C	154
C=C	133
C≡C	120

The carbon-carbon bonds are all **139 pm** which is intermediate between the length of a **C-C single bond (154 pm)** and a **C=C double bond (133 pm; double bonds are shorter)**.

BONDING IN BENZENE

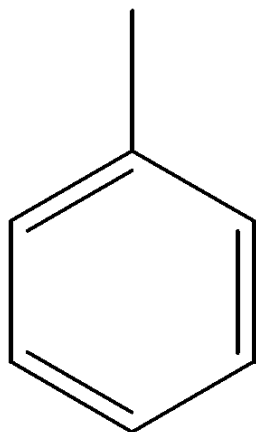
- The electrons that make up the 'double bonds' in benzene are actually **delocalized** (shared) around all 6 carbon atoms
- This arrangement is indicated by placing a **circle** in the centre of the 6-member ring



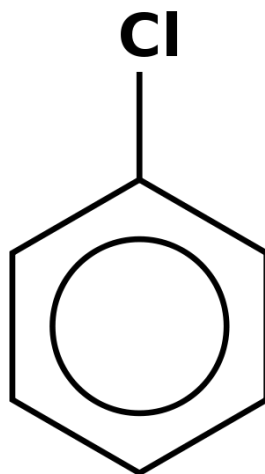
AROMATIC HYDROCARBONS

IUPAC naming system:

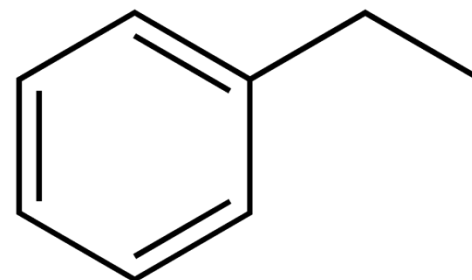
With side-chains, aromatic naming follows similar rules as for C-chains.



methylbenzene



chlorobenzene

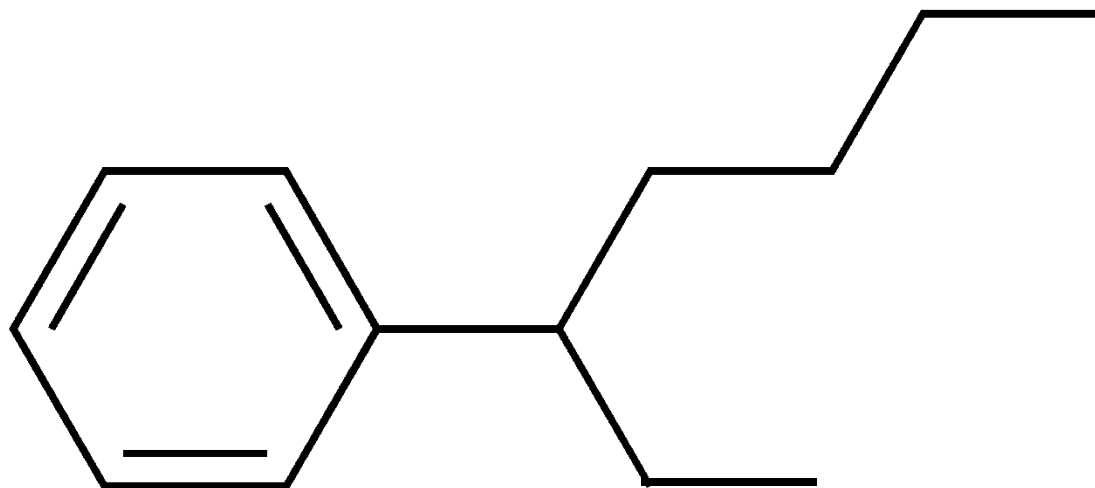


ethylbenzene

AROMATIC HYDROCARBONS

IUPAC naming system:

When benzene is considered to be a side group, it is called a **phenyl** group



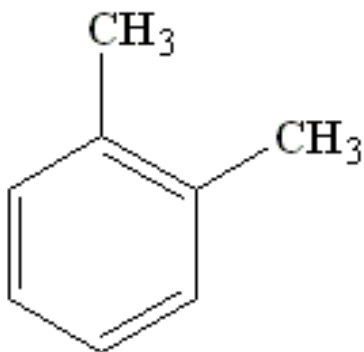
3-phenylheptane

AROMATIC HYDROCARBONS

IUPAC naming system:

When only *two* groups* are present on benzene, the following prefixes are used:

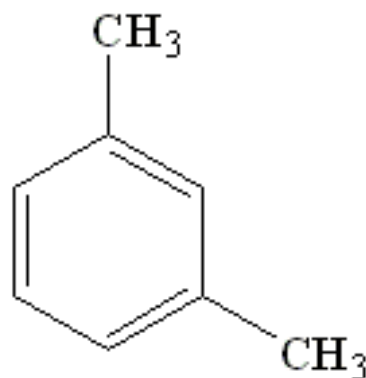
ortho



o-dimethylbenzene

1,2-dimethylbenzene

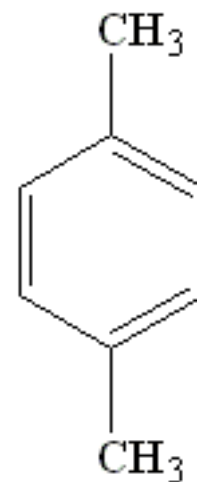
meta



m-dimethylbenzene

1,3-dimethylbenzene

para



p-dimethylbenzene

1,4-dimethylbenzene

**groups* refer to any substituents other than hydrogen, and the two groups may be different from each other

AROMATIC HYDROCARBONS

Solve these Rebus puzzles:

