

Properties of Hydrocarbons

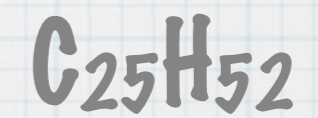
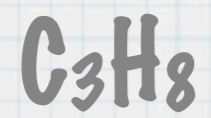
Physical Properties of Hydrocarbons

- * Both aliphatic and aromatic hydrocarbons are non-polar.
- * This means they are insoluble in water and are very soluble in non-polar solvents.
- * *Exceptions cyclopropane and benzene.

Alkanes

- * States:
 - * small molecular mass alkanes are gasses
 - * medium molecular mass alkanes are liquids
 - * large molecular mass alkanes are solids

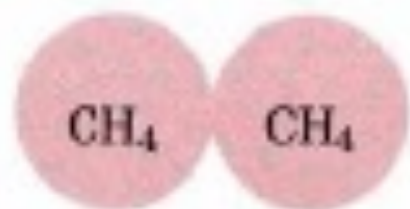
PROPANE



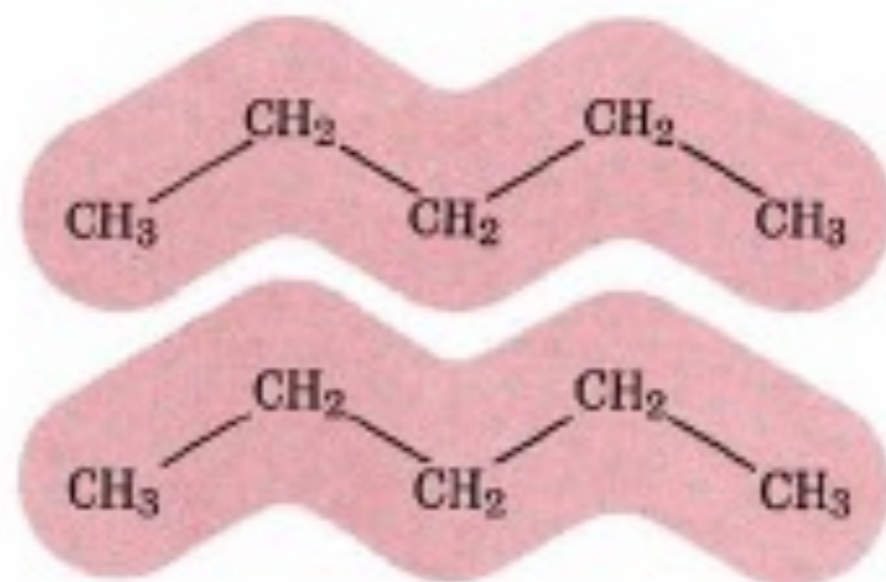
Alkanes

* Boiling Point:

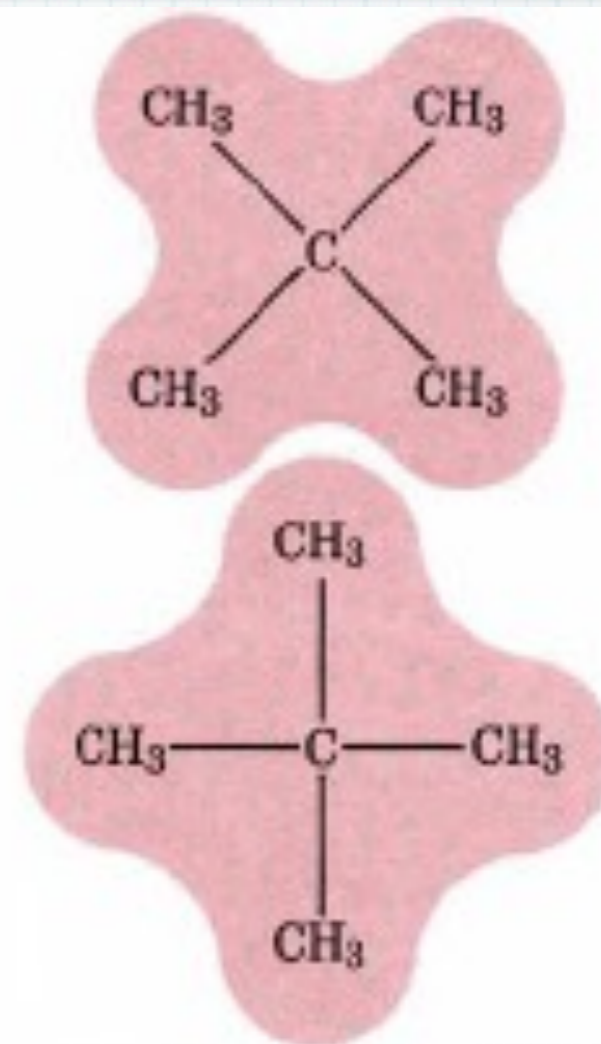
- * The longer the hydrocarbon chain, the higher the boiling point
- * Highly branched molecules have lower boiling point than straight chains containing the same number of carbon atoms.



Boiling point = -161°C



Boiling point = 36°C



Boiling point = 9.5°C

Alkenes

* States:

* First three alkenes are gasses

* All other alkenes are liquids

Alkenes

- * Boiling Point:
- * Boiling point of alkenes are slightly lower than those of alkanes
- * Example: BP ethane -88.6 C , BP ethene -103.8 C

Alkynes

- * **Boiling Point:**
 - * Boiling point of alkynes are higher than those of alkanes
 - * Straight chain nature caused by triple bond causes them to form strong attractions between molecules

Alkanes	BP	Alkenes	BP	Alkynes	BP
ethane	-89	ethene	-104	ethyne	-84
propane	-42	propene	-47	propyne	-23
butane	-0.5	but-1-ene	-6.3	but-1-yne	8.1
pentane	36	pent-1-ene	30	pent-1-yne	39
hexane	69	hex-1-ene	63	hex-1-yne	71

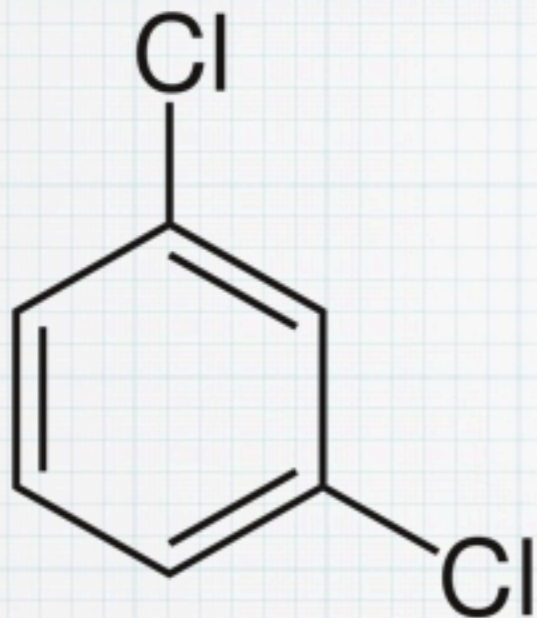
Cyclic Hydrocarbons

- * All cyclic hydrocarbons (with the exception of cyclopropane) are insoluble in water.
- * BP is higher than straight chain hydrocarbons

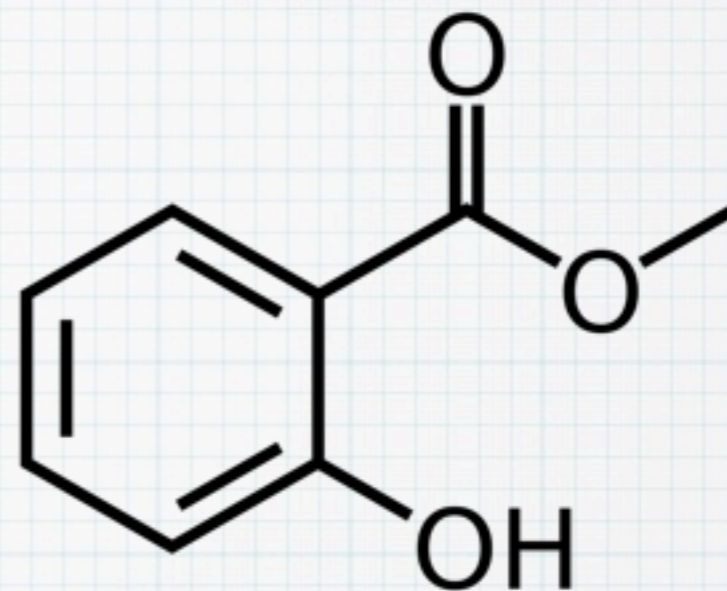
Cyclic Alkanes	BP	Cyclic Alkanes	BP
propane	-42	cyclopropane	-32.7
butane	-0.5	cyclobutane	12
pentane	36	cyclopentane	49.3
hexane	69	cyclohexane	80.7

Aromatic Hydrocarbons

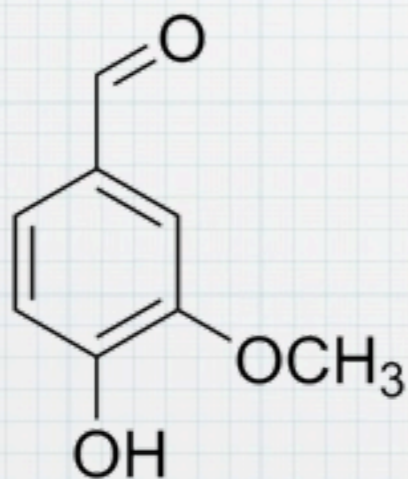
- * Benzene is liquid at standard temperatures.
- * Boiling and melting point are similar to aliphatic hydrocarbons with the same number of carbons.



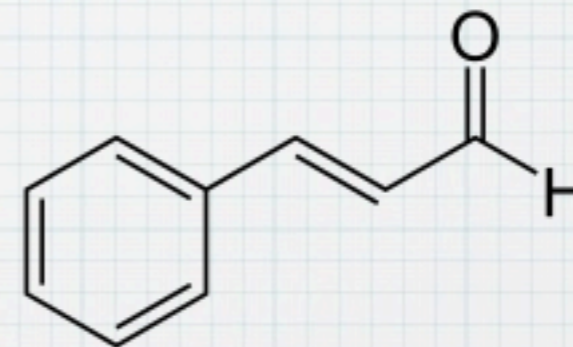
Moth Balls



Wintergreen



Vanilla



Cinnamon