

Members have similar chemical properties (they have the same functional group.)

Physical properties change gradually with increasing number of carbon atoms per molecule.

Functional group is a special group of atoms attached to an organic molecule

Successive members differ from each other by  $\text{CH}_2$

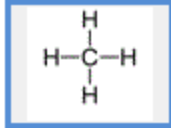
Members can be prepared by similar methods

### Alkanes and the Alkane Homologous Series



General Formula

Methane (  $\text{CH}_4$  )

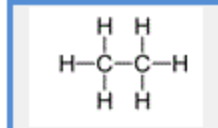


BP =  $-162^\circ\text{C}$

MP =  $-182^\circ\text{C}$

Gas at  $20^\circ\text{C}$

Ethane (  $\text{C}_2\text{H}_6$  )

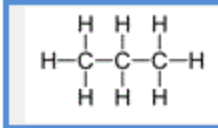


BP =  $-89^\circ\text{C}$

MP =  $-183^\circ\text{C}$

Gas at  $20^\circ\text{C}$

Propane (  $\text{C}_3\text{H}_8$  )

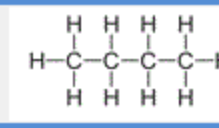


BP =  $-42^\circ\text{C}$

MP =  $-187^\circ\text{C}$

Gas at  $20^\circ\text{C}$

Butane (  $\text{C}_4\text{H}_{10}$  )

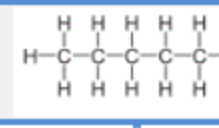


BP =  $-0.5^\circ\text{C}$

MP =  $-138^\circ\text{C}$

Gas at  $20^\circ\text{C}$

Pentane (  $\text{C}_5\text{H}_{12}$  )

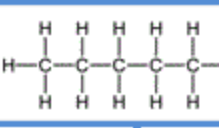


BP =  $36^\circ\text{C}$

MP =  $-130^\circ\text{C}$

Liquid at  $20^\circ\text{C}$

Hexane (  $\text{C}_6\text{H}_{14}$  )

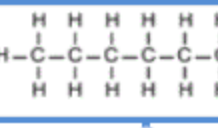


BP =  $69^\circ\text{C}$

MP =  $-94^\circ\text{C}$

Liquid at  $20^\circ\text{C}$

Heptane (  $\text{C}_7\text{H}_{16}$  )

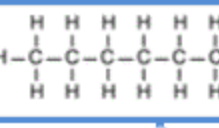


BP =  $98^\circ\text{C}$

MP =  $-91^\circ\text{C}$

Liquid at  $20^\circ\text{C}$

Octane (  $\text{C}_8\text{H}_{18}$  )



BP =  $126^\circ\text{C}$

MP =  $-57^\circ\text{C}$

Liquid at  $20^\circ\text{C}$