Organic chemistry

Organic Chemistry Revision

- **Alkanes**
- Hydrocarbons: organic compounds containing carbon and hydrogen
- Saturated (No more atoms can be added to their structure)
- Naming: end with -ane
- Molecular formula
- Structural formula

— Carbon
— Hydrogen
— ane
C_nH_{2n+2}

Alkanes

General formula

$C_n H_{2n+2}$

$C_1 H_{2\times1} + 2$

CH_4 $\Rightarrow$ methane

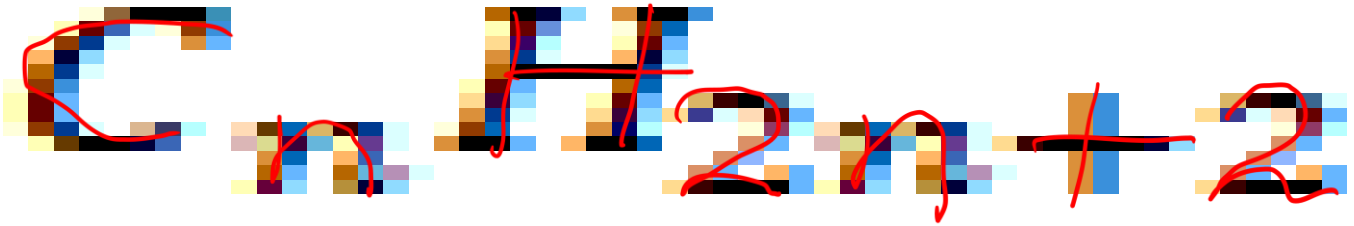
$C_n H_{2n+2}$

$C_2 H_{2\times2} + 2$ $\Rightarrow$ C_2H_6 Ethane

Alkanes

- Hydrocarbons where all carbon atoms are joined together in chains by a single bond
- Are saturated

GENERAL FORMULA



Naming and molecular formula

Methane = CH_4

$C_n\ H_{2n+2} \Rightarrow C_1\ H_{2\times1+2} \Rightarrow C\ H_4$

Ethane = C_2H_6

$C_n\ H_{2n+2} \Rightarrow C_2\ H_{2\times2+2} \Rightarrow C_2\ H_6$

Propane = C_3H_8

$C_3\ H_{2\times3+2} \Rightarrow C_3\ H_8$

⇒ Butane = C_4H_{10}

$C_4H_{2\times4+2} \Rightarrow C_4H_{10}$

Pentane = C_5H_{12}

$C_5H_{2\times5+2} \Rightarrow C_5H_{12}$

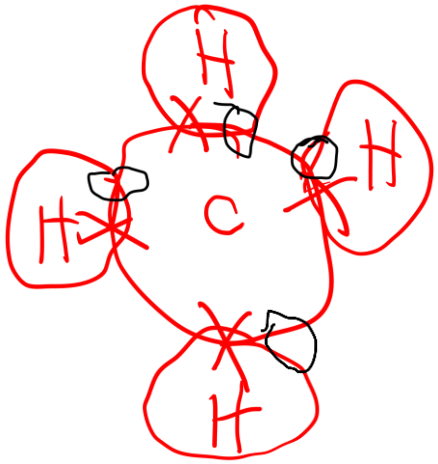
⇒ Hexane = C_6H_{14}

$C_6H_{2\times6+2} \Rightarrow C_6H_{14}$

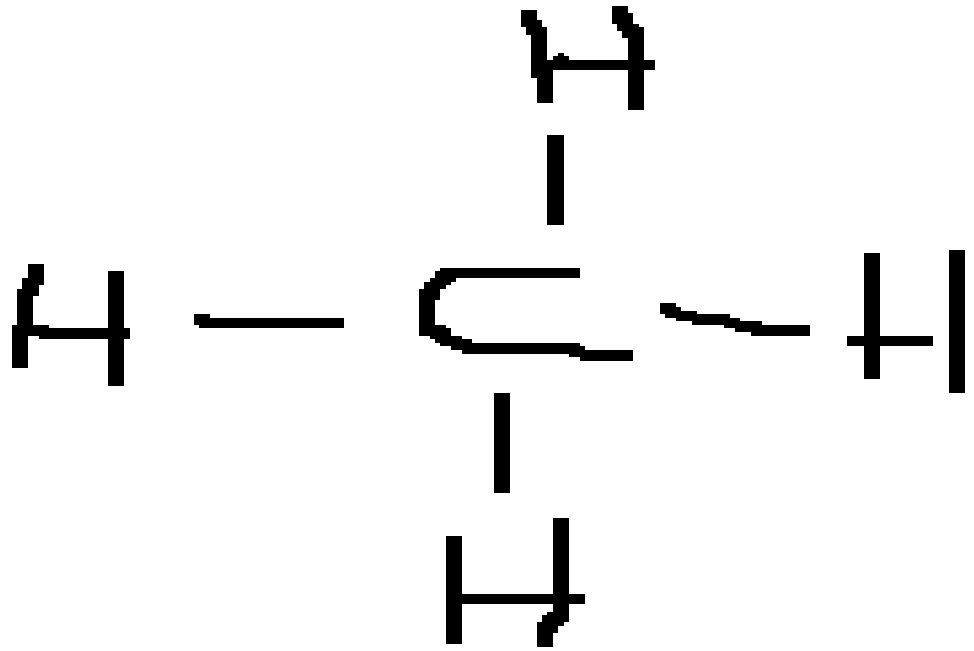
Methane

Structural formula

CH_4

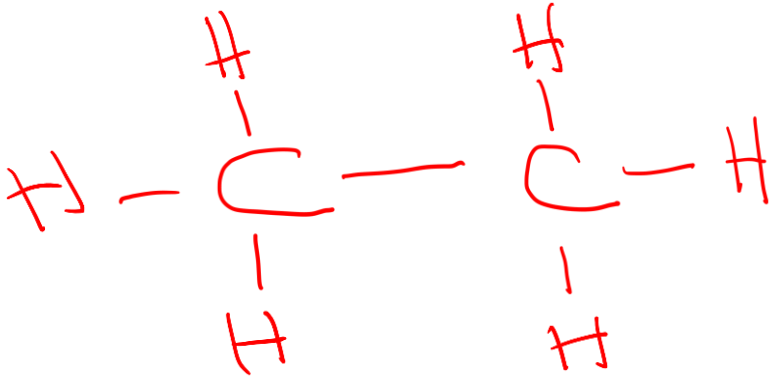


$$Methane = CH_4$$

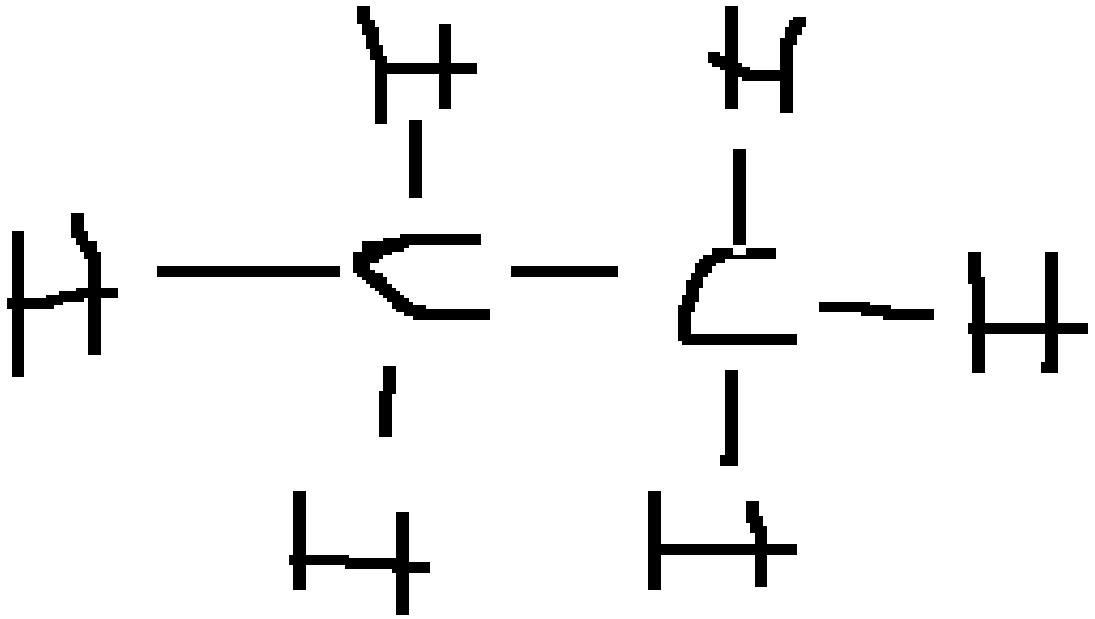


Ethane

C_2H_6

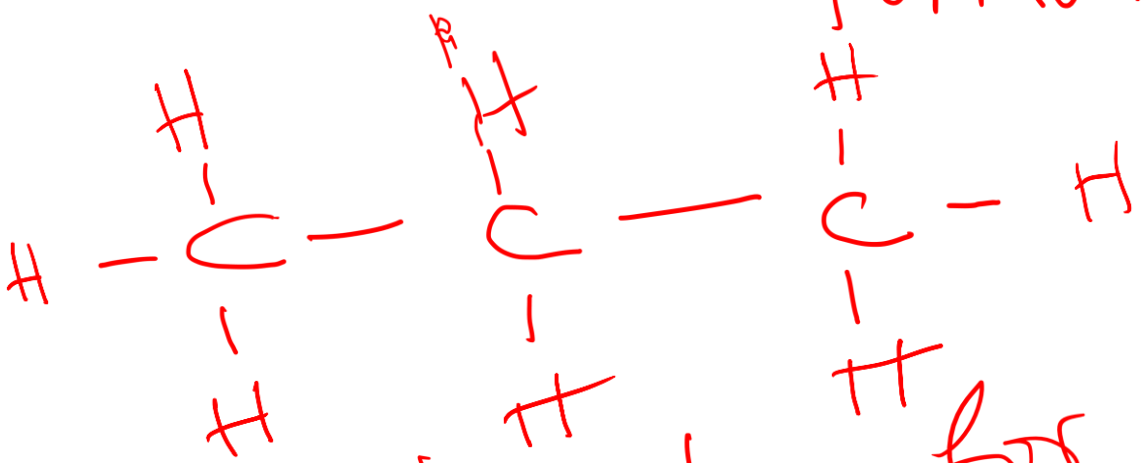


$$Ethane = C_2H_6$$



Propane

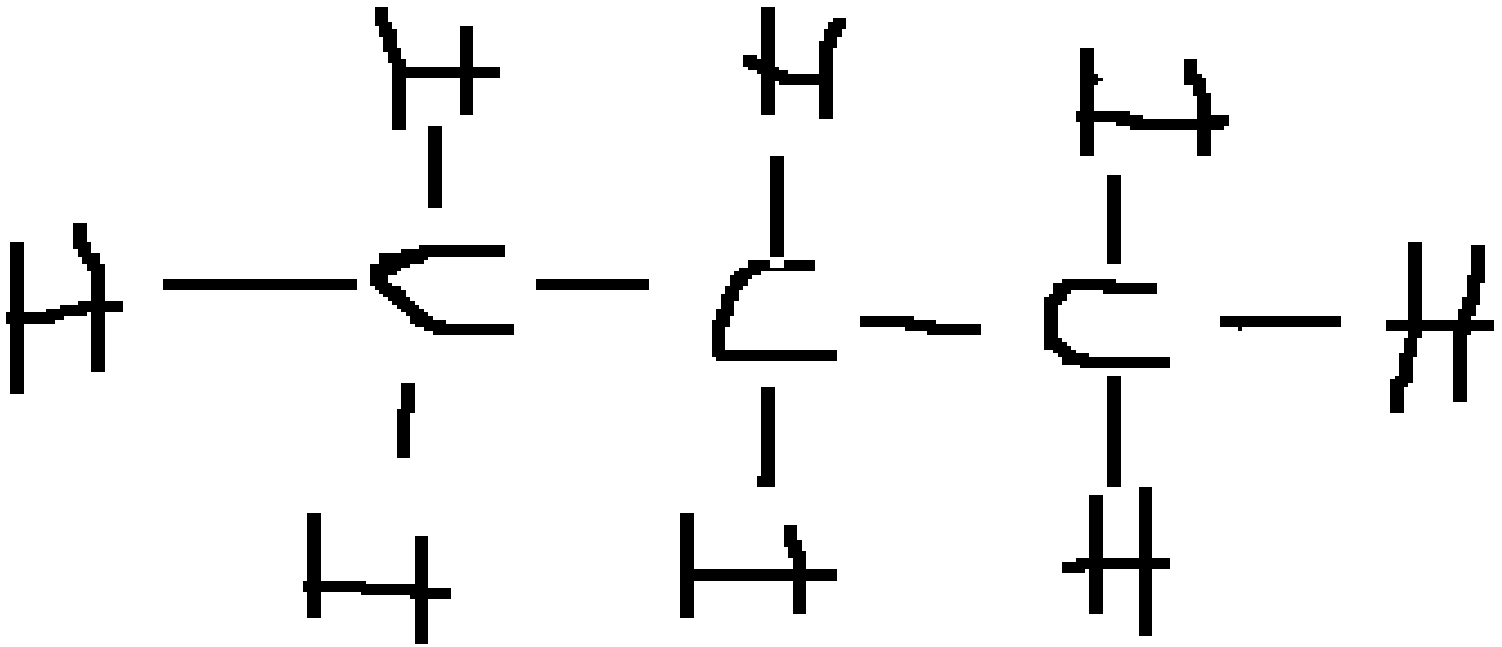
C_3H_8 molecular formula



structural formula

$CH_3CH_2CH_3$

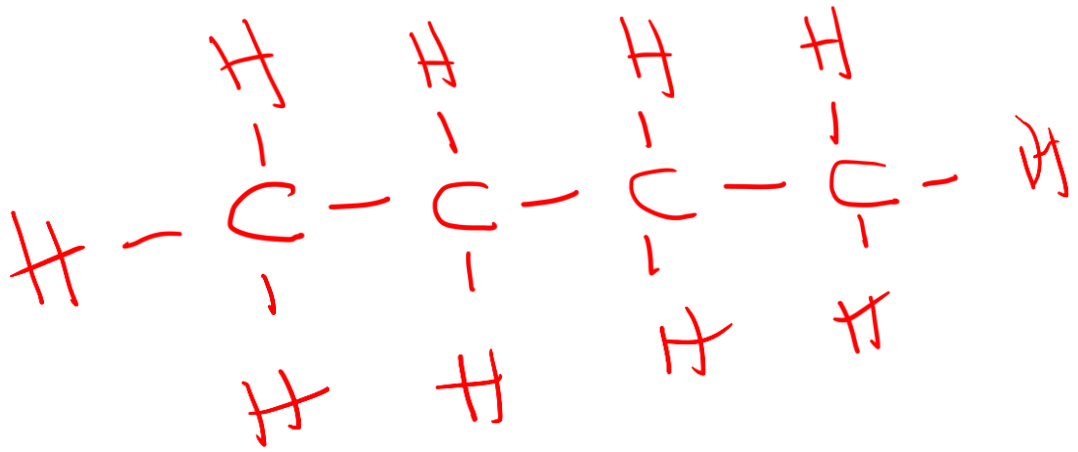
Propane = C_3H_8



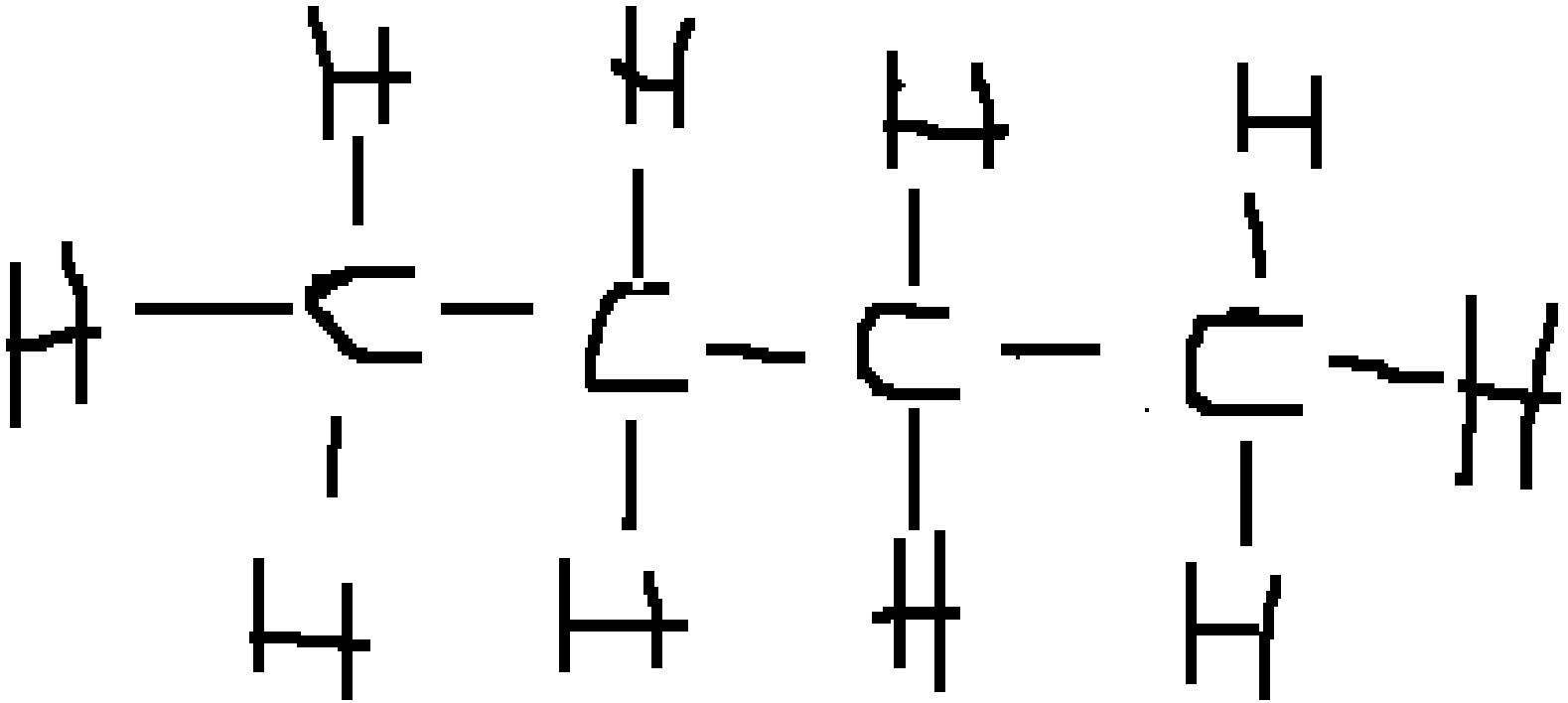
Butane

C_4H_{10} ~~molecular~~ formula

~~structural~~ formula

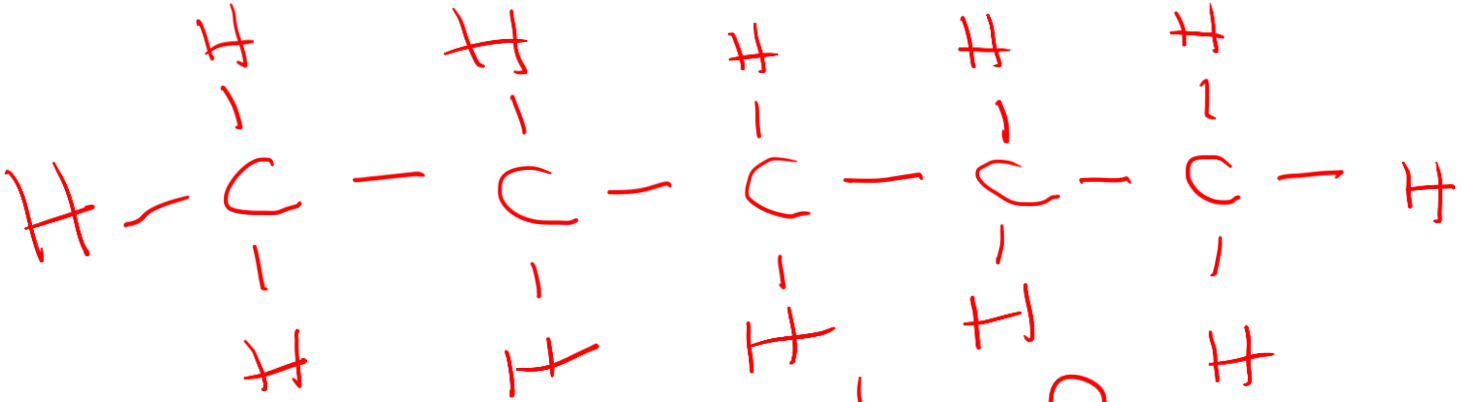


$$Butane = C_4H_{10}$$



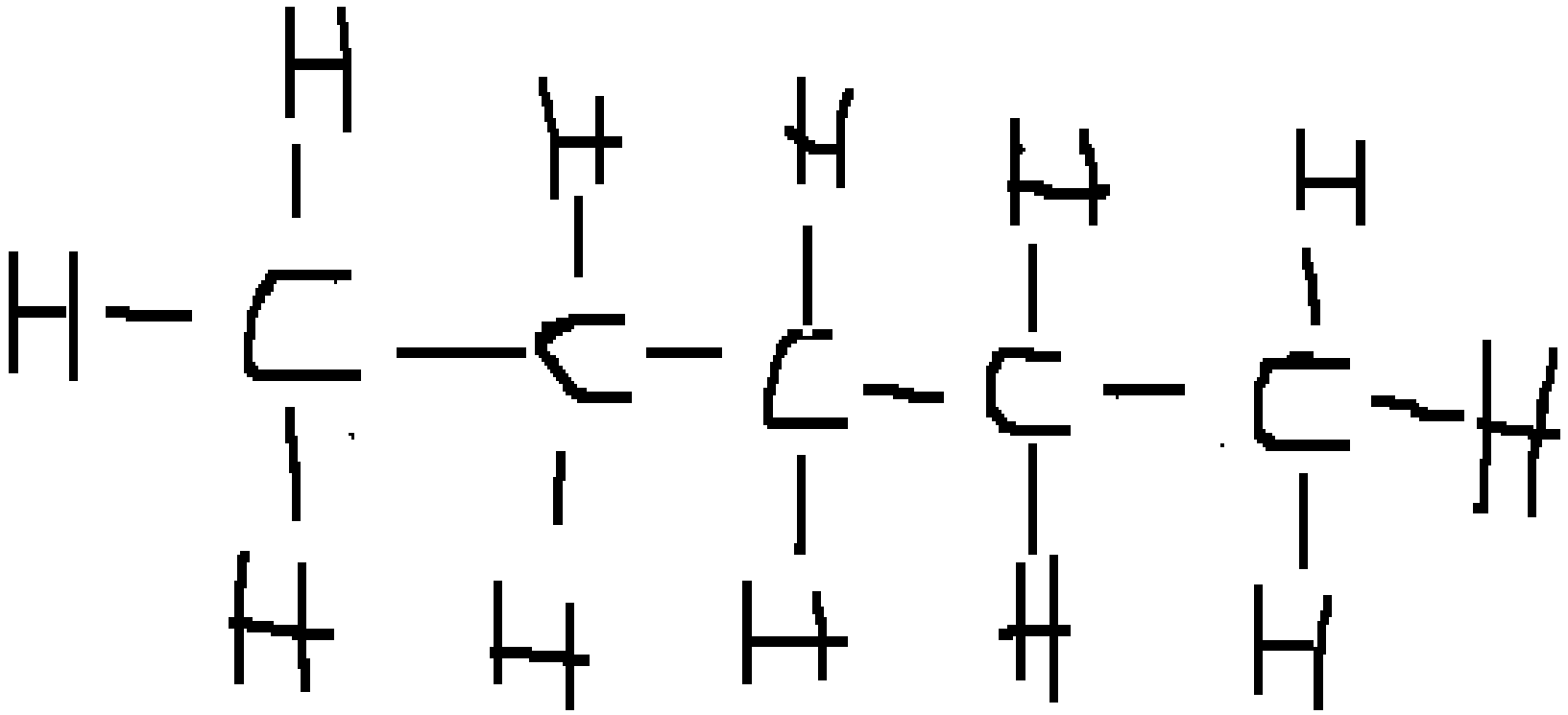
Pentane

C_5H_{12} Molecular formula

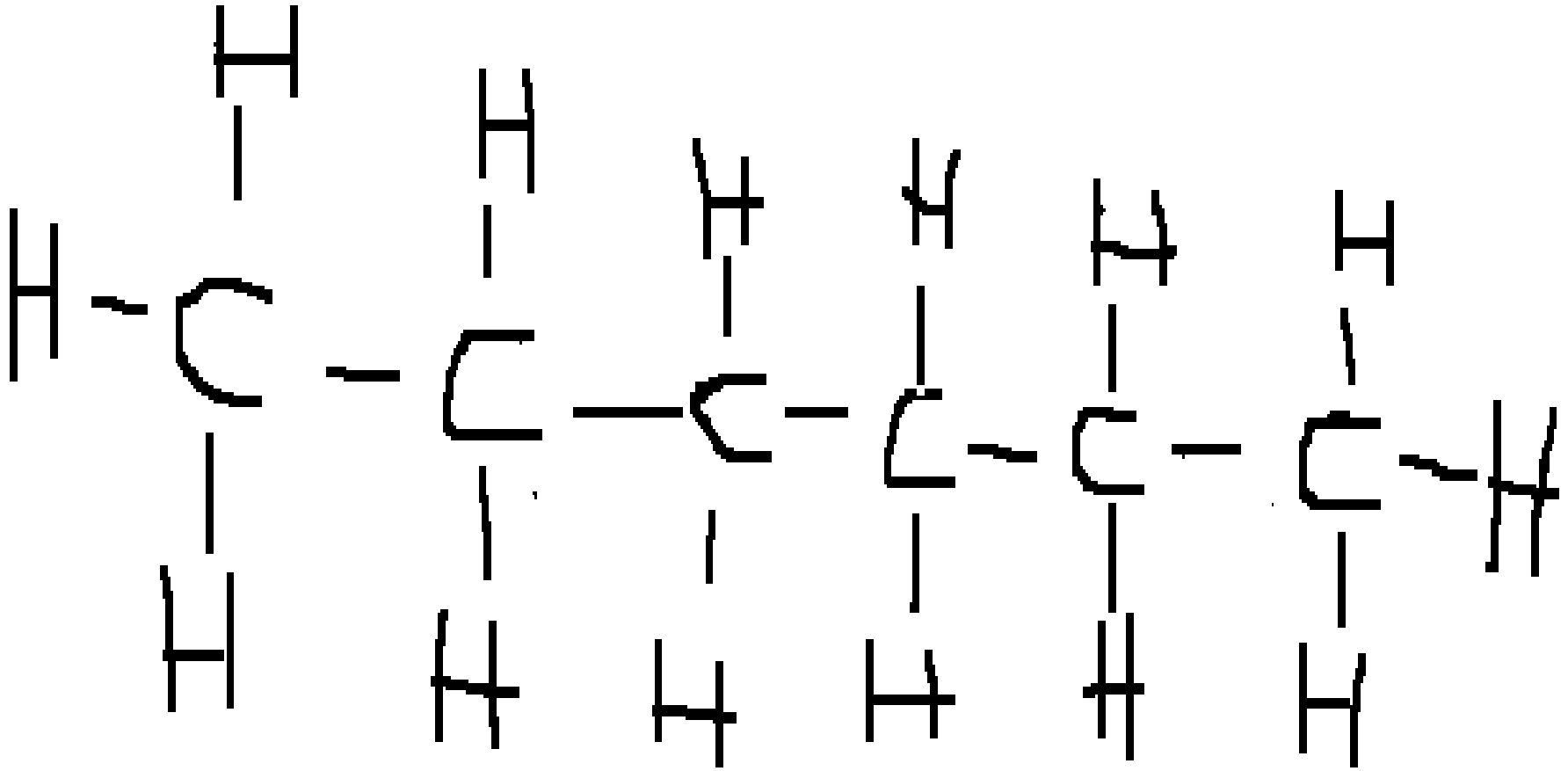


Structural formula

$$Pentame = C_5H_{12}$$



$$Hexane = C_6H_{14}$$



EXERCISE

Q1. What are hydrocarbons?

Q2. Write the general formula of alkanes

Q3 Write the molecular formula of (i) Methane (ii) Ethane (iii) Propane (iv) Butane

Q4 Write the structural formula of (i) Methane (ii) Ethane (iii) Propane (iv) Butane

smaller Molecules (Less Carbon Atoms) Lower B.p

Alkanes that are gases

- Methane CH_4
- Ethane C_2H_6
- Propane C_3H_8
- Butane C_4H_{10}

Alkanes which are liquids

- Pentane
- Hexane

C_5H_{12}
C_6H_{14}
> Liquids