

Isomers ... are molecules w the same molecular formula but diff. structures. (2)

① Alkanes (C_nH_{2n+2})

- **unreactive** (only C-C and C-H bonds $\rightarrow$ strong & difficult to break)

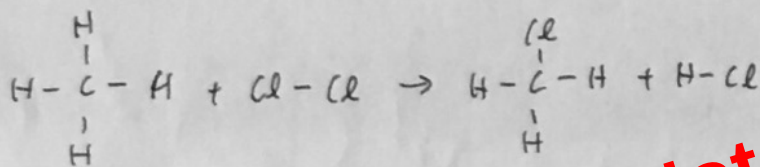
- **combustion**

$\hookrightarrow$ complete (enuf O_2) : $CO_2 + H_2O$ (same for alkenes and alcohol) $\leftarrow$

$\hookrightarrow$ Incomplete (not enuf O_2) : $CO + C + H_2O$

* molecules w a higher % of carbon by mass tend to go through incomplete combustion
 $\hookrightarrow$ smokier flame.

- **substitution reaction** (u.v light)
[w chlorine]



② Alkenes (C_nH_{2n})

low in demand

high in demand

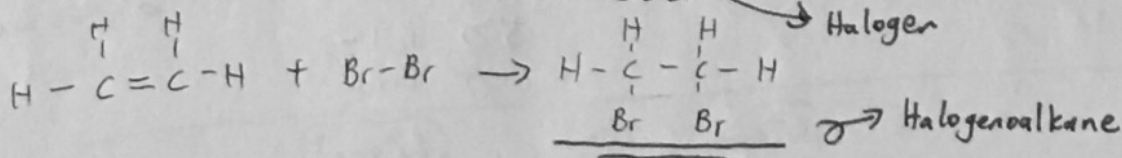
- **Cracking** (of large alkenes) [breaking large hydrocarbon molecules into smaller molecules]

$\times$ [change naphtha to alkenes (usually ethene)]

$\times$ [produce H_2 gas]

$\rightarrow$ Always have alkene, maybe H_2 , C and alkane

- **Test for $C=C$ bond w aq. Bromine** (brown to colourless)



hydrogenation

- **Alkene + $H_2 \rightarrow$ Alkane** (Nickel catalyst)

- **Alkene + $H_2O \rightarrow$ Alcohol** (H_3PO_4 catalyst, 60 atm, $300^\circ C$)
hydration