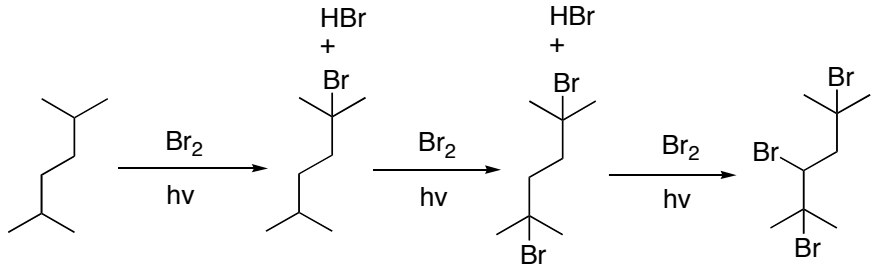
Reviews



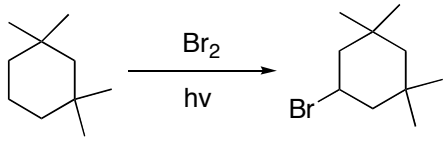
2, 5-dimethylhexane

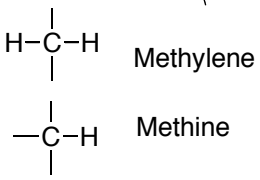
Stability of radical

Least Most

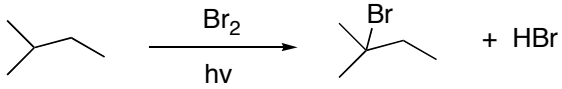
$\cdot CH_3$ < $R-\dot{C}H_2$ < $R-\dot{C}HR$ < $R-\dot{C}R_2$ R= alkyl

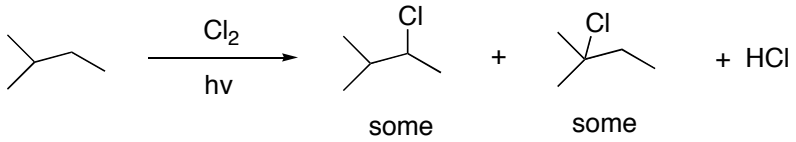
Methyl Radical | Primary 1° | Secondary 2° | Tertiary 3°

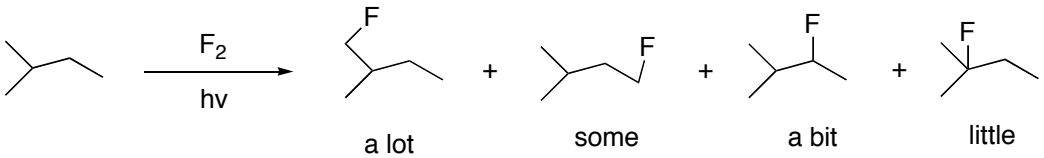




Reactivity

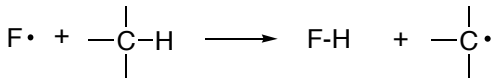






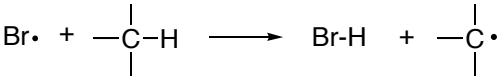
Reactivity

$F_2 > Cl_2 > Br_2 > I_2$



ΔH= -35kcal/mole

Exothermic



ΔH= +16kcal/mole

Endothermic

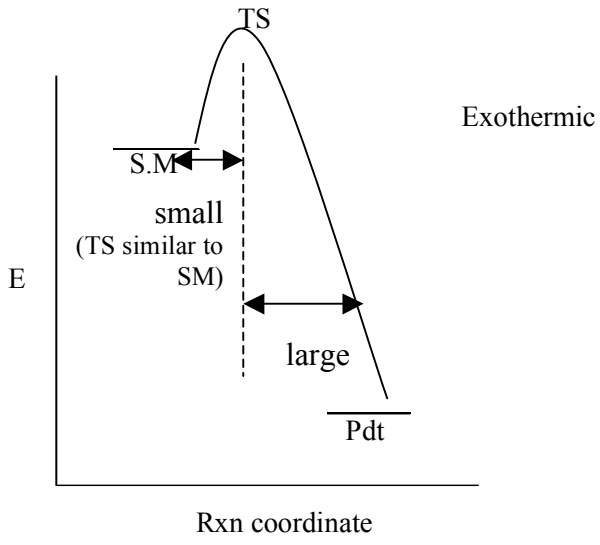
Br• > Cl• > F•

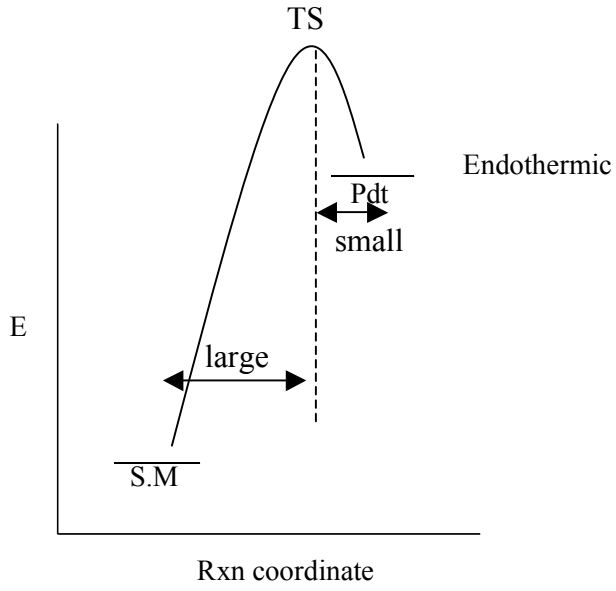
most selective — least selective

endothermic — exothermic

Hammond Postulate

- The more exothermic a reaction, the more the transition state (TS) resembles the starting materials.
- The more endothermic a reaction, the more the TS resembles the product.

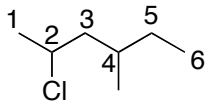




Alkyl Halides = haloalkanes

Structure and Nomenclature

1) Find longest chain with largest number of branches
2) Number from end so as to give 1st branch the lowest number
3) Name prefix with "Halo" (chloro, bromo, iodo, fluoro). Or name alkyl and add halide

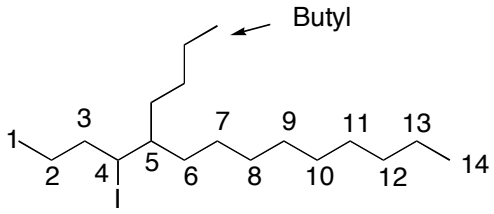


2 -chloro -4-methylhexane

Fluorocyclopropane

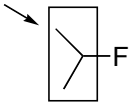
Cyclopropyl fluoride

look at atomic number



5-butyl-4-iodotetradecane

Isopropyl

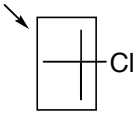


2-Fluoropropane

2-Propylfluoride

Isopropyl Fluoride

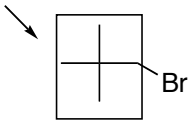
tert-Butyl



2-Chloro-2-methylpropane

tert-Butyl Chloride

Neopentyl



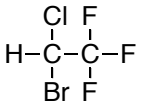
Neopentyl Bromide

1-Bromo-2,2-dimethylpropane

Properties of Haloalkanes

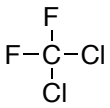
-
- if % composition > 65% halogen by weight, then more dense than water
- ρ = density > 1.0 g/cm^3 (water)
- immiscible (insoluble) in H_2O
- governed primarily by dipole-dipole interactions
- good solvents for organic compounds eg Dichloromethane and Chloroform
- High MP and BP relative to alkanes, alkenes, alkynes of similar molecular weight

Ex) Halothane

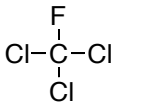


1,1,1-trifluoro-2-bromo-2-chloroethane

Ex) refrigerants

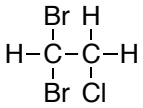


Freon 12



Freon 11

Ex)

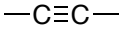


1,1-dibromo-2-chloroethane

In adult male, sperm count is typically 100million/mL - can be reduced to 0 by these antifertility agents

ALKENES AND ALKYNES

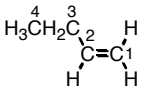
Alkenes and Alkynes – Term olefin comes from: oleum facere
↳ Olefin "oil" + "to make"

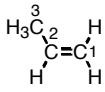
Alkene (olefin) Alkyne (acetylene)

Alkenes – structure and nomenclature

ethylene (common name)
ethene (systematic name)
replace "ane" of corresponding alkane name with "ene"



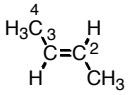
1-butene

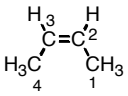


propylene (common name)
or propene(systematic name)

- to name find longest chain containing maximum number of C=C with both multiply bonded carbons in chain

- number from end to give 1st carbon of C=C lowest number, prefix with number to indicate position of first double bonded carbon





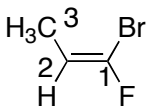
- cis = two large groups on same side
- trans = two large groups on opposite side

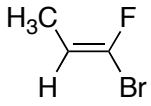
trans-2-butene

cis-2-butene

These 2-butenes are structural isomers with respect to the 1-butene above

Stereoisomers (Diastereomers)





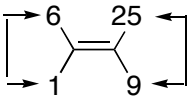
1-Bromo-1-Fluoropropane

Stereoisomers

E, Z Nomenclacture

Entgegen (opposite)

Zusammen (together)



Z

look at atomic number