# Chemistry Formula Sheet

Chapter by chapter, topic by topic. Written by the PadhoNa team for quick revision.

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CHAPTER 14

## Hydrocarbons

### Alkanes

WURTZ

$$2\mathrm{RX}+2\mathrm{Na}\xrightarrow{\text{dry ether}}\mathrm{R{-}R}+2\mathrm{NaX}$$

KOLBE ELECTROLYSIS

$$2\mathrm{RCOO^-}\rightarrow\mathrm{R{-}R}+2\mathrm{CO_2}+2e^-$$

HALOGENATION

$$\text{reactivity: } \mathrm{F_2}>\mathrm{Cl_2}>\mathrm{Br_2};\qquad \text{selectivity: } 3^\circ\mathrm{H}>2^\circ>1^\circ$$

### Alkenes and alkynes

MARKOVNIKOV

$$\mathrm{H}\text{ adds to the carbon with more H};\qquad \mathrm{HBr}+\text{peroxide: anti-Markovnikov}$$

OZONOLYSIS

$$\mathrm{C{=}C}\xrightarrow{\mathrm{O_3},\ \mathrm{Zn/H_2O}}\text{two }\mathrm{C{=}O}$$

ALKYNE REDUCTION

$$\text{Lindlar}\rightarrow \textit{cis}\text{-alkene};\qquad \mathrm{Na/liq.\ NH_3}\rightarrow \textit{trans}\text{-alkene}$$

$$\text{terminal alkynes are acidic: give precipitates with ammoniacal } \mathrm{AgNO_3}\text{ and }\mathrm{Cu_2Cl_2}$$

### Aromatic hydrocarbons

DIRECTING GROUPS

$$o/p:\ -\mathrm{OH},-\mathrm{NH_2},-\mathrm{OR},-\mathrm{R},-\mathrm{X};\qquad m:\ -\mathrm{NO_2},-\mathrm{CN},-\mathrm{CHO},-\mathrm{COOH}$$

FRIEDEL–CRAFTS

$$C_6H_6 + RCl \xrightarrow{AlCl_3} C_6H_5R$$

halogens deactivate the ring but direct $o/p$

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