**PATHWAYS IN ORGANIC CHEMISTRY**

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| --- | --- | --- | --- | --- | --- |
| REACTION | REAGENT | CONDITIONS | TYPE OF REACTION | MECHANISM | EQUATION |
| HALOGENATIONof alkanes | chlorine or bromine or iodine | UV light | substitution | Free radical (homolytic)Full mechanism needed | CH4 + Cl2 🡪 CH3Cl + HCl |
| HYDROLYSISof halogenoalkanes | NaOH(aq) | Heat, reflux | substitution | Nucleophilic(heterolytic)Full mechanism needed | CH3Cl + NaOH 🡪 CH3OH + NaCl |
| DEHYDRATIONof alcohols | Conc H2SO4 | heat | elimination | NOT REQUIRED | C2H5OH 🡪 C2H4 + H2O |
| HALOGENATIONof alkenes | Cl2 | Room temp | addition | Electrophilic(heterolytic)Full mechanism needed | C2H4 + Cl2 🡪 C2H4Cl2 |
| HYDROGEN-HALOGENATIONof alkenes | HCl | Room temp | addition | Electrophilic(heterolytic)Full mechanism needed | C2H4 + HCl 🡪 C2H5Cl |
| HYDROGENATIONof alkenes | H2 | Ni catalyst, 150o C | addition | NOT REQUIRED | C2H4 + H2 🡪 C2H6 |
| HYDRATIONof alkenes  | H2O(g) | Conc H3PO4300 oC, 60 atm | addition | NOT REQUIRED | C2H4 + H2O 🡪 C2H5OH |
| POLYMERISATIONof alkenes | - | High T, high P, catalyst | addition | NOT REQUIRED | nC2H4 🡪 (C2H4)n |
| PARTIAL OXIDATIONof alcohols | K2Cr2O7, H2SO4 | distillation | oxidation | NOT REQUIRED | CH3CH2OH + [O] 🡪 CH3CHO + H2O |
| COMPLETE OXIDATIONof alcohols | K2Cr2O7, H2SO4 | Reflux, heat | Oxidation | NOT REQUIRED | CH3CH2OH + 2[O] 🡪 CH3COOH + H2O |
| OXIDATIONof aldehydes | K2Cr2O7, H2SO4 | Reflux, heat | oxidation | NOT REQUIRED | CH3CHO +[O] 🡪 CH3COOH |
| ESTERIFICATIONof alcohols or carboxylic acids | Carboxylic acid + alcohol | Reflux, heat | condensation | NOT REQUIRED | CH3CH2OH + CH3COOH 🡺 CH3COOCH2CH3 + H2O |