Reactions

Haloalkanes

Nucleophilic Substitution

- produces and alcohol and another product
- carbon has slight + charge - attract nucleophiles
- **nucleophile -** electron pair donator, have a lone pair of electrons and may carry a negative charge (H2O, NH3, OH- CN- H-)
- reaction of water/aqueous hydroxide/Na or K hydroxide solution results in breaking of bond and two products
- converted to alcohols using aqueous Sodium/Potassium hydroxide and REFLUX
- halogen atom replaced
- **heterolytic fission** - covalent bond breaks, both electrons in the bond go to one atom, ions are formed
- rate depends on strength on C-HALOGEN bond (CF strongest - slowest, CI weakest - fastest)
- measure rate - in presence of aqueous Silver Nitrate - precipitate forms - nucleophile in H2O present in aqueous silver nitrate) - reaction carried out in ethanol - allows water and haloalkane to mix
- tertiary haloalkanes react more quickly - produce the most stable carbo cation - more lily to be formed

Ozone

- formed when high energy UV breaks oxygen O2 to 20 (oxygen radical with 2 unpaired electrons)
- steady state between O2 and oxygen radicals (O2 + O —- O3)

Removal - halogen radicals from CFCs

- initiation: CFCl3 - . Cl + . CFCl2
- propagation 1: . Cl + O3 — — ClO. + O2
- propagation 2: ClO. + O ——. Cl + O2
- overall - O3 + O ——— 2O2

Removal - nitrogen oxide radicals . NO from lighting and aircraft engines

- nitrogen monoxide facials destroy the ozone
- propagation 1: .NO + O3 ——— . NO2 + O2
- propagation 2: .NO2 + O ——— . NO + O2
- overall: O3 + O ———— 2O2