❖ APPLICATION SODIUM HYDROXIDE, NaOH AND POTASSIUM HYDROXIDE, KOH IN ORGANIC SYNTHESIS.

(i) Aqueous caustic alkalis in nulceophilic substitution reactions are warmed with haloakanes to form alcohols.

(ii) Aqueous sodium hydroxide reacts with sulphonated benzene in a neutralization reaction forming benzene sodiumsulphonate salt.

(iii) Sodium hydroxide pellets $NaOH_{(s)}$, is heated with benzene sodium sulphate to 300^oC to 350^0C to form sodium phenoxide.

(iv) Aqueous sodium hydroxide alkalis are reacted with phenyl ammonium salt to form phenylamine. Phenyl ammonium salt is a product of heating nitrobenzene with tin and concentrated hydrochloric acid/ iron and dilute hydrochloric acid.

(v) Soda lime which is a mixture of sodium hydroxide pellets and Calcium oxide ($NaOH_{(s)}$/ $CaO_{(s)}$); which when heated/refluxed with a sodium carboxylate, an alkane is formed in a decarboxylation reaction.

(vi) Concentrated aqueous sodium hydroxide/ potassium hydroxide react with carbonyl compounds (methanal and benzaldehyde) with no alpha hydrogens at room temperature in a canizzaro reaction to form carboxylic salt and corresponding alcohols.

(vii) Cold, dilute alkalis react with carbonyl compunds, aldehydes and ketones with atleast one alpha hydrogen in an aldo condensation reaction to form an aldol compound with both an aldehyde and alcohol group.

(viii) Concentrated aqueous alkalis are heated with fats or oils in presence of in saponification reaction to form soap

(ix) Phenol reacts with haloakanes in presence of aqueous alkalis to form ethers

(x) Aqueous alkalis reacted with benzene Diazonium salt in coupling reactions to form azo-dyes

(xi) Aqueous sodium hydroxide and iodine solution, forming the Iodoform regent used. In organic qualitative analysis. ***Read applications of Iodoform test.***

(xii) Concentrated aqueous alkalis and bromine in Hoffmann degradation reaction are warmed amides to form primary amines.

(xiii) Concentrated alcoholic caustic alkalis are heated with mono-haloalkanes (with one halogen atom)

Primary alkylhalides to form ethers as the major product in a bimolecular nulceophilic substitution reaction and alkenes as the minor product in an elimination bimolecular reaction. Secondary and tertiary haloakanes to form straight chain alkenes and branched chain alkenes respectively as the major product in an elimination reaction. And ethers as the minor product in nulceophilic substitution reactions

(xiv) Excess concentrated alcoholic caustic alkalis are heated with polyhaloalkanes e.g. dihaloalkanes (with two halogen atoms) to form alkynes in Elimination bimolecular reaction..

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