

Amines

- ❖ **Nomenclature**
- ❖ **Properties**
- ❖ **Preparation reactions**
- ❖ **Characteristic reactions**
- ❖ **Spectroscopy**

*Nomenclature
and Properties
of Amines*

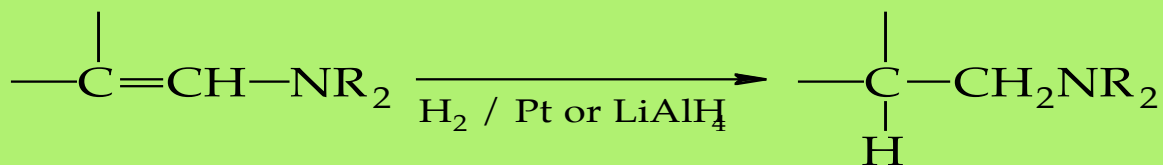
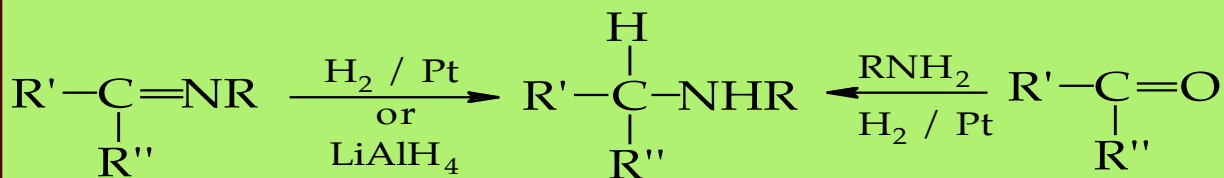
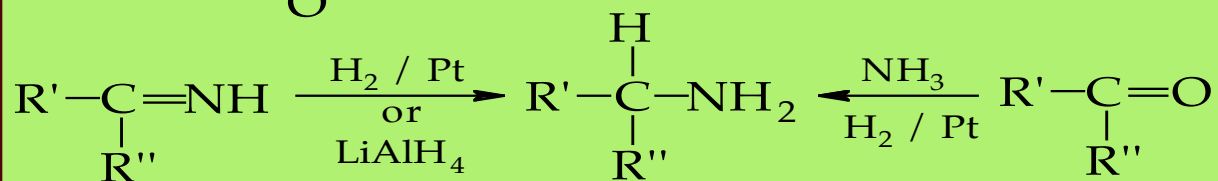
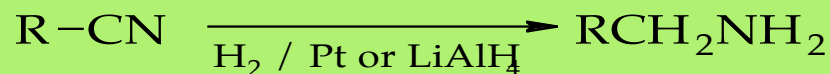
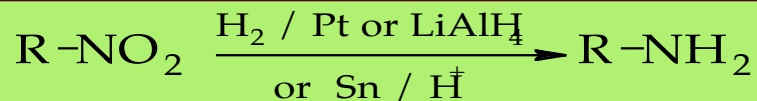
Preparation Reactions of Amines

- * **Reduction reactions**
- * **Rearrangements**
- * **Nucleophilic substitution reactions**

AMINES VIA REDUCTION

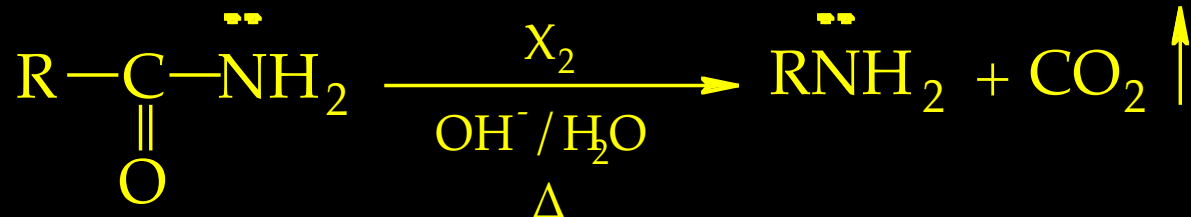
- ★ **Reduction of nitro compounds**
 - ★ **Reduction of nitriles**
 - ★ **Reduction of amides**
- ★ **Reduction of imines/enamines**
- ★ **Reductive amination of aldehydes/
ketones**

Amines via Reduction: A Summary

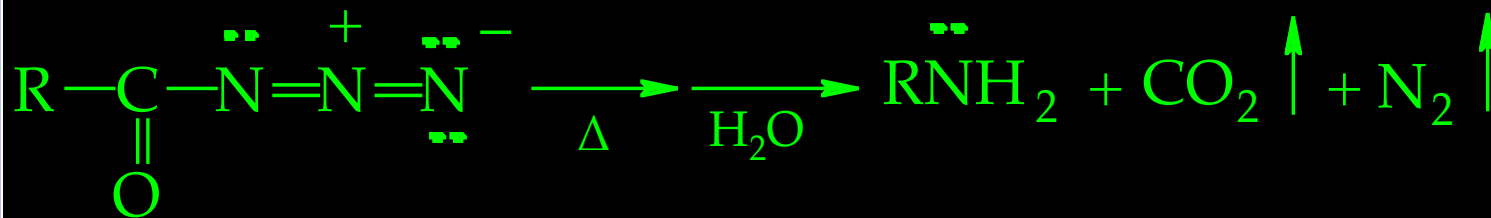


Amines via Rearrangement

- * Hofmann rearrangement (degradation)
- * Curtius rearrangement

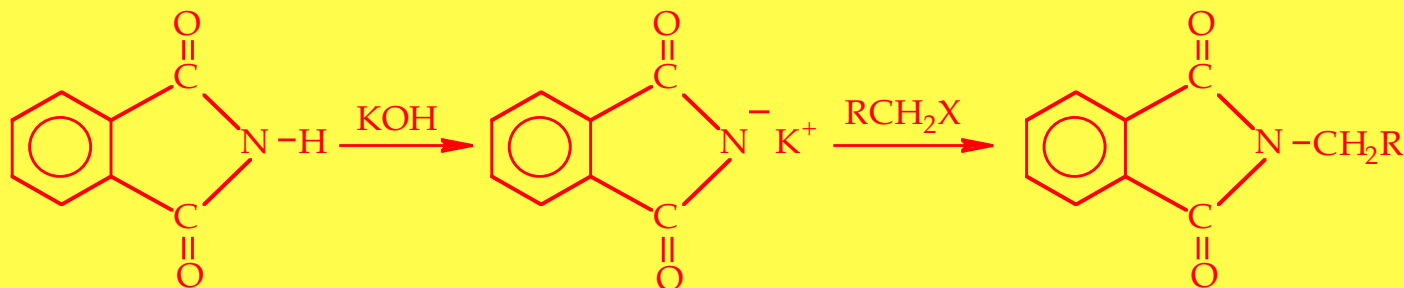


Primary amide

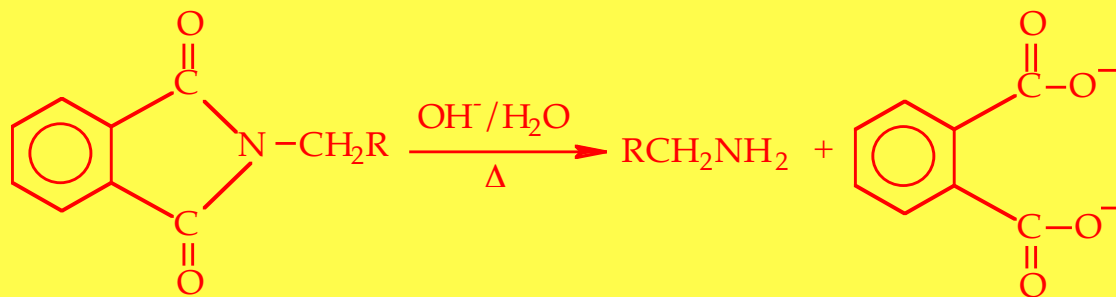


Acyl azide

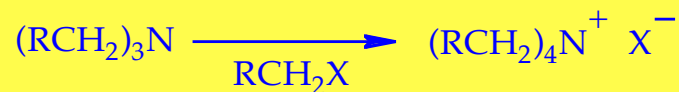
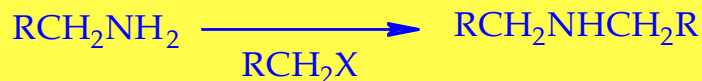
Amines via Bimolecular Nucleophilic Substitution



**Gabriel
Synthesis**



Alkylation

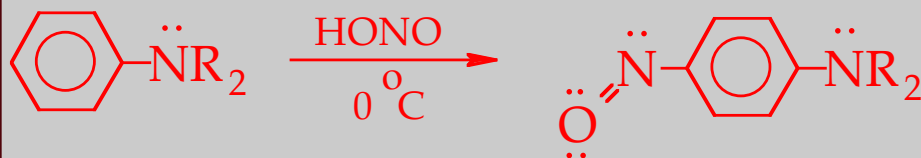
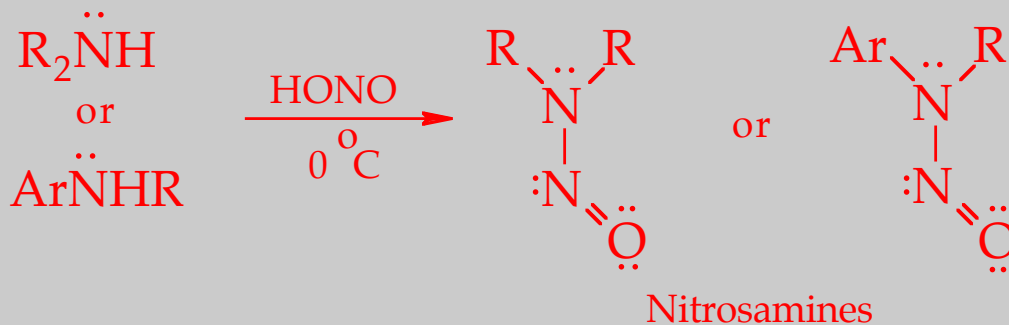
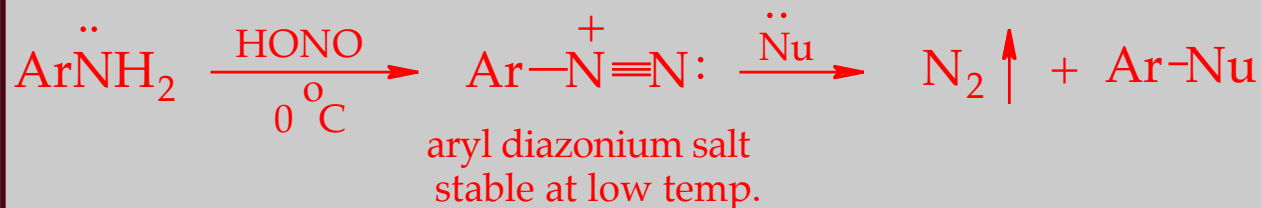
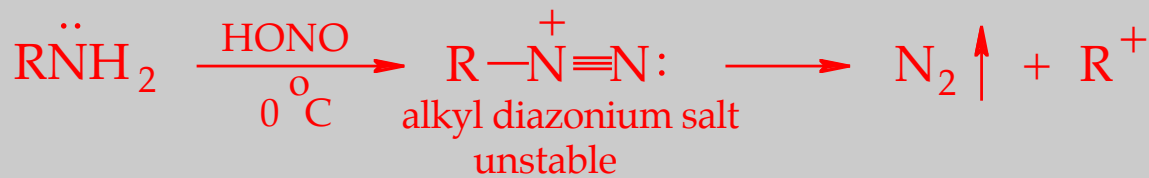


AMINE REACTIONS

- ◆ **Reaction as Bases: Salt Formation**
- ◆ **Amide Formation**
- ◆ **Alkylation**
- ◆ **Reaction with Nitrous Acid**

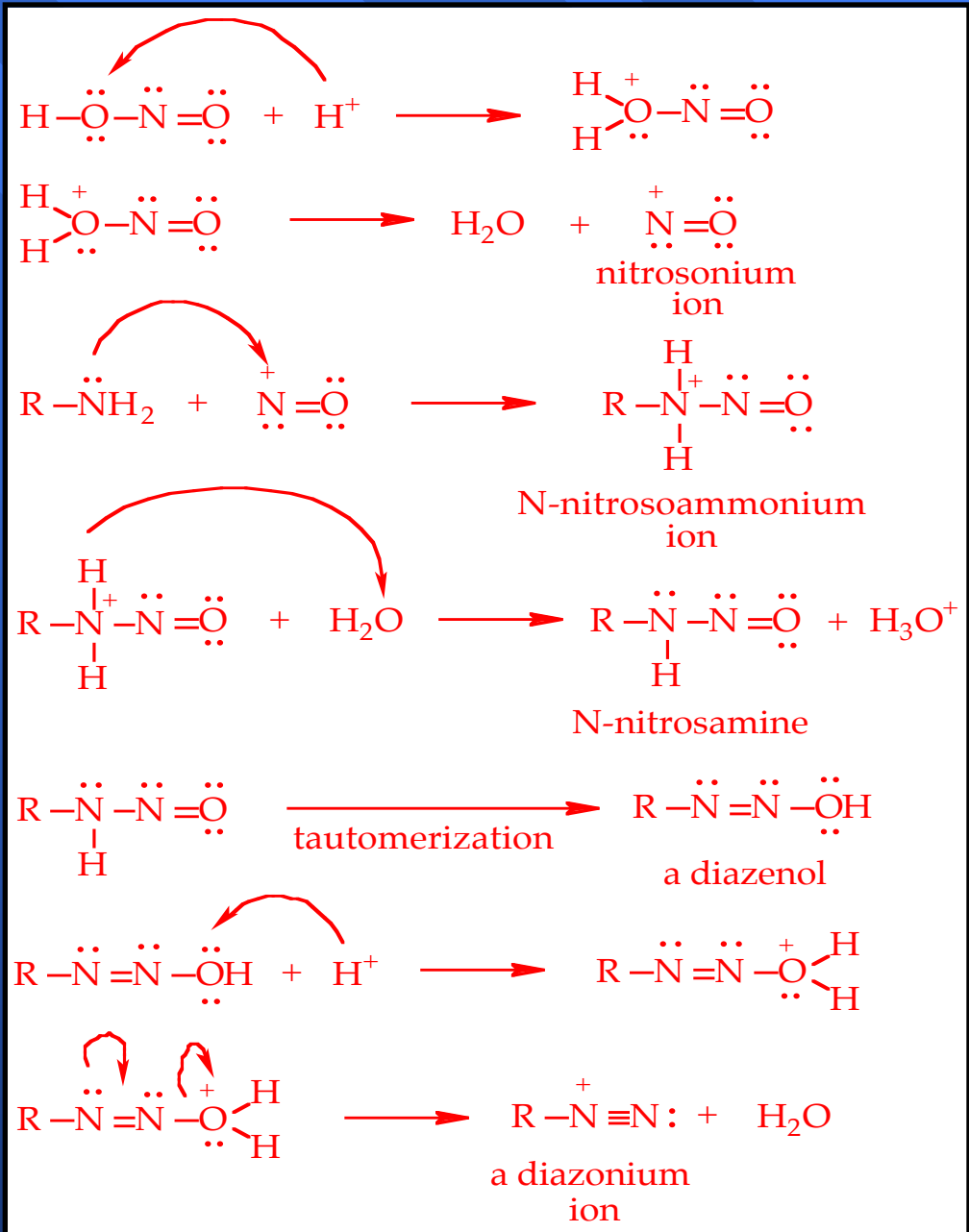
Amine Reactions with Nitrous Acid

- ❖ **Primary amines: Diazotization**
- ❖ **Secondary Amines: Nitrosamine formation**
- ❖ **Tertiary Amines: C-nitroso compounds**

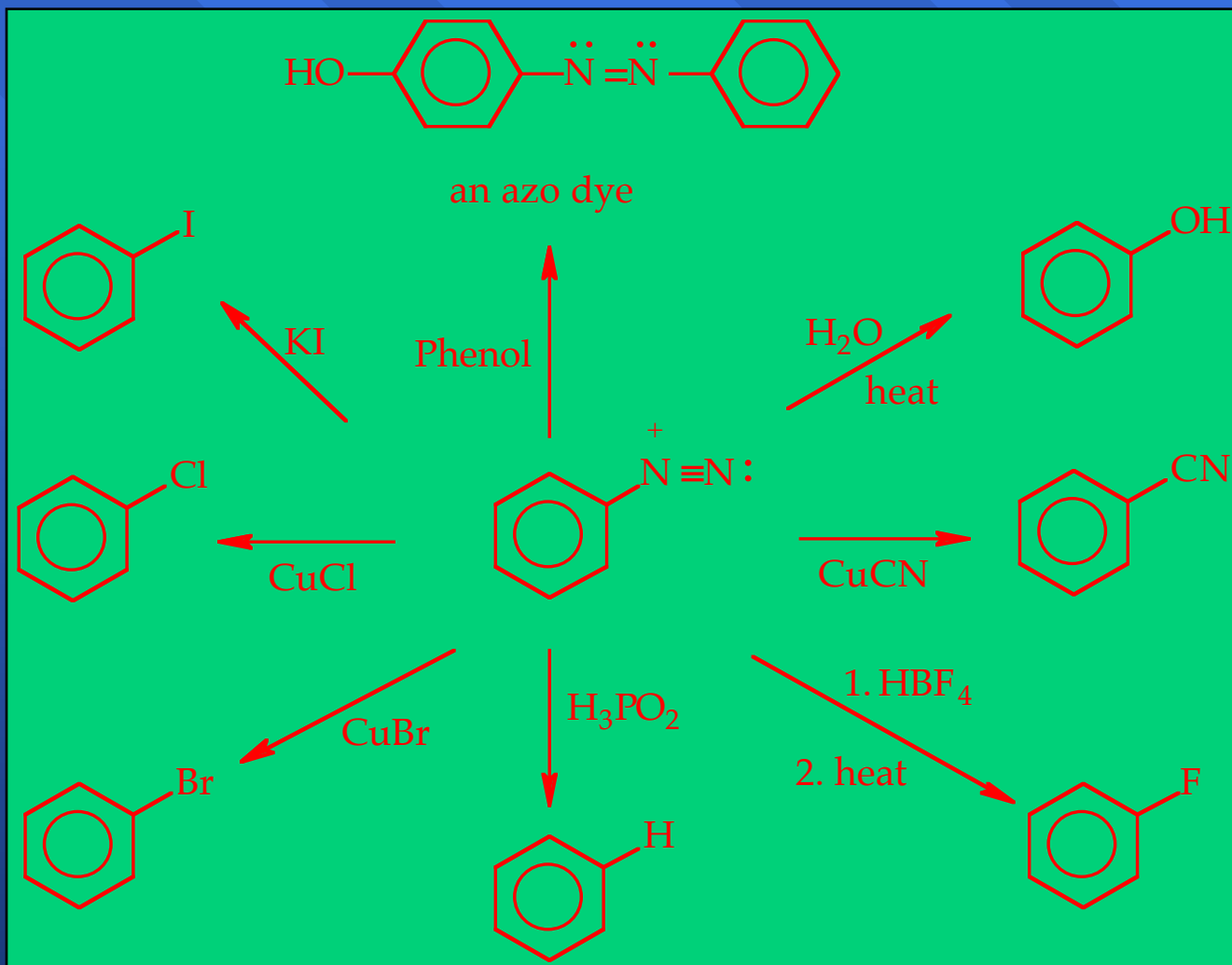


Aromatic C-nitroso compound

Mechanism of Diazonium salt formation



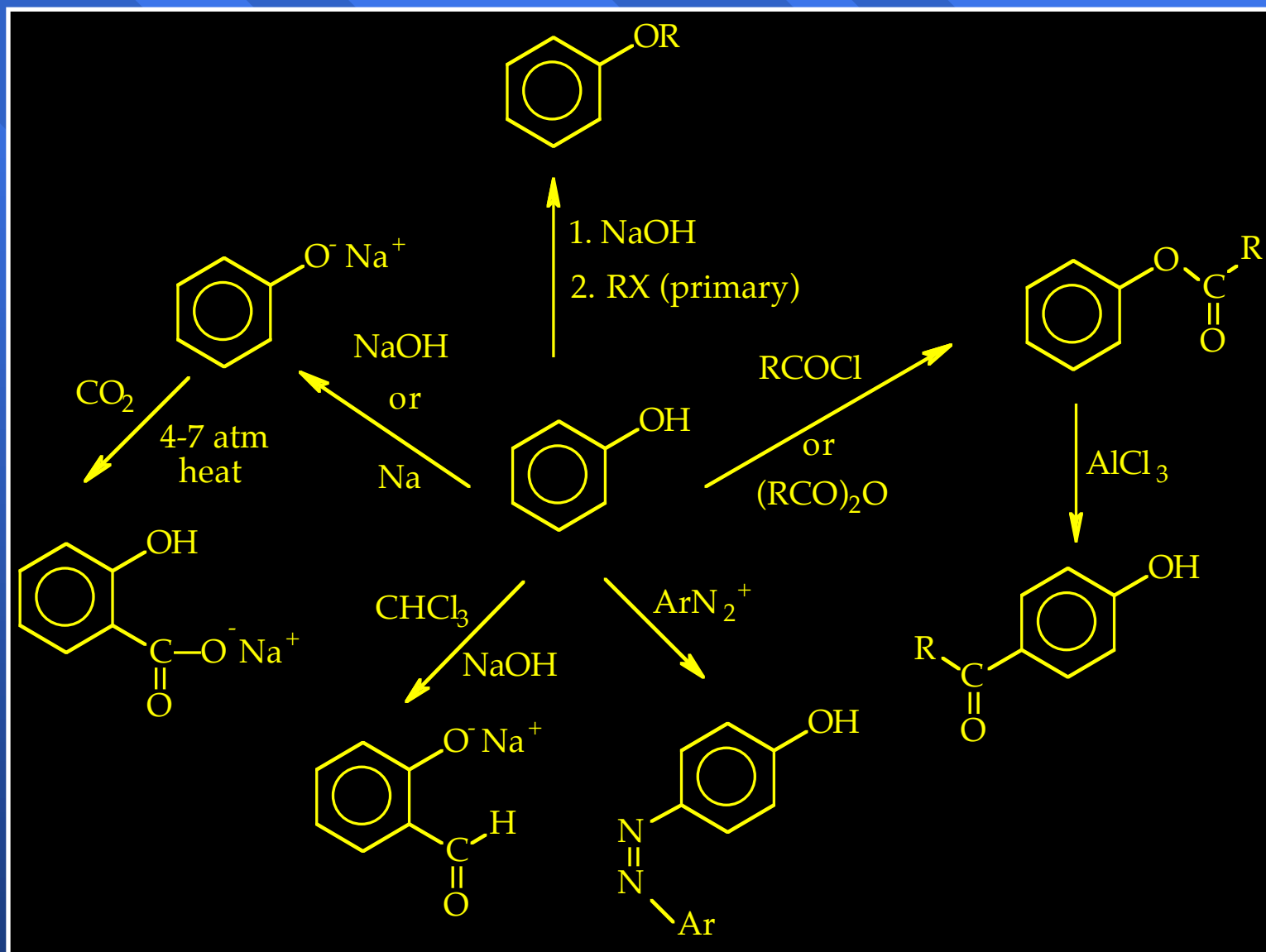
Diazonium Salt Reactions



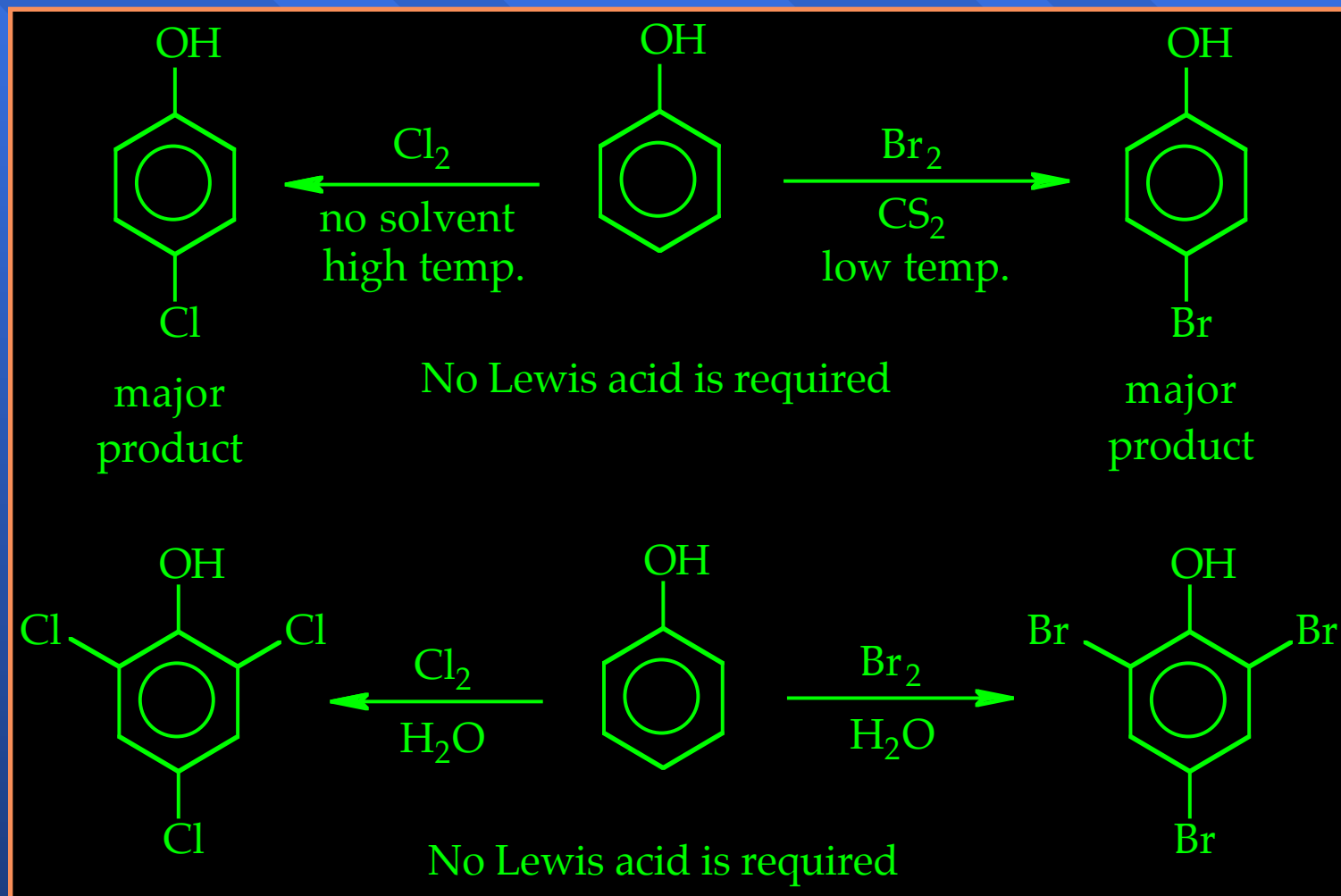
Reactions of Phenols

- ❖ **Salt formation via strong base or active metal**
 - ❖ **Williamson ether synthesis**
 - ❖ **Ester formation**
- ❖ **Friedel-Crafts acylation: Fries rearrangement**
 - ❖ **Halogenation**
 - ❖ **Coupling with diazonium salts**
 - ❖ **Kolbe-Schmitt Carboxylation**
 - ❖ **Reimer-Tiemann reaction**

PHENOL REACTIONS: A SUMMARY



HALOGENATION OF PHENOLS



Reimer-Tiemann Reaction Mechanism

