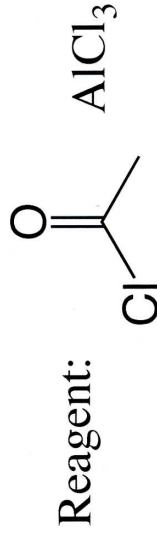
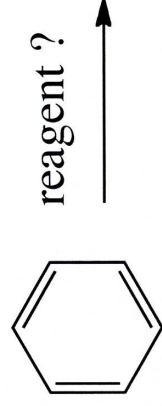
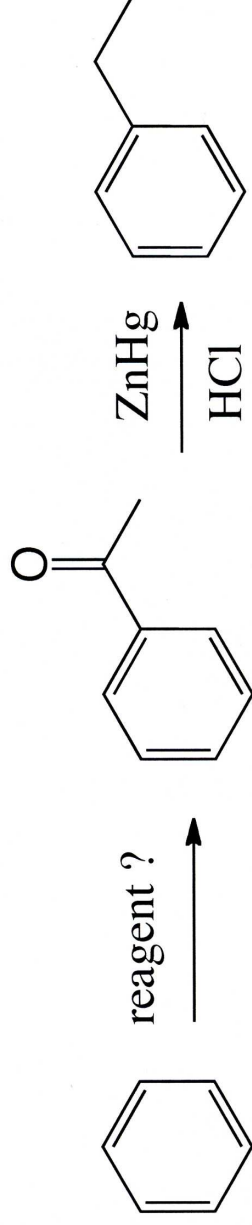
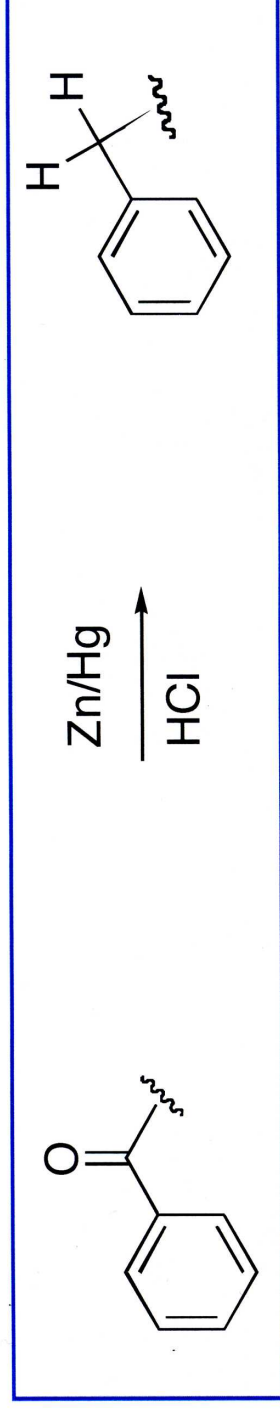
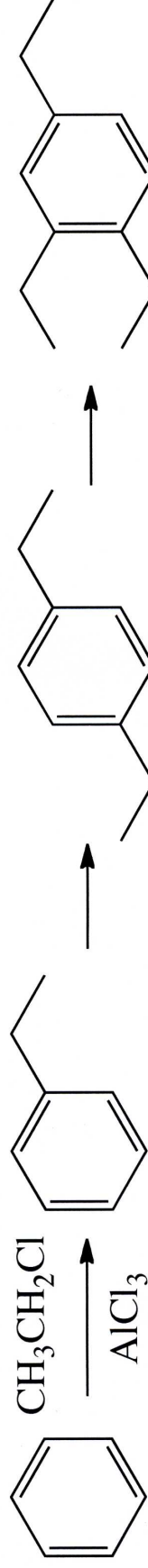


2. Clemmensen Reduction: Ar Ketone to Methylene



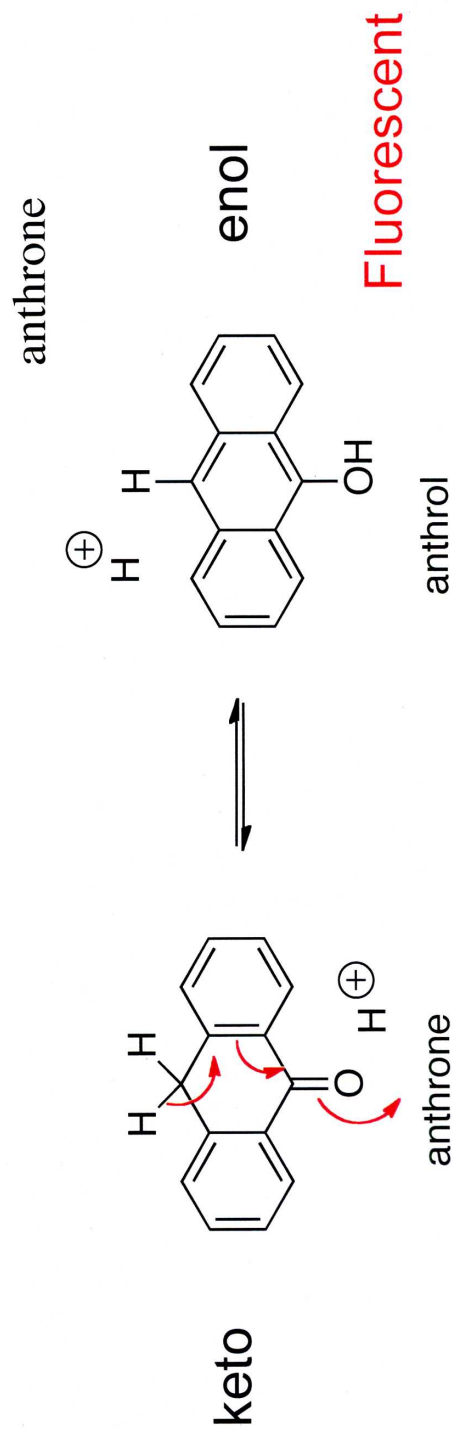
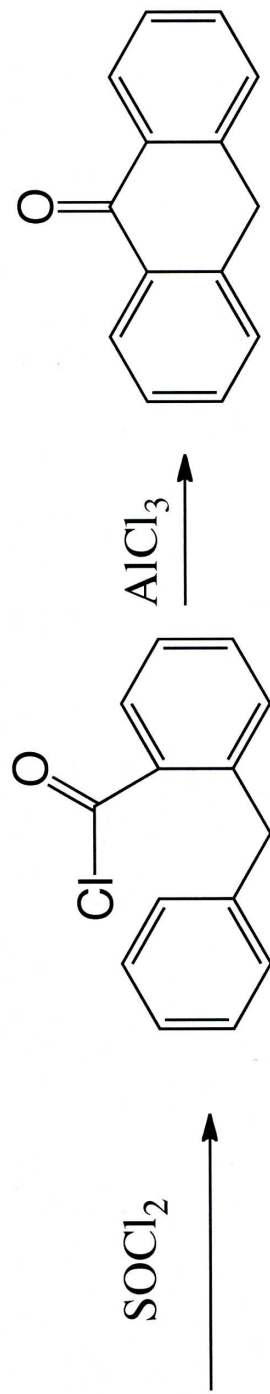
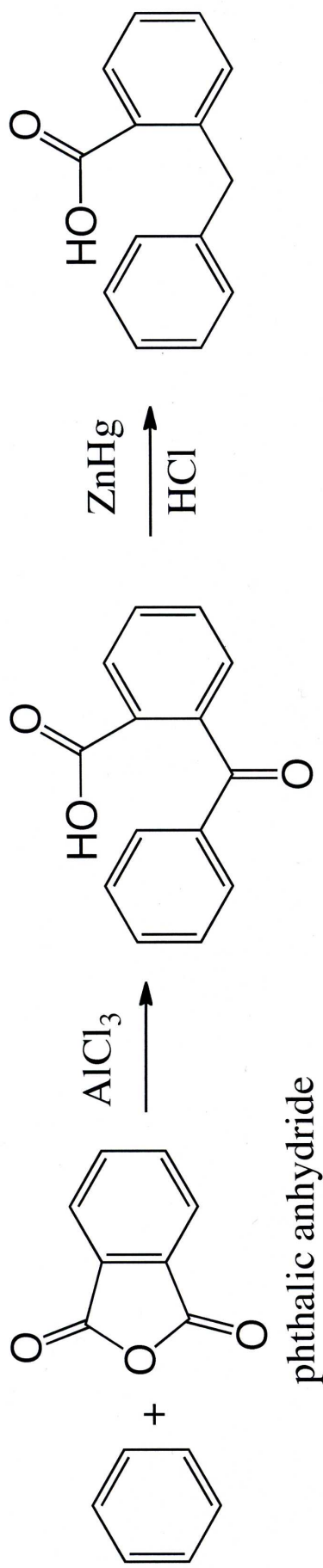
it may seem simpler to make ethyl benzene with ethyl chloride, BUT....



ethyl benzene is more reactive than benzene (inductive effect): **reacts faster**

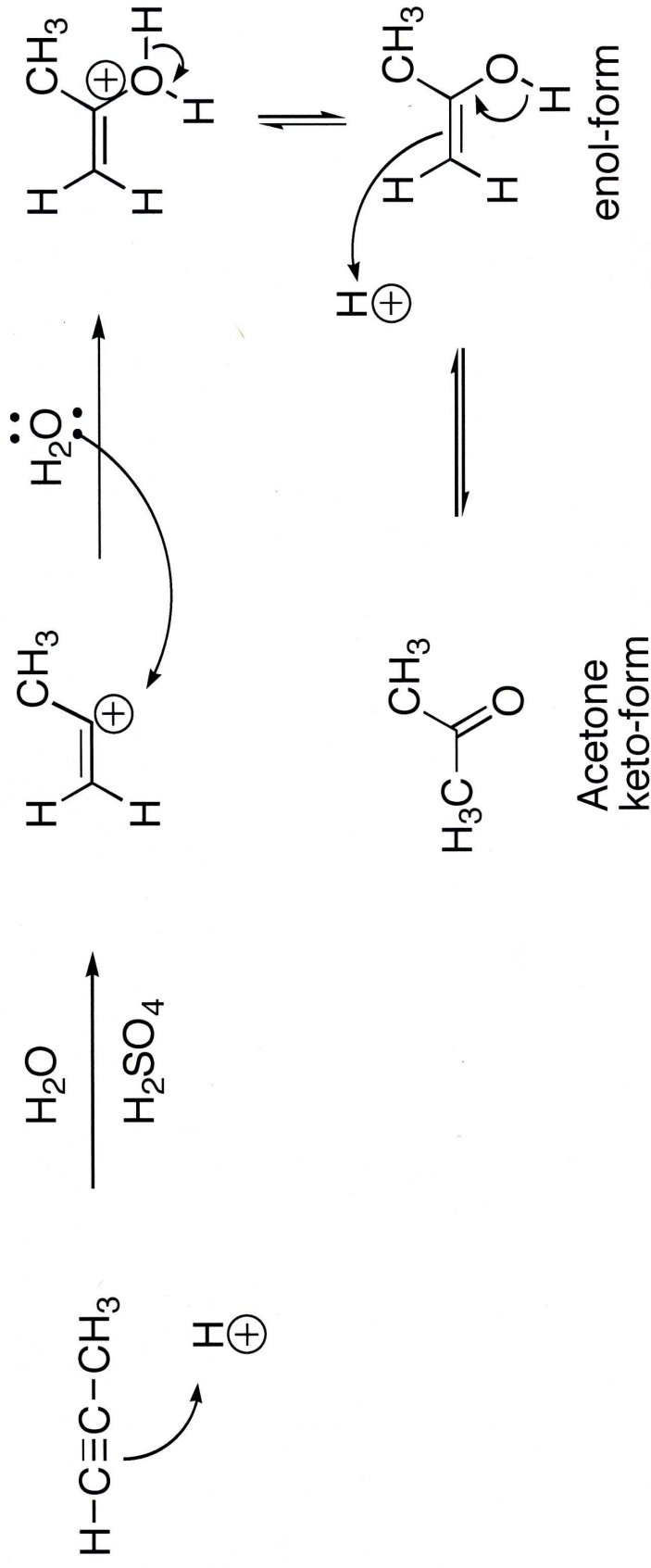
acetophenone is less reactive than benzene (resonance effect): **reacts slower**

2. Clemmensen Reduction: Ar Ketone to Methylene



Review tautomerization from CHEM 261

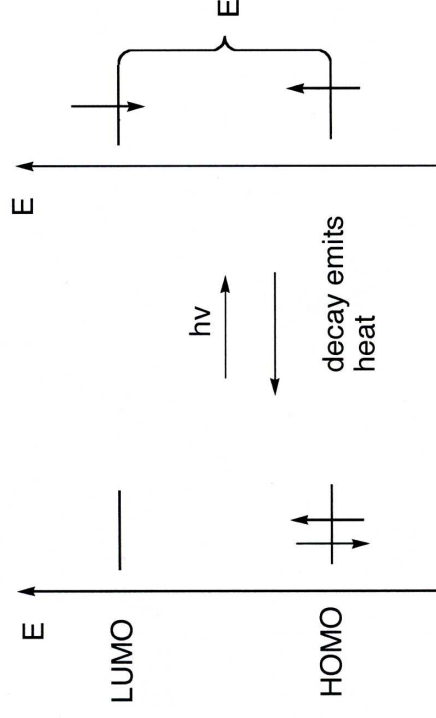
water addition to acetylenes to make ketones



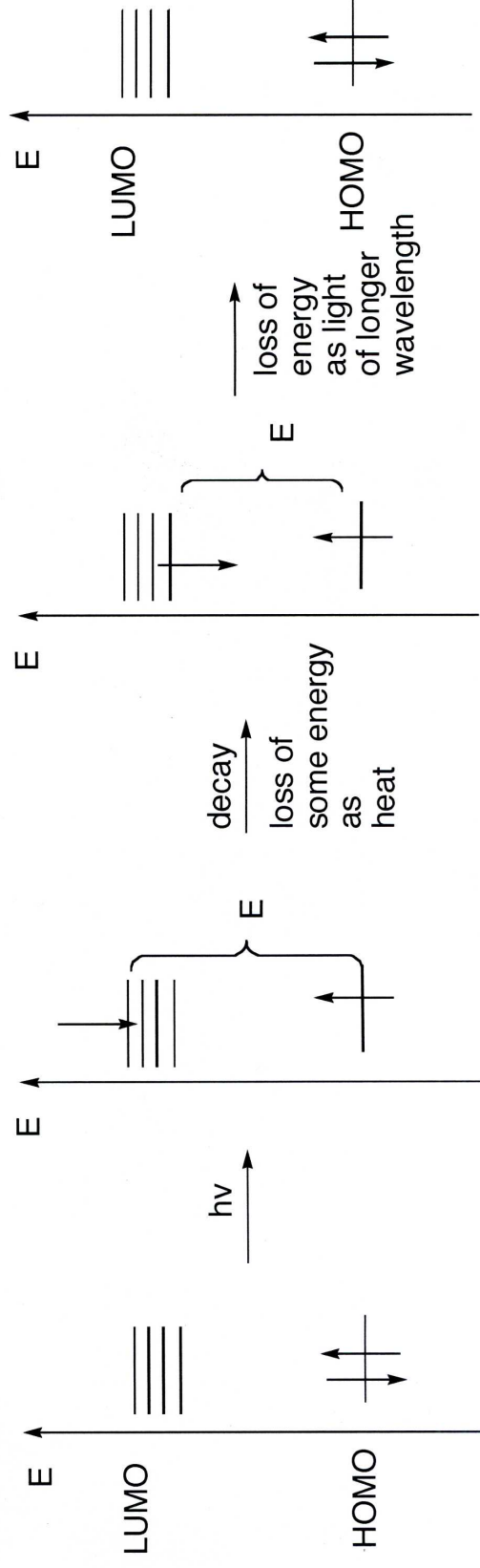
Digression: Fluorescence

Fluorescence is the emission of electromagnetic energy from an excited state (obtained by irradiation, normally in the ultraviolet) as light (usually visible wavelengths)

usually absorbed energy
decay emits heat

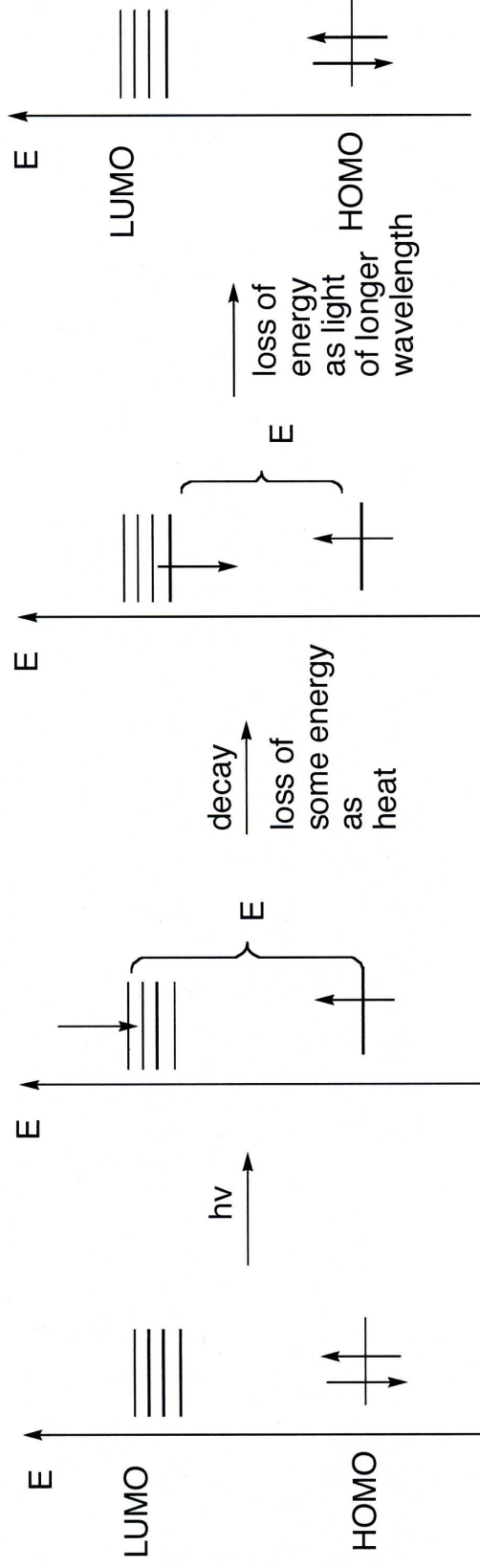


certain compounds absorb energy
into higher state: **decay emits light**



Digression: Fluorescence

certain compounds absorb energy into higher state: **decay emits light**



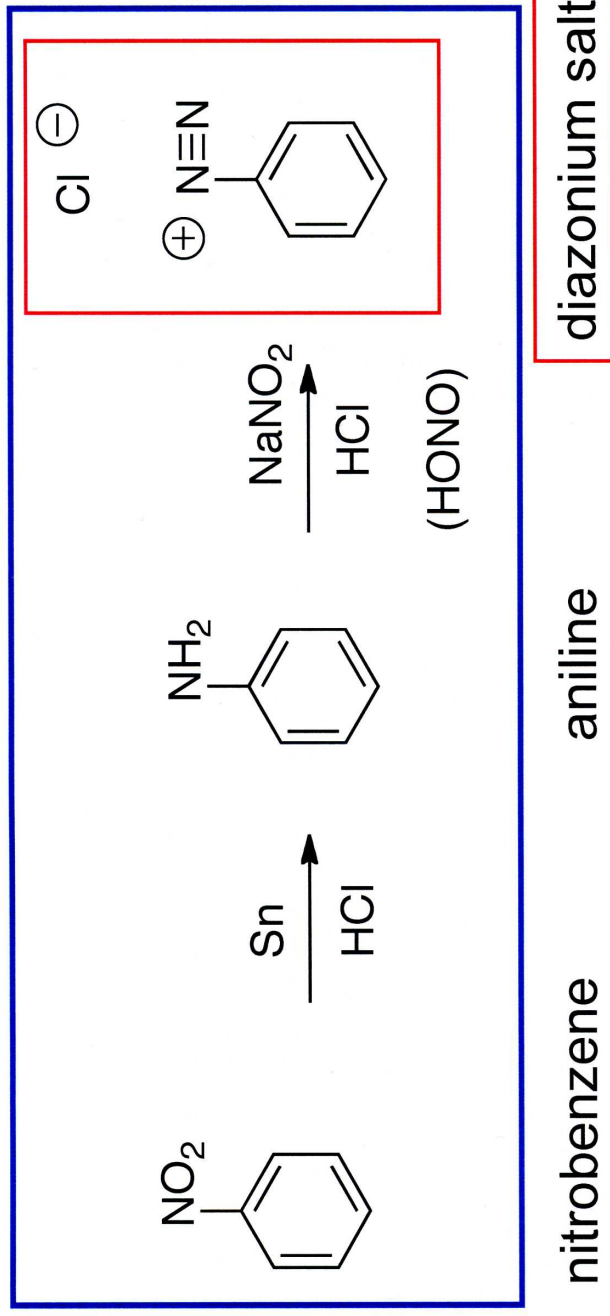
many natural conjugated molecules that exhibit fluorescence, seen by UV irradiation
 e.g. green fluorescent protein (GFP)

Phosphorescence occurs for some compounds if the electrons become unpaired

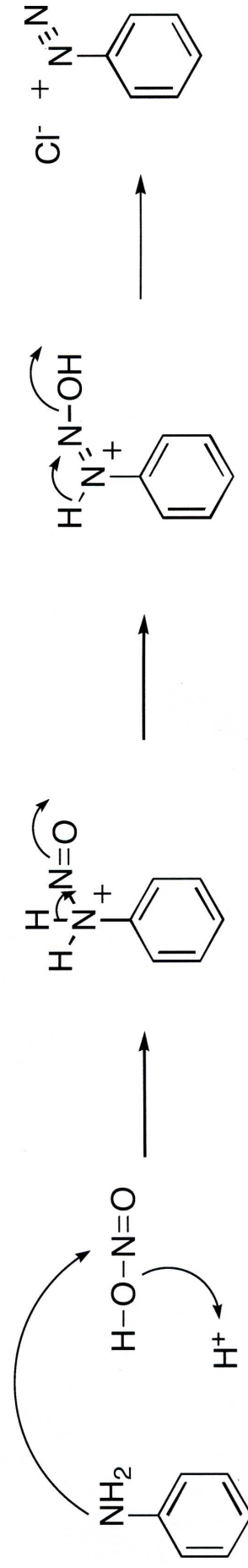
Phosphorescence decay is slower process than fluorescence: lasts longer
 e.g. “glow in dark stars”

Chemiluminescence is result of reaction that emits energy as light

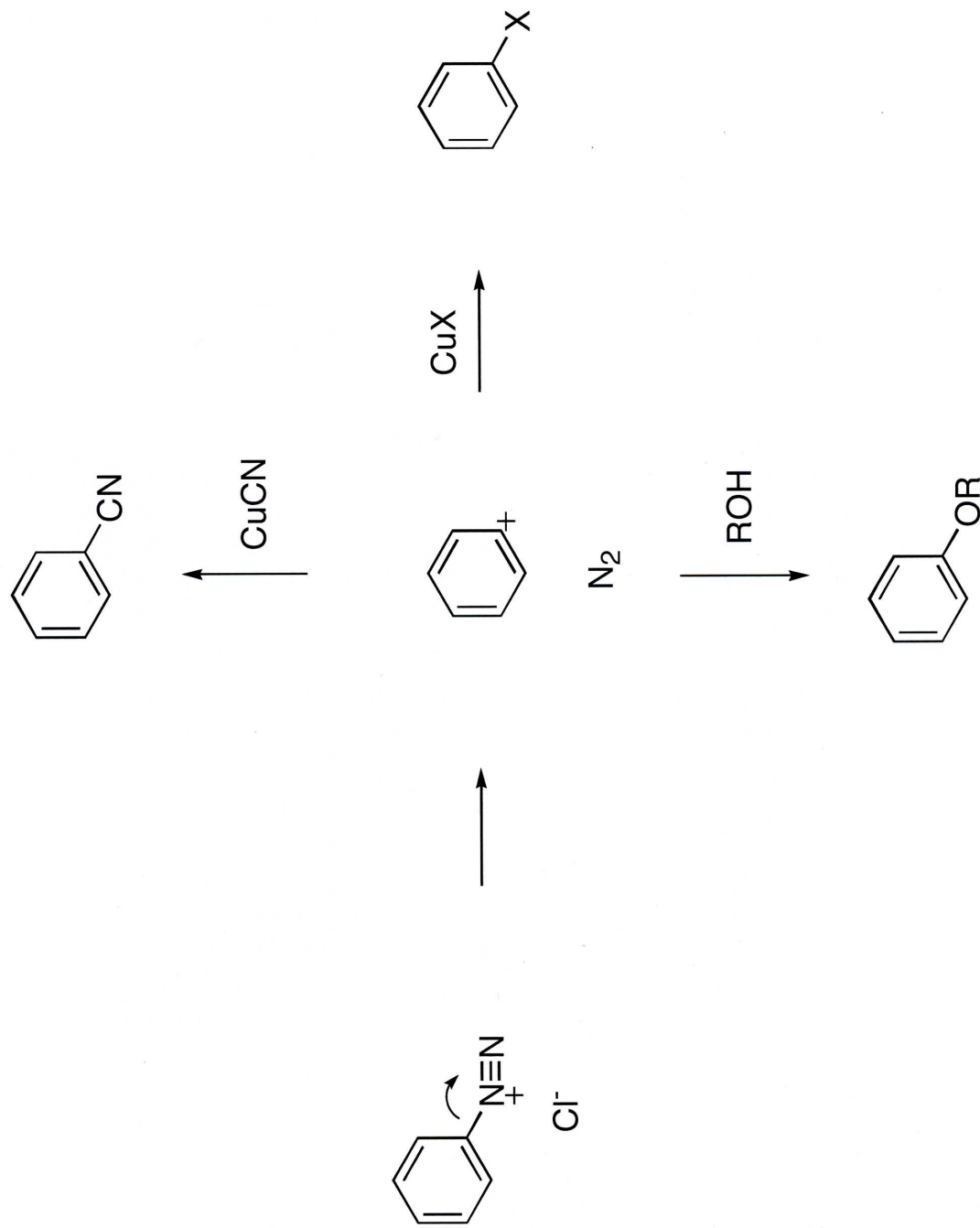
3. Nitro Reduction & Aromatic Amino Diazotization Reaction



mechanism

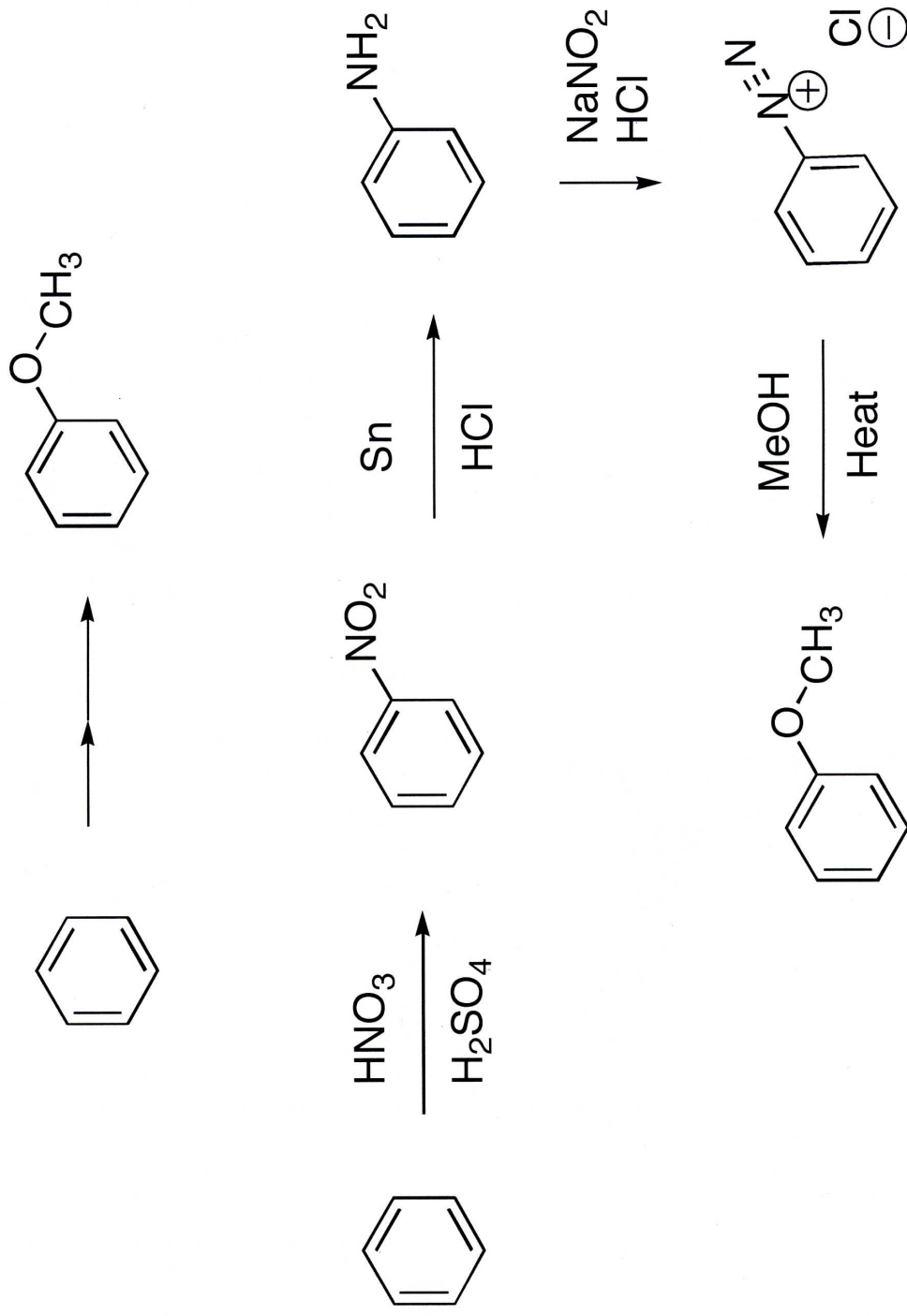


Replacement of N_2 of Diazonium salts



Replacement of N₂ of Diazonium salts

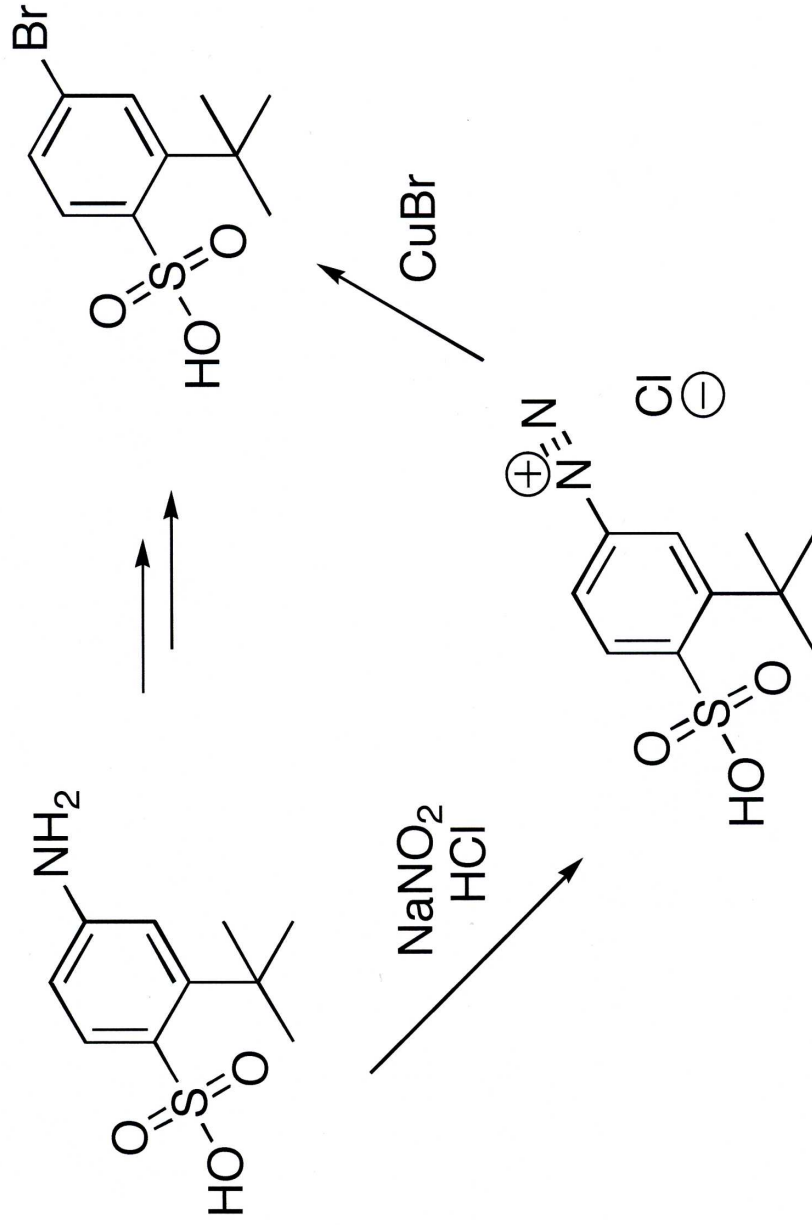
Example: make anisole (methoxybenzene) from benzene



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Replacement of N_2 of Diazonium salts

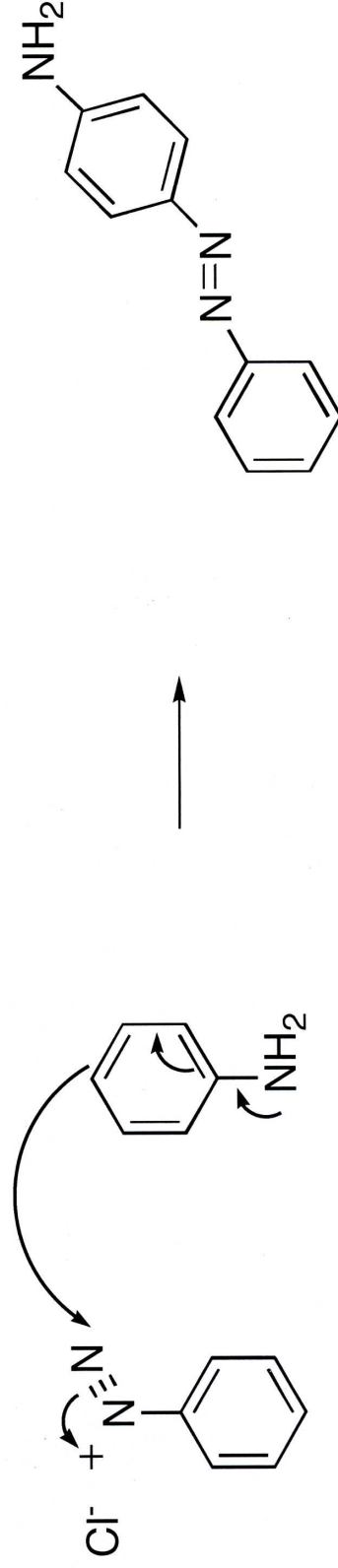
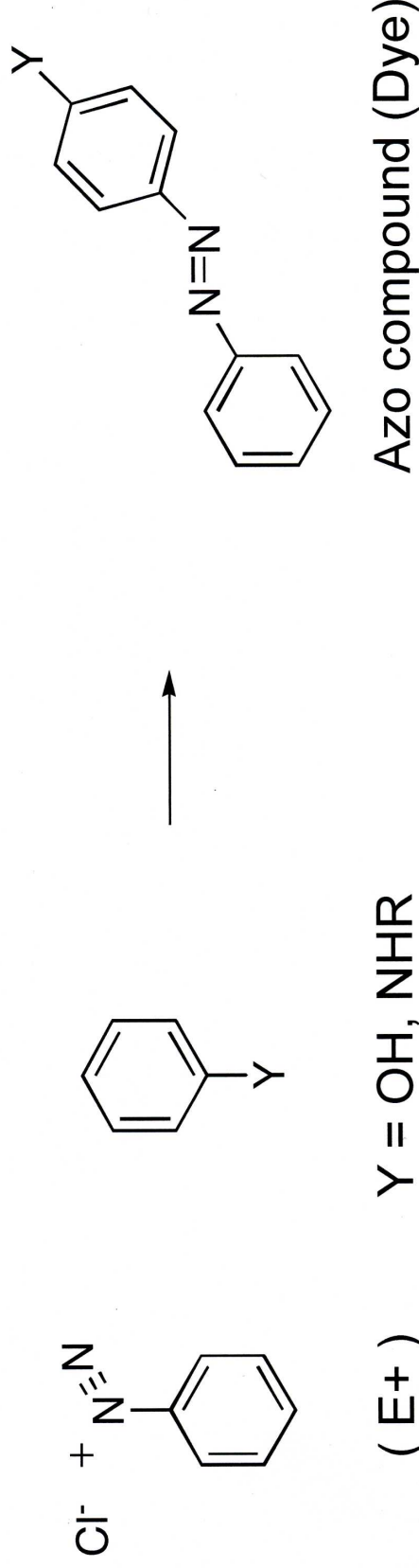
Example: make substituted bromoaryl



Diazonium Salts in Electrophilic Ar Substitution

Diazonium Coupling: requires phenol or aniline as partner

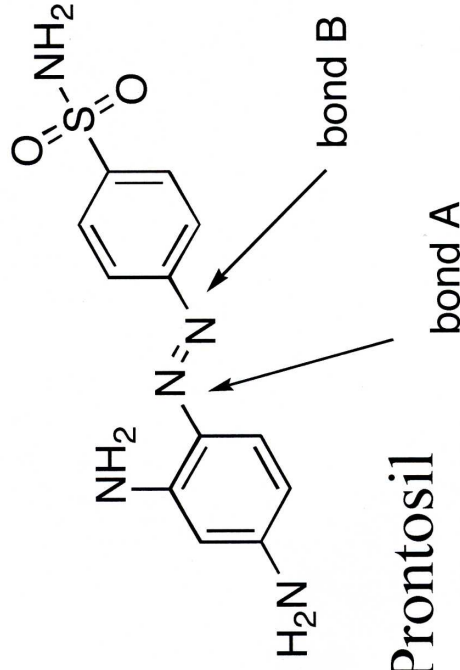
Diazonium salts form highly colored azo compounds



Diazonium Salts in Electrophilic Ar Substitution

Diazonium Coupling: requires phenol or aniline as partner

Prontosil was prepared commercially by diazonium coupling.

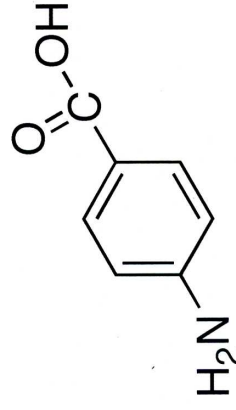
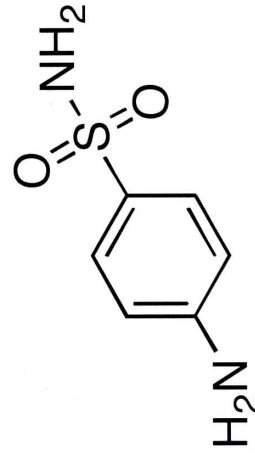


which bond made by coupling ? A

Gerhard Domagk 1895-1964

Nobel 1939

1st Sulfa drug - first broad spectrum antibiotic



bacteria

→

Folic Acid

Diazonium Salts in Electrophilic Ar Substitution

How could Basic Brown be synthesized from toluene? Retrosynthesis

