

**B.Sc. Semester-VI
Organic Chemistry
Paper-XIV**



3. Heterocyclic Compounds

Coverage:

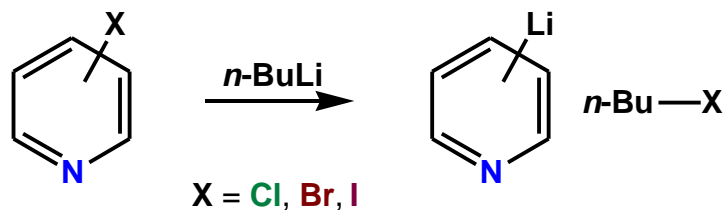
8. Pyridines : Metal-Halogen Exchange and Direct Metallation



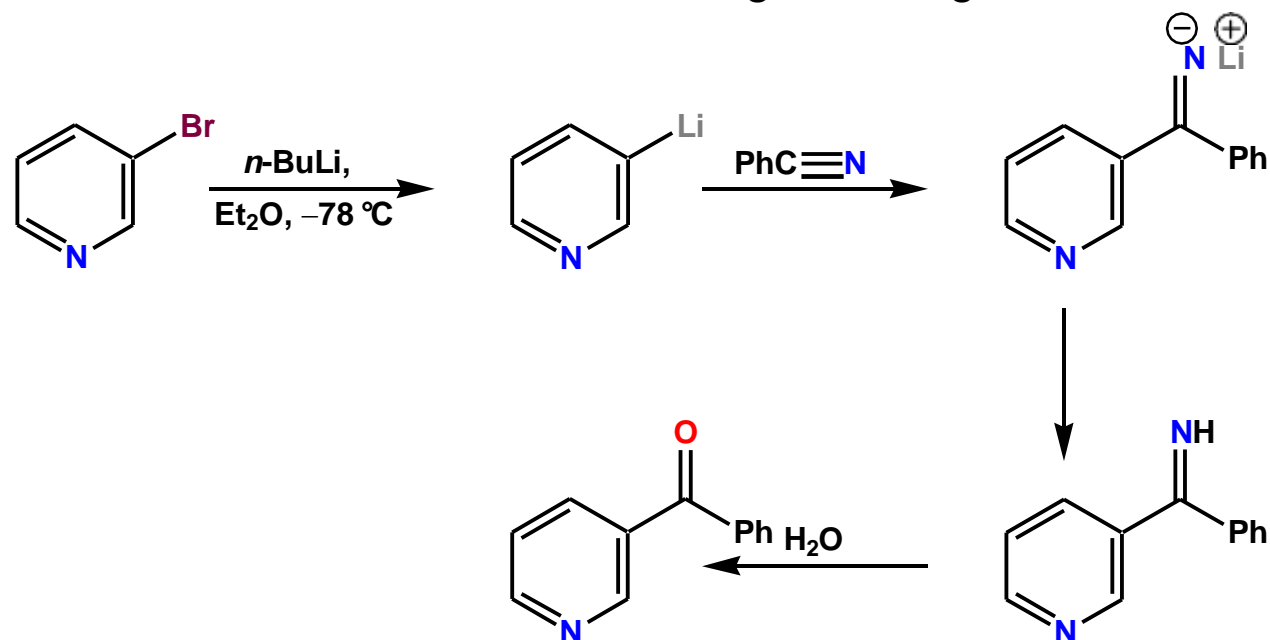
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Pyridines – Metal-Halogen Exchange

Direct Exchange of Metal and a Halogen

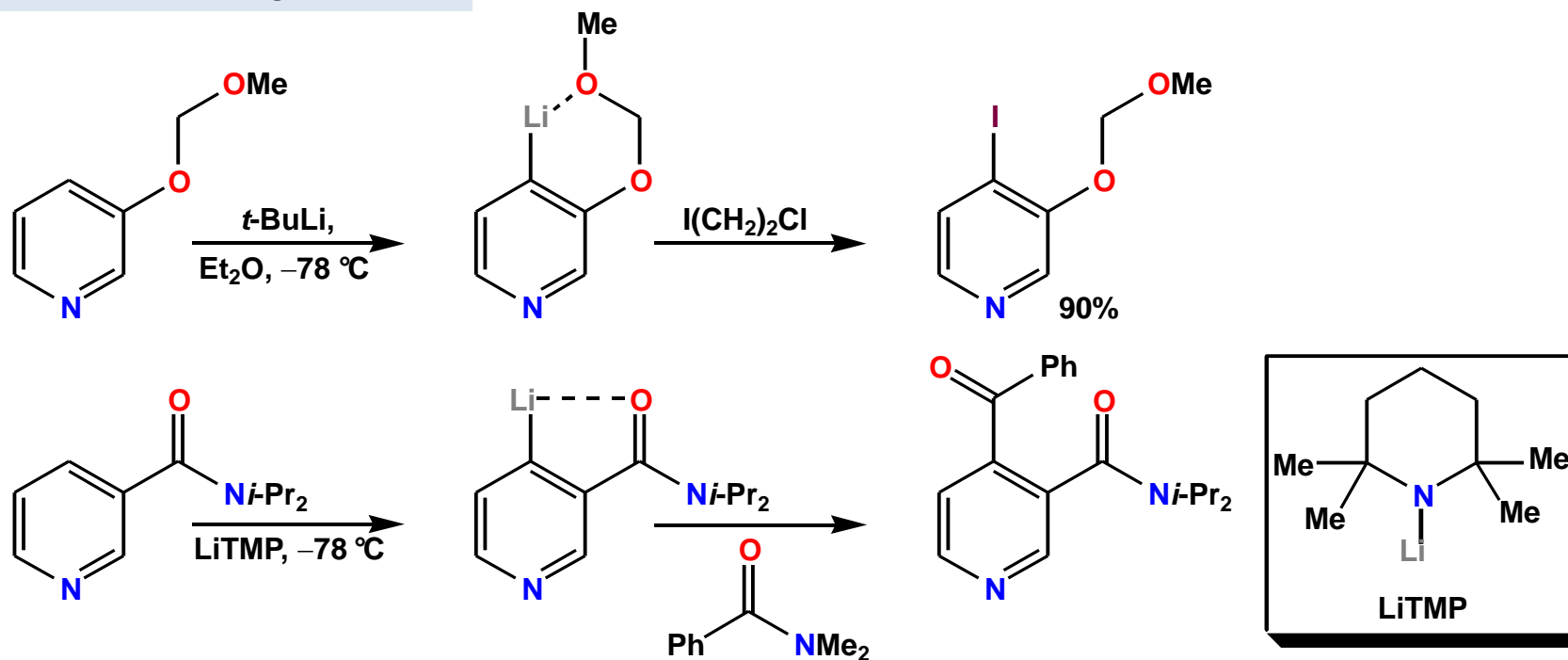


- Halogenated pyridines do not tend to undergo nucleophilic displacement with alkyl lithium or alkyl magnesium reagents
- Metallated pyridines behave like conventional Grignard reagents



Pyridines – Directed Metallation

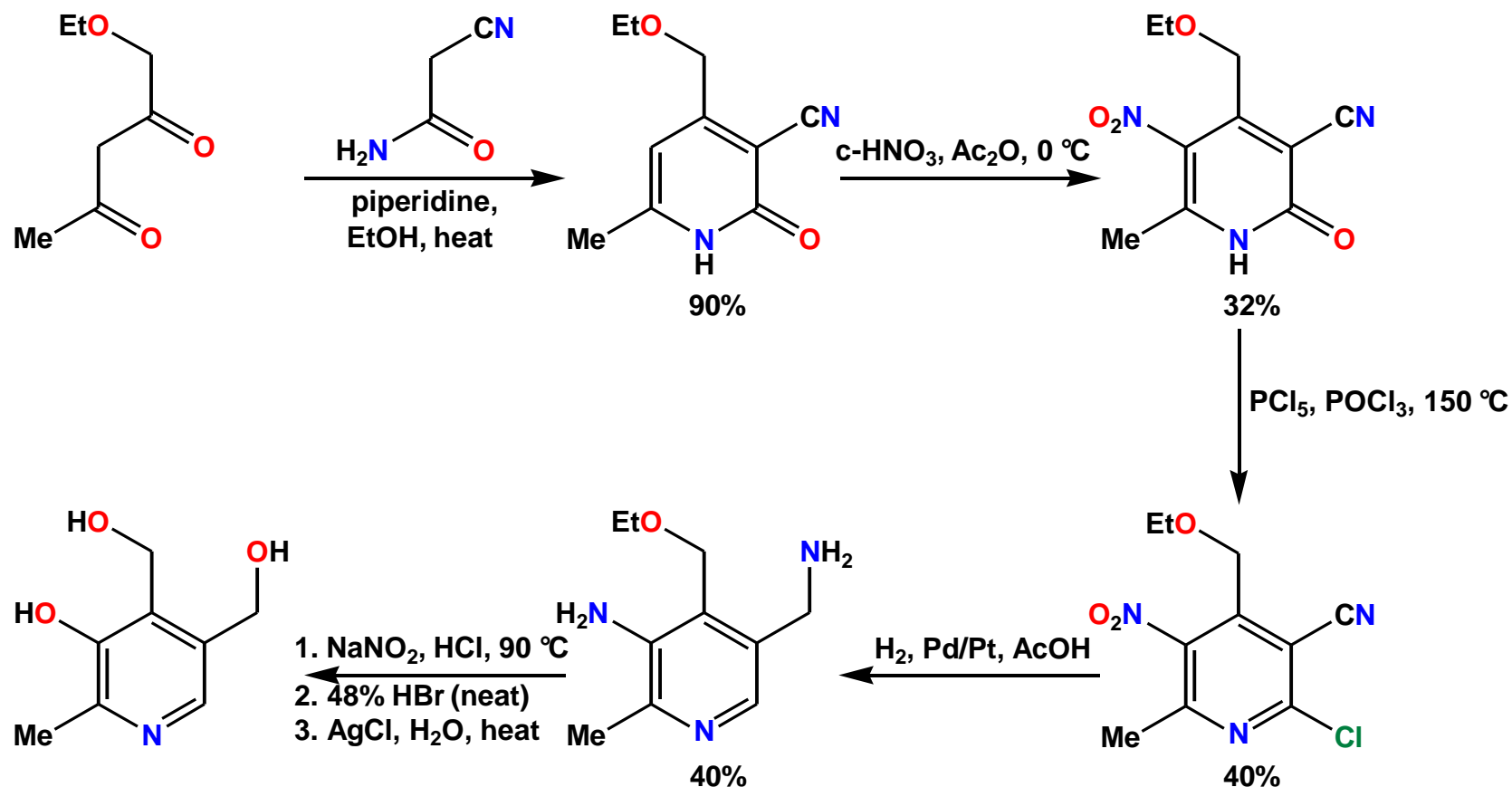
Use of Directing Groups



- Directing groups allow direct lithiation at an adjacent position
- A Lewis basic group is required to complex the Lewis acidic metal of the base

Pyridines – Synthesis of a Natural Products

Synthesis of Pyridoxine (Vitamin B₆) Using the Guareschi Synthesis



- The final sequence of steps involves formation of a *bis*-diazonium salt from a diamine
- Pyridoxine performs a key role as the coenzyme in transaminases