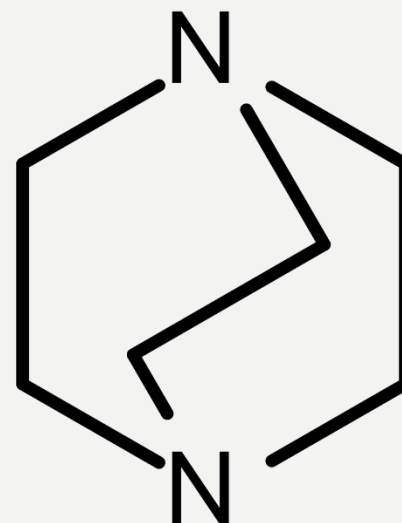
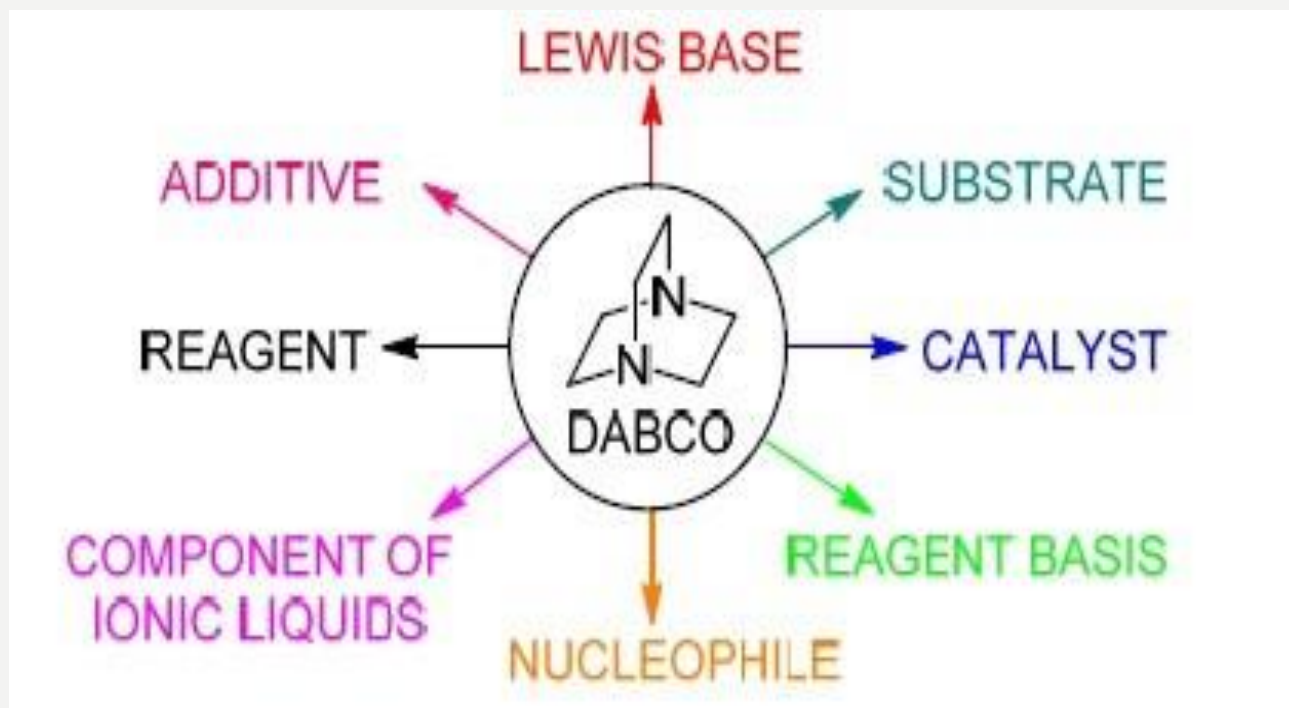


DABCO

- **DABCO (1,4-diazabicyclo[2.2.2]octane)** is a bicyclic organic compound with the formula $N_2(C_2H_4)_3$.
- This colorless solid is a highly nucleophilic tertiary amine base, which is used as a catalyst and reagent in polymerization and organic synthesis.

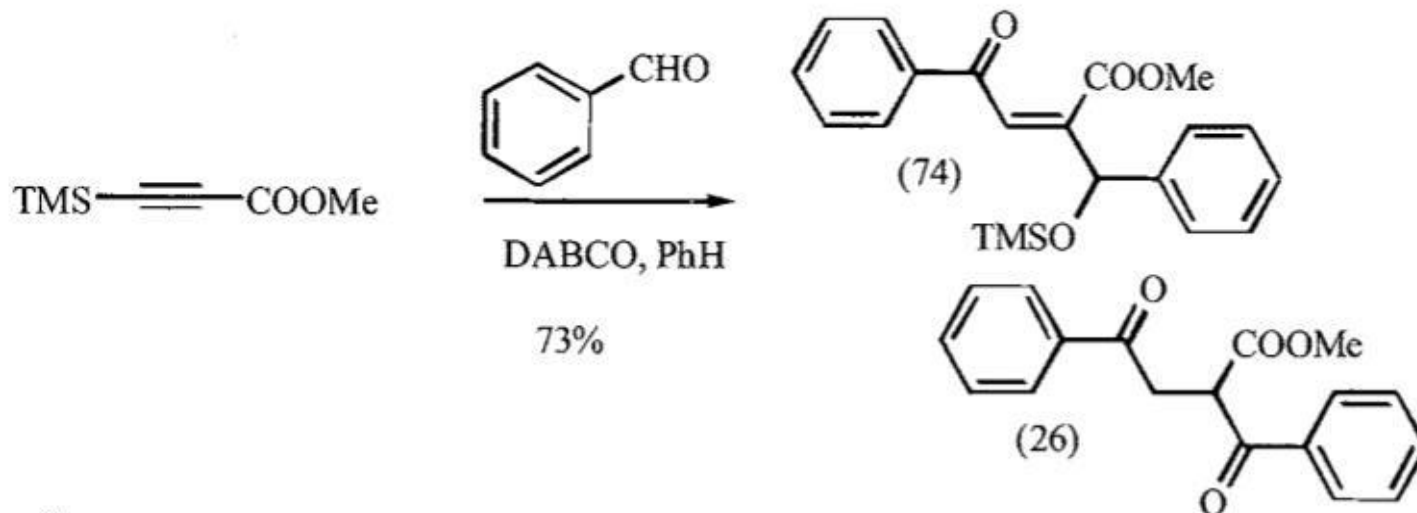


- DABCO is used as a base-catalyst for formation of polyurethane from alcohol and isocyanate functionalized monomers and pre-polymers.

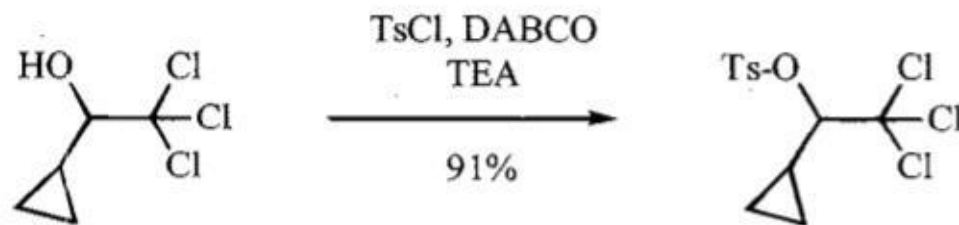


Examples:

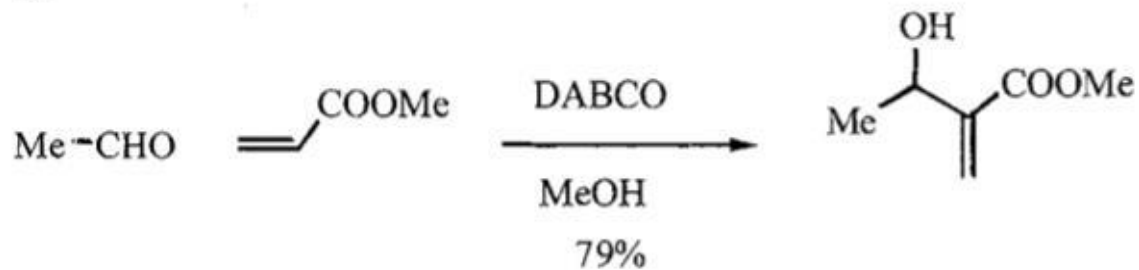
1.²



2.³

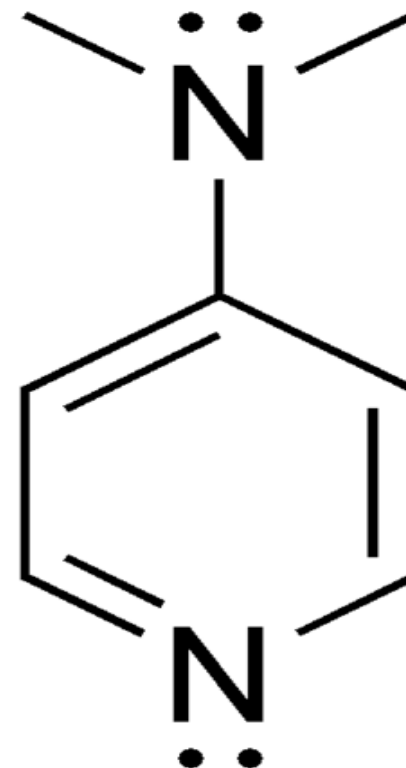


3.⁴

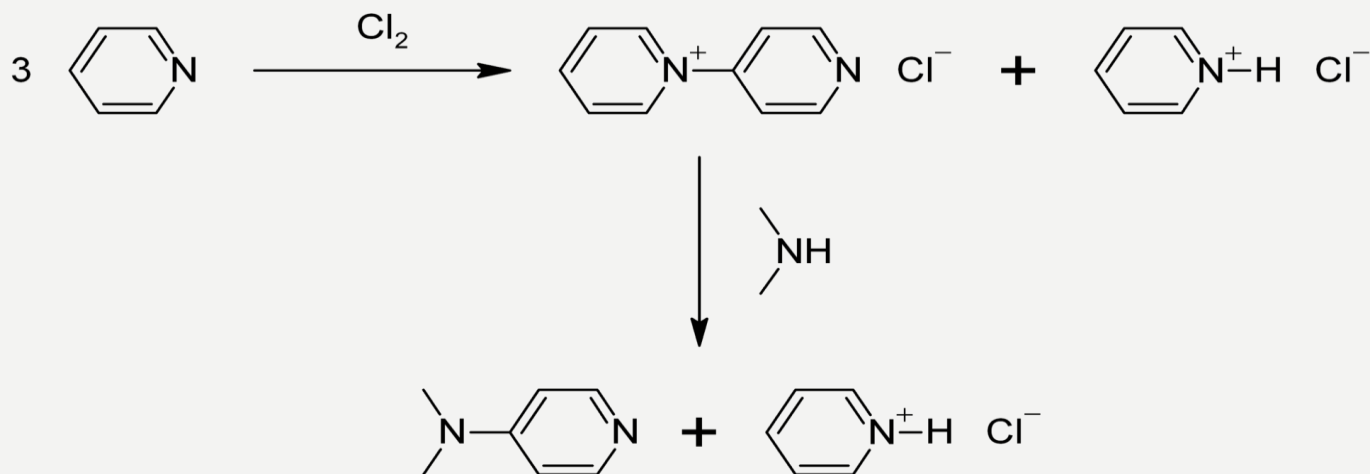


DMAP

- **4-Dimethylaminopyridine (DMAP)** is a derivative of pyridine with the chemical formula $(\text{CH}_3)_2\text{NC}_5\text{H}_4\text{N}$.
- This colourless solid is of interest because it is more basic than pyridine, owing to the resonance stabilisation from the NMe_2 substituent.
- Because of its basicity, DMAP is a useful nucleophilic catalyst for a variety of reactions such as esterification with anhydrides



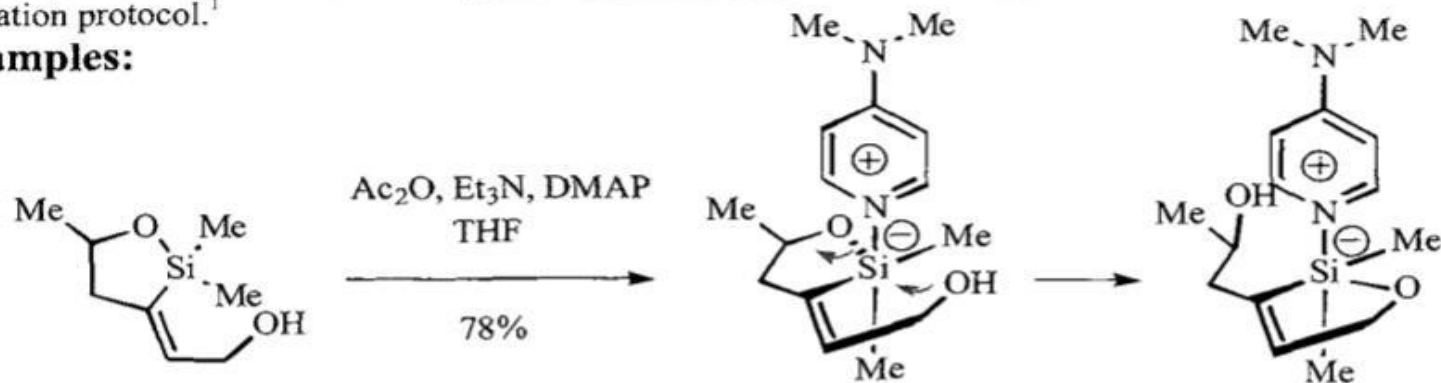
- DMAP has a relatively high toxicity and is particularly dangerous because of its ability to be absorbed through the skin. It is also corrosive.
- DMAP can be prepared in a two-step procedure from pyridine, which is first oxidized to 4-pyridylpyridinium cation. This cation then reacts with dimethylamine



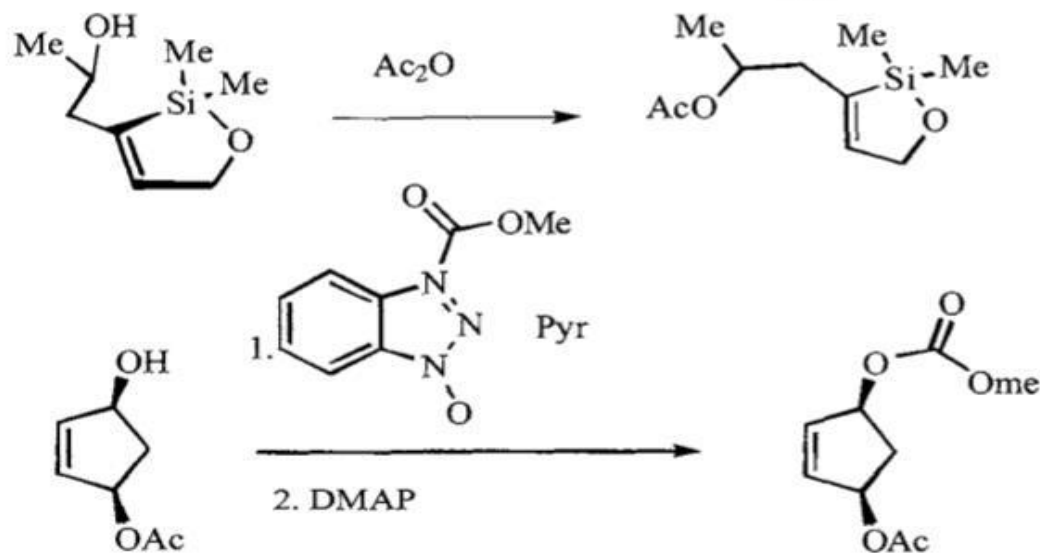
oxidation protocol.¹

Examples:

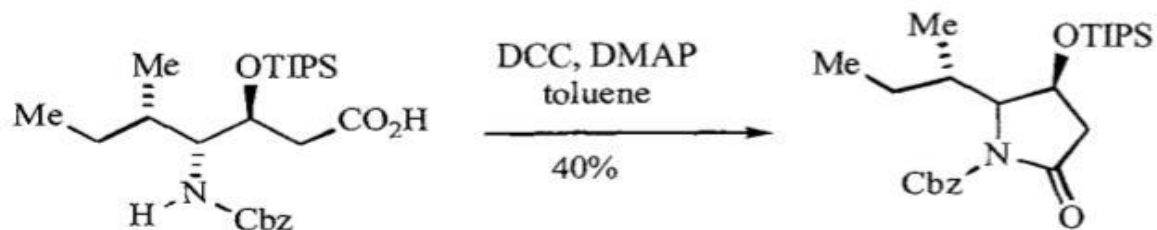
1.²



2.³

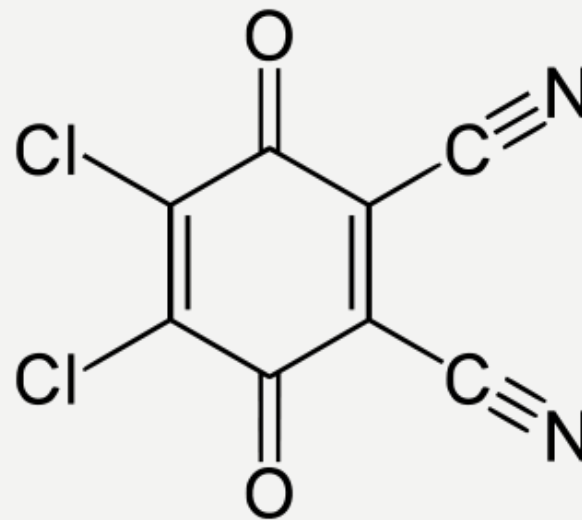


3.⁴

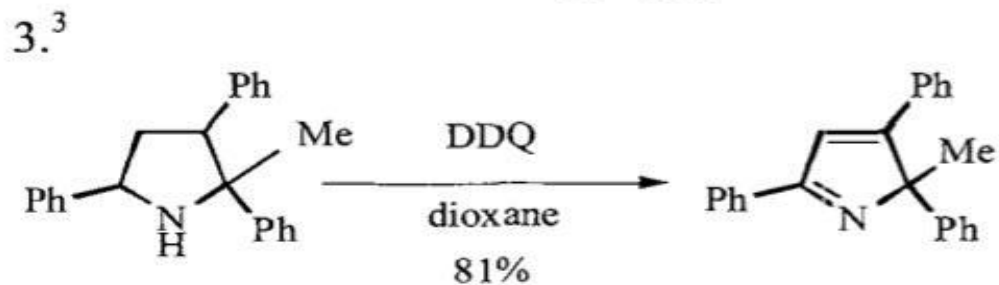
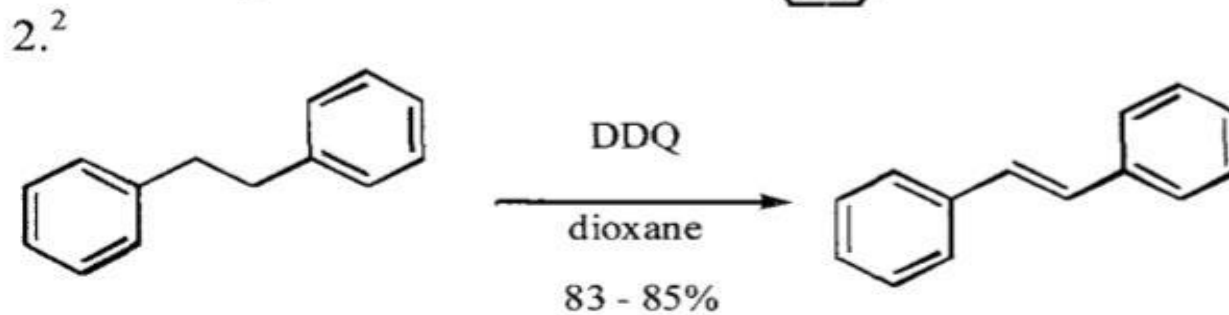
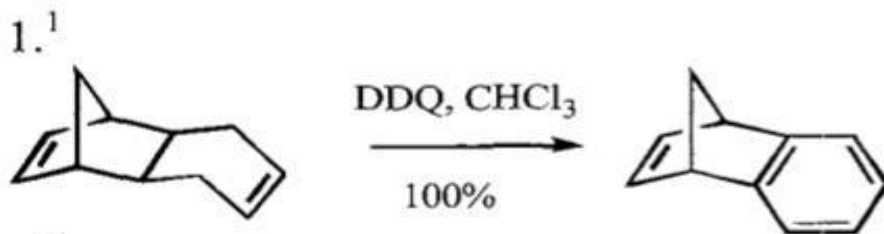


DDQ

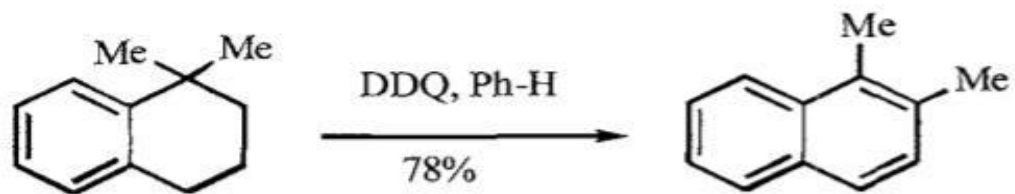
- **2,3-Dichloro-5,6-dicyano-1,4-benzoquinone** (or **DDQ**) is the chemical reagent with formula $C_6Cl_2(CN)_2O_2$.
- This oxidant is useful for the dehydrogenation of alcohols, phenols, and steroid ketones in organic chemistry.
- DDQ decomposes in water, but is stable in aqueous mineral acid.



- DDQ (2,3-dichloro-5,6-dicyanobenzoquinone), which is a stronger oxidant than 1,4-benzoquinone, is used as reagent for oxidative couplings and cyclization reactions and dehydrogenation of hydroaromatic compounds.

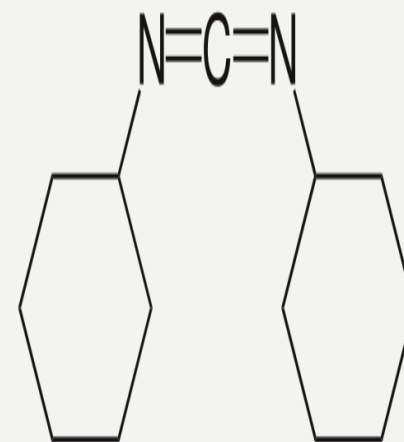


4.⁴ Rearrangement may accompany dehydrogenation:



DEC

- ***N,N'* Dicyclohexylcarbodiimide** (**DCC** or **DCCD**) is an organic compound with the chemical formula $(C_6H_{11}N)_2C$.
- It is a waxy white solid with a sweet odor. Its primary use is to couple amino acids during artificial peptide synthesis.
- The low melting point of this material allows it to be melted for easy handling. It is highly soluble in dichloromethane, tetrahydrofuran, acetonitrile and dimethyl formamide, but insoluble in water



- The C-N=C=N-C core of carbodiimides (N=C=N) is linear, being related to the structure of allene.
- DCC is a dehydrating agent for the preparation of amides, ketones and nitriles.
- In protein synthesis (such as Fmoc solid-state synthesizers), the N-terminus is often used as the attachment site on which the amino acid monomers are added.
- To enhance the electrophilicity of carboxylate group, the negatively charged oxygen must first be "activated" into a better leaving group, DCC is used for this purpose.

- The negatively charged oxygen will act as a nucleophile, attacking the central carbon in DCC.
- DCC is temporarily attached to the former carboxylate group forming a highly electrophilic intermediate, making nucleophilic attack by the terminal amino group on the growing peptide more efficient.

