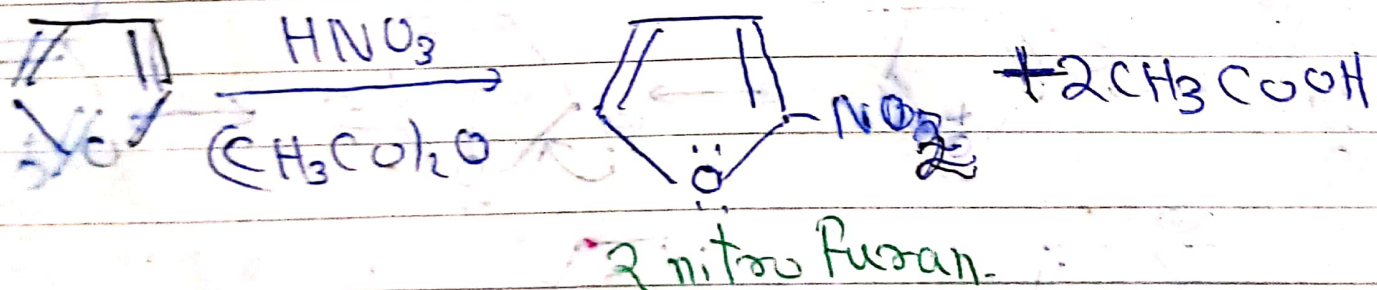


(B) Electrophilic Substitution reactions:- Furan

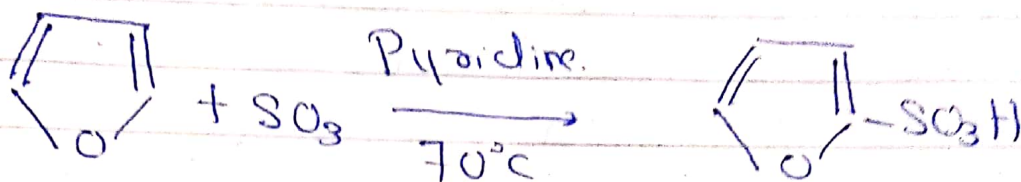
like pyrazole undergoes electrophilic substitution reactions mainly at C-2 position.

(a) Nitration- Furan can be nitrated with a hot solution of HNO_3 in acetic anhydride to form 2 nitro furan.



(b) Sulphonation- Furan may be sulphonated by

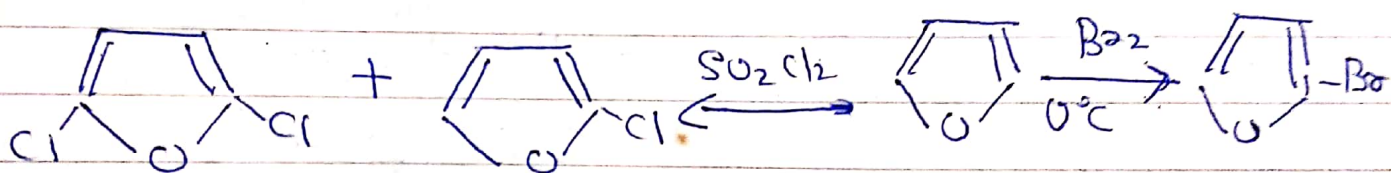
sulphur dioxide in pyridine at 70°C to form Furan 2-sulphonic acid.



Furan 2-sulphonic acid.

(c) Halogenation—

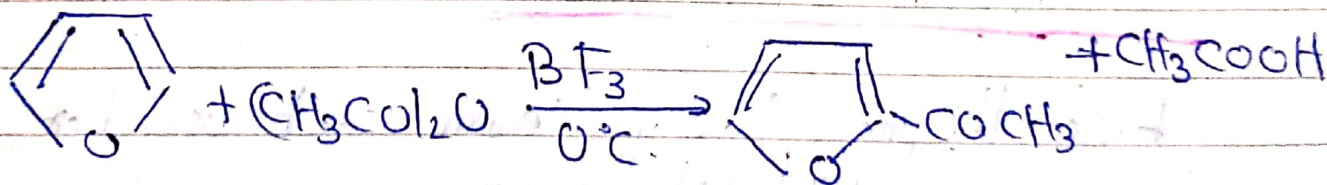
Furan reacts vigorously with Cl_2 and Br_2 at room temperature but does not react at all with I_2 .



2-bromofuran.

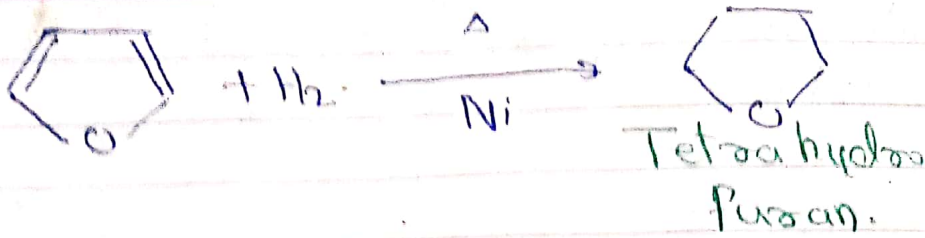
(d) Friedel-Crafts reaction—

Furan can be acetylated with acetylated with acetic anhydride in the presence of BF_3 at 0°C to yield 2-acetyl furan.

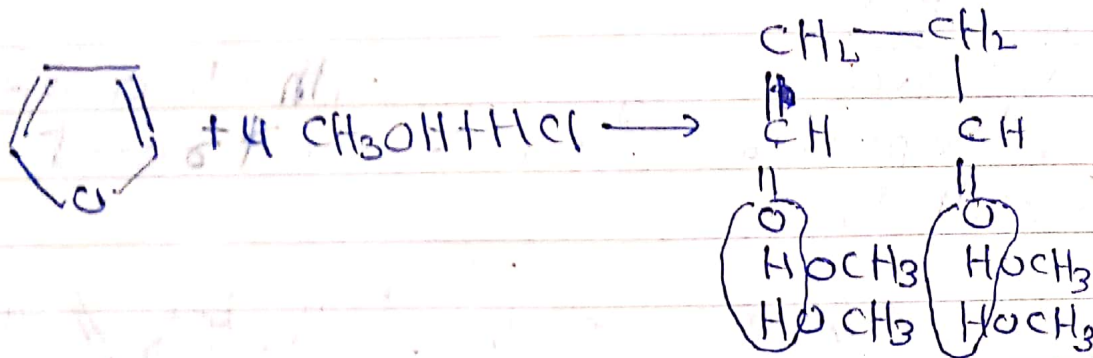


2-acetyl
Furan.

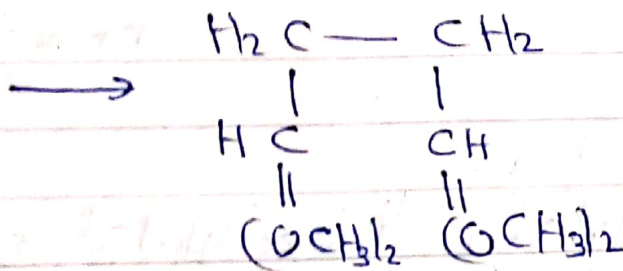
(3) Reduction— Furan is reduced by hydrogen in the presence of nickel to produce tetrahydrofuran.



Imp. Ring opening reaction: Furan undergoes ring opening reaction when treated with methanol and hydrochloric acid,



Succinaldehyde.

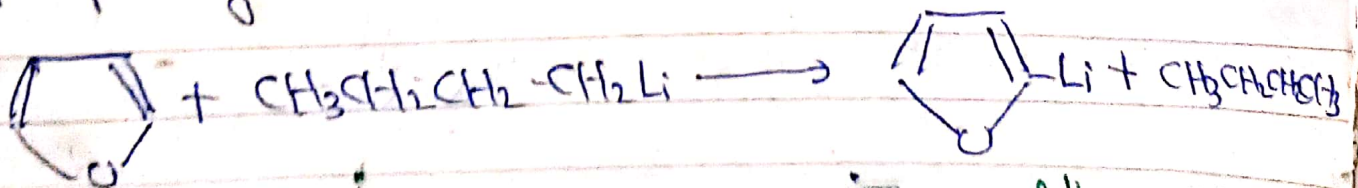


diacetal of succinaldehyde.

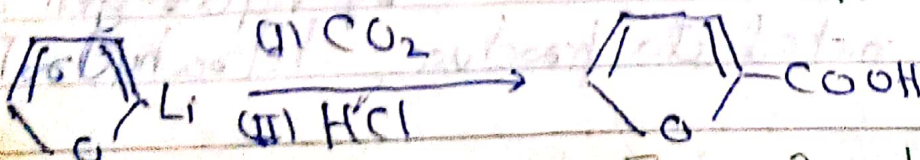
Imp.

(5). Reaction with n butyl lithium.

Like thiophene furan lithium can be used for preparing 2 substituted furan.



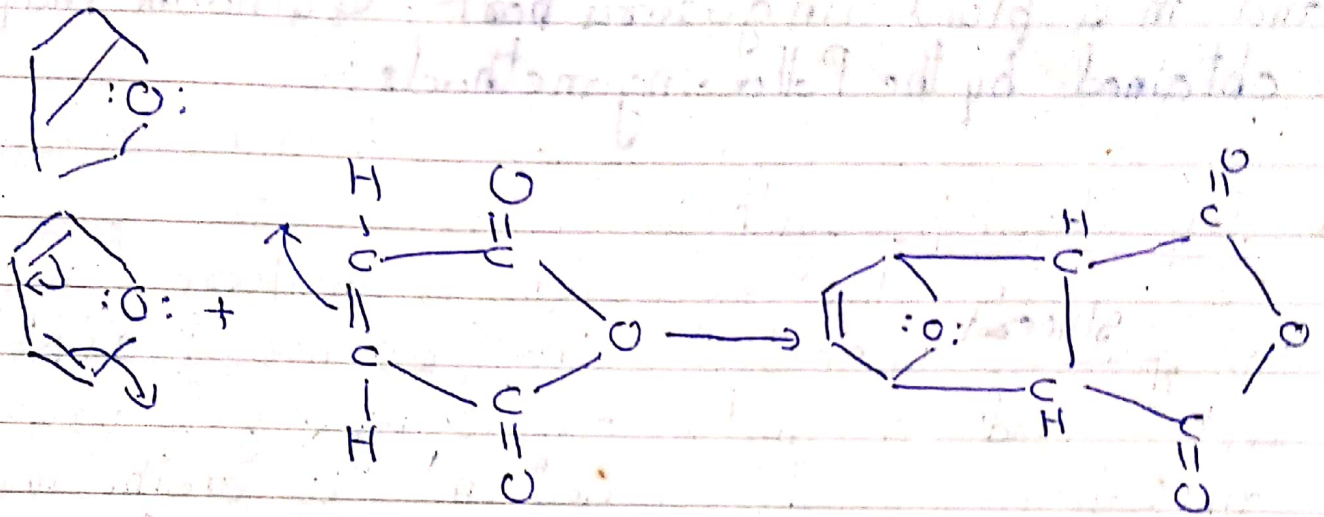
Furan lithium.



Furan 2 carboxylic acid

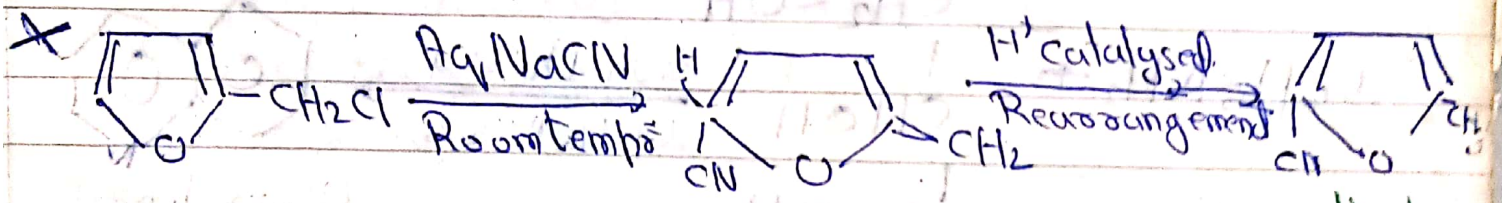
(6) Reaction with maleic anhydride - (Diels Alder reaction).

Furan has sufficient diene character to undergo Diels-Alder reaction with maleic anhydride to form an addition product. Pyrrole and thiophene do not give the reaction.

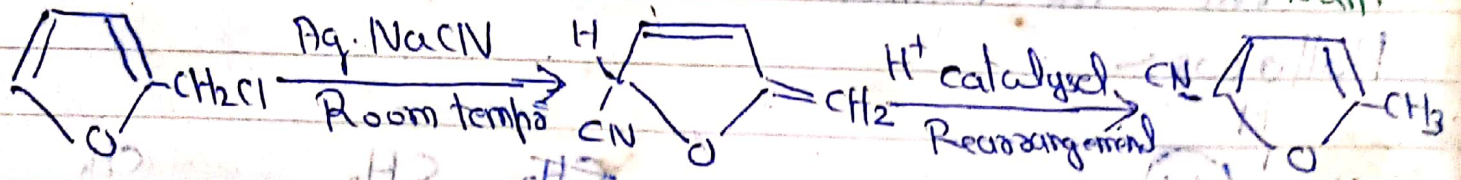


Maleic anhydride. Diels Alder Adduct.

(7) Reaction of Furofuryl chloride -



2 methyl 5 cyano Furan.



Furofuryl chloride.

2 methyl 5 cyano Furan