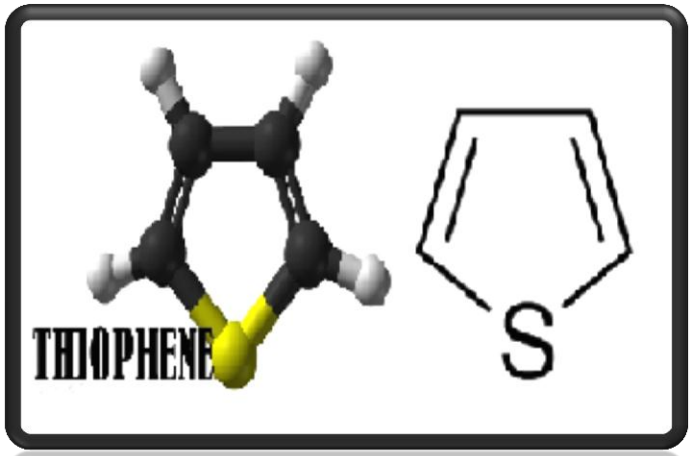
Fayoum Univesity

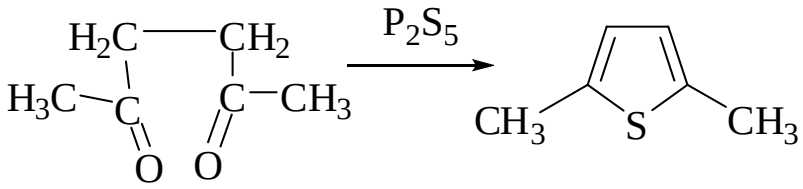
Heterocyclic Compounds

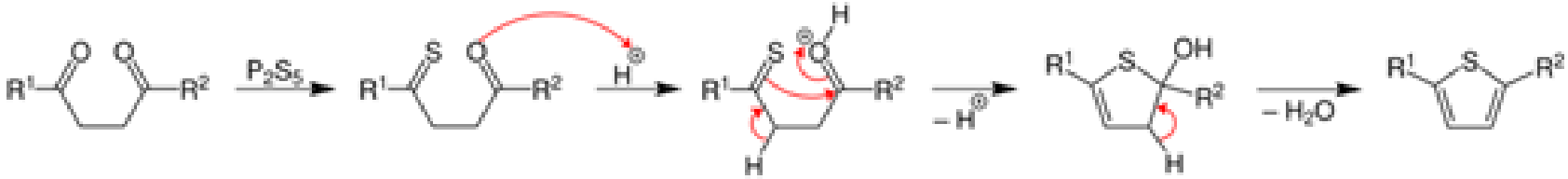


3rd Year Students
Special Chem, Chem-Phys, Geo-chem, Zoo-Chem, Bot-Chem,

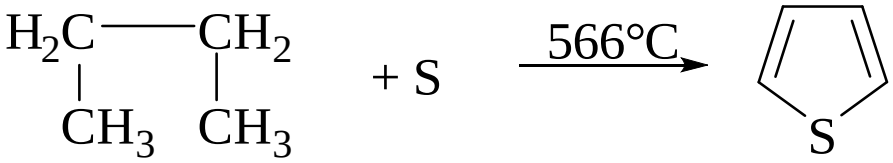
Synthesis Of Thiophene

1. From Paal-Knorr synthesis

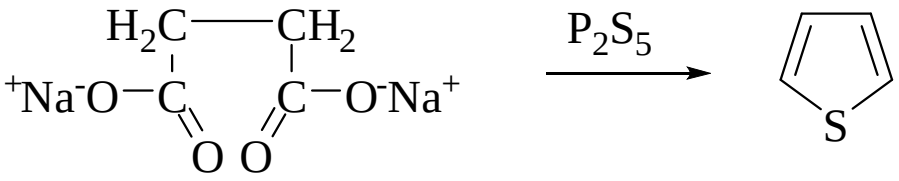




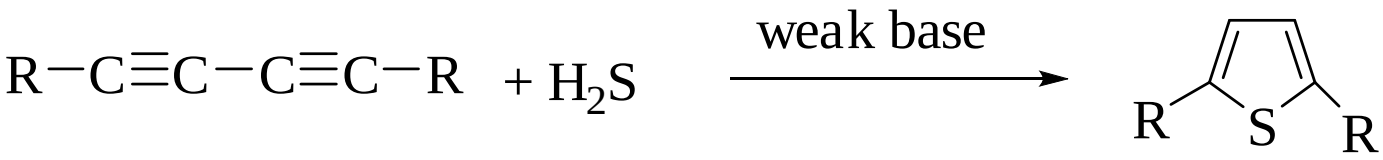
2. From action of sulphur on butane



3. By distilling sodium succinate with P_2S_5



4. By treatment of diacetylenes with hydrogen sulphide in basic conditions

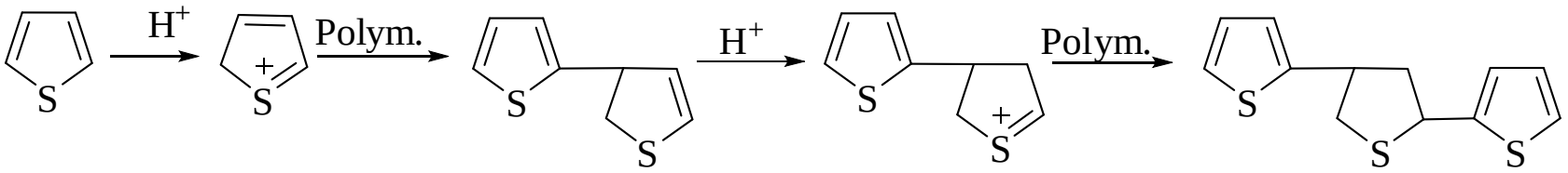


Reactions Of Thiophene

Thiophene resembles benzene, rather than furan or pyrrole in many of its reactions.

1. Addition reaction:

a) Thiophene is stable to aqueous, but not to anhydrous mineral acids which causes polymerization.



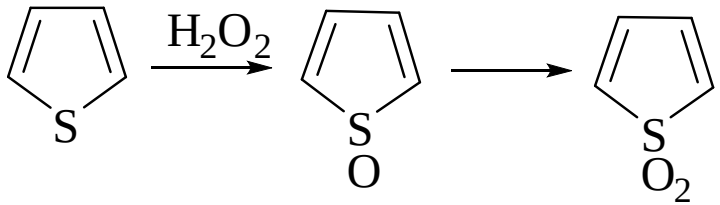
b) Reduction: thiophene is reduced by sodium and alcohol to give 2,3-dihydrothiophene and 2,5-dihydrothiophene, but catalytic reduction of thiophene yielding n-butane and H_2S.

c) Thiophene doesn't undergo Diels-Alder reaction.

Reactions Of Thiophene

d) Thiophene forms addition products with halogens, it reacts with chlorine at 40°C yielding addition product; tetrachlorotetrahydro thiophene, with substitution products 2-chloro or 2,5-dichlorothiophene.

e) Oxidation.



1-oxide 1,1-dioxide

2. Electrophilic substitution reactions with thiophene