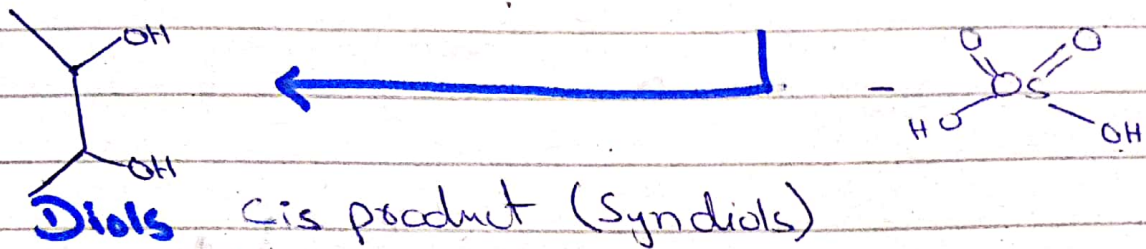
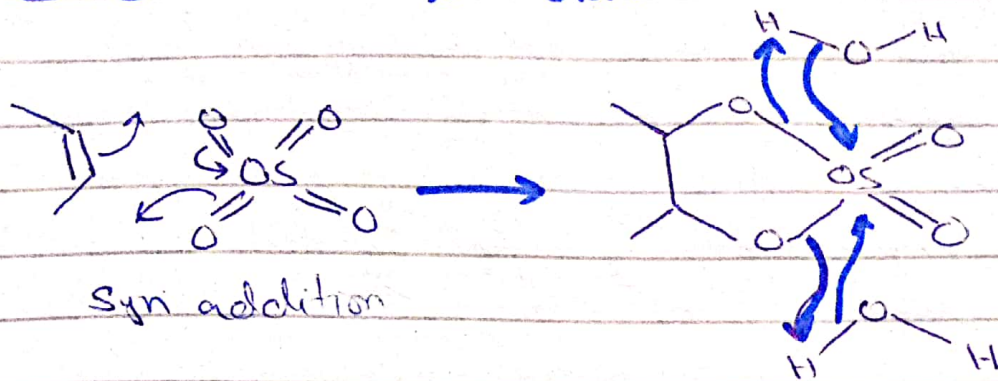
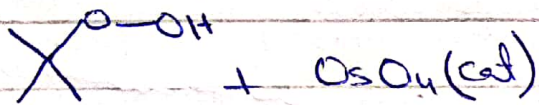


C-O bond formation:-



expensive & toxic

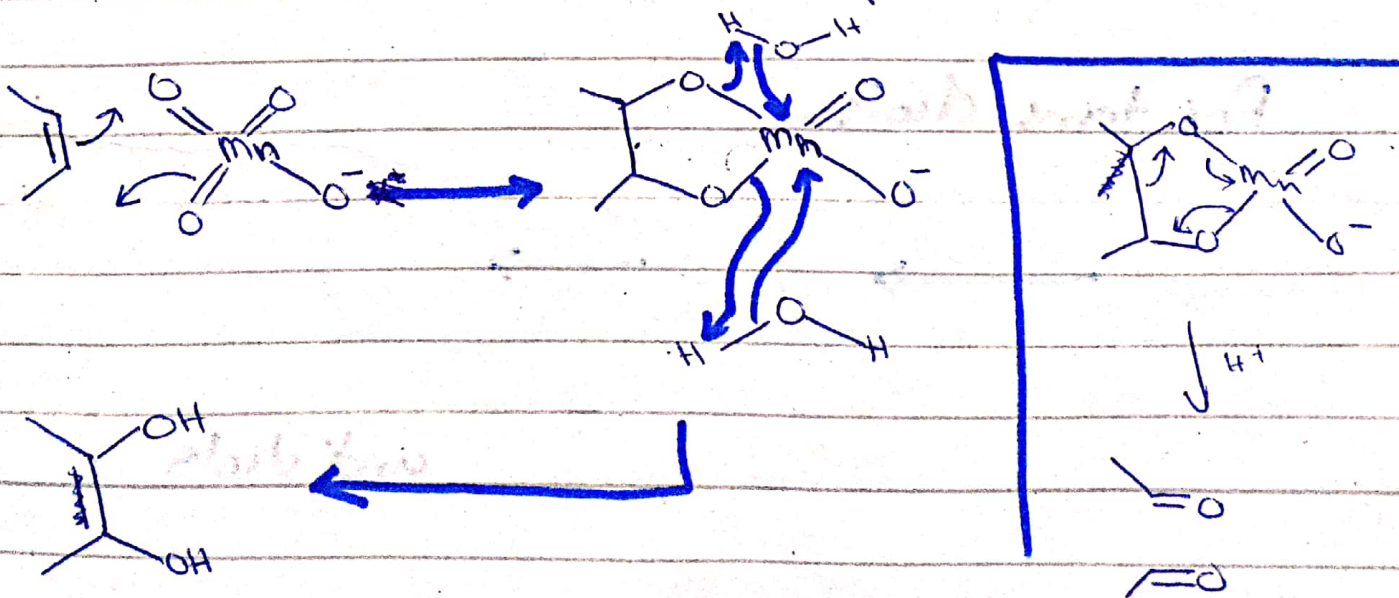
But it give clean reaction as oxidizing
 so we use some other reagents & add OsO_4 as catalyst. e.g



3° butyl hydrogen peroxide

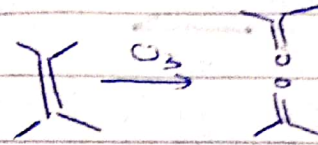
Bayer's test:- $KMnO_4$

so much cheaper
 in ancient it is used as antiseptics

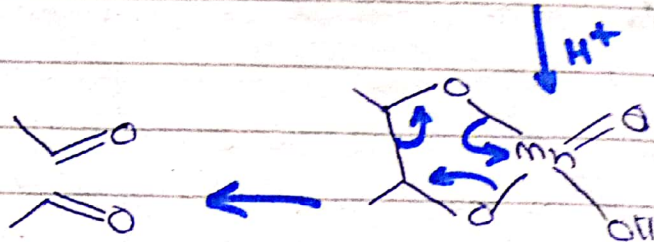
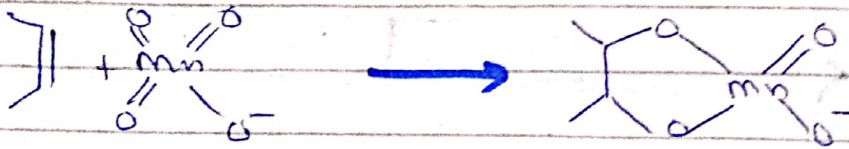


it is used for detection of unsaturation.

Drawback. used dilute, cold for diol.
 But if this cond not used then it leads to excess oxidation OH convert to acid then bond cleavage occur.
 Just like ozonolysis



if acidic condition given then present Reaction

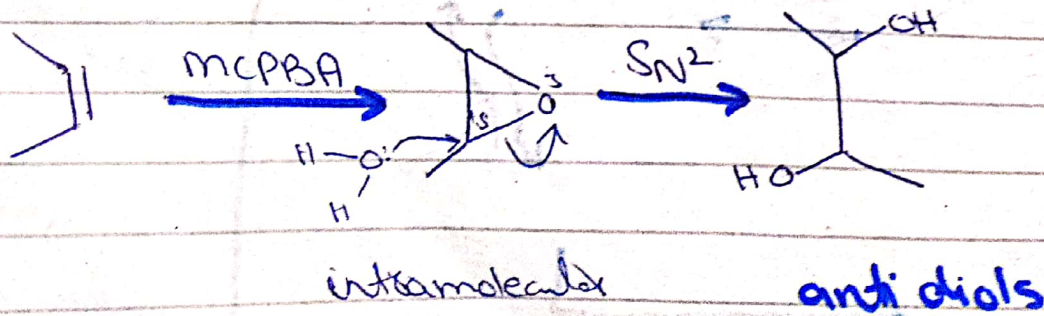


so Reaction by $KMnO_4$ is not controlled it undergoes cleavage.

in Both case OsO_4 & $KMnO_4$ Syn addition occur & cis diol form

* Both OH are above the plane ~~to~~ Both OH are below the plane.

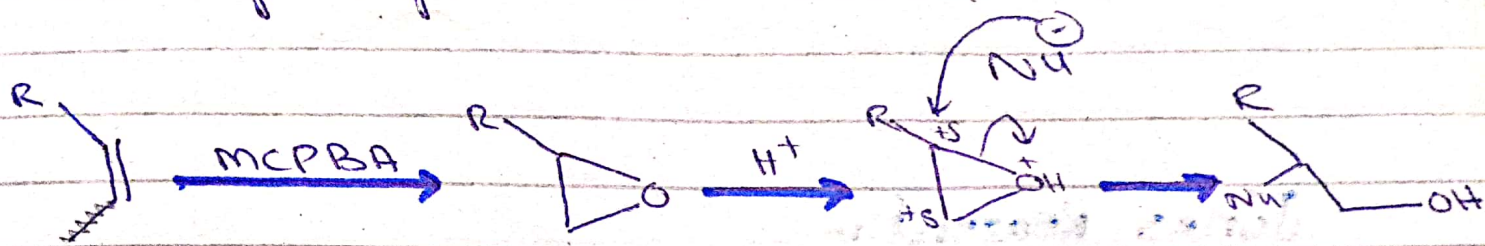
For trans diols:-



in normal conditions attack on less subs side



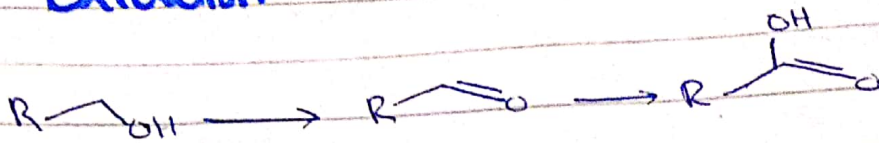
Reaction occurs in both acidic & basic conditions but selectivity change.



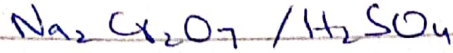
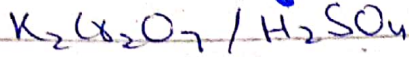
- in acidic condition attack on more substituted side.
- Ring opening of epoxide is always at exact anti side (trans 180°)

cyclohexane trans opening
axial opening

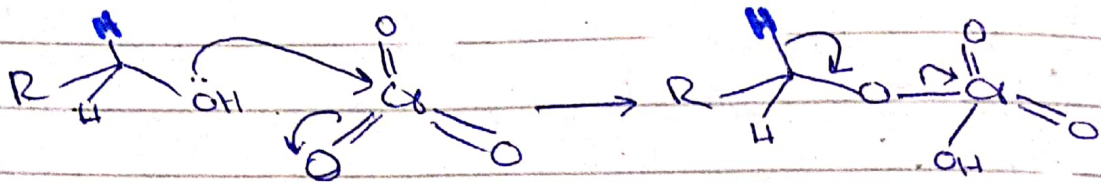
Oxidation



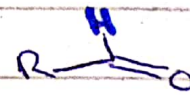
Jones Reagent:-



Before Jones Chromium oxide CrO_3 was used as reagent.



We use that H which is attached to the α carbon so that alcohol $R-CH_2OH$ 3° that not have OH not undergoes oxidation.

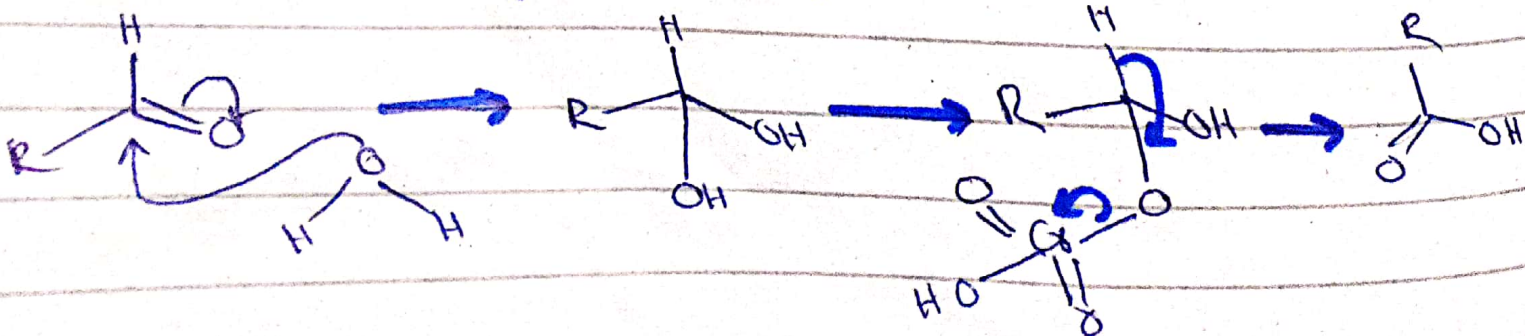


In Jones reagent $H_2O-Cr(O)_2-OH$ produce it

react just like CrO_3 but also somewhat ^{more} reactive.

Draw back of Jones reagent

- 1 harsh (reagent) conditions require H_2SO_4 are not moist free. water absorbed by H_2SO_4 (dehydrating agent) that water react with resulting carbonyl & cause over oxidation
- 2



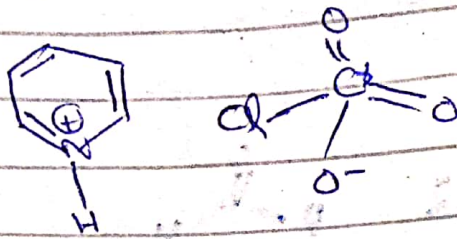
Modification in Jones reagent

to control over oxidation

Corey's Reagent:-

PCC (Pyridinium chlorochromate)

Basic
nature.



Cationic site anionic part

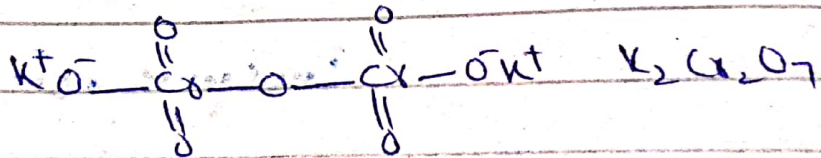
water is not present when PCC used so oxidation stops at aldehyde.

PCC is milder version of chromic acid. it convert 1° OH to aldehyde or 2° OH to ketone. further not to acid.

Collin's reagent

PDC

Pyridinium
dichromate.



with this anion use another cation to control reactivity to get neutral conditions to avoid over oxidation to moist free.

