

18 SYNTHETIC REAGENTS 2

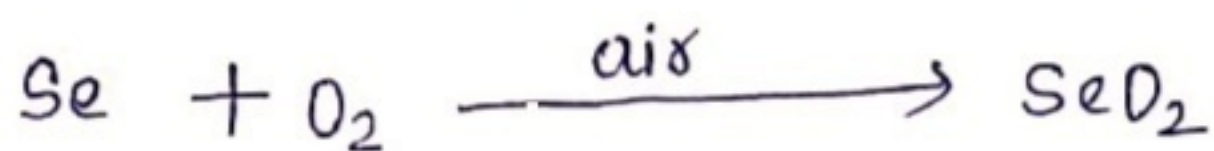
A DEGREE -III (H), LECTURE-8 0

U ORGANIC CHEMISTRY, PAPER-VII 2

G. 0

TOPIC : SELENIUM DIOXIDE

- * It is prepared by the direct oxidation of Selenium which burns in air with a blue flame. The oxidation is catalysed by Nitrogen peroxide.



- * H.L. Riley introduced selenium dioxide as an oxidising agent for organic compounds.

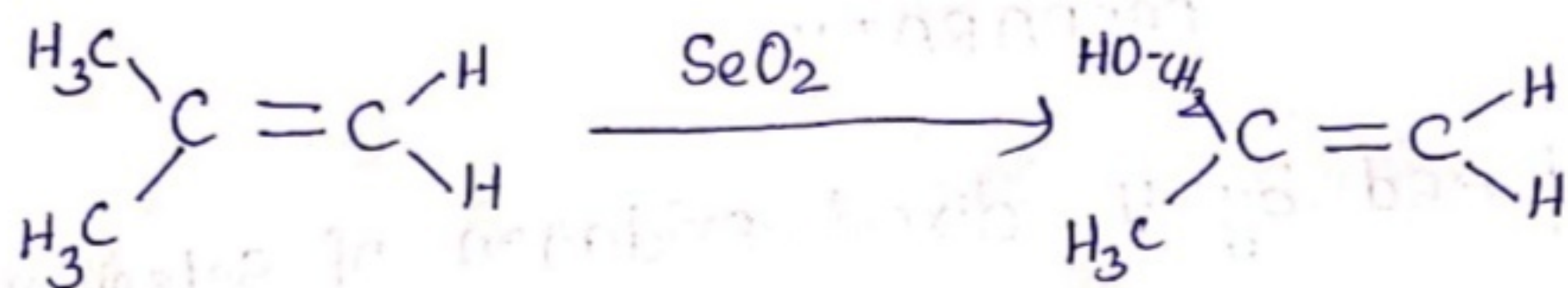
OXIDATION OF ALLYLIC OR BENZYLIC COMPOUNDS

- * SeO_2 is used primarily for the oxidation of allylic or benzylic C-H fragments to the corresponding allylic or benzylic alcohols.
- * This reaction is very useful because allylic alcohols can easily be oxidised further to the α, β - unsaturated carbonyl compounds.

By Dr. Rinky

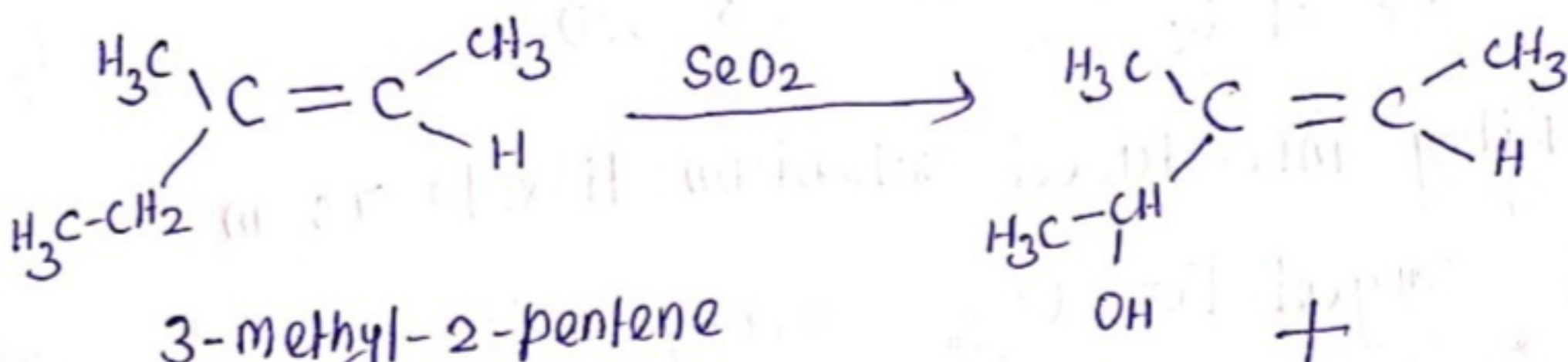
* The order of ease of oxidation is $\text{CH}_2 > \text{CH}_3 > \text{CH}$.

* The oxidation occurs at the more substituted end of the double bond.

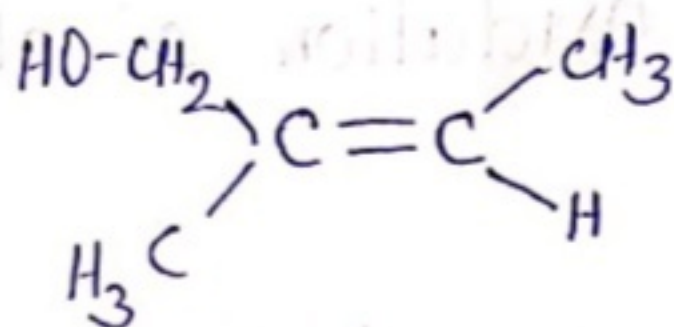


2-methyl propene

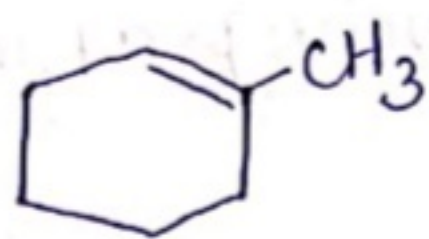
2-methyl-2-propen-1-ol



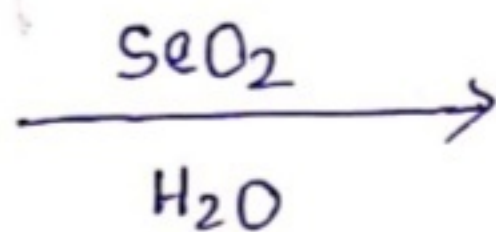
3-methyl-2-pentene



2-methyl-2-buten-1-ol



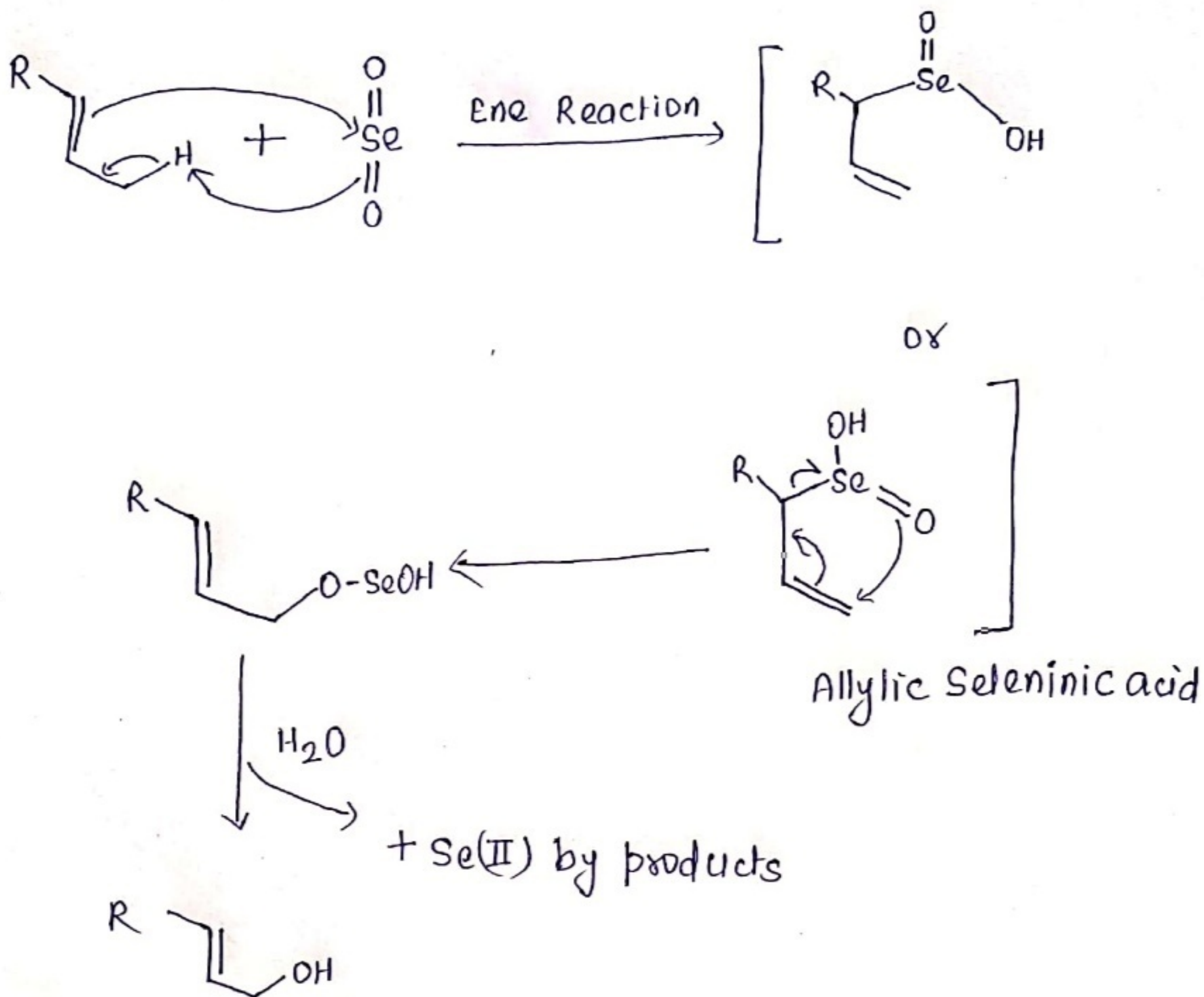
1-methylcyclohexene



3-methyl-2-cyclohexen-1-ol

Mechanism

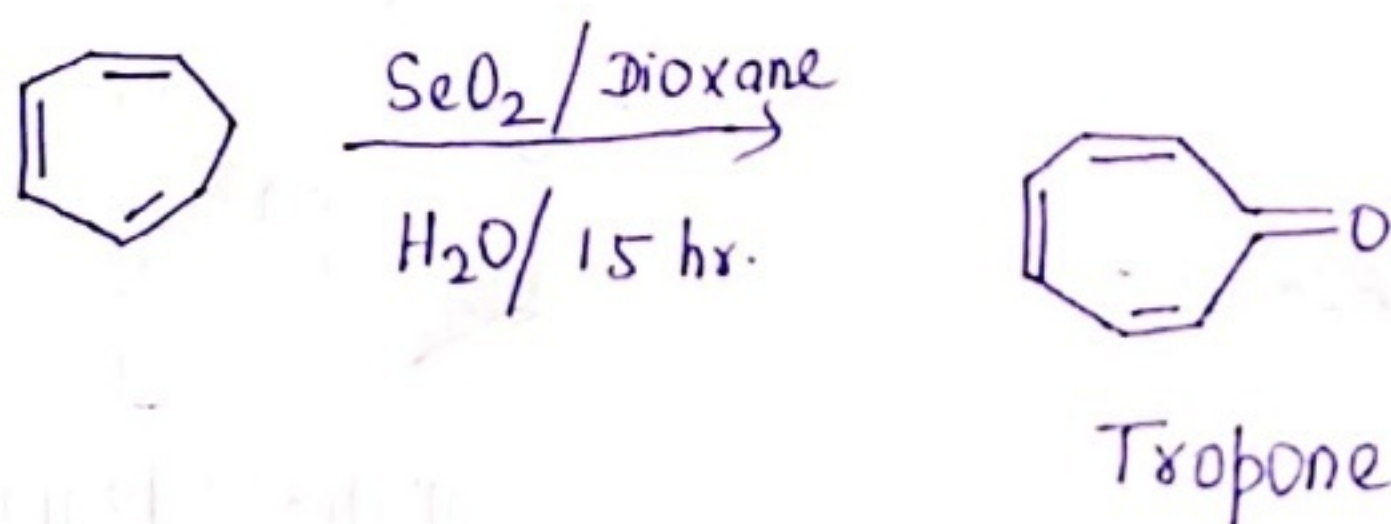
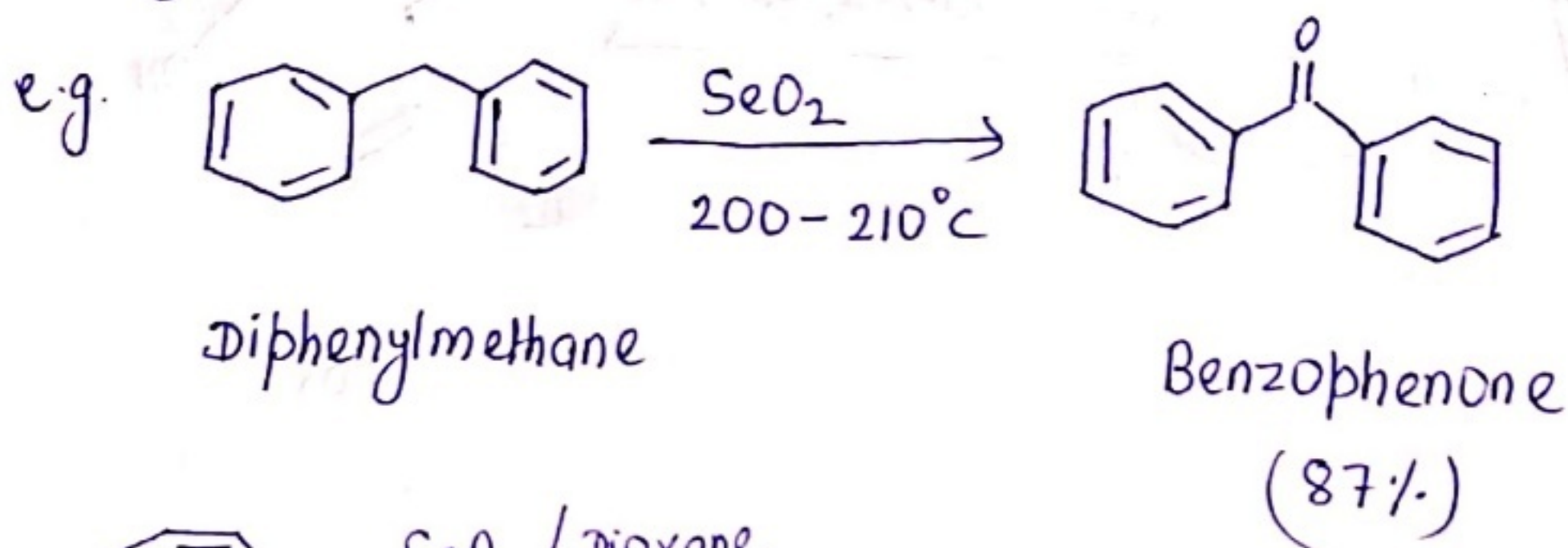
3.



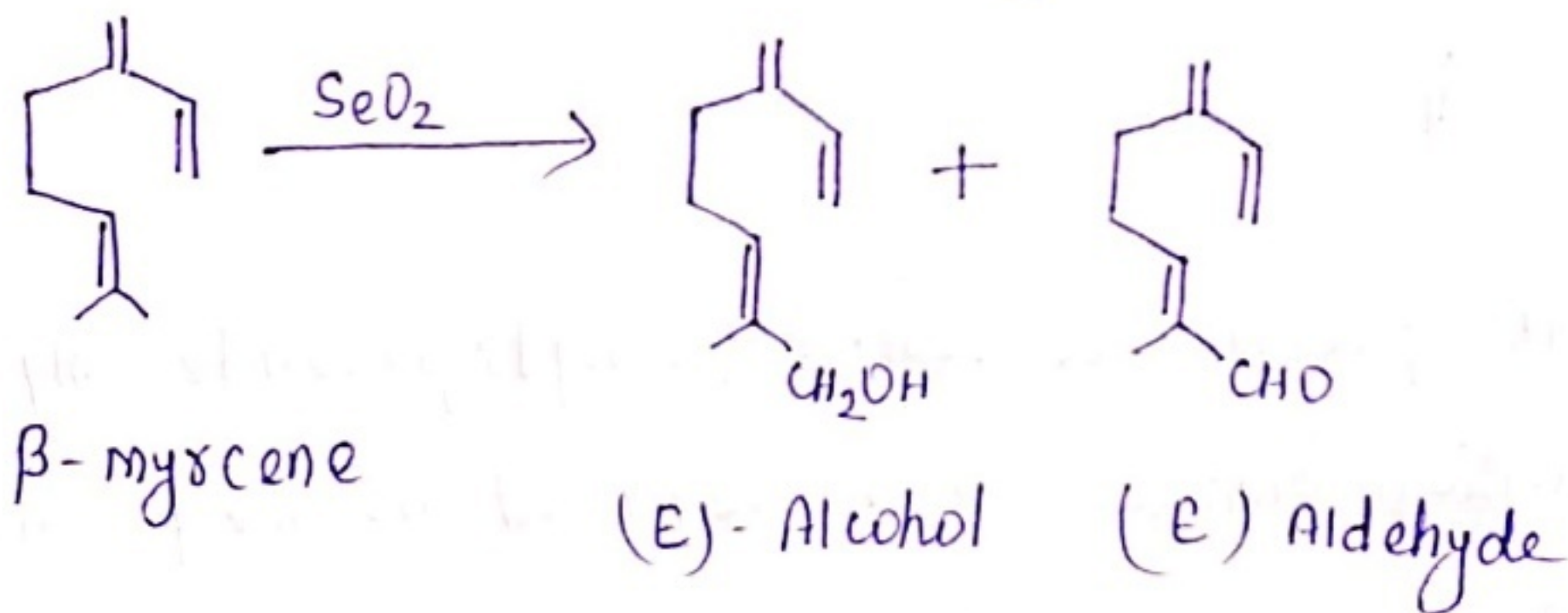
* In the presence of tert. butyl hydroperoxide only a catalytic amount of SeO_2 is required, as, the peroxide reoxidises the formed Se(II) to give back SeO_2 after each cycle of the reaction.

This eliminates the need to get rid of large amount of selenium containing products which are toxic.

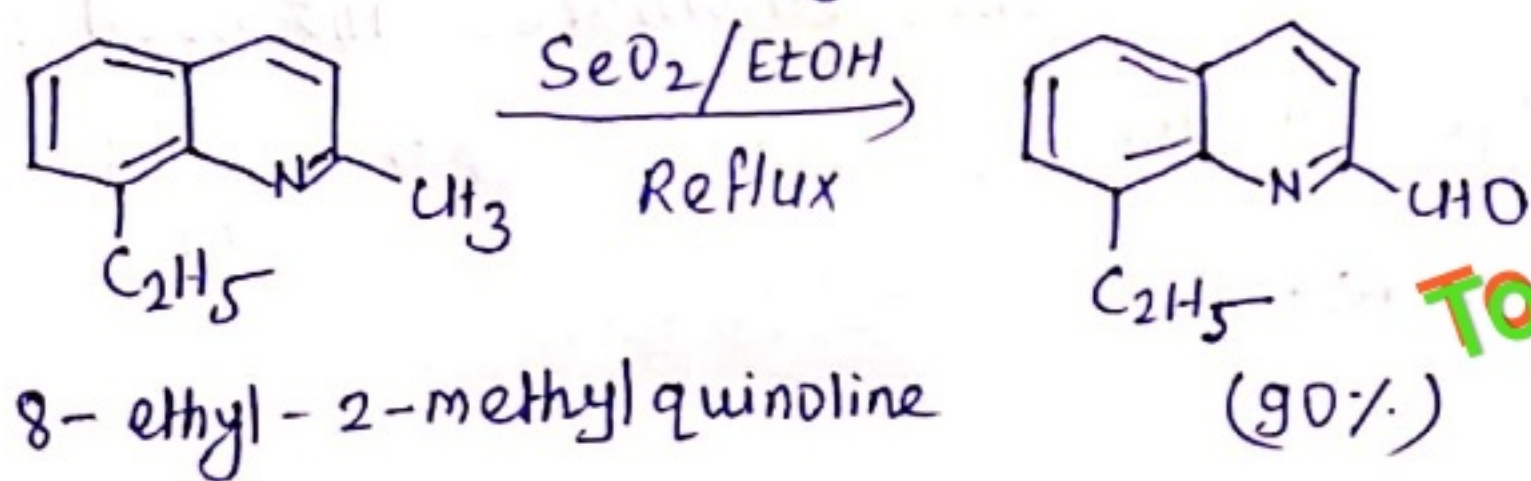
* In some cases, SeO_2 Oxidation contains to give an aldehyde or ketone.



* The methyl group trans to the main chain will react rather than the cis, thus, only one (E) isomer is formed.



* In aromatic heterocycles, the methyl group in α -position with respect to nitrogen are oxidised more easily.



To be continued in
next lecture...