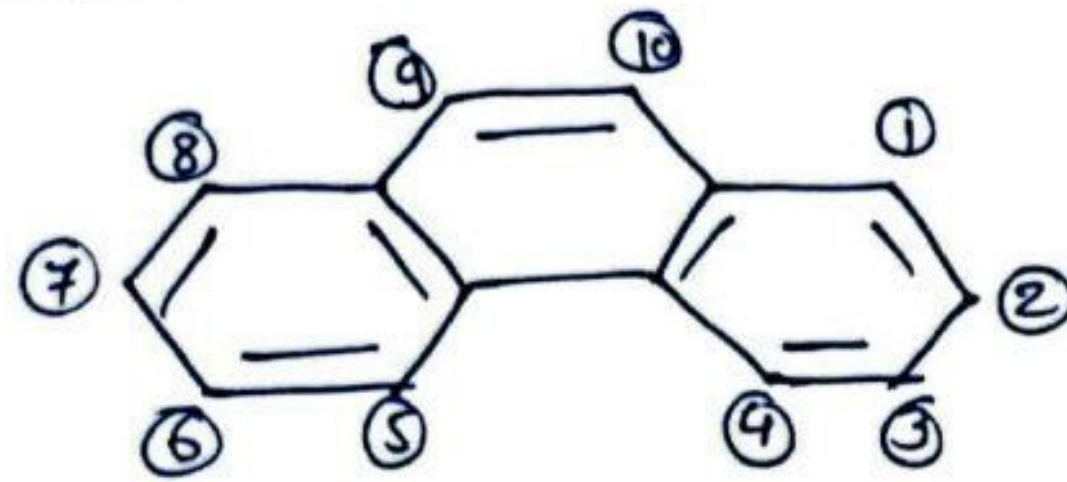


* PHENANTHRENE:

- polycyclic aromatic Hydrocarbon.
- composed of 3-fused benzene ring.

Structure:



Synthesis:

[DEPTH OF BIOLOGY]

① coal Tar:

(phenanthrene + Anthracene)

- solid mass form crystal on cooling
- Treated with solvent Nephthol.
- phenanthrene → goes into solution.

↓
Evaporation of this soln
gives phenanthrene.

[DEPTH OF BIOLOGY]

② Haworth Synthesis:

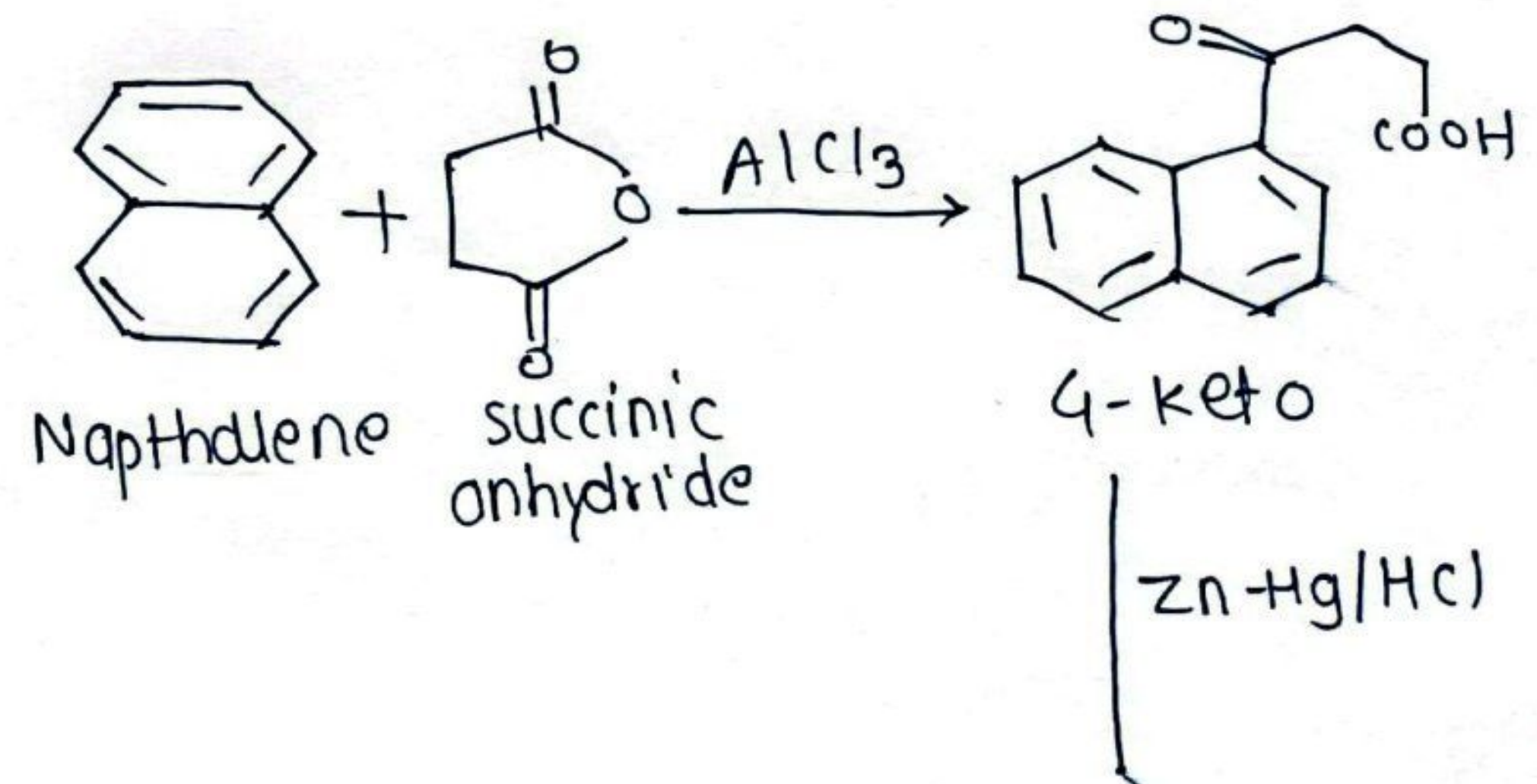
Napthalene is treated with Succinic Anhydride → Gives 4-keto to 4-Nephthyl Butanoic acid.

↙
In the presence of
aluminium chloride
(AlCl₃).

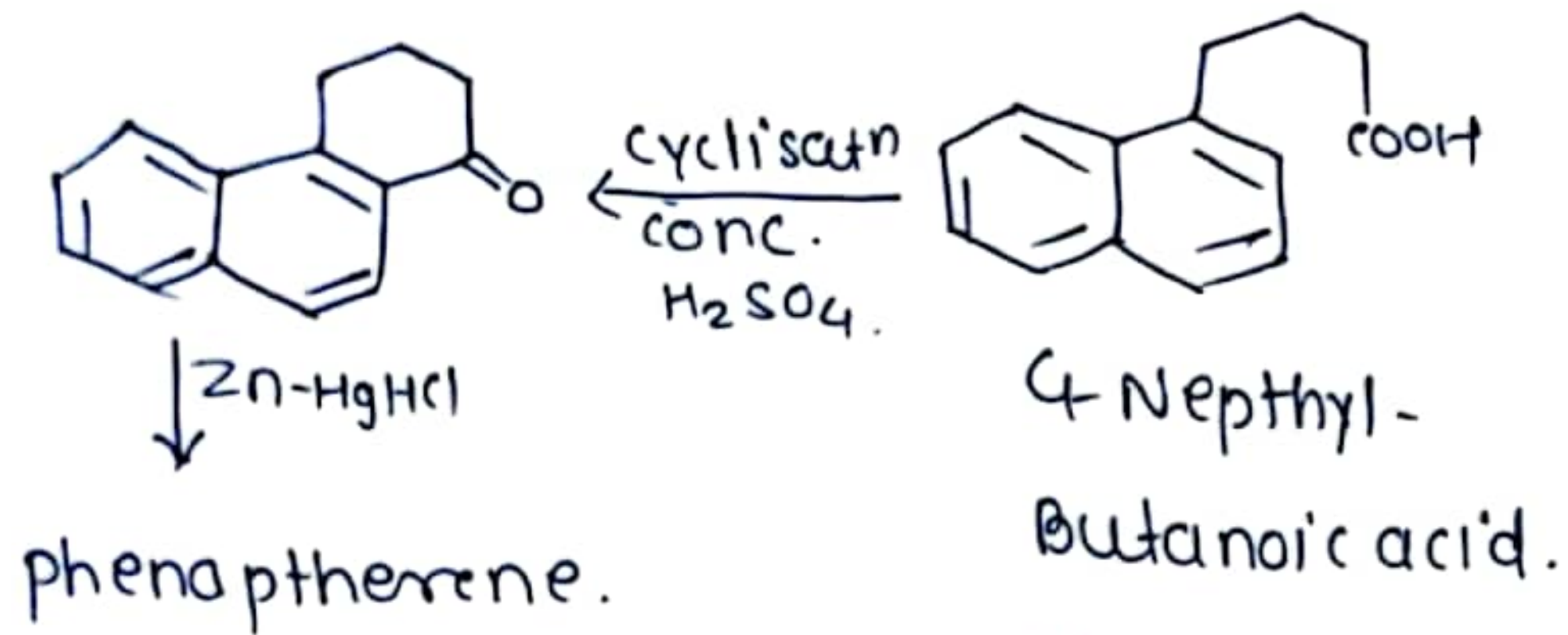
↓ reduction
ZnHg/HCl

4-Nephthyl-
Butanoic acid.

4-keto-1,2,3,4-
tetra-
hydroxy-phenanthrene. ^{cyclisation} _{conc. H₂SO₄} → phenanthrene.



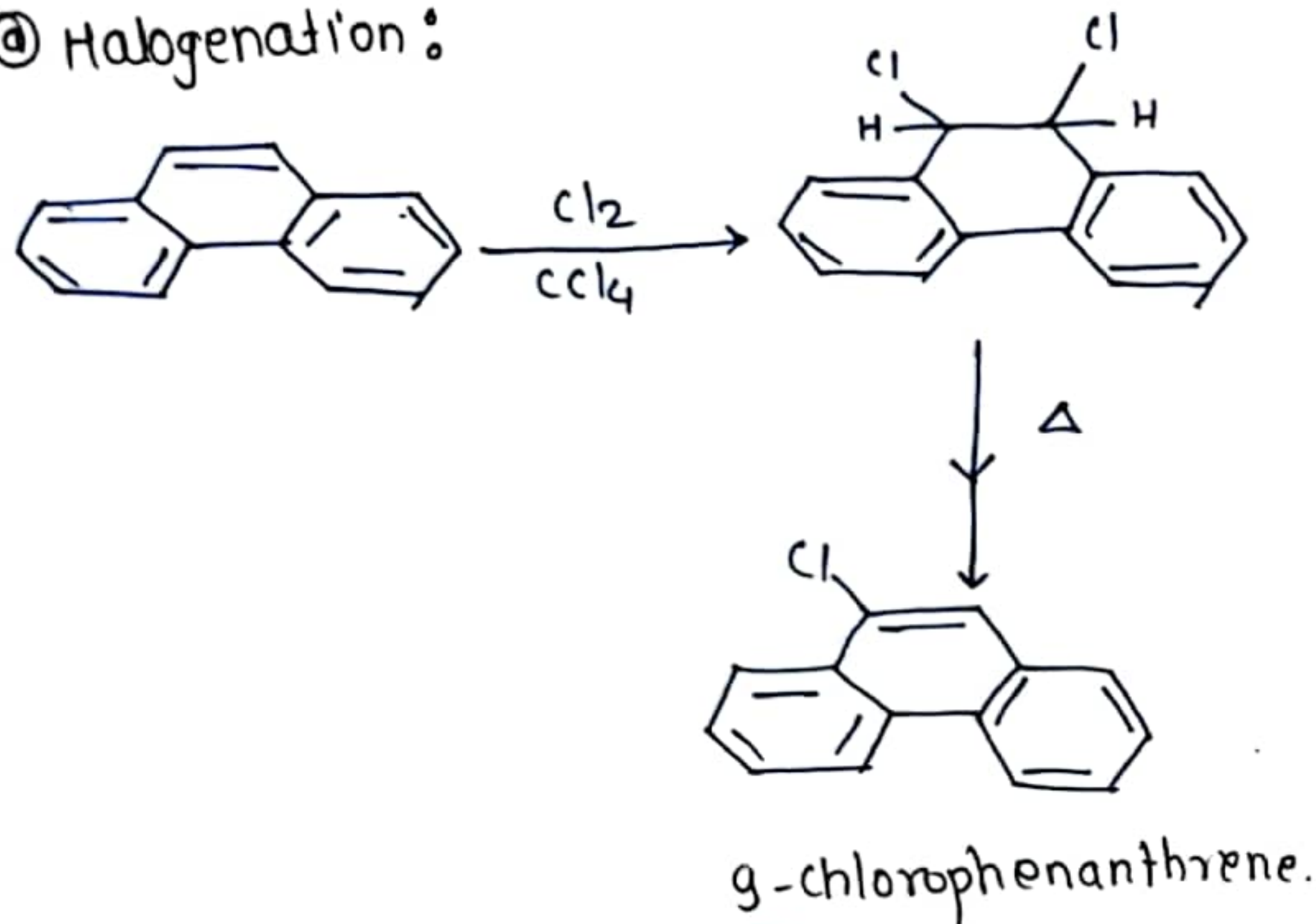
[DEPTH OF BIOLOGY]



[DEPTH OF BIOLOGY]

#Reaction of phenanthrene:

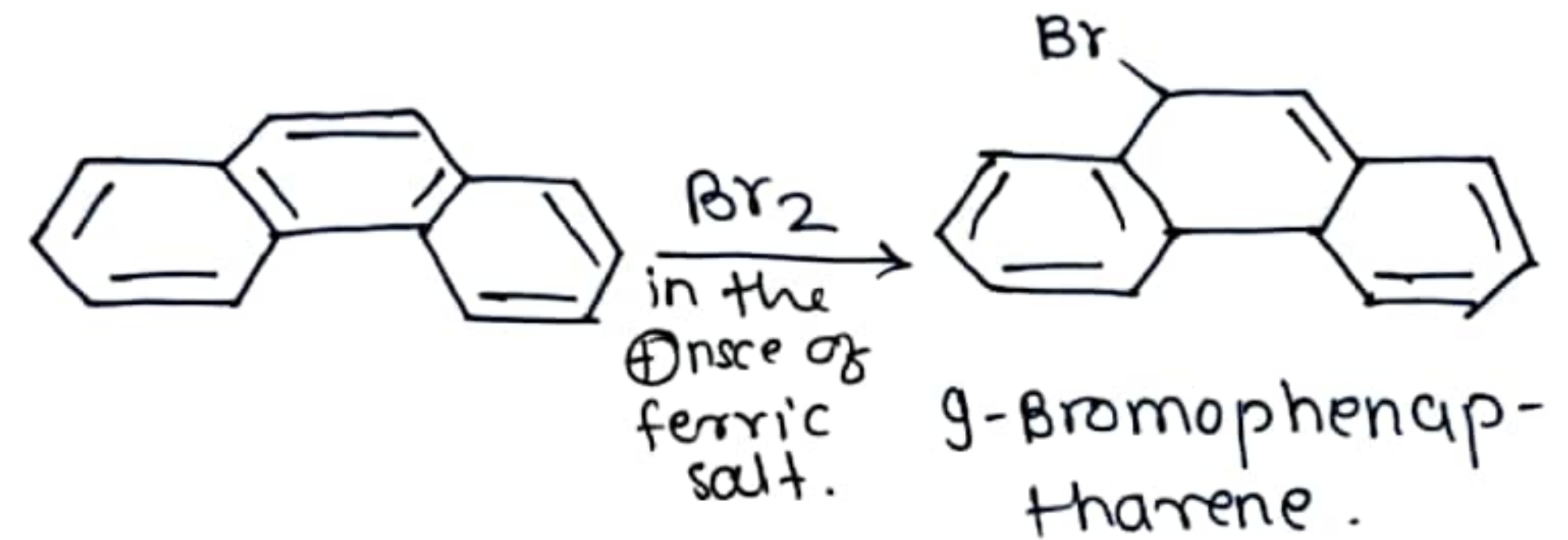
① Halogenation:



[DEPTH OF BIOLOGY]

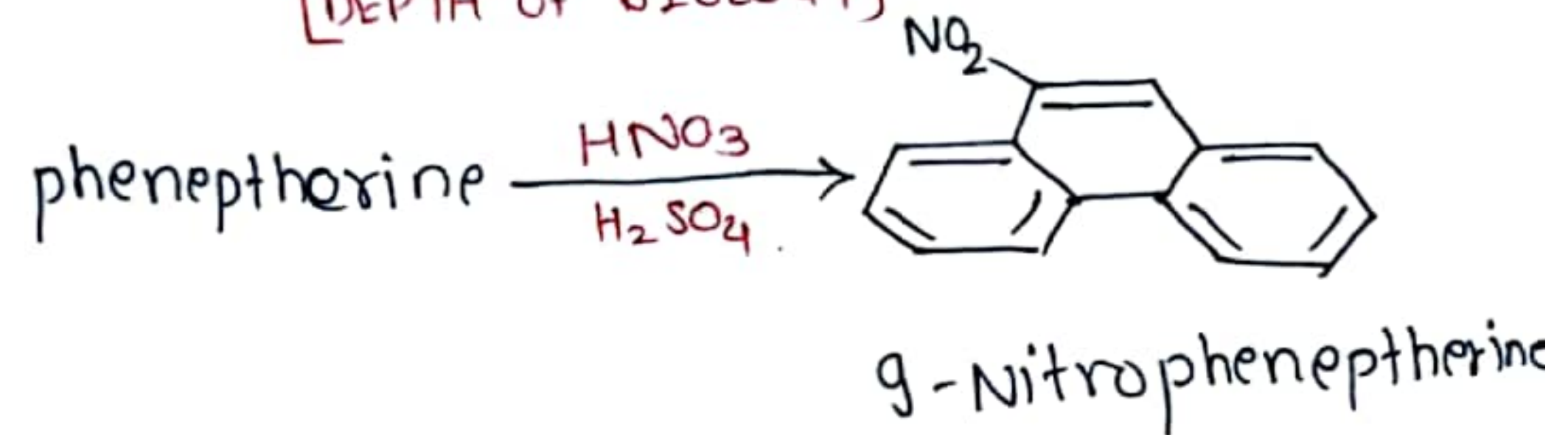
[DEPTH OF BIOLOGY]

② Bromination:

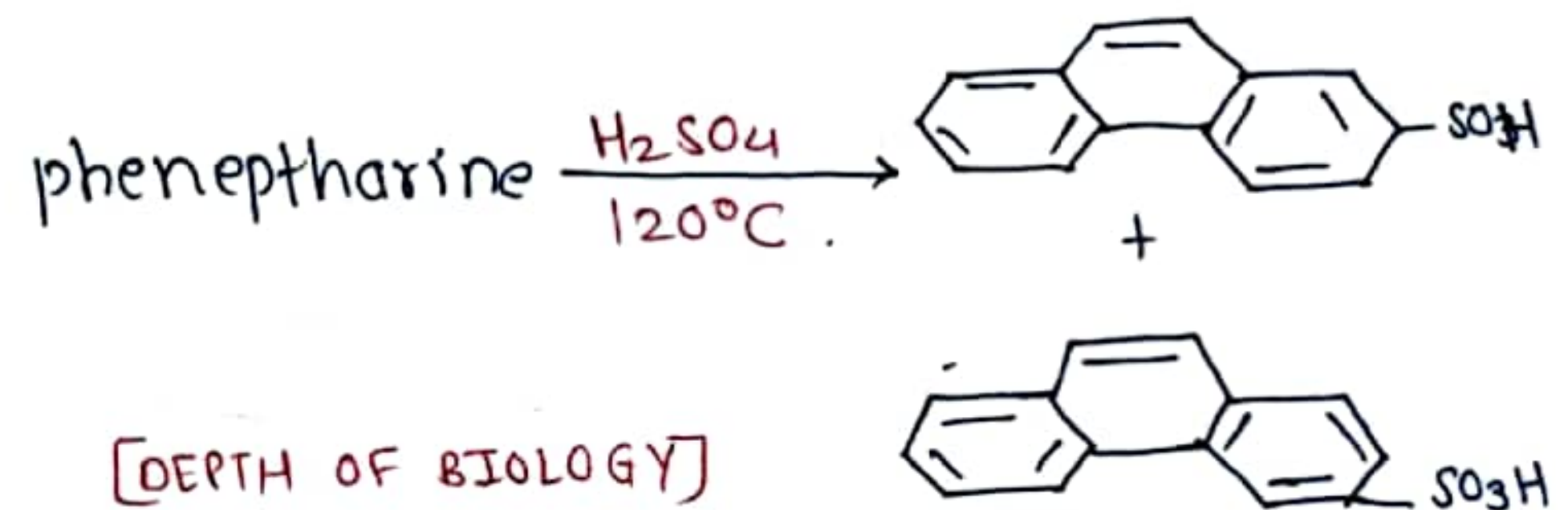


③ Nitration:

[DEPTH OF BIOLOGY]

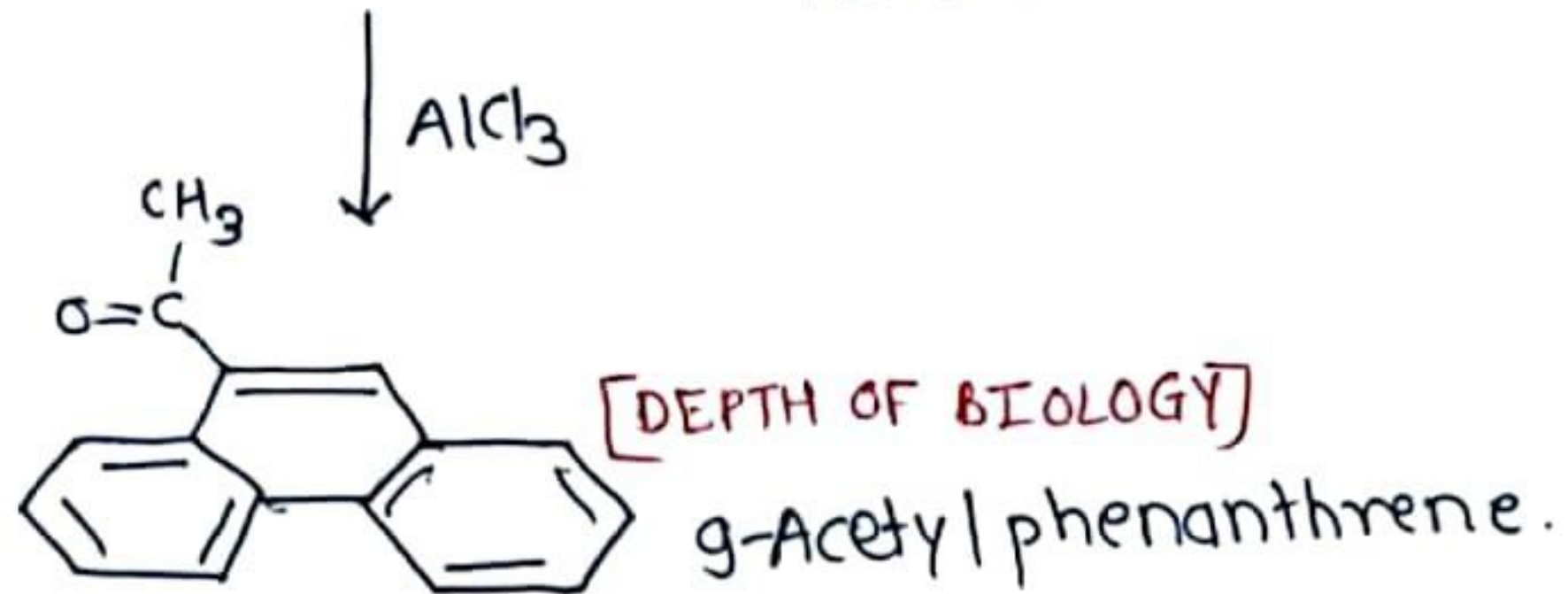
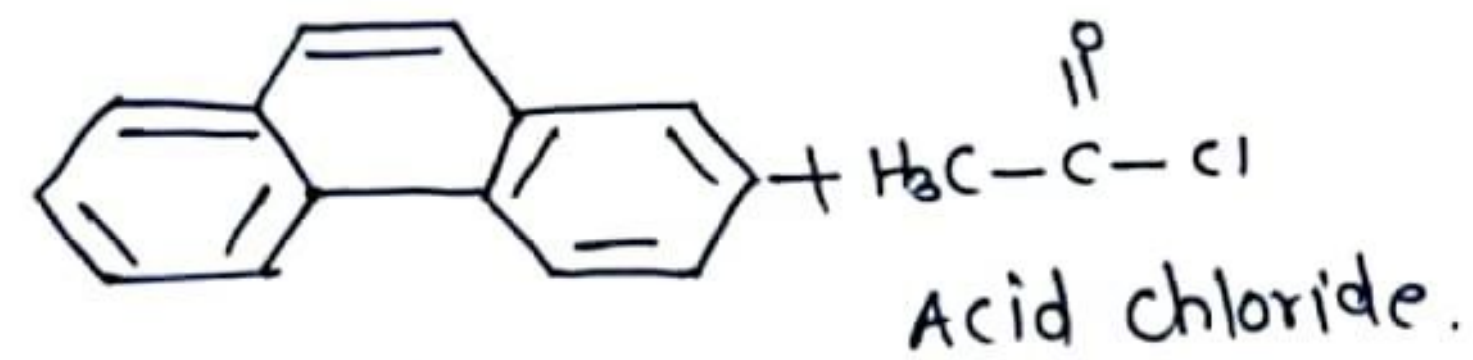


④ Sulphonation:



[DEPTH OF BIOLOGY]

© Friedal Craft Acylation :

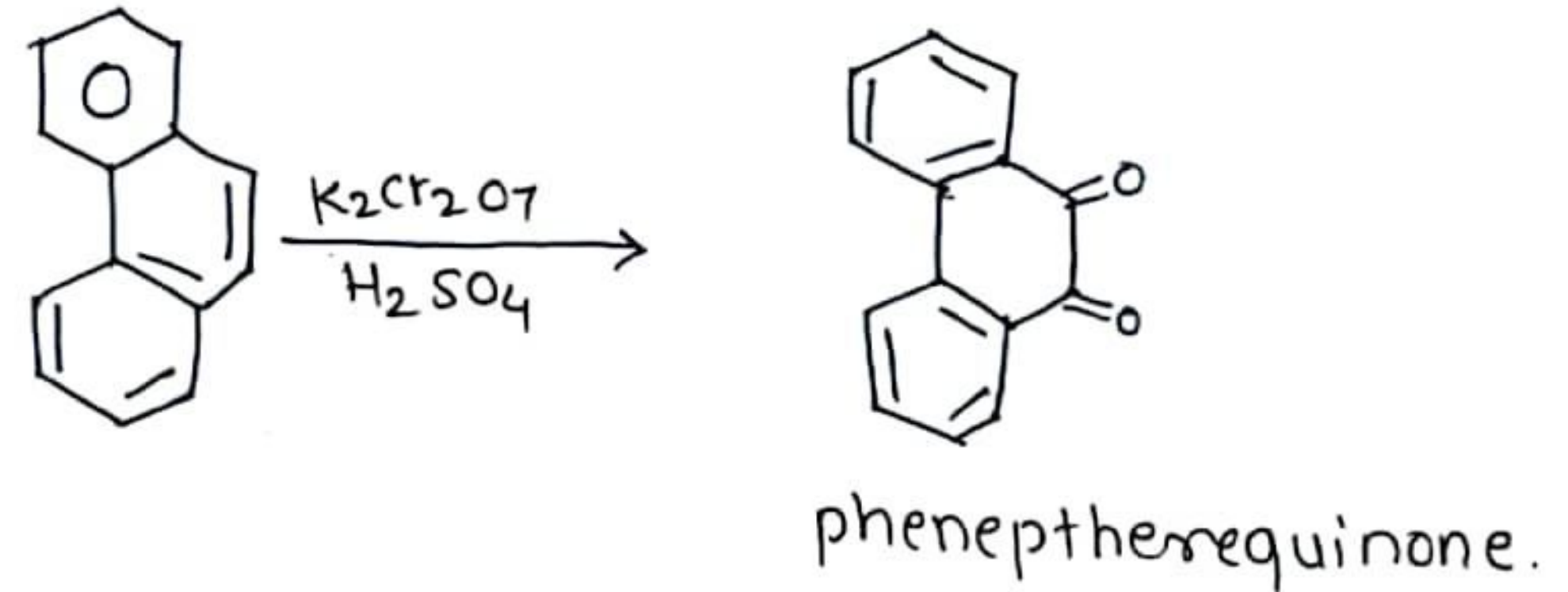


* uses of phenanthrene: - Antifogging Agent

- Bile acid steroid & sex hormone.
- Synthetic Resin
- Pesticide & preservatives.
- used in preparation of phenanthrenequinone.

Derivatives of phenanthrene:

© phenanthrenequinone $\Rightarrow$ by oxidation of phenanthrene.



USES:

- Synthesis of dye, explosive & drugs.
- Also used in preservatives.