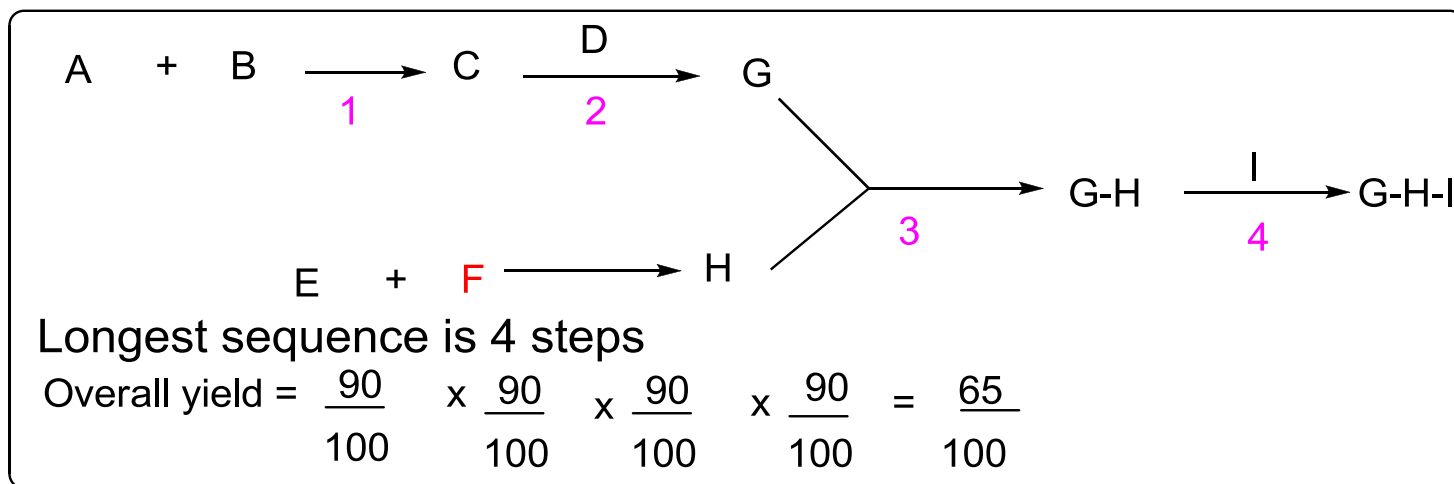


Convergent Synthesis

Definition

In convergent synthesis, key fragments of the target molecule are synthesized separately or independently and then brought together at a later stage in the synthesis to make the target molecule.



A convergent synthesis is shorter and more efficient than a linear synthesis leading to a higher overall yield.

It is flexible and easier to execute due to the independent synthesis of the fragments of the target molecule.

Strategies in Synthetic Planning

(a) Strive for success and good cost management

In planning a synthesis generate a large number of retrosynthetic pathways to the target molecule: Examine these retrosynthetic pathways to identify among them an optimal synthetic route for which reagents are readily available and inexpensive.

(b) Convergent vs Linear synthesis

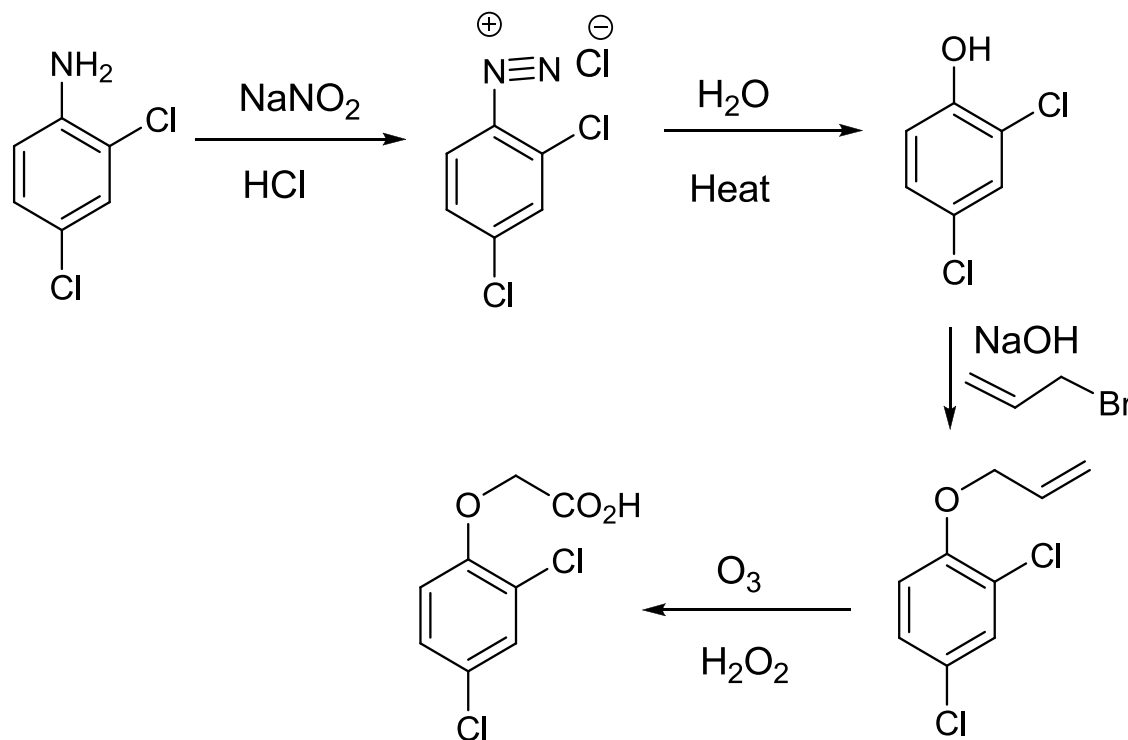
When considering a disconnection in the retrosynthetic analysis of a complex target molecule, try (if possible) to divide the molecule into halves at convenient bonds. This will make possible the formulation of a convergent synthesis with several mini-syntheses leading to the target molecule.

Strategies in Synthetic Planning

Synthesis of the Weed-Killer, 2,4-D

Based on the preceding retrosynthetic plan, 2,4-dichlorophenoxyacetic acid (2,4-D) can be synthesized as shown below:

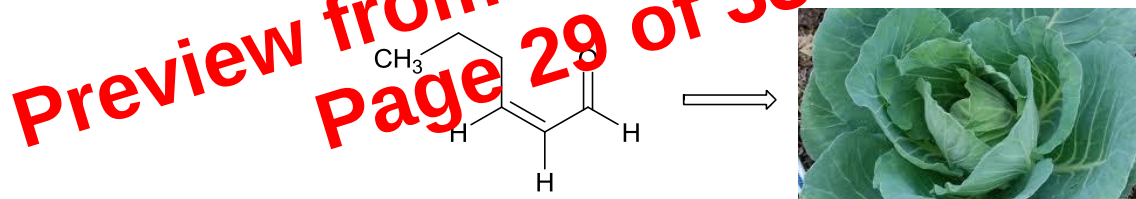
Synthetic Plan



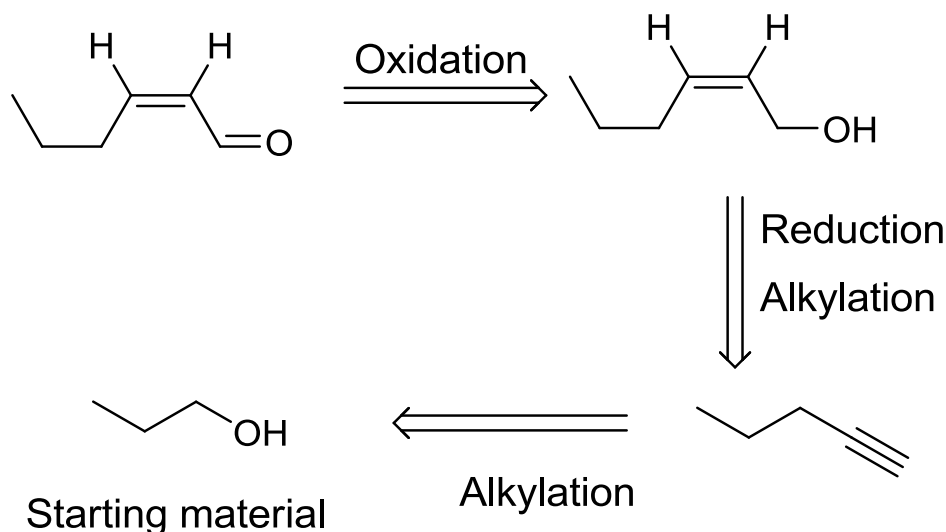
Sample Retrosyntheses and Syntheses

Retrosynthetic Analysis of Z-Hex-2-enal

Z-Hex-2-enal provides the aroma reminiscent of cabbages, but has also found application as an insect repellent.



The synthesis of Z-hex-2-enal can be approached based on partial syn-hydrogenation as shown below:



Sample Retrosyntheses and Syntheses

Synthesis of Z-Hex-2-enal



The key feature in the synthesis of Z-hex-2-enal is stereochemistry of the double bond that can stereospecifically be achieved by partial syn-hydrogenation of an alkyne.

