

1.5: A Protocol for Synthetic Design

In summary, some principles of synthetic planning that can provide a logical basis for designing a synthesis include the following (additional principles will be introduced on pages 83-84):

1. *Dislocate the target* to precursor synthons by connections (CON), by disconnections (DIS), adjustment of functionality level (FLA) – such as oxidations and reductions, polar reactivity inversion (PRI), or functional group addition (FGA) – by interconversion of functional groups (FGI) without a change of functionality level, or by addition of control elements (CEA).
 2. *Devise synthetic equivalents* of precursor synthons by appropriate functional group addition (FGA, a subclass of FLA, i. e. from $f = 0$ to $f \neq 0$).
 3. *Construct a synthetic tree* systematically generating sets of potential intermediates.
 4. *Prune the tree* as it grows by eliminating schemes that do not follow logically imposed boundary conditions such as favoring dislocations that exploit target related functionality to facilitate the corresponding chemical reactions during synthesis.
 5. *Rank alternative strategies* favoring efficient schemes that are most likely to deliver the desired target and synthetic intermediates by avoiding undesired side reactions. That is, disfavor schemes that probably incorporate flaws, especially ones that are fatal, i. e. will give 0% yield of the desired product.
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