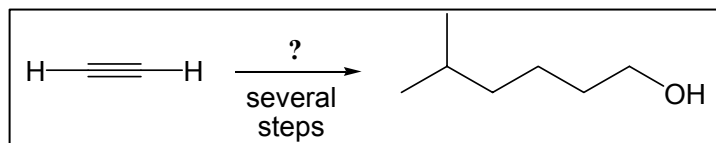


## SYNTHESIS - SUMMARY OF GENERAL STRATEGIES

Imagine you have been asked to synthesize the 1° alcohol shown here, starting from acetylene and any other reagents you need. It will take a sequence of several steps (*i.e.*, several reactions done via separate reagents/procedures in lab).



*Note: this is **not** the same as writing a multi-step mechanism for one reaction (which would be several elementary steps resulting from mixing a single set of reagents).*

The strategy for designing a synthesis (outlined below) starts with thoroughly comparing the starting material (SM) and the target product. Then, find reactions to build forwards from SM, backwards from target, & finally fill in the gaps in between.

1. **Connectivity:** Count Cs, compare skeleton/rings, identify functional gps (LGs in SM?) & positions
2. **Changes:** How do skeleton and functional groups change?
3. **Dissect:** Locate SM's C atoms inside target  $\Rightarrow$  which bonds must be broken/formed?  
 $\Rightarrow$  dissect target into "pieces" to build from
4. **Build bonds:** Nu + E+  $\rightarrow$  new bond...  $\Rightarrow$  convert "pieces" into reagents by adding LG or Nu group
5. **Precursor:** Now look at target: what type of compound would yield target in final step?  
what reagents would give desired regio- & stereochemistry?
6. **Combine:** Can you now see a sequence of rxns leading from SM to target?  
...if not: analyze precursor structure from step 5 (apply questions 4 & 5 to it)
7. **Synthesize!** Write sequence: draw SM, arrow/reagents, major product...next arrow/reagents...