

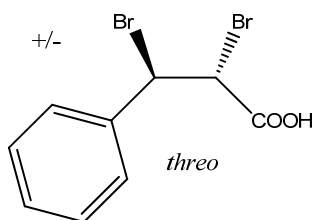
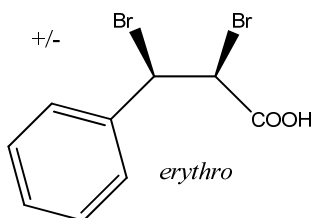
Prelab: Multistep synthesis

Step 1

How can you use spectroscopy to determine whether you have, in fact, synthesized *trans*-cinnamic acid rather than *cis*-cinnamic acid? Explain, be specific, and assume that you *do not* have access to an authentic sample.

Step 2

- Which of the compounds below (*erythro* or *threo*) would result...
 - From a *syn* addition of bromine to *trans*-cinnamic acid?
 - From an *anti*-addition of bromine to *trans* cinnamic acid?
 - From a *syn* addition of bromine to *cis*-cinnamic acid?
 - From an *anti*-addition of bromine to *cis*-cinnamic acid?



- Draw a Newman projection of the *erythro* dibromide down the C2-C3 bond, in which the carboxylate and the bromide on carbon 3 are *anti* to one another. Do the same for the *threo* diastereomer.

Step 3:

- Starting with the compound you formed in step 2 (*erythro* or *threo*), draw an E2 mechanism for this decarboxylation/elimination. Which product forms, or is there a mixture of major/minor product?
- Starting with the compound you formed in step 2 (*erythro* or *threo*), draw an E1 mechanism for this decarboxylation/elimination. Which product forms, or is there a mixture of major/minor product?
- Explain, with reference to questions 1 and 2 above, whether you will use water or acetone as a solvent in step 3.