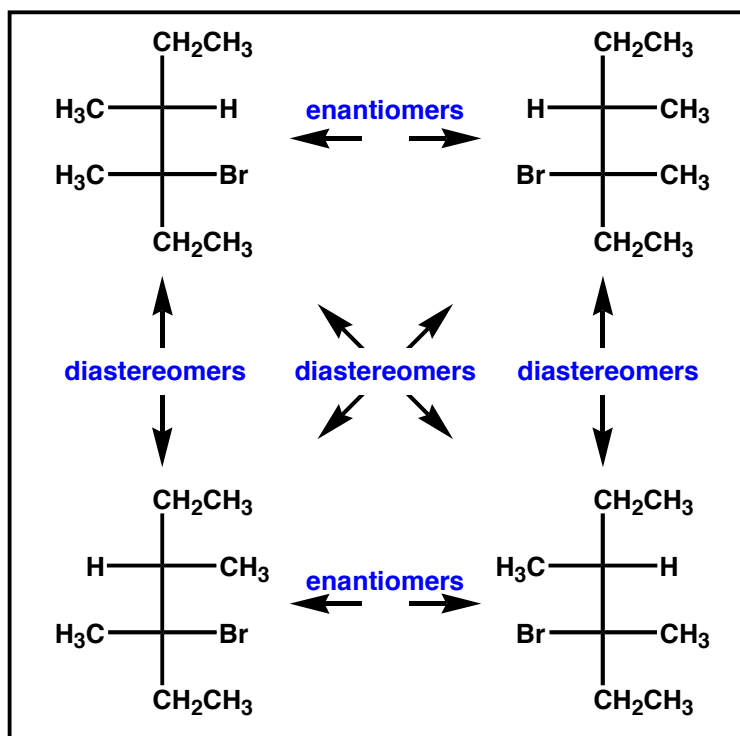
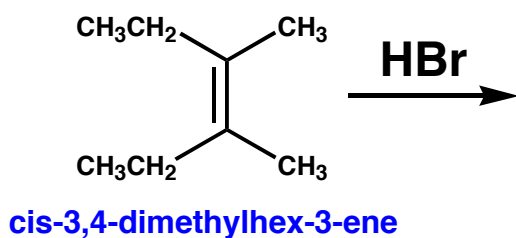


# A Non-Stereospecific Example

Reactions that proceed by non-stereospecific mechanisms will result in a much greater array of stereoisomers. Consider the reaction of HBr adding to an alkene (recall that the addition of HBr to an alkene proceeds via either a cationic or radical intermediate). As a specific case, the addition of HBr to cis-3,4-dimethylhex-3-ene results in all four possible stereoisomers as shown below. Those isomers related as enantiomers must be formed in equal amounts. Those isomers related as diastereomers may be present in unequal amounts. Think through the mechanism and decide if trans-3,4-dimethylhex-3-ene will produce the same stereoisomer mixture as cis (will the proportions of the various isomers be the same for cis vs. trans?).



# Pathways Involving Carbocation and Radical Intermediates Are Not Stereospecific

The uniqueness of the bromonium ion intermediate in its ability to stereospecifically govern the stereochemical outcome of reactions is appreciated when we compare its behavior to that of pathways that proceed via carbocation or radical intermediates. In these cases, there is generally equal probability that the nucleophile or radical will react on either side of the plane as shown. Thus, carbocation and radical intermediates are not-stereospecific and unless there is another stereocenter in the molecule, non-stereoselective. Only if a stereocenter exists elsewhere in the carbocation or radical intermediate will there be a stereoselective (not stereospecific) preference. Typically, even when another stereocenter is present, the stereoselectivity induced from this remote site will only result in a small bias.

