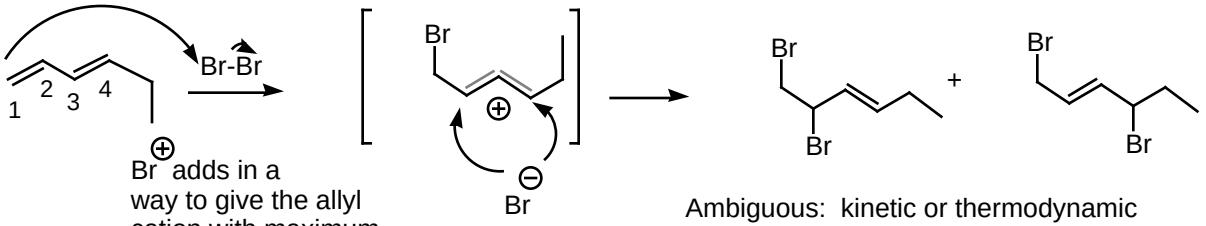
CORRECTION TO ANSWER TO PROBLEM 8. As pointed out by a student in an email, I drew the wrong starting material. The answers I gave for the starting material I drew (2,4-hexadiene) are correct, but below is the proper answer for the question as originally stated.

8. Give the most likely major product expected when *trans*-1,3-hexadiene reacts with each of the following reagents:

a. bromine



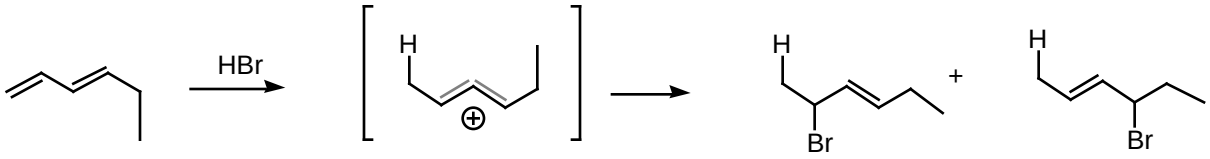
Br adds in a way to give the allyl cation with maximum number of alkyl substitutents

Ambiguous: kinetic or thermodynamic control? Both are possibly major.

The 1,2-addition product is likely to be favored kinetically, as one imagines something resembling a bridged bromonium ion in the extreme picture, as in simple bormination of an alkene. This is different, since the allyl cation is particularly favorable and the actual case may be something inbetween the closed bromonium and the open allyl cation which I wrote above. Either one can account for the 1,4-product, and it can also arise from spontaneous equilibration after the initial addition.

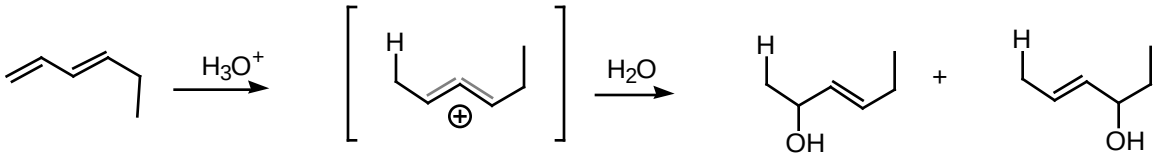
Note that one particular regio-selectivity is favored, where the Br initially adds at C-1 and not at C-4.

b. HBr



Ambiguous: kinetic or thermodynamic control? Both are possibly major.

c. H_2O, H^+



Ambiguous: Probably kinetic control, but products (and therefore the transition states) are very similar in stabilization. Probably 50:50