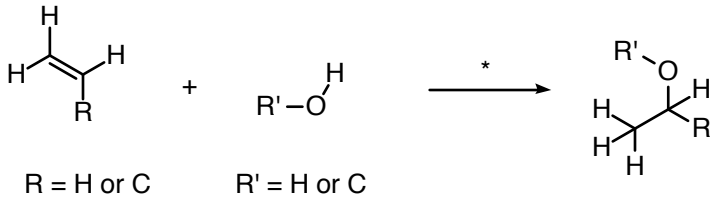
#1.



R = H or C R' = H or C

* Notes:
- Filename: AdditionOfROHAcrossMonosubstitutedAlkene
- Acid-catalyzed addition of water or alcohol across ethene or a monosubstituted alkene
- Requires an acid catayst, such as H_2SO_4 or H_3PO_4
- For monosubstituted alkenes, this rule should demonstrate the preference for substitution at the 2° carbon

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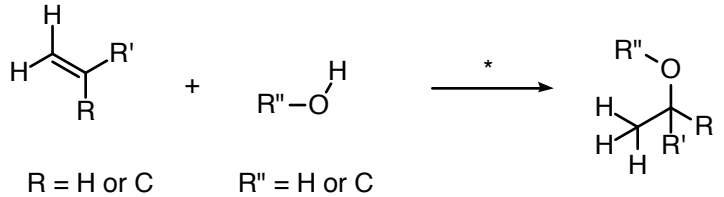
#2.



R = H or C R" = H or C
R' = C

* Notes:
- Filename: AdditionOfROHAcrossGemDisustitutedAlkene
- Acid-catalyzed addition of water or alcohol across a monosubstituted or 1,1-disubstituted alkene
- Requires an acid catayst, such as H_2SO_4 or H_3PO_4
- This rule should demonstrate the preference for substitution at the more substituted carbon

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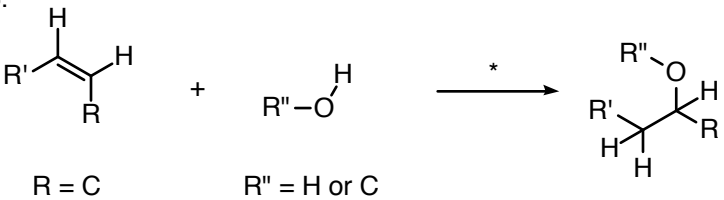
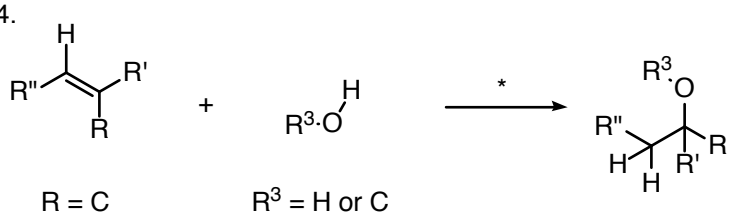
#3.



R = C R" = H or C
R' = C

* Notes:
- Filename: AdditionOfROHAcrossVicDisustitutedAlkene
- Acid-catalyzed addition of water or alcohol across a 1,2-disubstituted alkene
- Requires an acid catayst, such as H_2SO_4 or H_3PO_4
- Given the R and R' groups have the same constraints, this rule should demonstrate there is no preference for substitution, and I am curious how the algorithm will proceed with this in the case of an unsymmetrical alkene starting material. Will it recognize that either/both product is possible and potentially carry both through potential synthesis pathways, or will it arbitrarily decide on one product, ignoring the other?

#4.



R = C
R' = C
R" = C

R^3 = H or C

* Notes:
- Filename: AdditionOfROHAcrossTrisubstitutedAlkene
- Acid-catalyzed addition of water or alcohol across a trisubstituted alkene
- Requires an acid catayst, such as H_2SO_4 or H_3PO_4
- This rule should demonstrate the preference for substitution at the more substituted carbon

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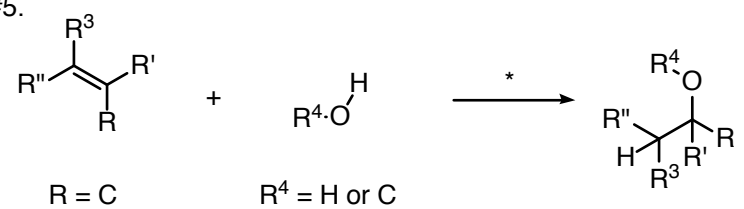
#5.



R = C
R' = C
R" = C
R^3 = C

R^4 = H or C

* Notes:
- Filename: AdditionOfROHAcrossTetrasusbtitutedAlkene
- Acid-catalyzed addition of water or alcohol across a tetrasubstituted alkene
- Requires an acid catayst, such as H_2SO_4 or H_3PO_4
- As with #3 above, there is no preference for position of reaction

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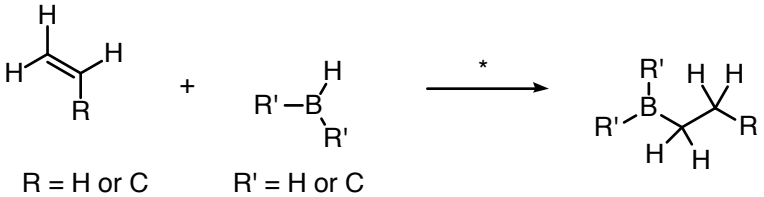
#6.



R = H or C

R' = H or C

* Notes:
- Filename: HydroborationOfMonosubstitutedAlkene
- Hydroboration of ethene or a monosubstituted alkene
- For monosubstituted alkenes, this rule should demonstrate the preference for substitution at the less substituted carbon

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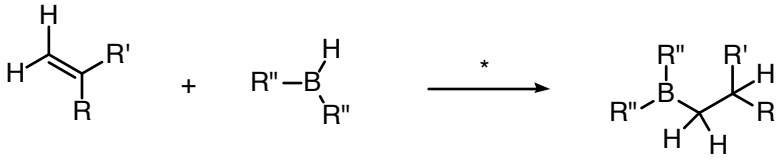
#7.

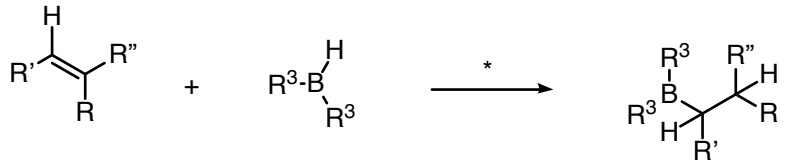


R = H or C
R' = C

R" = H or C

* Notes:
- Filename: HydroborationOfGemDisustitutedAlkene
- Hydroboration of a monosubstituted or 1,1-disubstituted alkene
- For monosubstituted alkenes, this rule should demonstrate the preference for substitution at the less substituted carbon

#8.

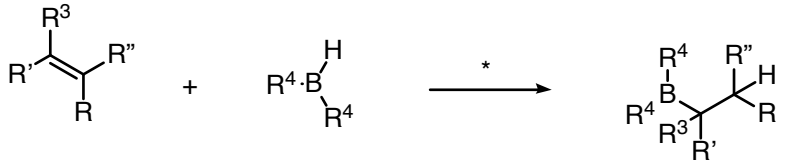


R = C
R' = C
R" = H or C

R^3 = H or C

* Notes:
- Filename: HydroborationOfDiOrTrisubstitutedAlkene
- Hydroboration of a 1,2-disubstituted or trisubstituted alkene
- Preference for substitution on the less substituted carbon for the trisubstituted, but no preference for 1,2-disubstituted (as with #3 above)

#9.

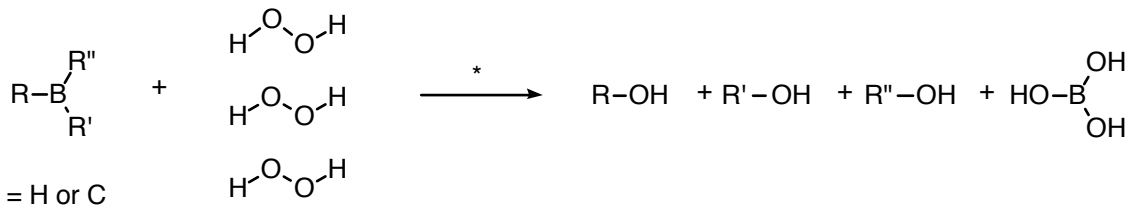


R = C
R' = C
R" = C
R^3 = C

R^4 = H or C

* Notes:
- Filename: HydroborationOfTetrasubstitutedAlkene
- Hydroboration of a tetrasubstituted alkene
- No preference (as with #3 above)

#10.



R = H or C
R' = H or C
R" = H or C

* Notes:
- Filename: OxidationOfBorane
- Oxidative work up of a borane
- Requires a base, like NaOH, the identity of which is inconsequential for the balanced equation

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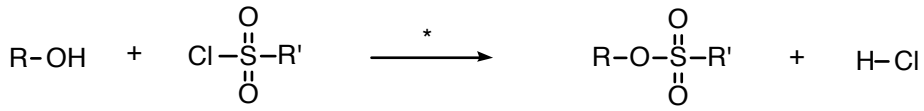
#11.

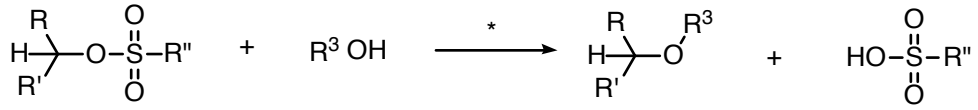


R = C

R' = C

* Notes:
- Filename: SulfonylationOfAlcohol
- Sulfonylation of an alcohol (which converts the oxygen into a suitable leaving group for substitution and elimination reactions)
- Requires a base to neutralize the HCl generated, but the identity of this base is inconsequential.

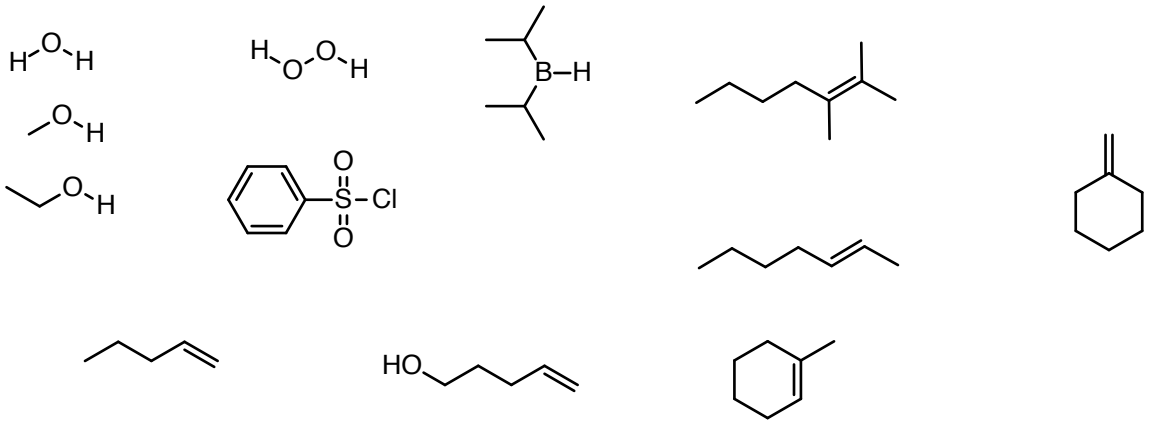
#12.



R = H or C
R' = H or C
R" = C

* Notes:
- Filename: EtherFormationBySulfonateDisplacement
- Synthesis of an ether by S_N2 reaction
- Requires a base (e.g. NaH) to deprotonate the nucleophile prior to nucleophilic substitution (and therefore generate the sulfonate slat rathern than the sulfonic acid), but this is inconsequential to the balanced equation.
- The definitions of R and R' are meant to signify that the sulfonate must be methyl, 1°, or 2° (but cannot be 3°)

Available Chemicals:



Targets: