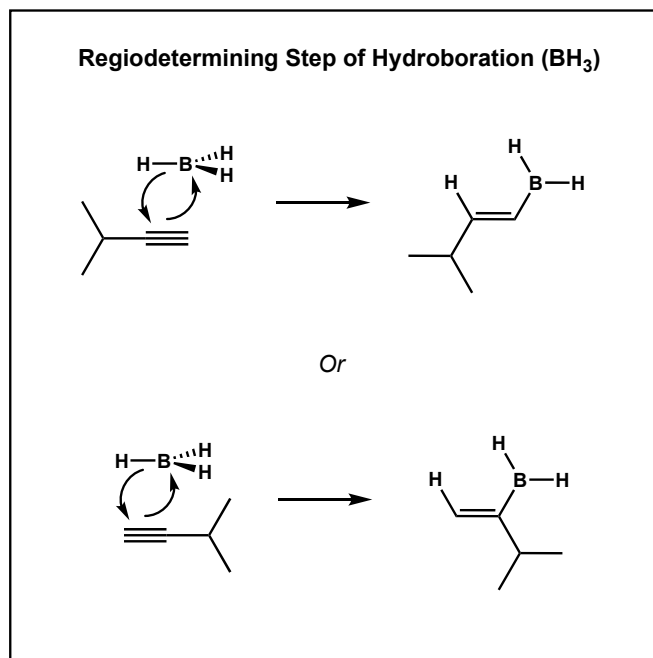
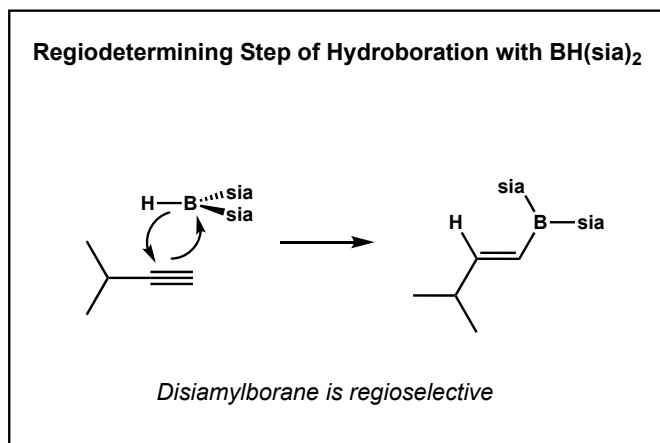
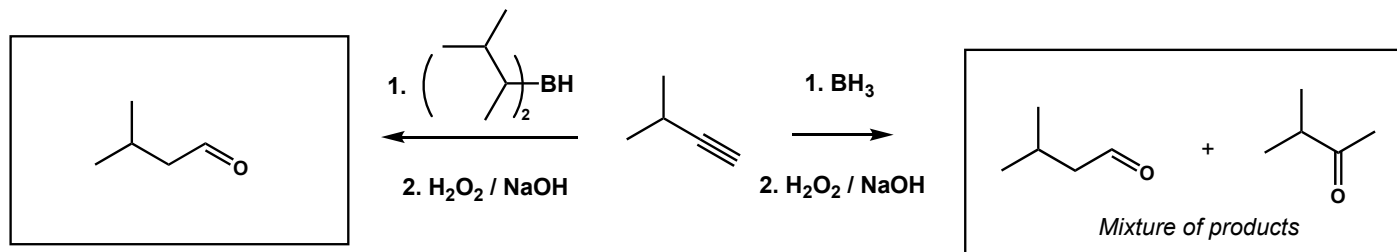


Selective versus Unselective Hydroboration-Oxidation

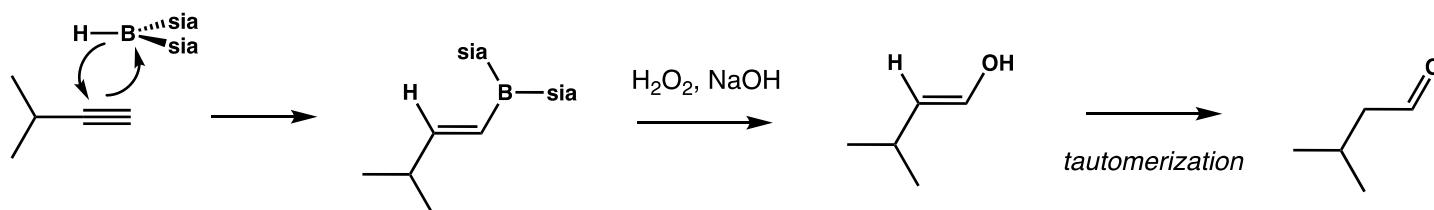
Not all hydroboration-oxidations are regioselective. Using your knowledge of sterics and the H-O reaction, propose products for the following.



Mechanism

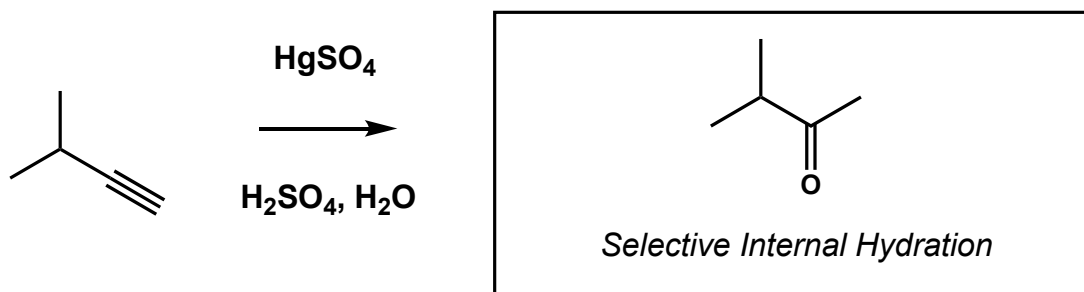
The bulky sialyl groups prefer to lie next to the unsubstituted (terminal) position of the alkyne, making the hydroboration step regioselective.

Upon the second step, oxidation, the product tautomerizes to form the aldehyde.

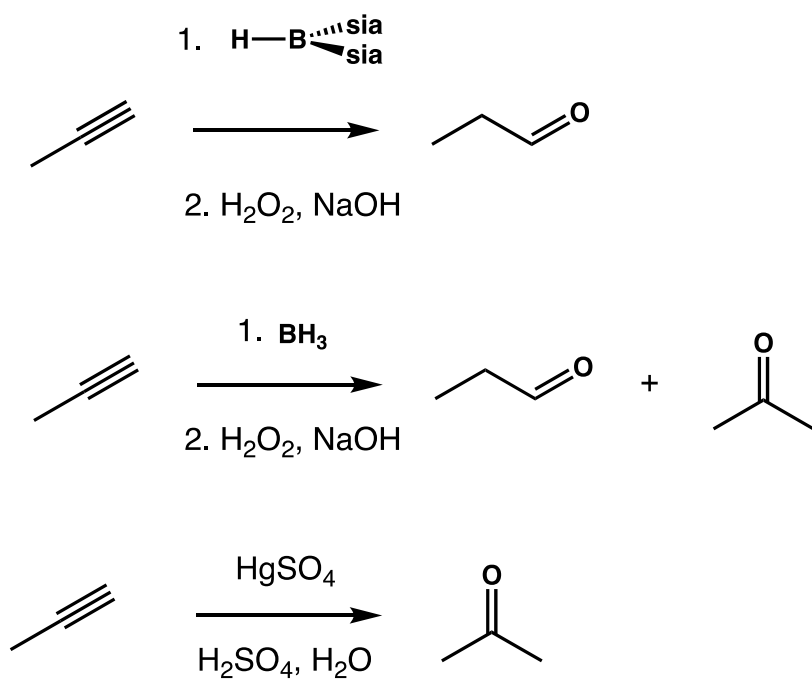


Selective Alkyne Hydration to the Ketone

We can also get the ketone product selectively from the same alkyne using other conditions.

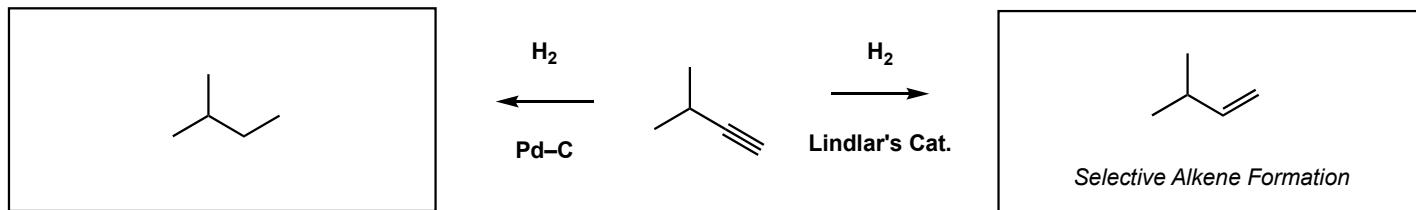


Alkyne Hydration Summary



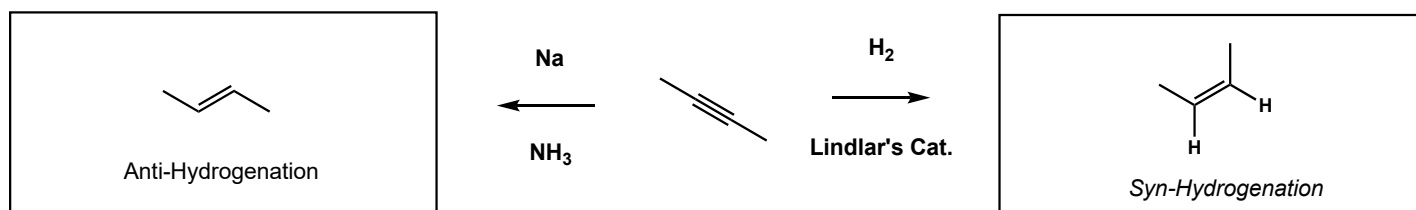
Selective Hydrogenation of Alkenes to Alkynes

Normally, Pd-C will hydrogenate alkynes all the way to an alkane. How can we get selective formation of the alkene?

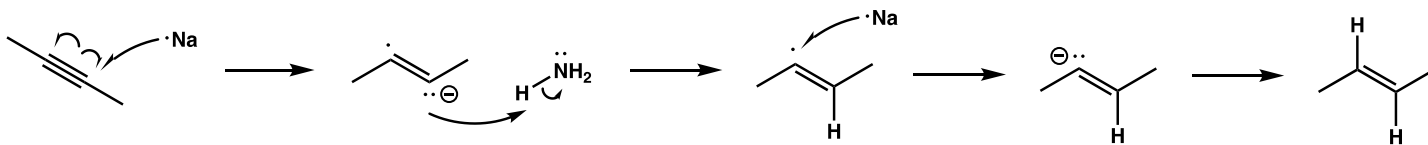


Diastereoselectivity of Alkyne Reductions

Two different reactions will afford the E or Z alkene isomer for internal alkynes.



Mechanism



Sodium/ammonia reduction leads selectively to the trans alkene product.