

ORGANIC CHEMISTRY 1 LECTURE GUIDE 2019

BY RHETT C. SMITH

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By Rhett C. Smith, Ph.D.

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Organic Chemistry 1 Reactions and Practice Problems 2019

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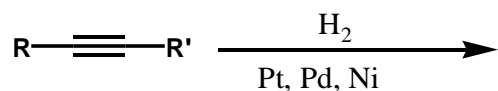
Organic Chemistry 1 Primer 2019,

by Rhett C. Smith, Andrew G. Tennyson, and Tania Houjeiry

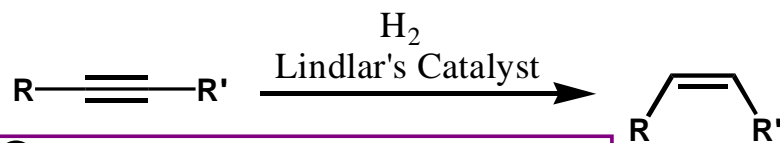
Lecture Topic III.13: Three Ways to Reduce Alkynes

Hydrogenation

An alkyne can be hydrogenated using conditions similar to those used to hydrogenate an alkene (H_2 / transition metal catalyst):



Gentler conditions (a less active catalyst) are required if conversion of an Alkyne to an alkene is desired without further hydrogenation. To do this, use H_2 with **Lindlar's catalyst** (Pd/CaCO_3 , $\text{Pb}(\text{OAc})_2$, quinoline).

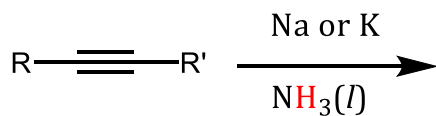


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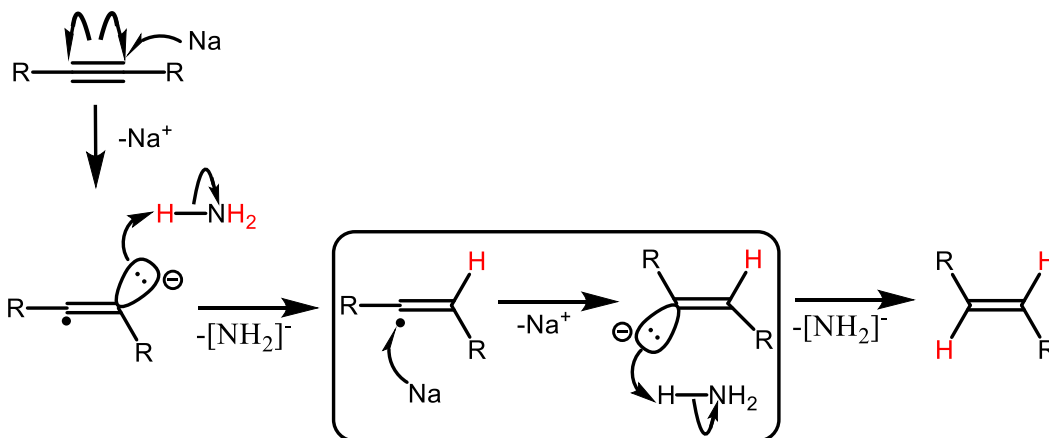
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Reduction with Na (or K) with NH₃

When an alkali metal such as Na or K is dissolved in liquid ammonia, solvated electrons are formed. The resulting solution can be used to reduce alkynes:



The mechanism is somewhat complex and involves radicals:



Notes