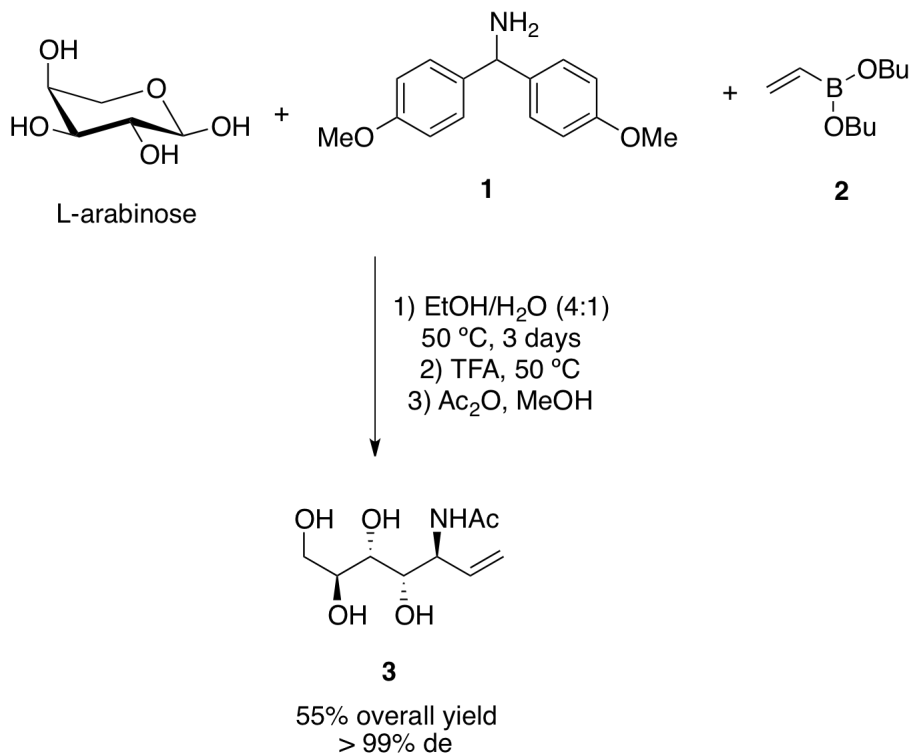


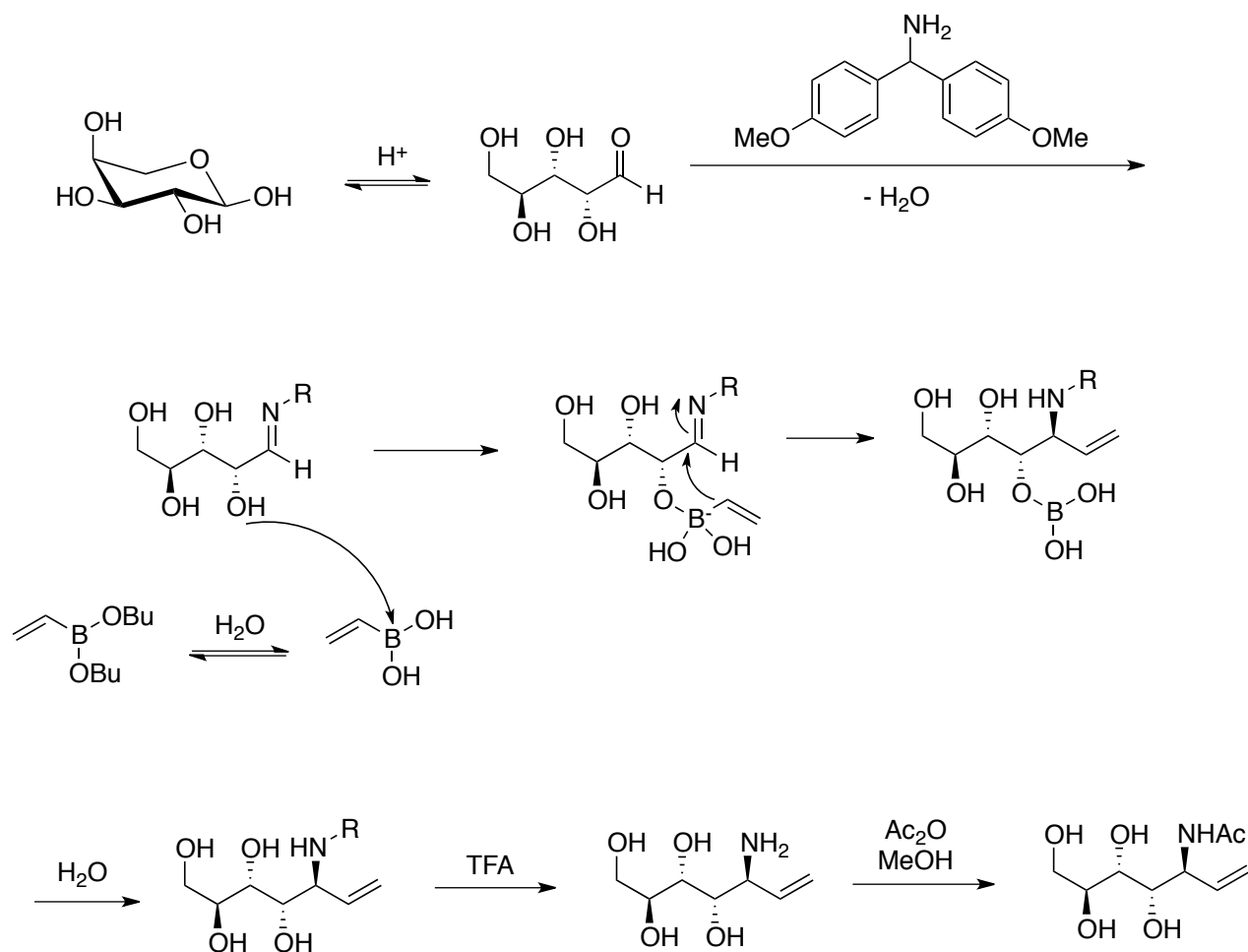
Three-Step Synthesis of Sialic Acids and Derivatives

Problem:



- Give the mechanism of this three-component reaction. (*Hint: water is crucial for this reaction: what happens to the boronic acid ester when water is present?*)
- What is the name of this reaction?

Solution:



The name of the reaction is Petasis reaction.

Comments:

The standard Petasis reaction is a three-component condensation of an α -hydroxy aldehyde, a primary or secondary amine, and a substituted vinyl boronic acid (or aryl boronic acid). The unsubstituted vinyl boronic acid was not compatible with an aldose due to the rapid deterioration of vinyl boronic acid. So commercially available vinyl boronic ester in presence of water was used to generate in situ an equilibrium between reactive boronic acid and inactive boronic acid ester.

References:

Z. Hong, L. Liu, C.-C. Hsu, C.-H. Wong, *Angew. Chem. Int. Ed.* **2006**, *45*, 7417-7421.

Keywords:

Petasis reaction