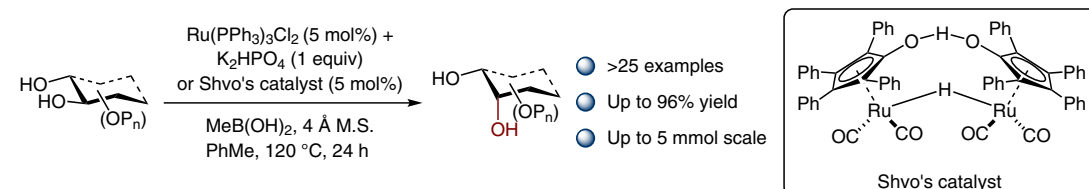


X. LI, J. WU, W. TANG\* (UNIVERSITY OF WISCONSIN-MADISON, USA)

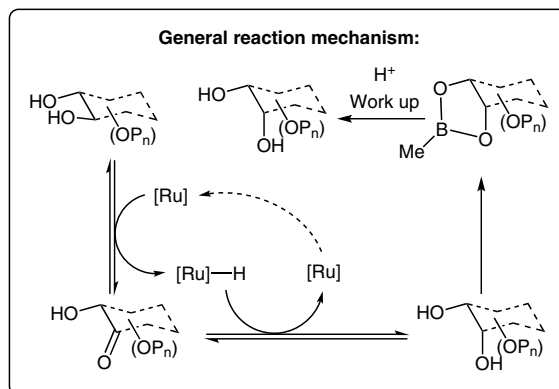
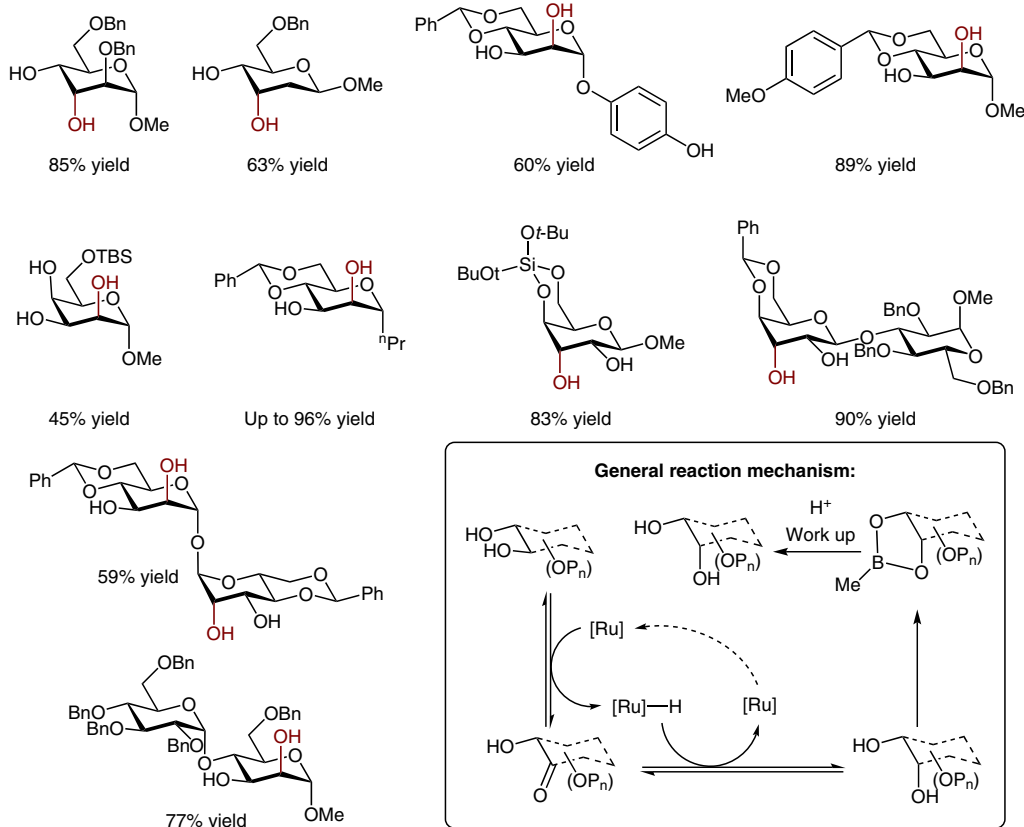
General Strategy for the Synthesis of Rare Sugars via Ru(II)-Catalyzed and Boron-Mediated Selective Epimerization of 1,2-*trans*-Diols to 1,2-*cis*-Diols

*J. Am. Chem. Soc.* **2022**, *144*, 3727–3736, DOI: 10.1021/jacs.1c13399.

# General Strategy for the Synthesis of Rare Sugars via Ru(II)-Catalyzed and Boron-Mediated Selective Epimerization of 1,2-*trans*-Diols to 1,2-*cis*-Diols



## Selected examples:



**Significance:** The Tang group reports a selective strategy for the conversion of sugars containing a *trans*-1,2-diol into the corresponding *cis* isomers. This method affords access to a wide host of rare sugars, with the OH group that flanks an axial OH group undergoing the epimerization each time. This approach was amenable to a variety of sugars, including complex disaccharides.

**Comment:** The formation of the boronate ester of the *cis*-1,2-diol drives the equilibrium toward the desired product. Shvo's catalyst was better for substrates containing an axial  $\gamma$ -substituent, while Ru(PPh<sub>3</sub>)<sub>3</sub>Cl<sub>2</sub> was superior for equatorial groups in the same  $\gamma$ -position. The authors propose this selectivity could be due to the difference in H-abstraction mechanisms for each catalyst.

**SYNFACTS Contributors:** Mark Lautens, Austin D. Marchese  
Synfacts 2022, 18(05), 0505 Published online: 20.04.2022  
DOI: 10.1055/s-0041-1737428; Reg-No.: L03222SF

© 2022, Thieme. All rights reserved.  
Georg Thieme Verlag KG, Rüdigerstraße 14, 70469 Stuttgart, Germany

Category

Metals in Synthesis

Key words

ruthenium catalysis

boronic acid

sugars

epimerization

hydrogenation

Synfact  
of the  
Month

This document was downloaded for personal use only. Unauthorized distribution is strictly prohibited.