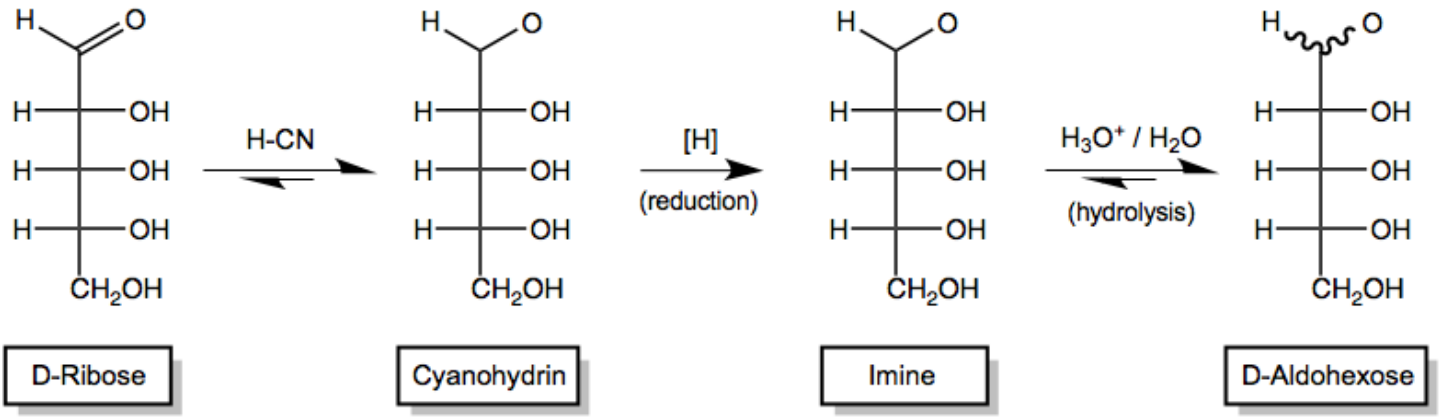
CONCEPT: MONOSACCHARIDES – MODERN KILIANI-FISCHER SYNTHESIS

Aldose aldehydes are susceptible to the same *nucleophilic addition* reactions that we learned in carbonyl chemistry

● When exposed to _____, aldoses can *reversibly* transform into *cyanohydrins*.

□ The cyano group can then be reduced and hydrolyzed to form a new, *chain-lengthened* aldehyde

□ Synthesis can be repeated multiple times, however a mixture of C2 epimers are created at every cycle

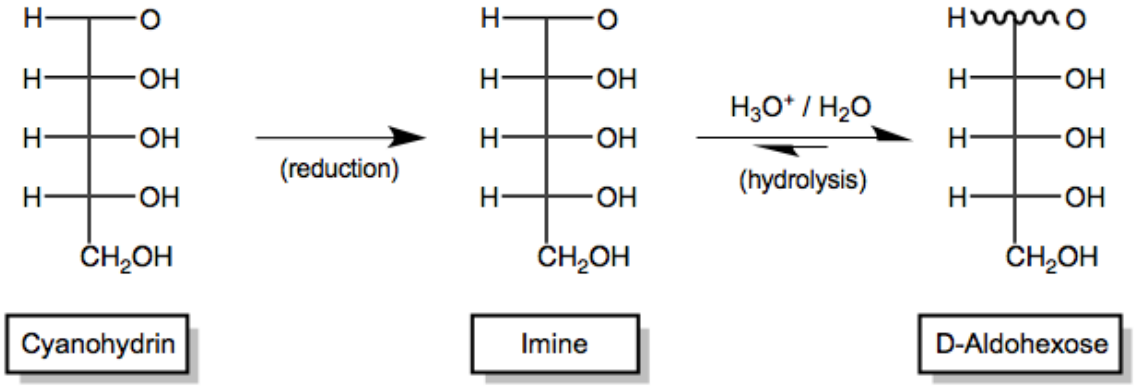


Modern vs. Classical Method:

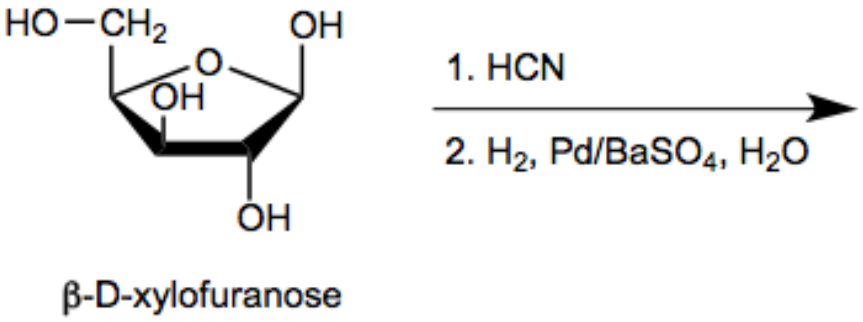
The original Kiliani-Fischer synthesis required two additional steps after cyanohydrin addition, and resulted in poor yields

● An improved reducing agent was developed _____ which was "poisoned" to form *imines* instead of *amines*

□ In aqueous solution, imines rapidly hydrolyze into carbonyls. Same mechanism as *imine hydrolysis.*



PRACTICE: Predict the product(s) for the following reaction. Provide the mechanism of the imine hydrolysis step if required.



β-D-xylofuranose