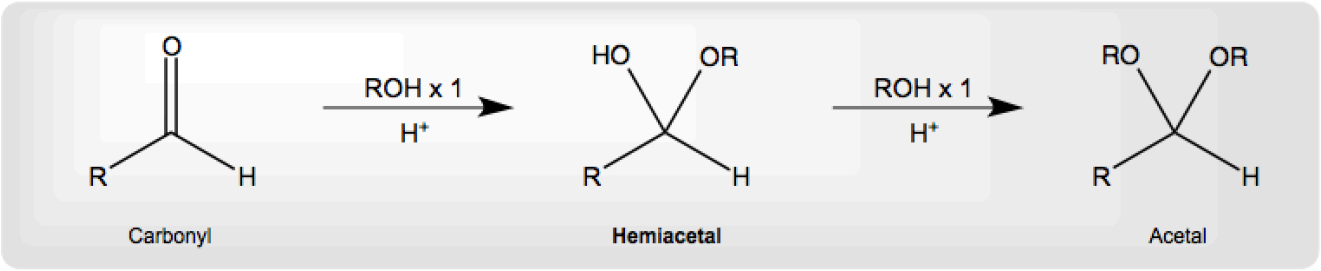
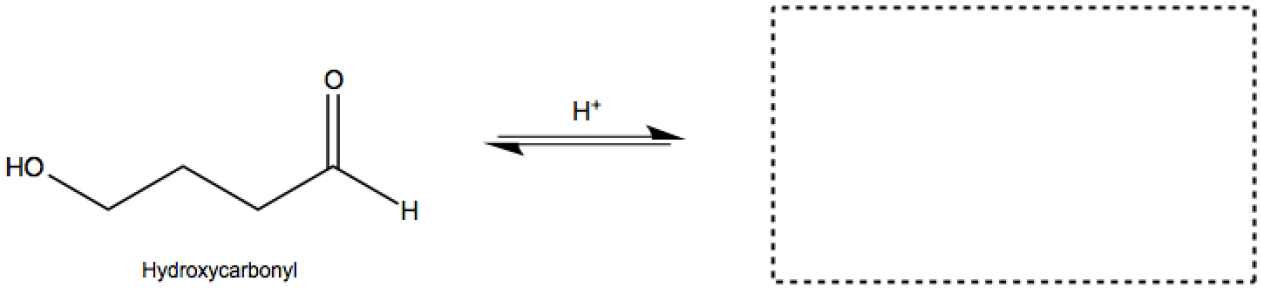
CONCEPT: MONOSACCHARIDES — FORMING CYCLIC HEMIACETALS

By definition, monosaccharides contain at least one carbonyl group and multiple alcohols.

- The ***nucleophilic addition*** of 1 eq. alcohol produces ***hemiacetals***. A second equivalent produces *acetals*

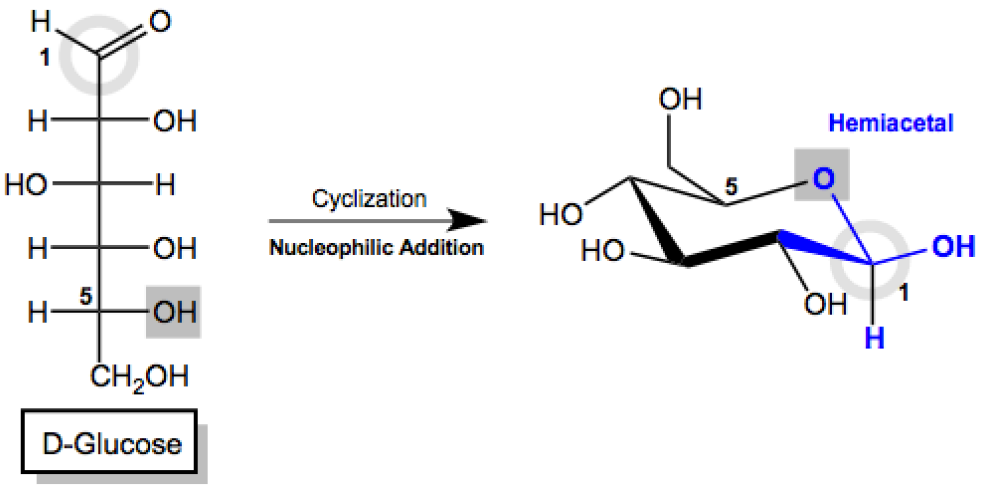


- Recall that the only stable hemiacetals are *cyclic* (5 and 6-membered rings)

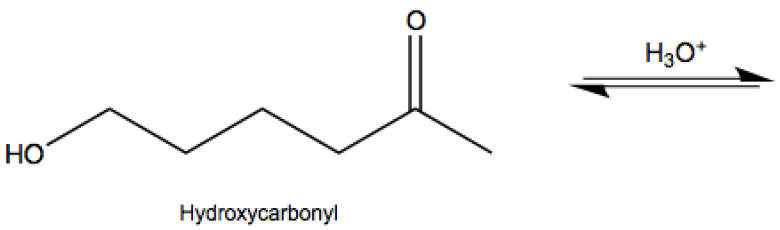


- Thus many monosaccharides can undergo *reversible* intramolecular, ring-forming hemiacetal mechanism

EXAMPLE: D-Glucose undergoes nucleophilic addition to form a cyclic, 6-membered hemiacetal.



PRACTICE: Provide the mechanism for the cyclic hemiacetal formation of the following hydroxycarbonyl.



Hydroxycarbonyl