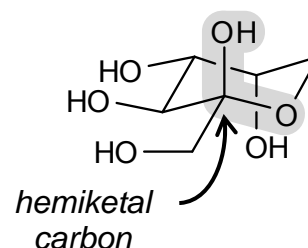
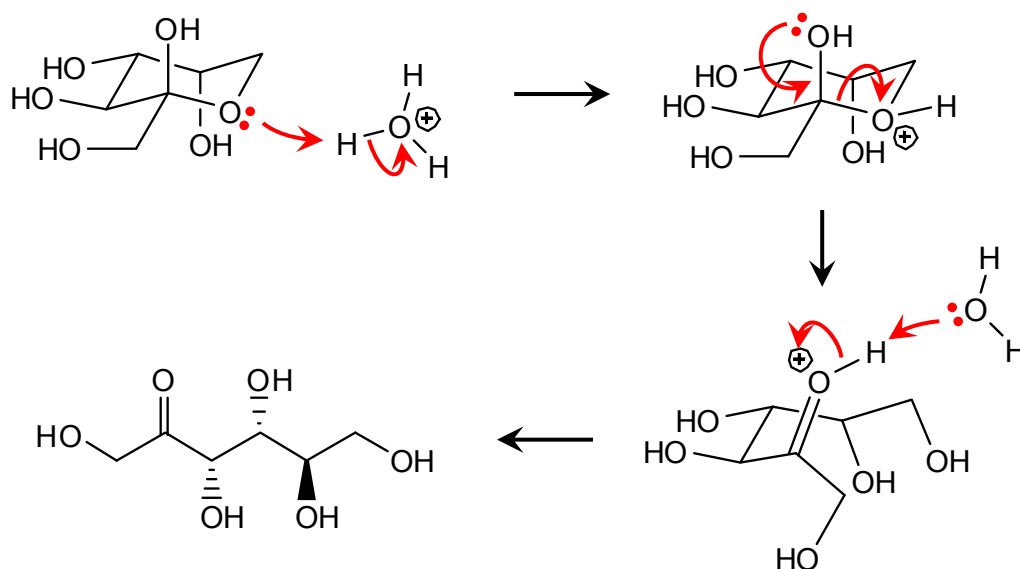


Workshop 12 Solutions
Sugars as Hemiketals

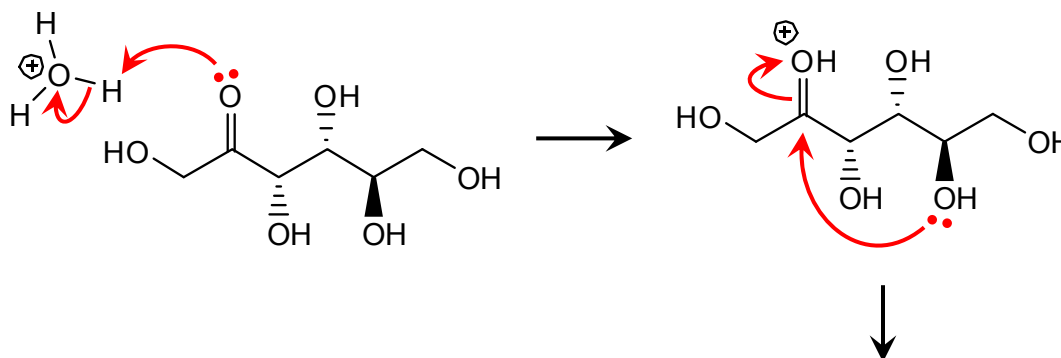
1. A hemiketal is a carbon center with two alkyl groups, one alkoxy group, and one hydroxyl group. In this molecule, it's probably most noticeable as the carbon with two oxygen atoms attached to it.

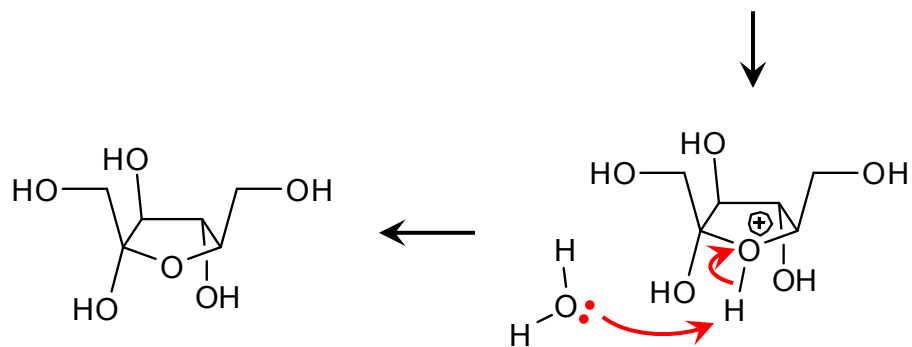


2. In our mechanism, the hemiketal -OH is going to become the ketone, and the alkoxide needs to be made into a good leaving group to leave.



3. If the six-membered ring was made from the ketone and an alcohol group four carbons away from it, then the five-membered ring should be made from the ketone and the alcohol three carbons away:





4. Water is neither added nor taken away to interchange the three structures. So, since each is one molecule, the entropy for each species should be about the same, and none should be favored entropically.