

## 10.S: Nucleophilic Carbonyl Addition Reactions (Summary)

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Before moving on to the next chapter, you should be confident in your ability to:

- Recognize aldehyde and ketone groups in organic biomolecules
- Draw/explain the bonding picture for aldehyde and ketone groups
- Explain why the carbonyl carbon in an aldehyde or ketone is electrophilic
- Draw complete curved arrow mechanisms for the following reaction types:
  - formation of a hemiacetal/hemiketal
  - collapse of a hemiacetal/hemiketal to revert to an aldehyde/ketone
  - formation and hydrolysis of an acetal/ketal
  - formation and hydrolysis of an N-glycosidic bond
  - formation and hydrolysis of an imine
  - transamination
- Explain how the carbocation intermediates in glycosidic bond formation and hydrolysis reactions are stabilized by resonance
- Explain the stereochemical considerations of a nucleophilic addition to an aldehyde/ketone, especially in the context of glycosidic bond formation. Be able to identify the re and si faces of an aldehyde, ketone, or imine.
- In addition to these fundamental skills, you should develop your confidence in working with end-of-chapter problems involving more challenging, multi-step biochemical reactions.

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