

OUTLINE

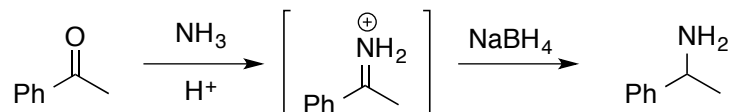
Amino Acid Synthesis

- Organic Synthesis – Reductive Amination - McMurry 26.3
- Biosynthesis of Asparagine and Proline – not in the textbook, use lecture notes
- Catabolism – Transamination – McMurry 29.9
 - Biosynthesis of Alanine, Glutamate, and Aspartate

HW assignment at the end of these notes (L5-6)

Organic Synthesis

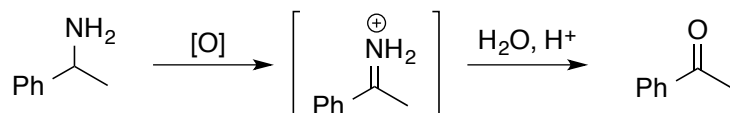
Reductive Amination (Ketone → [Imine] → Amine)

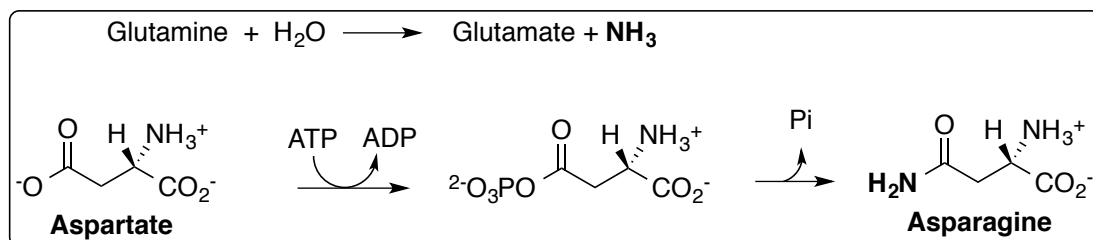


Applied to amino acid synthesis:

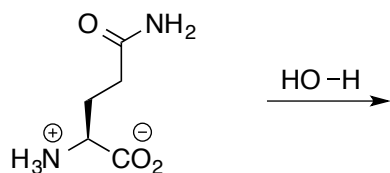
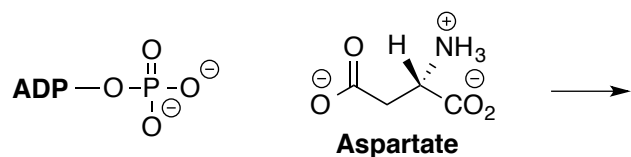
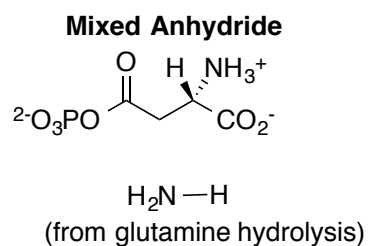


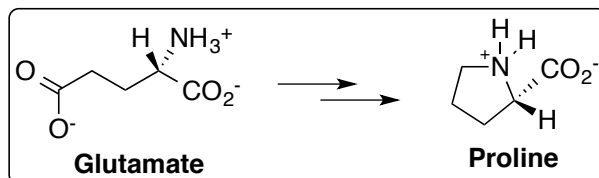
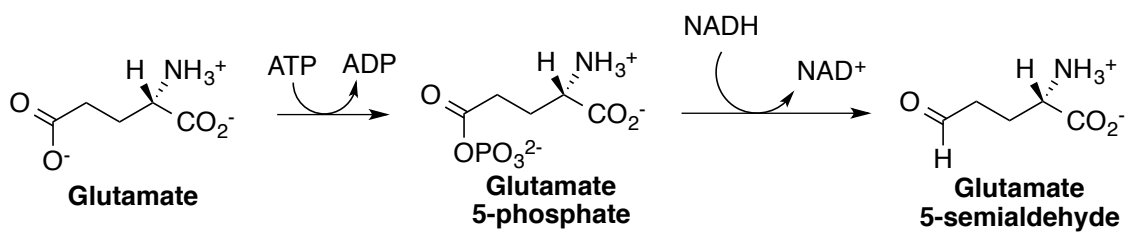
Reverse Reductive Amination (Amine → [Imine] → Ketone)



Biosynthesis of Asparagine

Each step takes place in the active site of an enzyme, which contains all acids (H⁺) and bases (:B) necessary to complete each transformation (more on that later). Until then, feel free to use H⁺ and :B as needed.

Hydrolysis of Glutamine*Phosphate Transfers with ATP**Amide Formation*

Biosynthesis of Proline*Formation and NADH Reduction of Phosphoester**Intramolecular Reductive Amination*