

Organische Chemie I – Teil 22

Stefan Bräse

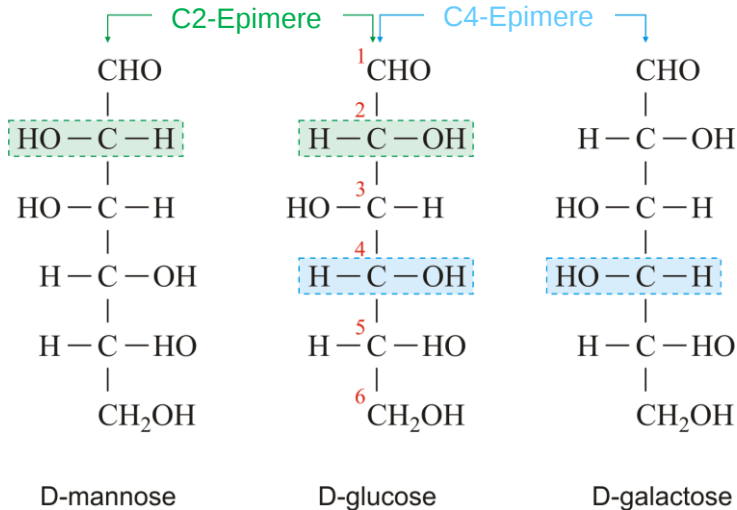
Institut für Organische Chemie & Institut für Biologische und Chemische Systeme

Aus Exkurs: Chiralität – Definitionen

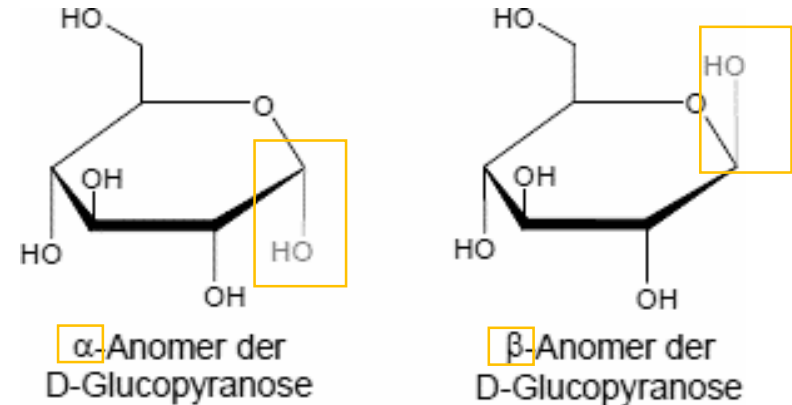
- Chiralität: Chiral heißt ein Körper, der mit seinem Spiegelbild nicht deckungsgleich ist
- Oder: Chirale Körper dürfen weder Spiegelebene noch Inversionszentrum enthalten, wohl aber Drehachsen.
- Konformation: Verbindungen gleicher Konstitution und Konfiguration, die sich durch Drehung um Einfachbindungen unterscheiden, heißen Konformere, haben unterschiedliche Konformation.
- Enantiomere sind Spiegelbild-Isomere. Chiralität ist eine notwendige und hinreichende Bedingung für die Existenz von Enantiomeren.
- Konfiguration: Räumliche Anordnung der Atome im Molekül, jedoch ohne Unterscheidung von Anordnungen, die durch Rotation um Bindungen ineinander übergehen. Konfigurations-Isomere sind räumlich verschiedene Isomere gleicher Konstitution.
- Diastereoisomere: Konfigurations-Isomere, die nicht Enantiomere sind.
- Epimer: Konfigurationsisomere, die sich an nur einem von mehreren stereogenen Zentren unterscheiden
- Anomer: Epimere, die bei der Bildung eines ringförmigen Halbacetals von Aldosen/Ketosen neu entstehen

Ergänzung Exkurs: Chiralität – Definitionen

■ Epimer

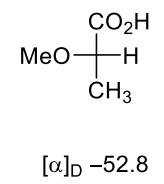
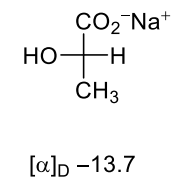
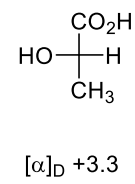
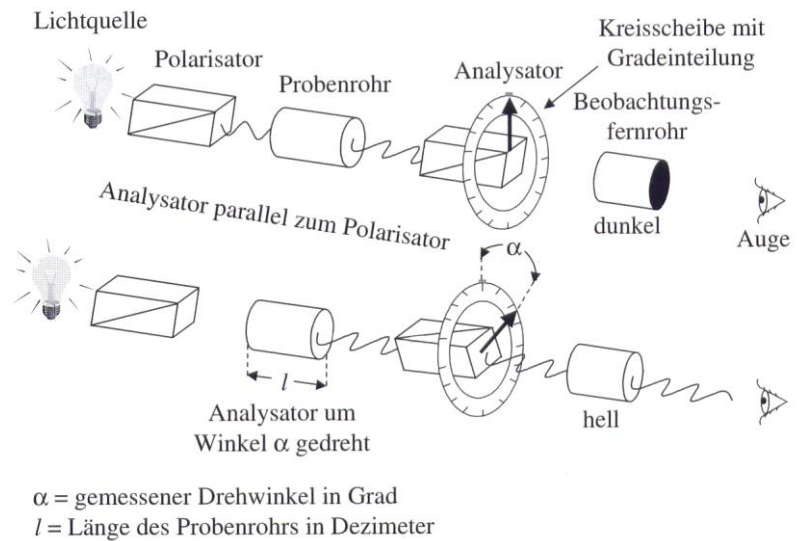


■ Anomer



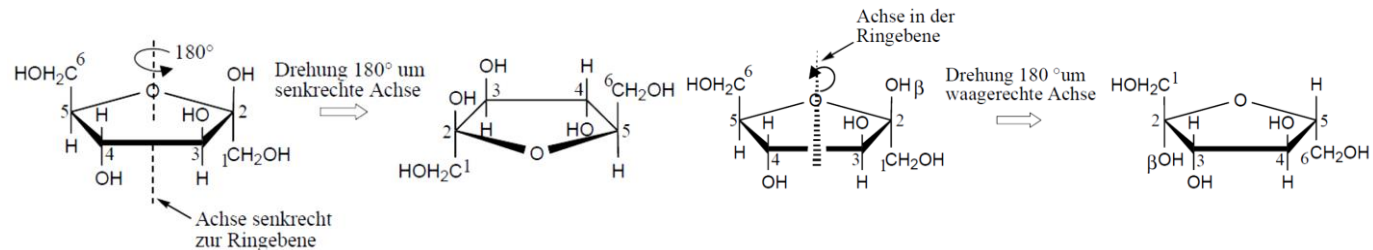
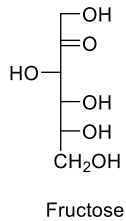
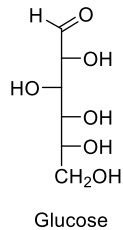
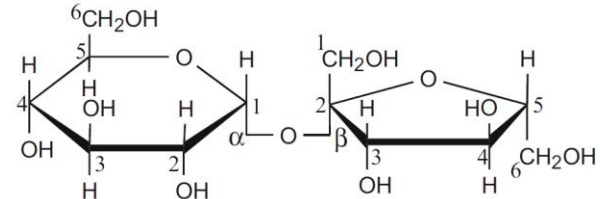
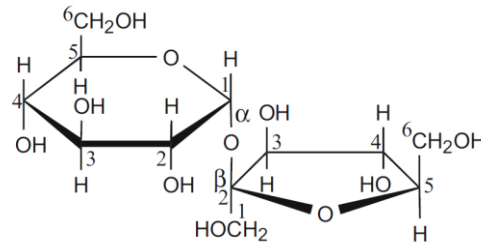
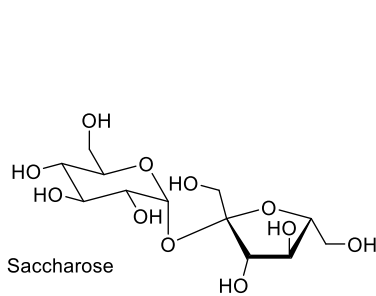
- D-/L-Zucker: Befindet sich die Hydroxy-Gruppe am stereogenen C, das am weitesten vom höchstoxidierten C-Atom entfernt ist, auf der rechten Seite, so spricht man von einem D-Zucker (dexter = lat., rechts), ist sie links, so spricht man von einem L-Zucker (leavus = lat., links). (D und L sind Enantiomere)

Kohlenhydrate



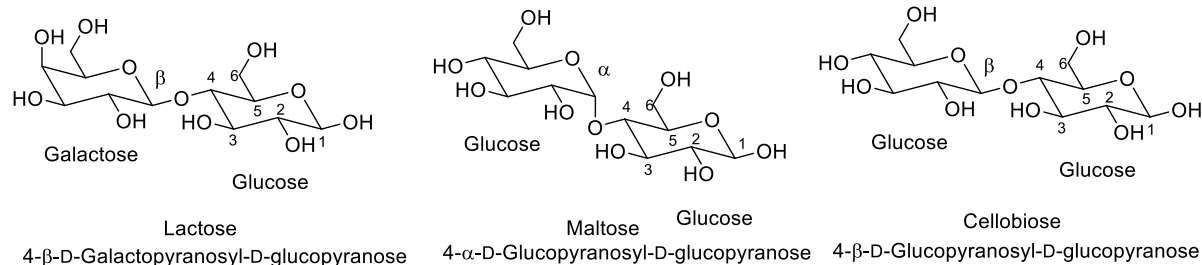
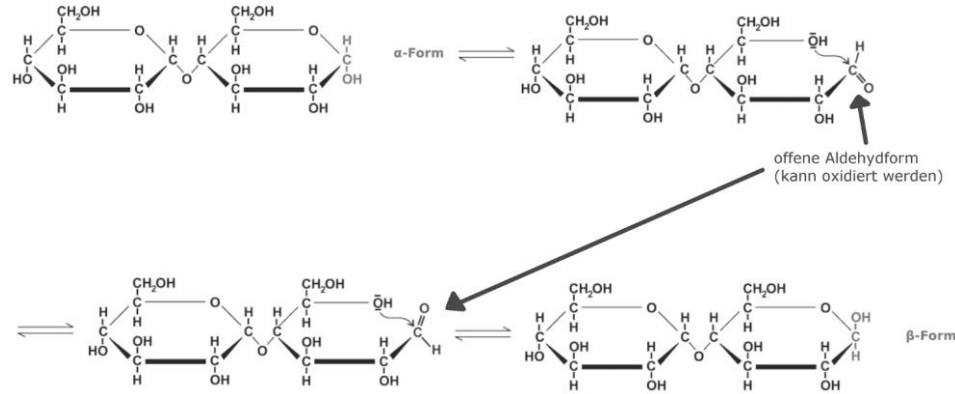
Kohlenhydrate – Di-, Oligo-, Polysaccharide

■ Disaccharide



Kohlenhydrate – Di-, Oligo-, Polysaccharide

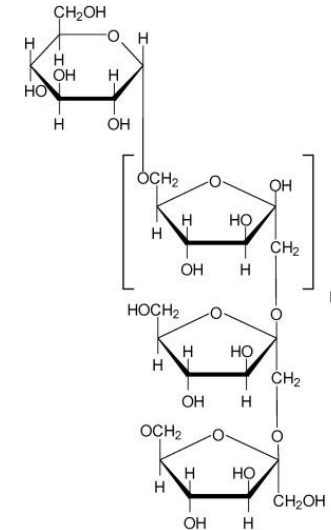
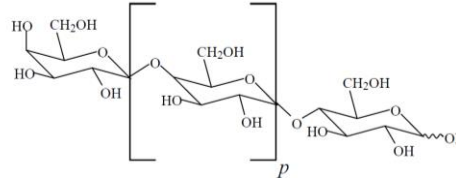
■ Disaccharide



Kohlenhydrate – Di-, Oligo-, Polysaccharide

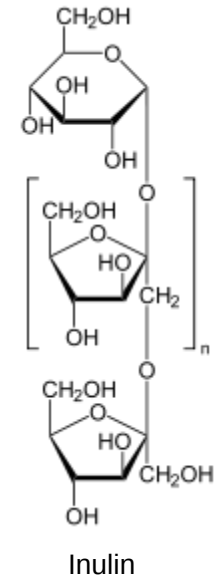
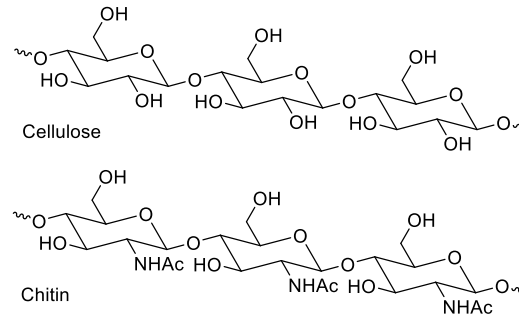
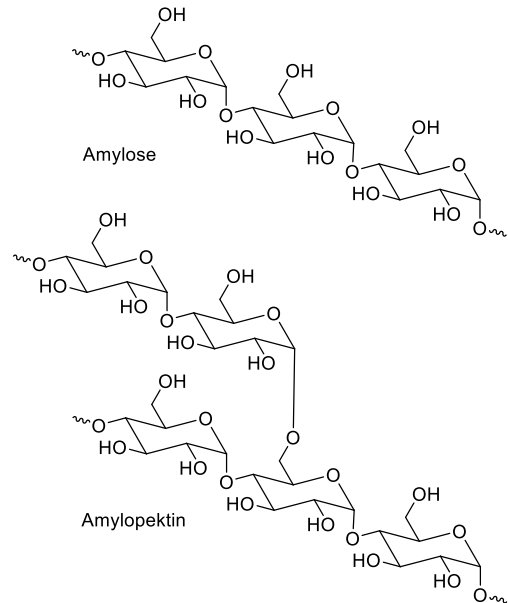
■ Oligosaccharide

- Di-, Tri-, Tetra-, Pentasaccharide...
- linear (unverzweigt) – verzweigt
- Grenze zwischen Oligo- und Polysacchariden ist fließend
- Ca. 3 – 10 Monosaccharide
- z.B. Galactooligosaccharide (GOS), Fructooligosaccharide (FOS)
 - bifidogen (präbiotisch)



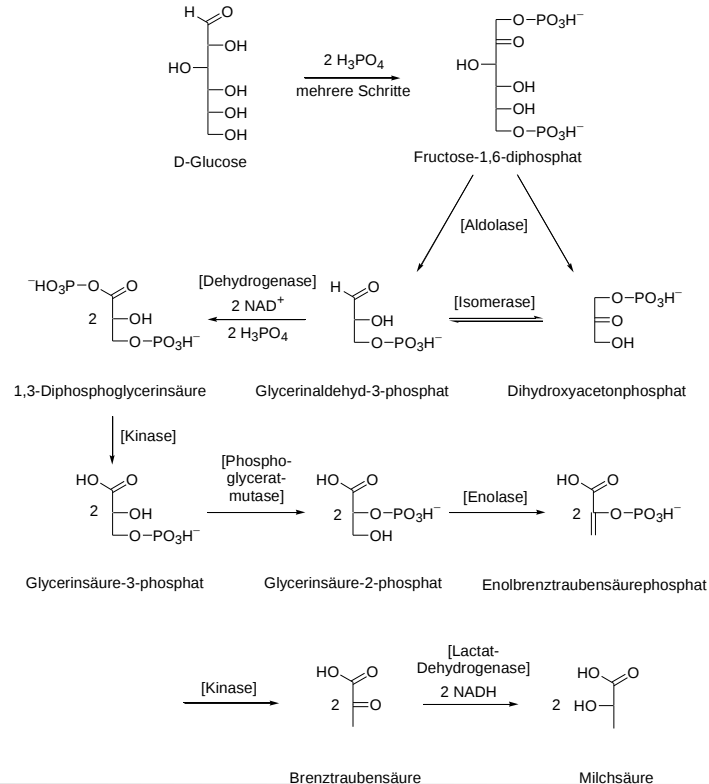
Kohlenhydrate – Di-, Oligo-, Polysaccharide

■ Polysaccharide



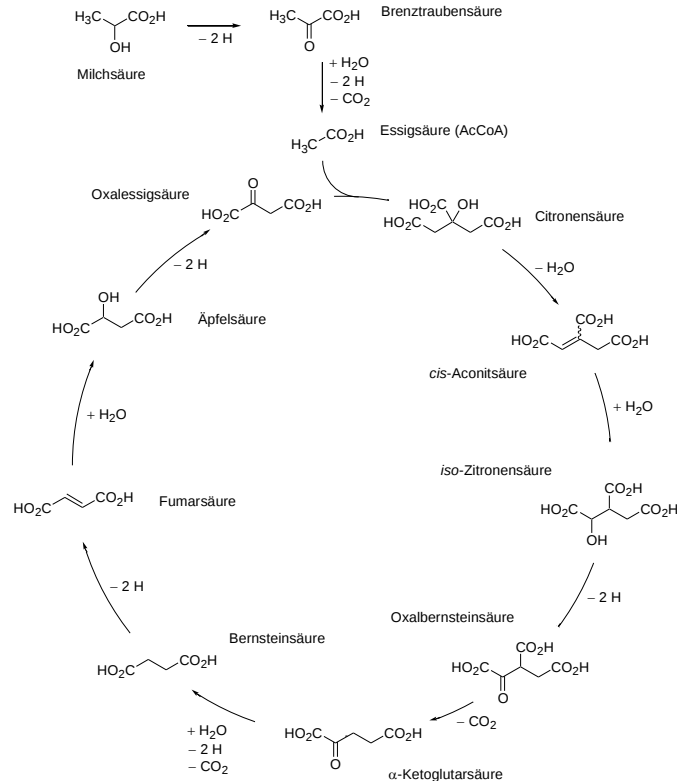
Kohlenhydrate – Biologische Prozesse

Milchsäuregärung



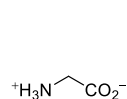
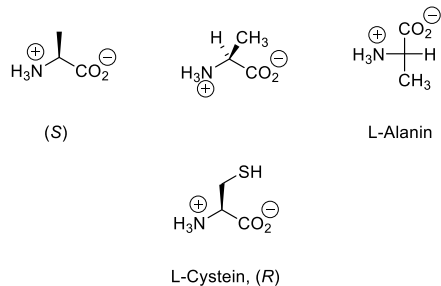
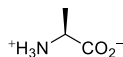
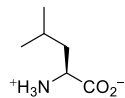
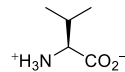
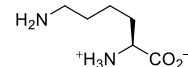
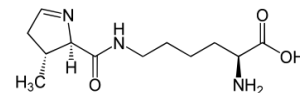
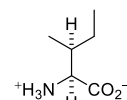
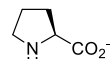
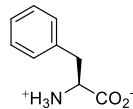
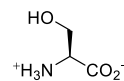
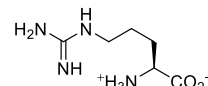
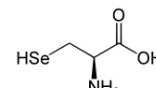
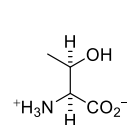
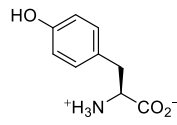
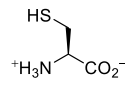
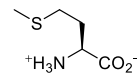
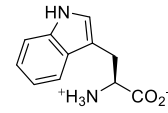
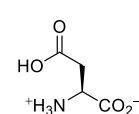
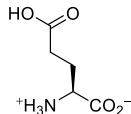
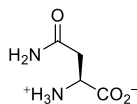
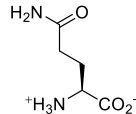
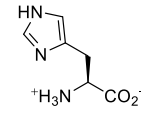
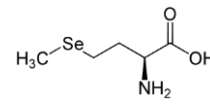
Kohlenhydrate – Biologische Prozesse

■ Citratzyklus, Krebszyklus



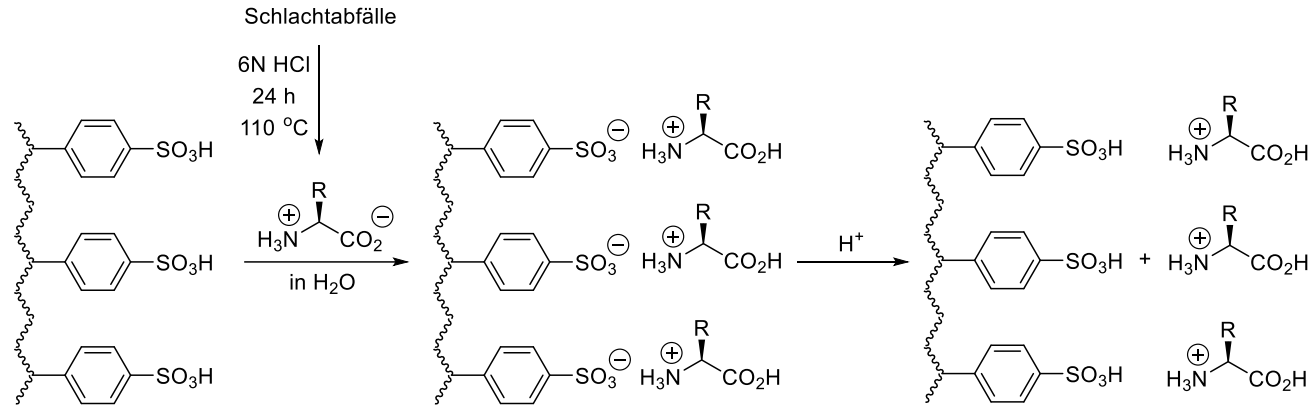
Aminosäure und Peptide

L-Aminosäuren


Glycin
Gly

Alanin
Ala

Leucin
Leu

Valin
Val

Lysin
Lys

Pyrrolysine
Pyl

Isoleucin
Ile

Prolin
Pro

Phenylalanin
Phe

Serin
Ser

Arginin
Arg

Selenocystein
Sec

Threonin
Thr

Tyrosin
Tyr

Cystein
Cys

Methionin
Met

Tryptophan
Trp

Asparaginsäure
Asp

Glutaminsäure
Glu

Asparagin
Asn

Glutamin
Gln

Histidin
His

Selenomethionin
Sem

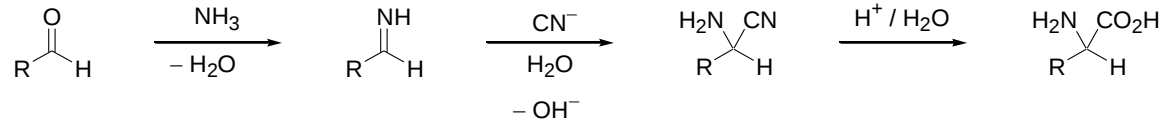
Aminosäure und Peptide – Synthese der AS I

■ Hydrolyse aus Schlachtabfällen

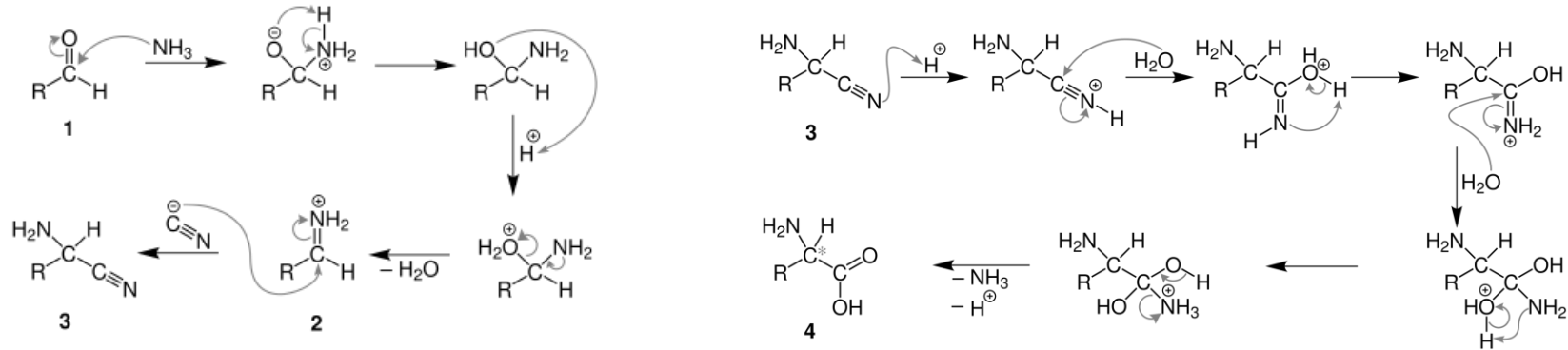


Aminosäure und Peptide – Synthese der AS II

■ Strecker-Synthese



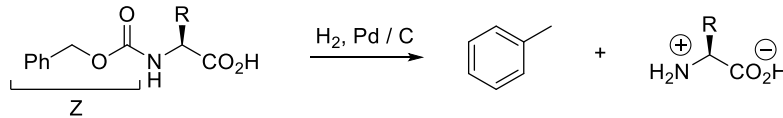
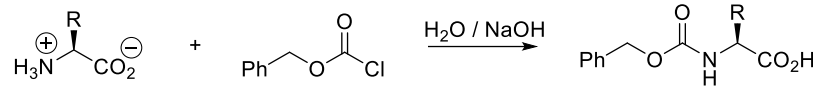
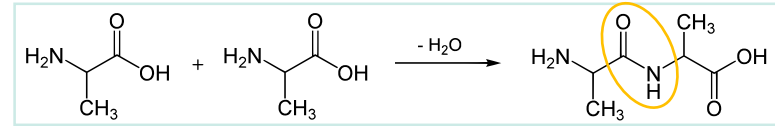
■ Mechanismus:



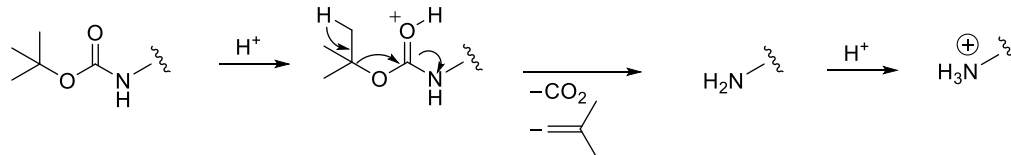
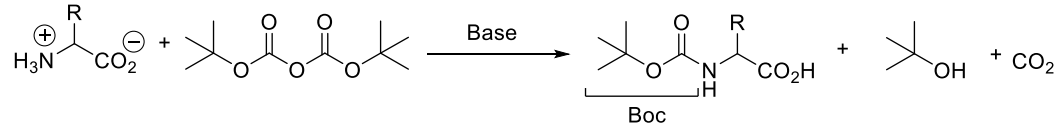
Aminosäure und Peptide – Peptidsynthese I

■ Schutzgruppen

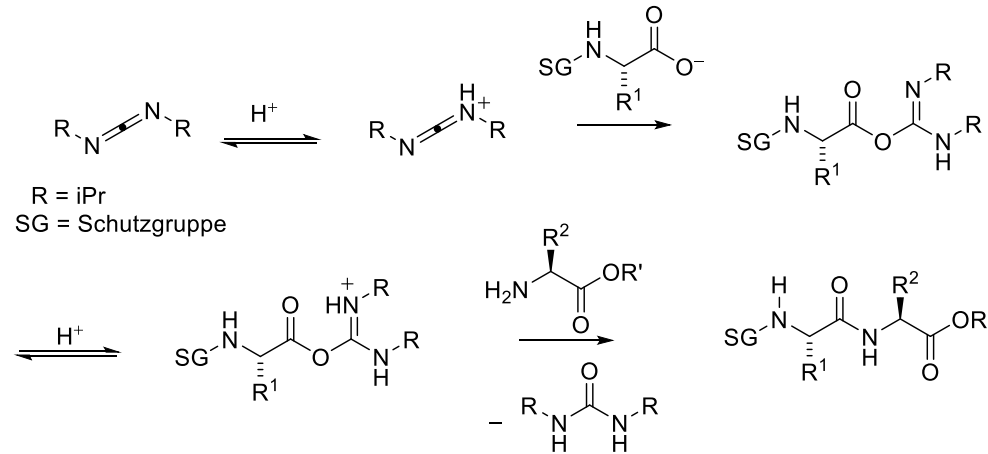
- Z- (Benzyloxycarbonyl-); Schotten-Baumann-Reaktion



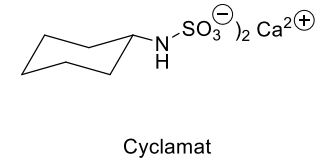
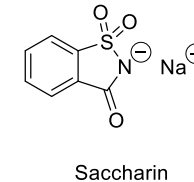
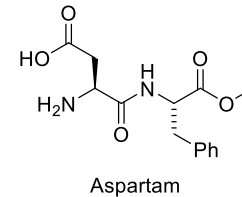
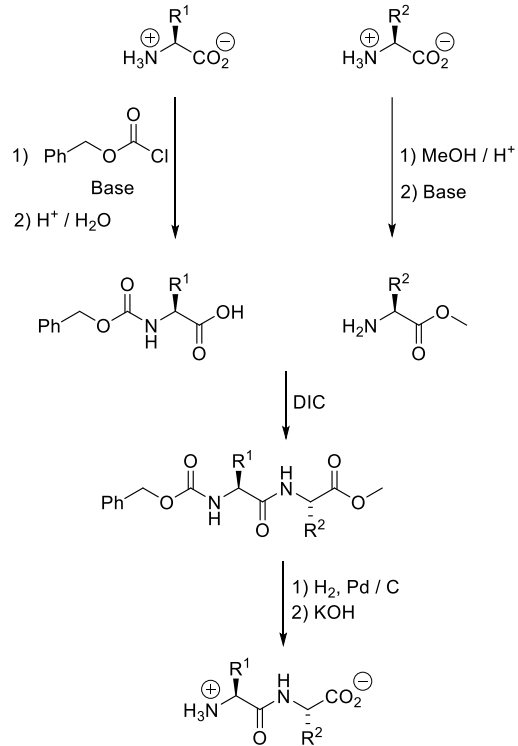
- Boc-Gruppe (tert-Butoxycarbonyl-)



Aminosäure und Peptide – Peptidsynthese II

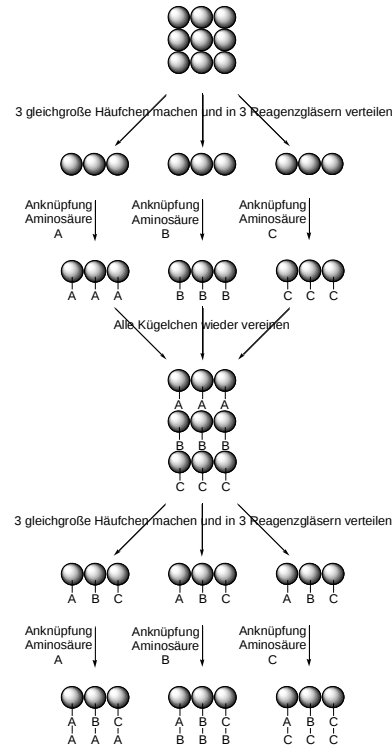


Aminosäure und Peptide – Peptidsynthese III



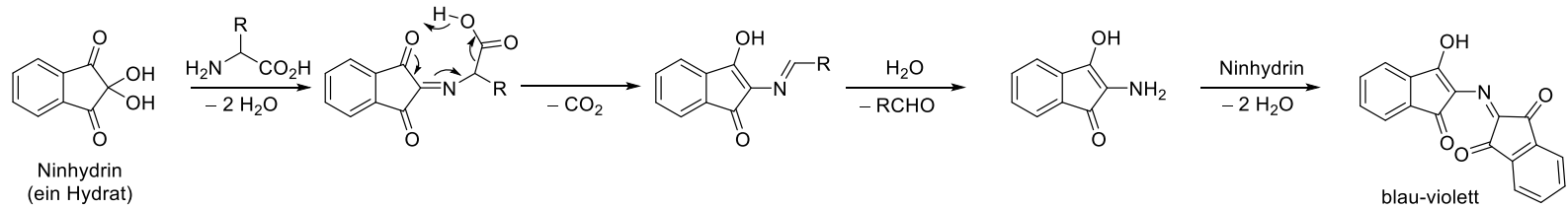
Aminosäure und Peptide – Peptidsynthese V

- Split and mix
- Peptidbibliothek



Aminosäure und Peptide – AS-Nachweis

■ Ninhydrin



Fragen?