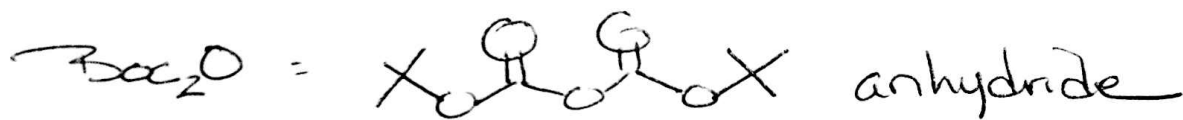
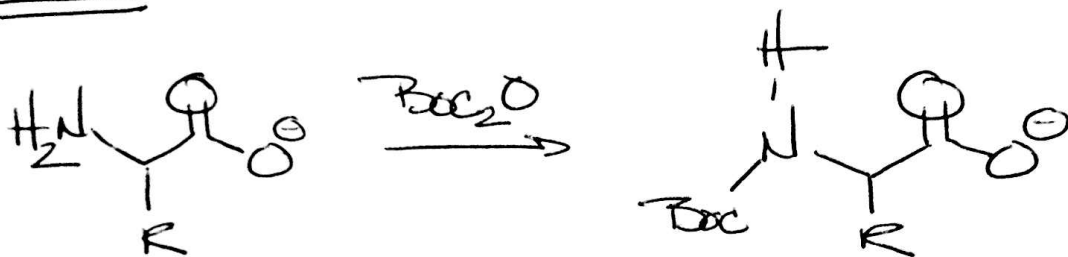


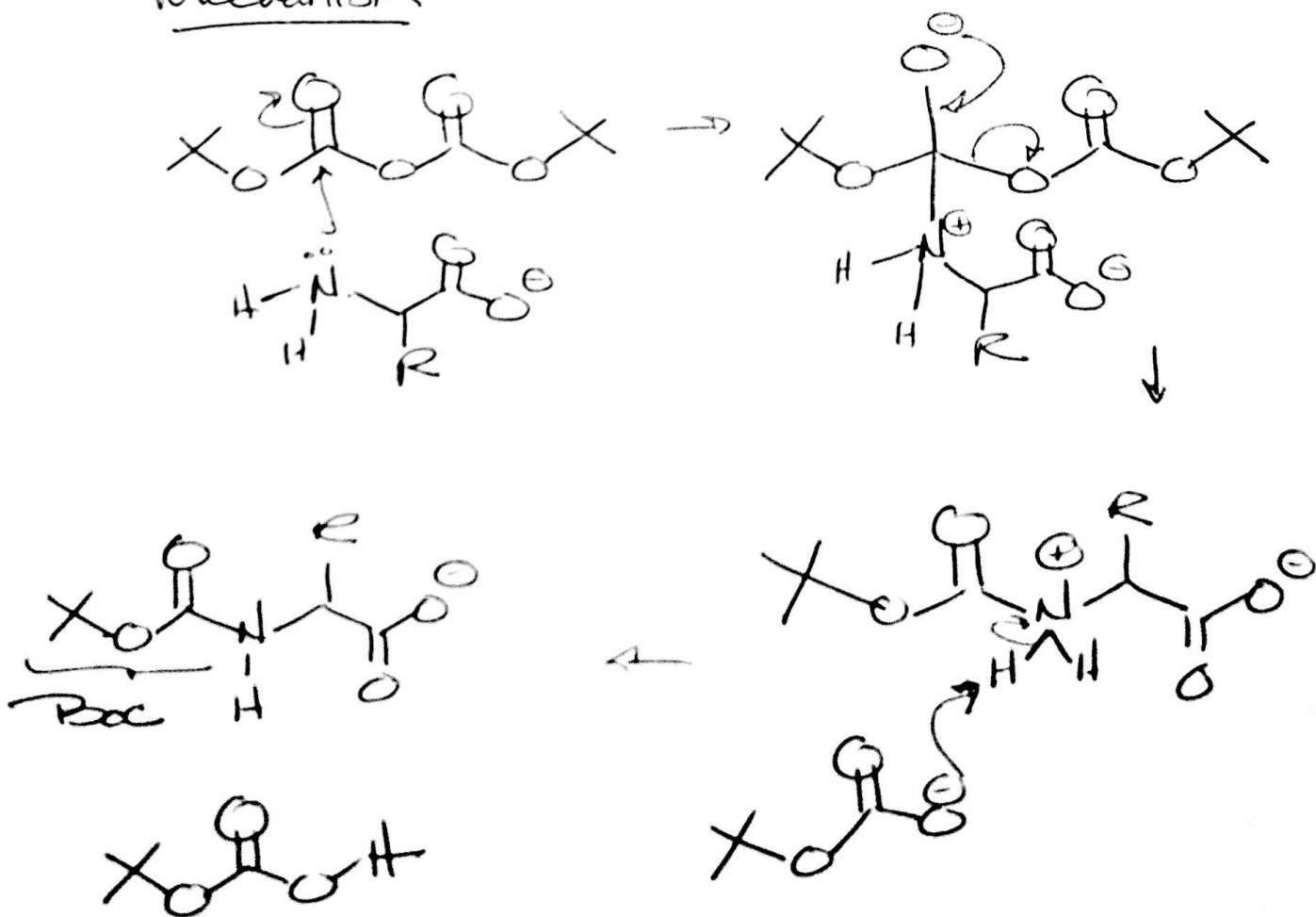
Amino Acids - Peptide Synthesis

Protecting Groups - Nitrogen (Boc, Cbz, Fmoc)

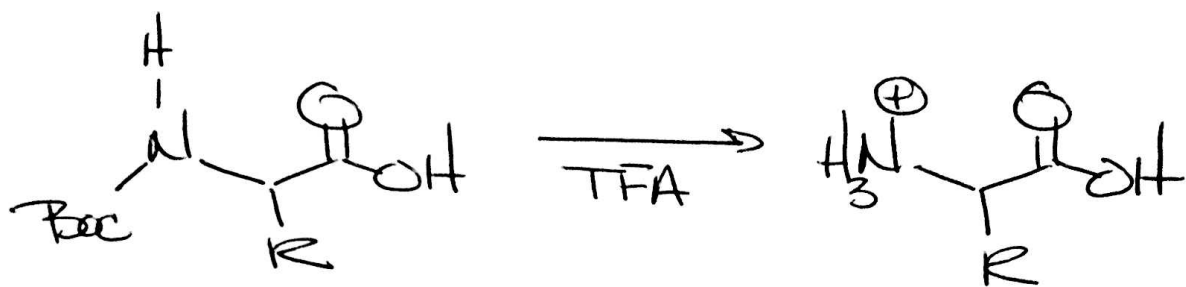
Boc



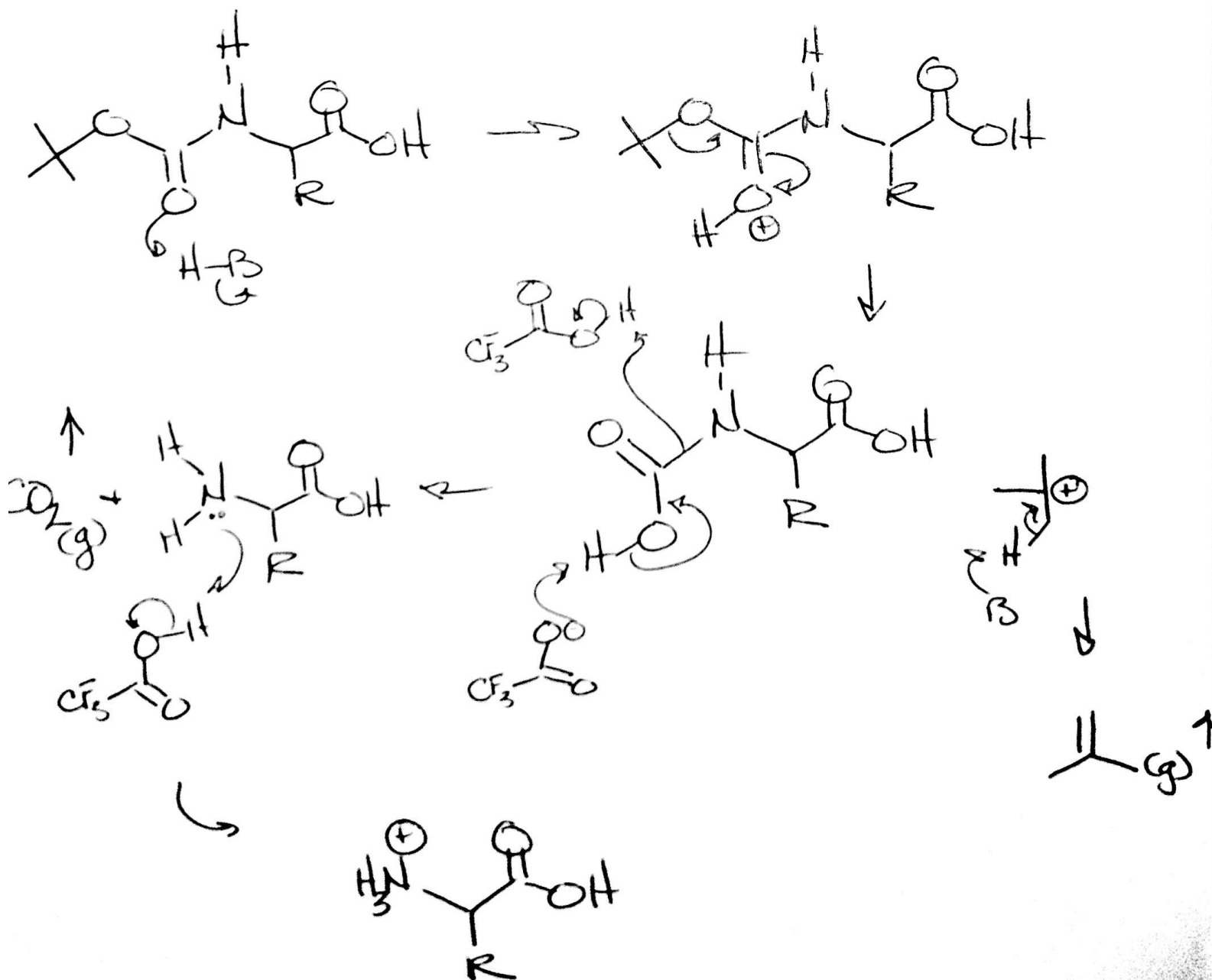
Mechanism



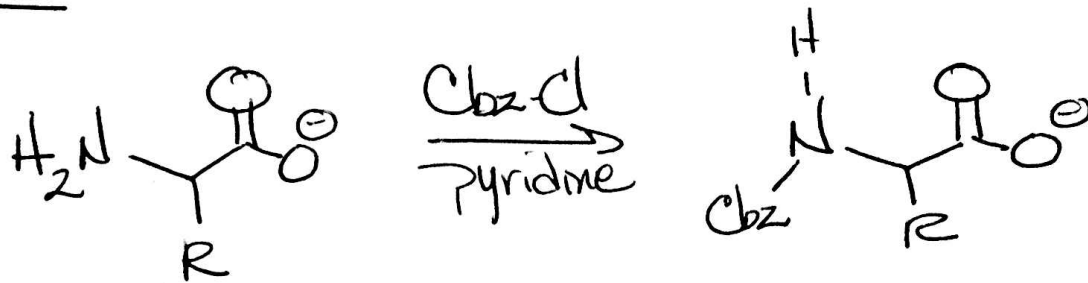
Removal of Boc



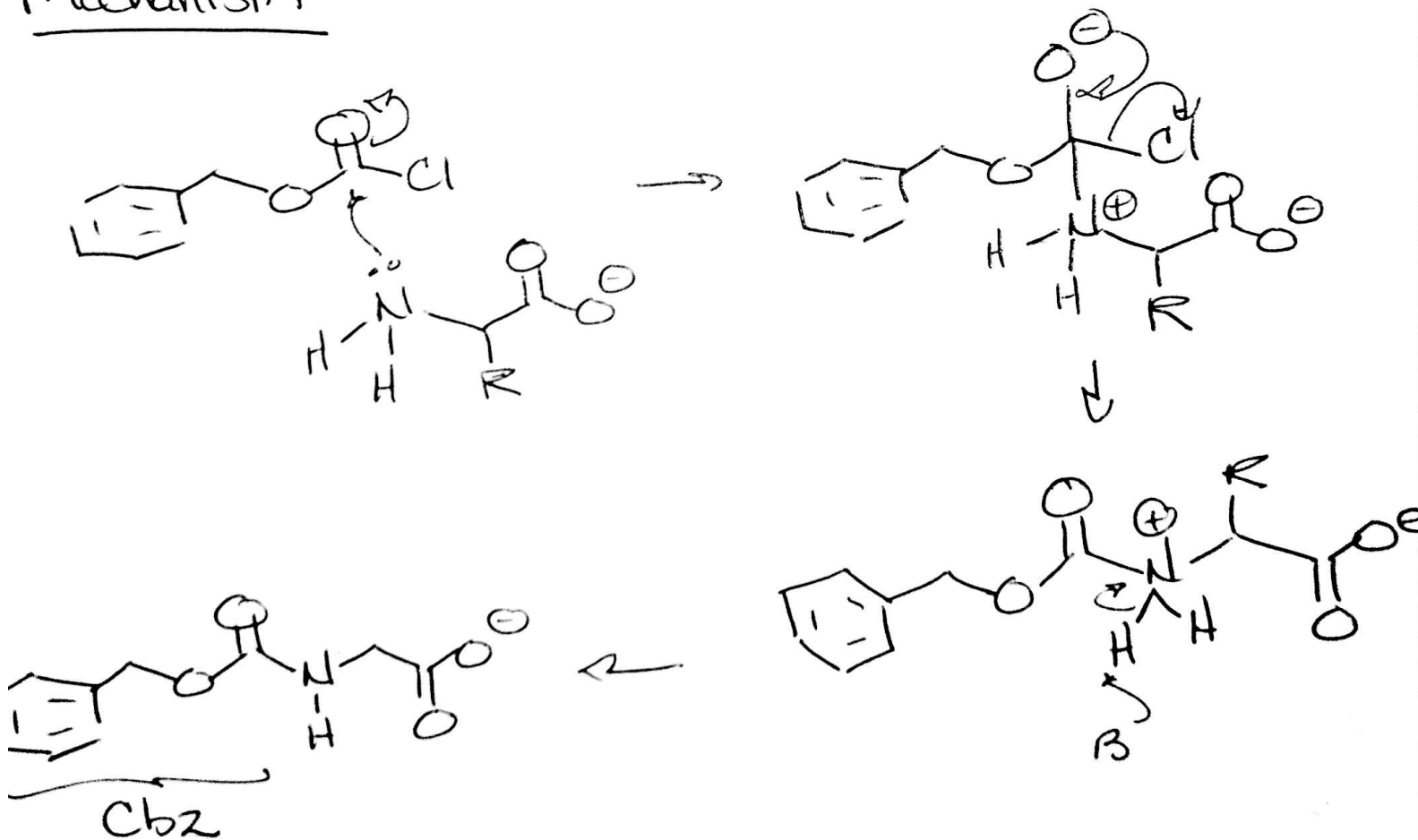
Mechanism



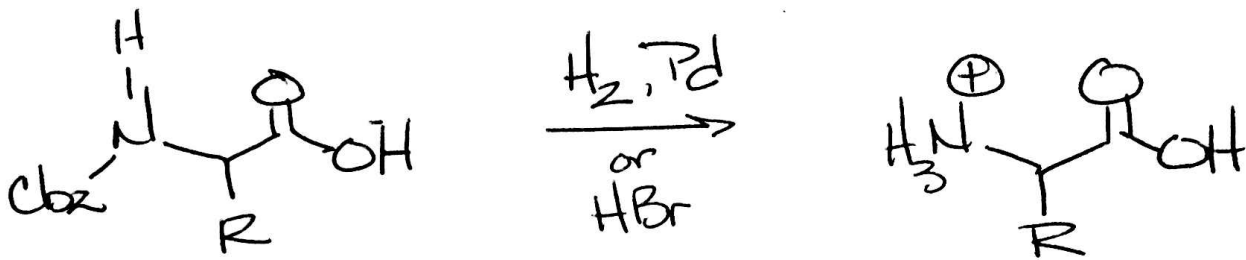
Cbz



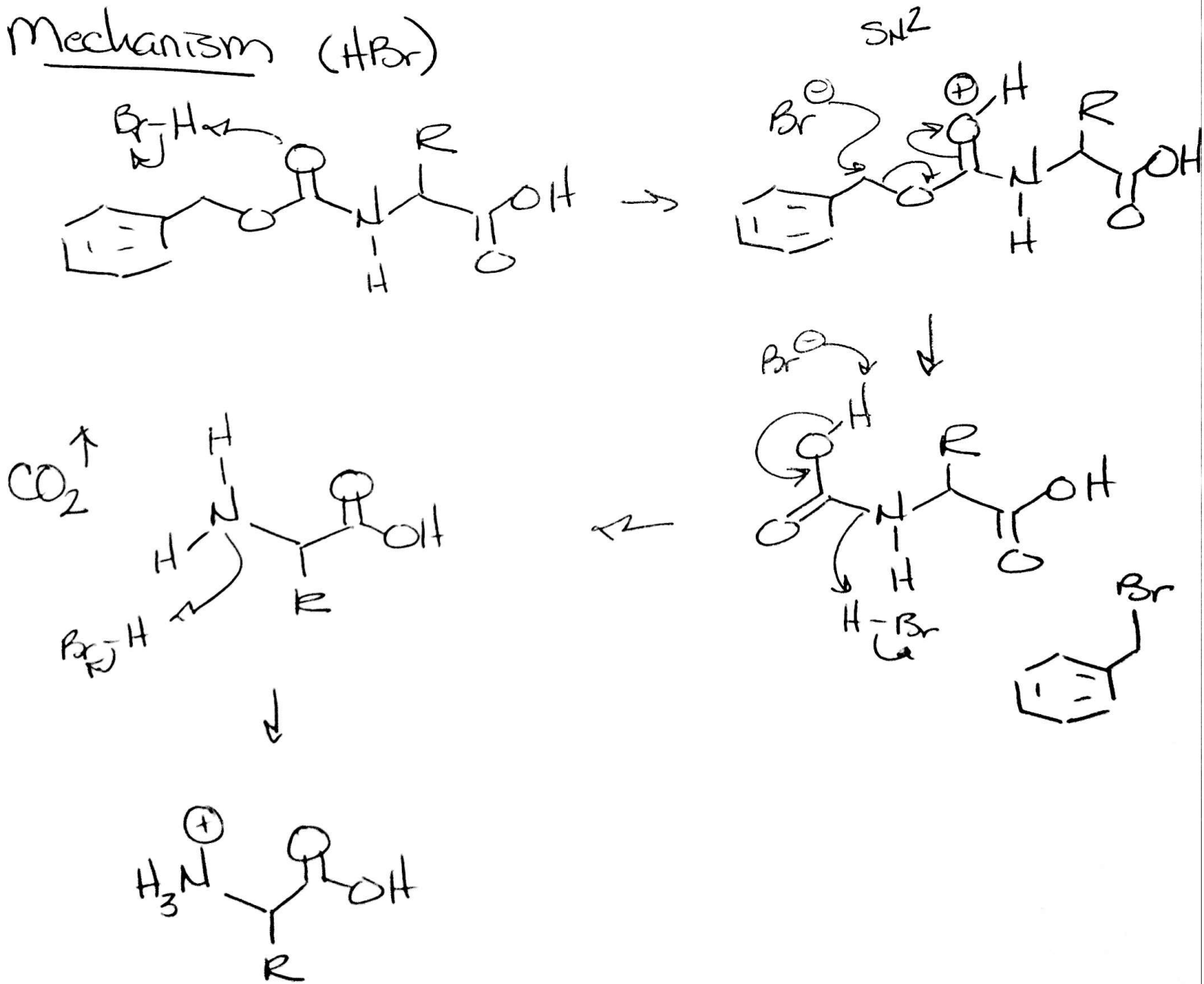
Mechanism



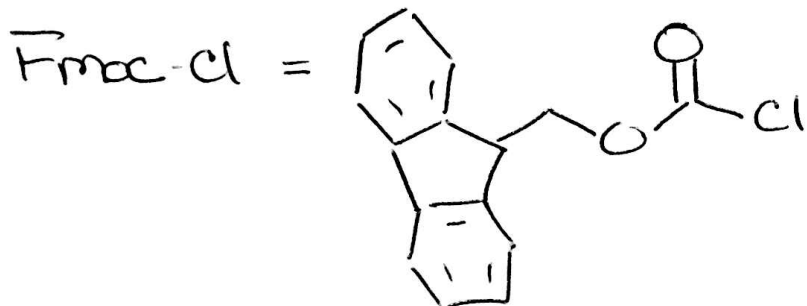
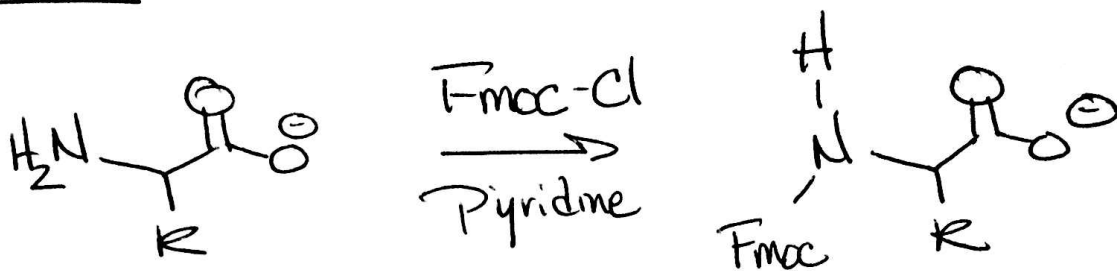
Removal



Mechanism (HBr)

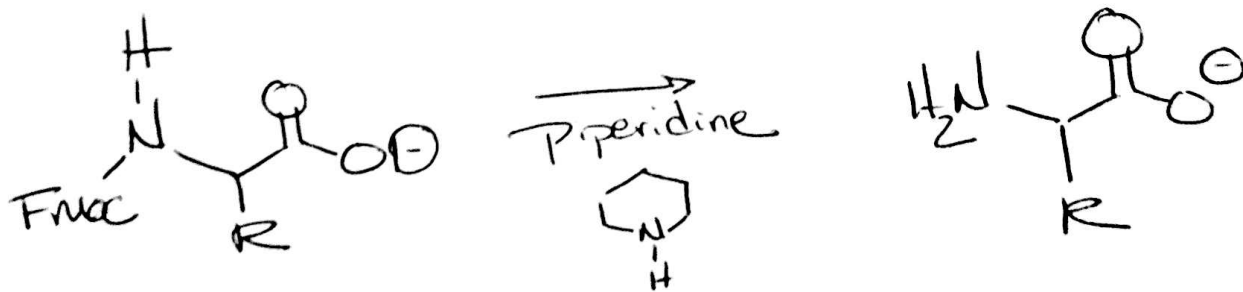


Fmoc

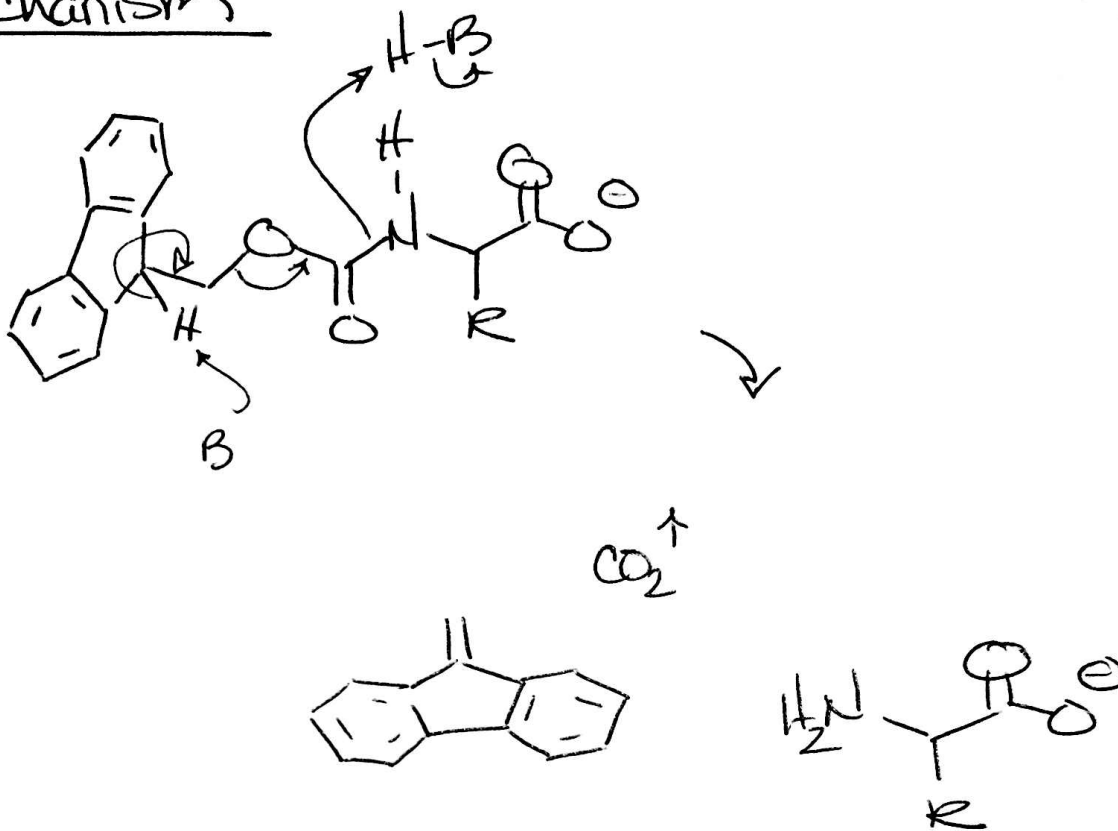


Mechanism Same as for Cbz group

Removal



Mechanism



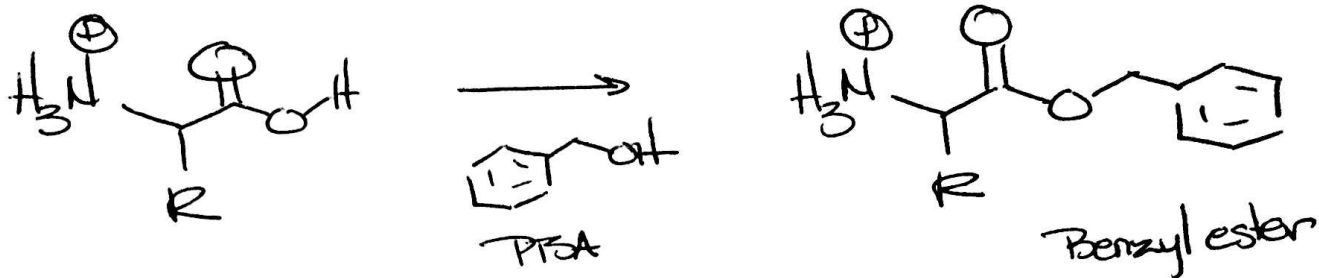
So why 3 groups?

Boc \rightarrow Removed by acid

Cbz \rightarrow Removed by acid or hydrogenation

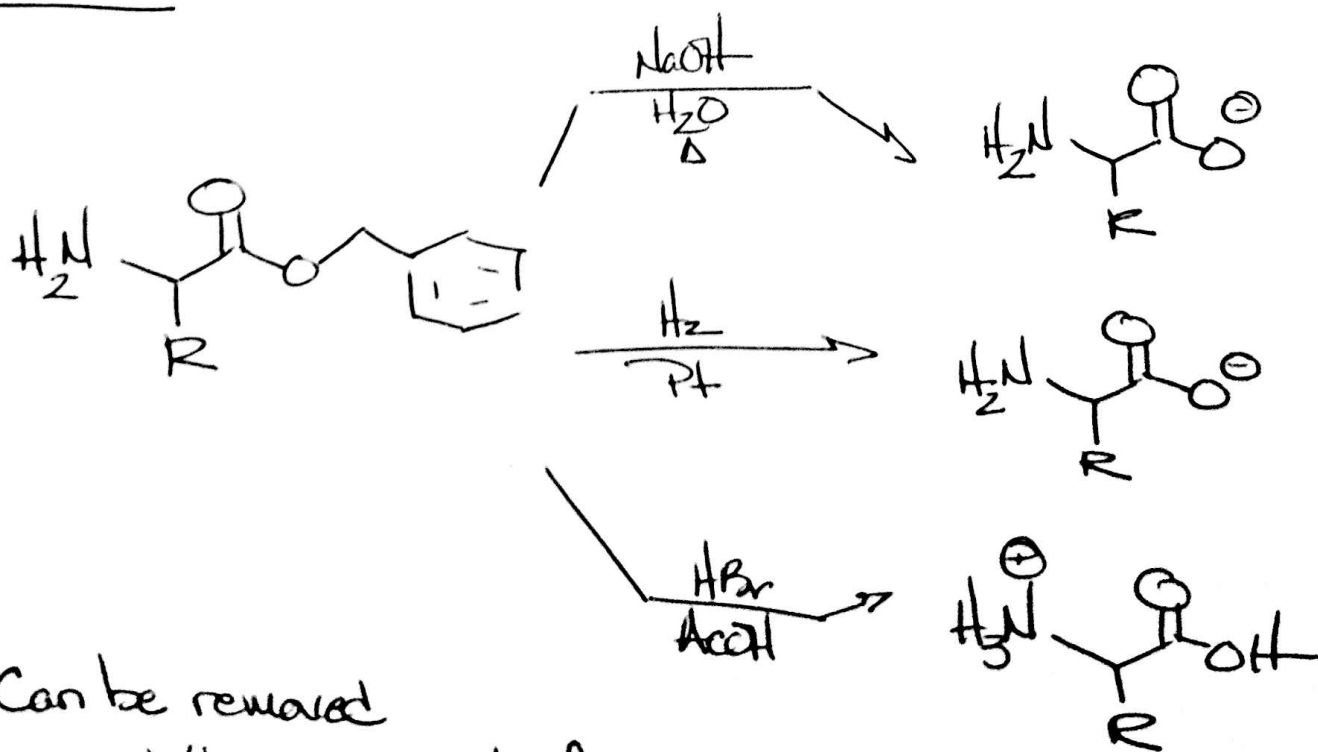
Fmoc \rightarrow Removed by base

Carbonyl Protection



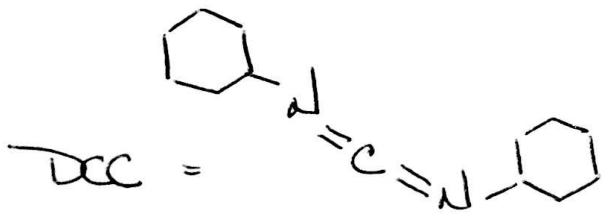
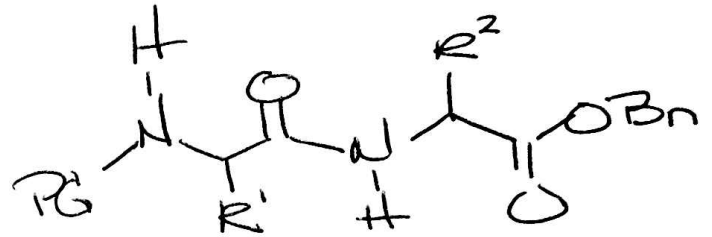
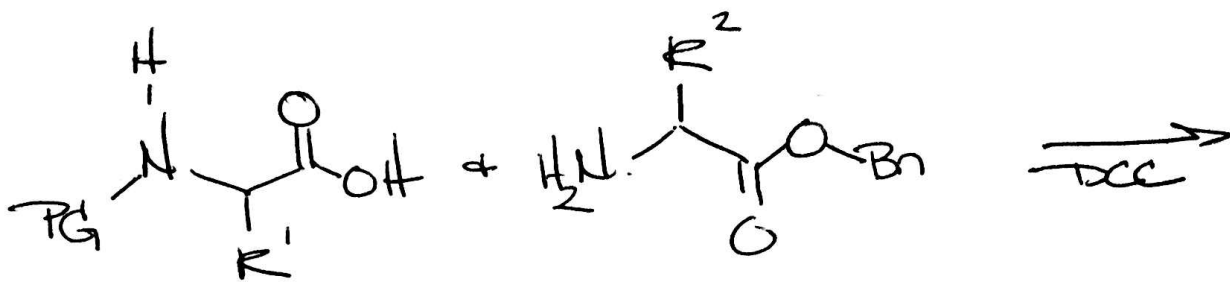
Mechanism - Standard ester formation. The amine group is protonated under the acidic conditions and does not act as a nucleophile.

Removal

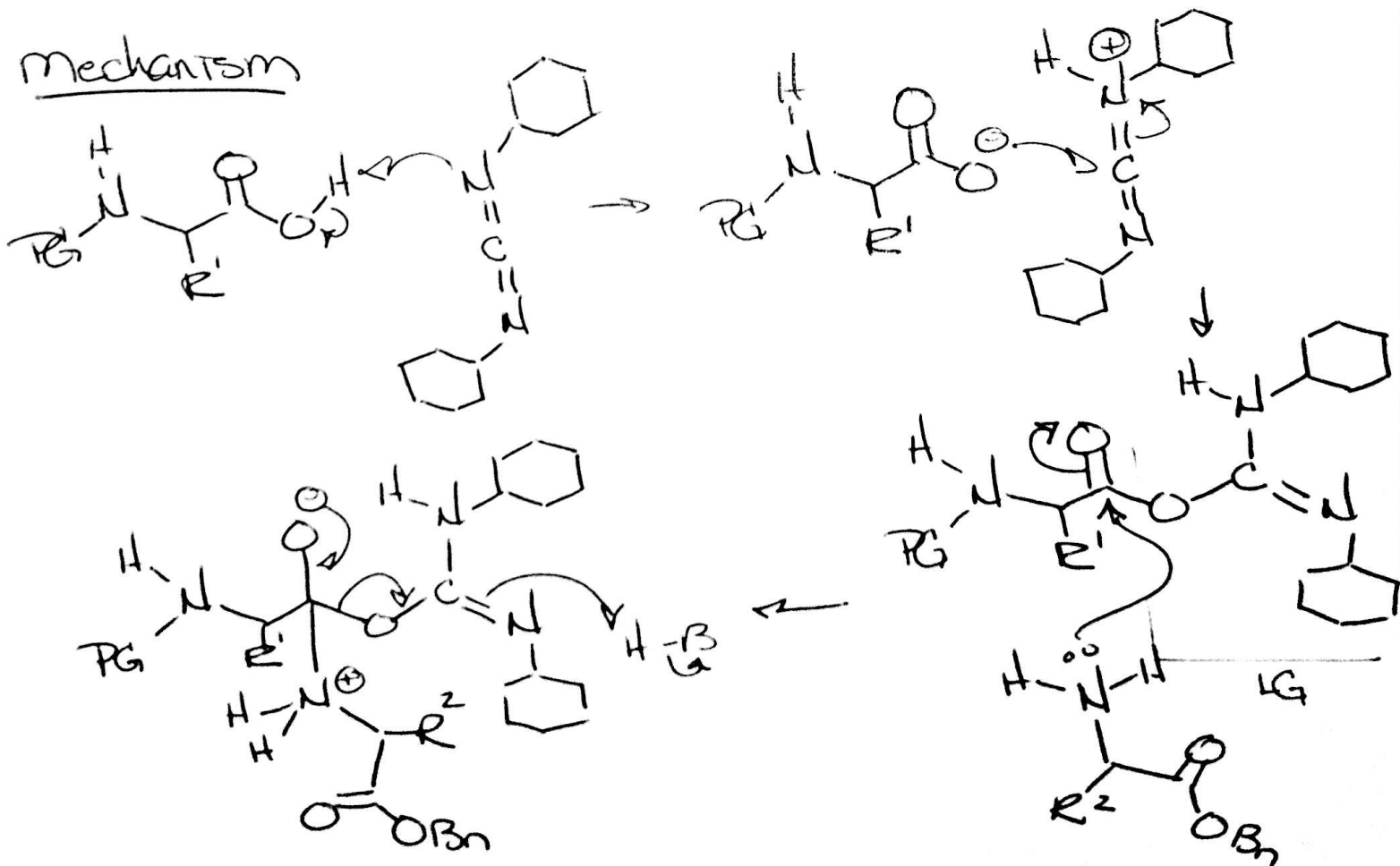


Can be removed by acid/base or neutral

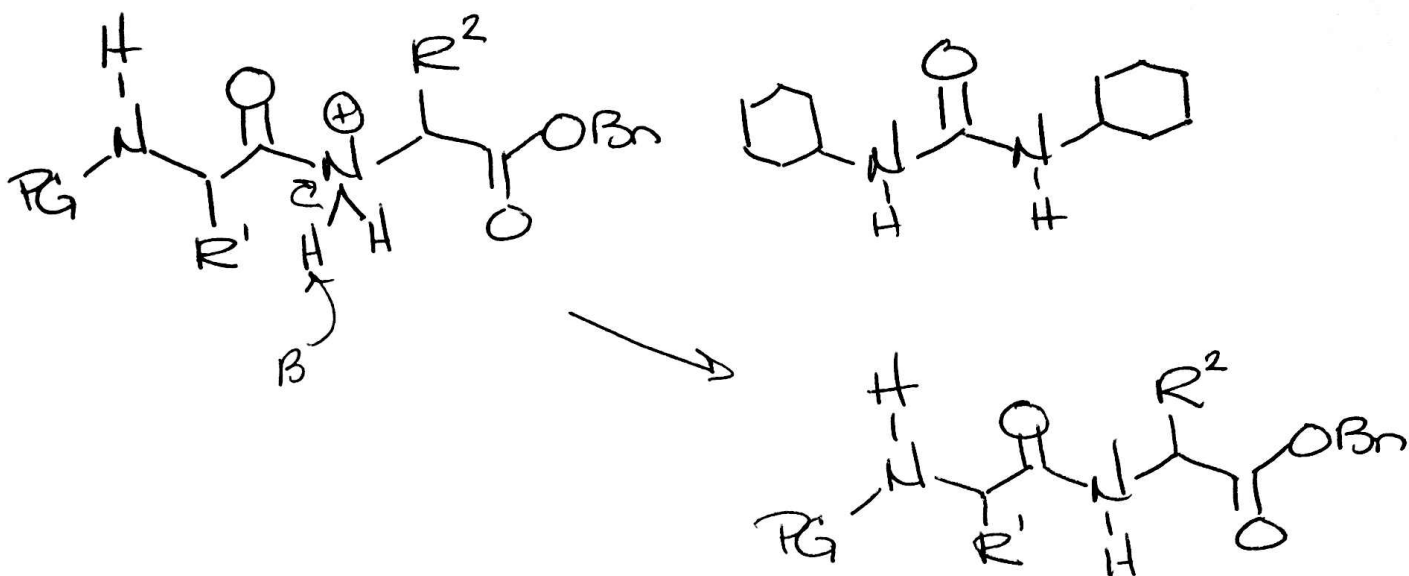
Peptide Bond Formation



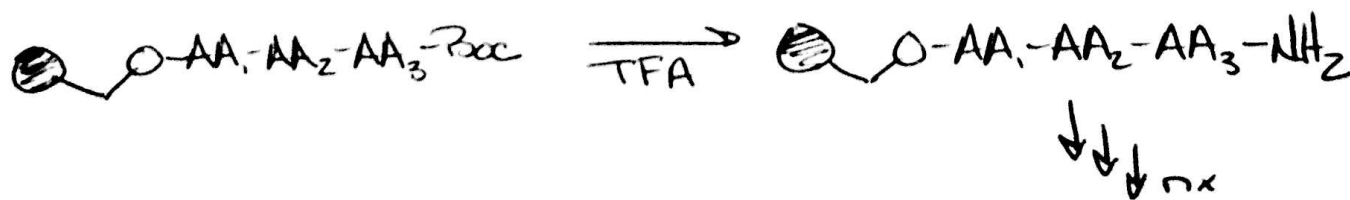
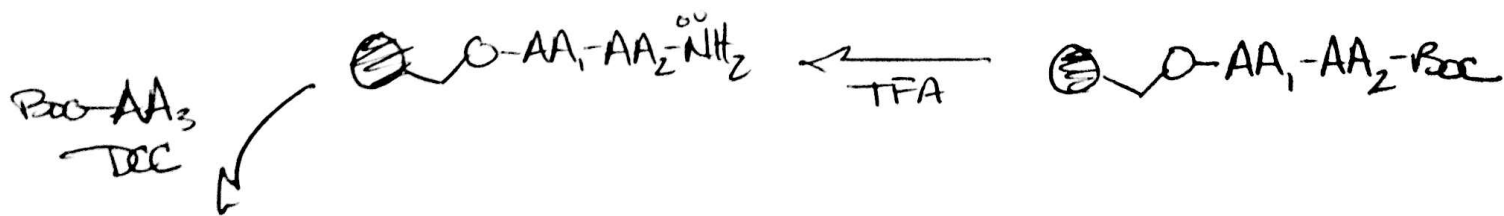
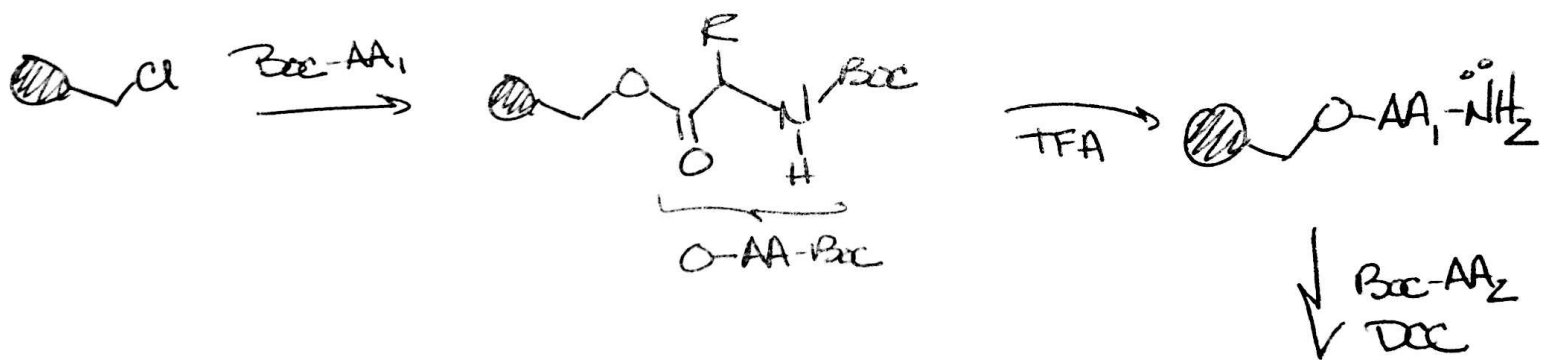
Mechanism



↓ next page

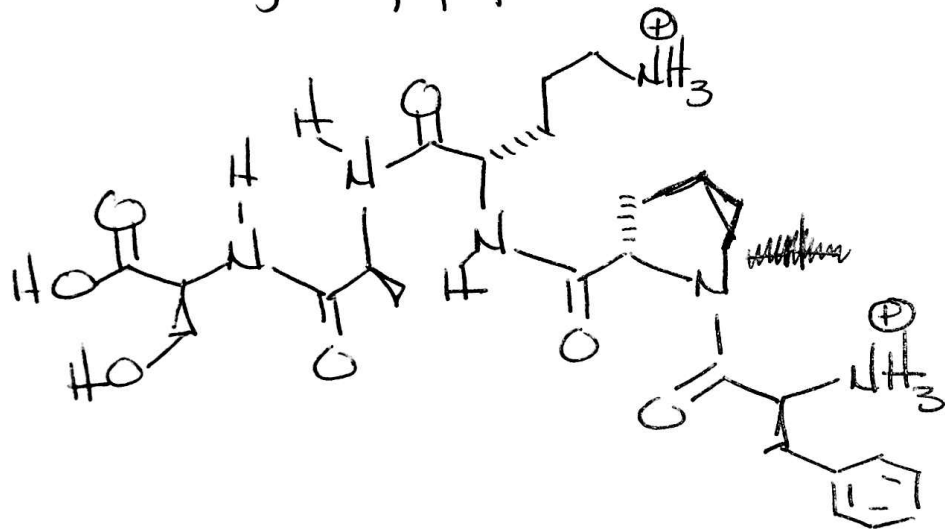


Merrifield Syn



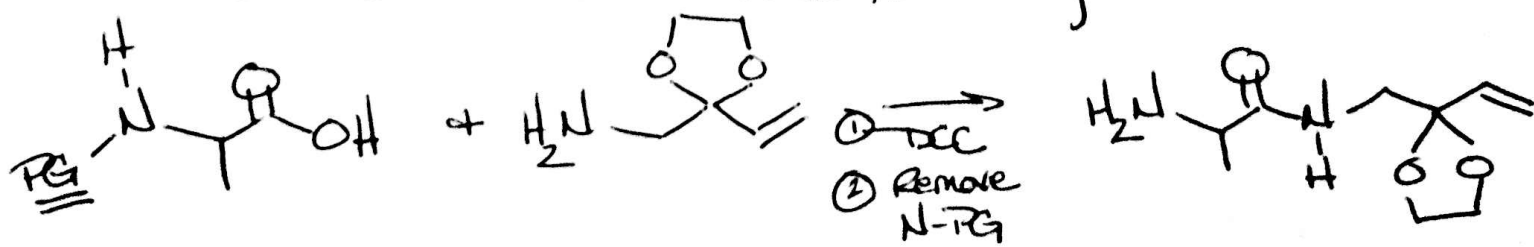
Problems

- A) Locate the N-term, C-term, and the 3-letter abbreviations for each of the amino acids in the following oligopeptide



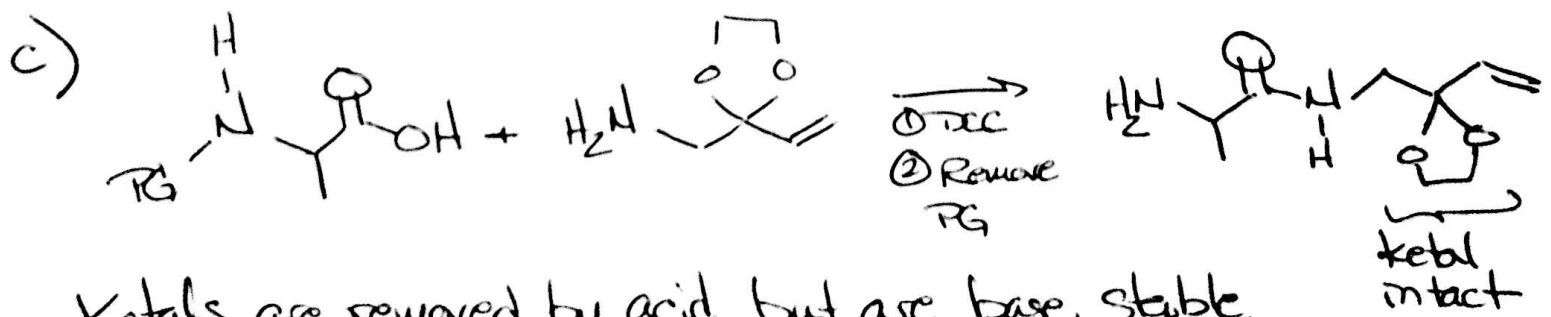
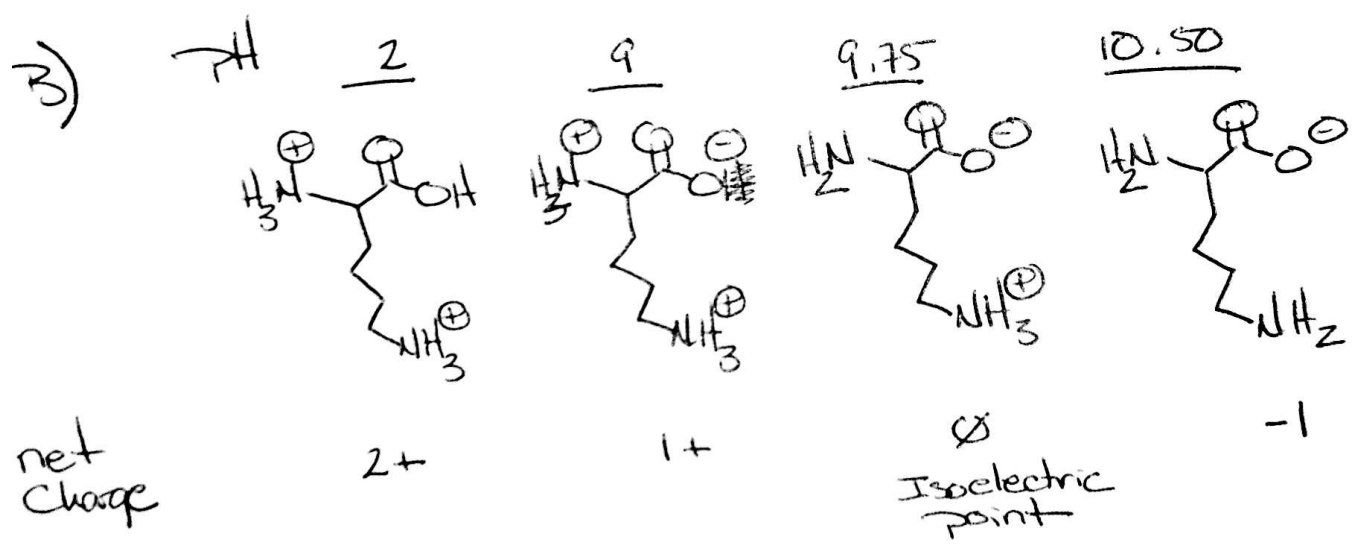
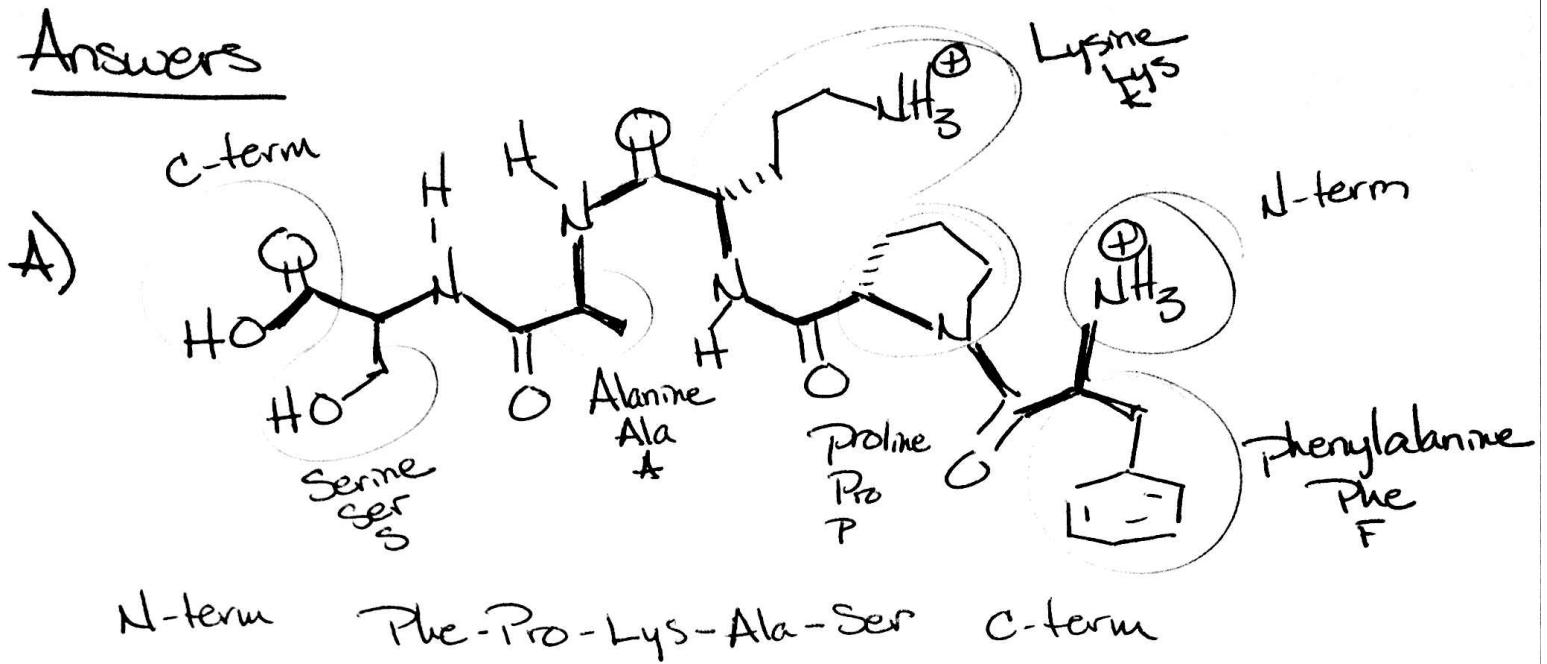
- B) Draw Lysine under pH 2, ~~9~~, 9.75, 10.5 ↖ correct 9

- C) Which amine protecting group would be the best choice to achieve the following



Explain

Answers



Ketals are removed by acid, but are base stable.
 Need a PG that can be removed by base.
 The Fmoc group was the only base labile PG.
 Hydrogenation also could not be used because of the double bond.
 ⇒ Fmoc