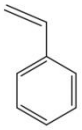
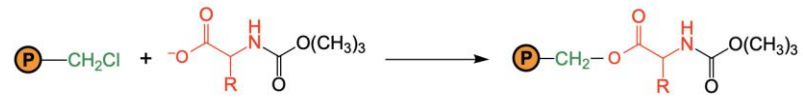
CONCEPT: MERRIFIELD SOLID–PHASE PEPTIDE SYNTHESIS

- An automated method that uses a *polystyrene* bead in synthesizing peptide chains.
  - □ **Polystyrene**: a _____ created from ethenylbenzene (styrene).


Styrene

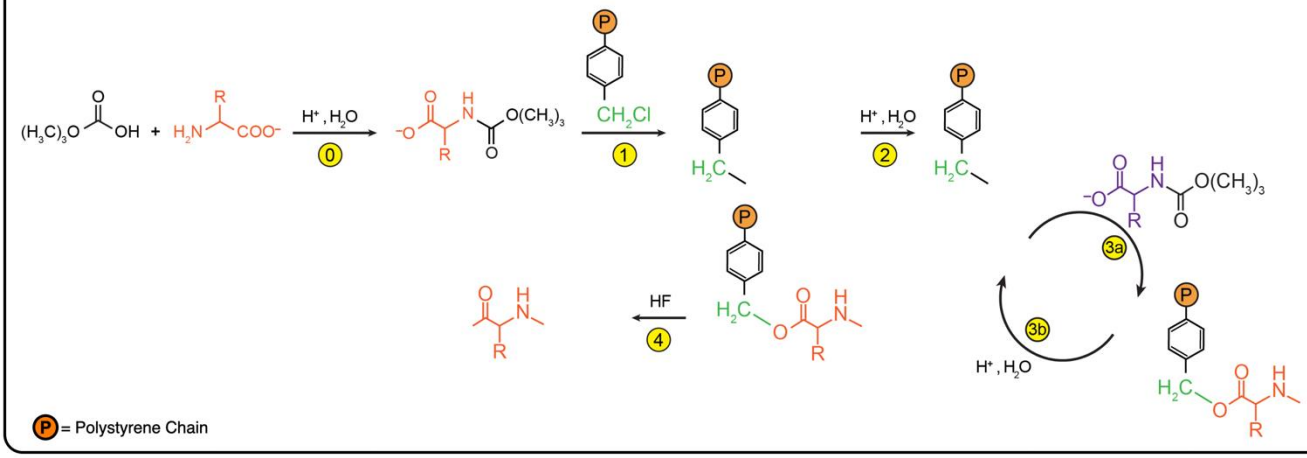

Polystyrene

Merrifield Solid–Phase Peptide Overview



- Takes place in ___ required steps:
  - **0** **Amino Acid Protection:** A _____ reaction between a carboxylic acid and N terminus end of amino acid.
  - **1** **S_N2 Reaction:** The _____ amino acid reacts with a chloromethylated polystyrene bead.
  - **2** **Hydrolysis Reaction:** _____ of N terminus end of the amino acid.
  - **3a** **Peptide Bond Formation:** Another protected amino acid attaches to ___ terminus end of the amino acid.
  - **3b** **Hydrolysis Reaction:** _____ of N terminus end of the amino acid.
  - **4** **Peptide Chain Release:** The peptide chain is released upon treatment with _____.

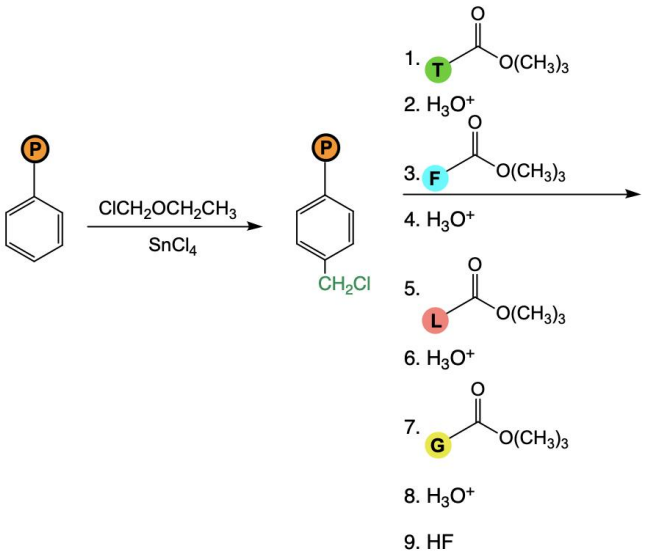
Merrifield Peptide Chain Synthesis Mechanism



CONCEPT: MERRIFIELD SOLID–PHASE PEPTIDE SYNTHESIS

EXAMPLE: Identify the steps needed to prepare the following dipeptide Val-Met based on a Merrifield synthesis.

PRACTICE: Provide the peptide chain structure produced from the following sequence of reagents. (**Note:** Show the ionic forms for the N and C terminus ends).



CONCEPT: MERRIFIELD SOLID–PHASE PEPTIDE SYNTHESIS

PRACTICE: Starting from polystyrene, provide the synthetic pathway in forming the tripeptide Gly-Leu-Ser using the Merrifield peptide synthesis method.