[10]

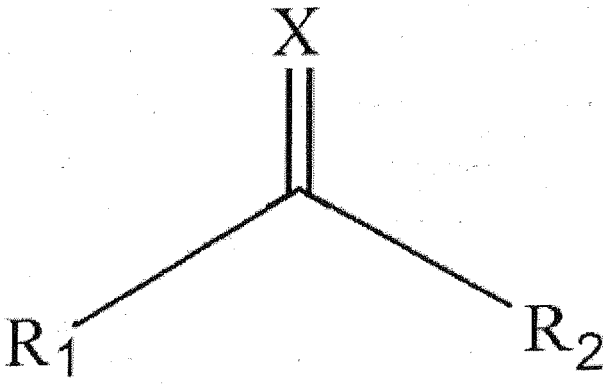
A process for producing a polypeptide comprising a step of binding the peptide thioester obtained by the process according to any of above [1] to [9] to a peptide chain having cysteine at a ~~C~~ N-terminal by a ligation method.

[11]

A process for producing a second intermediate used for the process for producing the peptide thioester according to any of [1] to [9] above, comprising:

(a) a step of producing a first intermediate by reacting a compound A represented by the following formula (I) with a thiol group of a cysteine residue in a peptide chain having the cysteine residue to eliminate R_2:

[Chemical formula 4]



(I)

wherein X is a sulfur atom or an oxygen atom, R_1 and R_2 are leaving

[Claim 4] The process according to any of claims 1 to 3, wherein R_2 is a halogen atom, or a substituted or unsubstituted -S-C_{6-10} aryl group.

[Claim 5] The process according to any of claims 1 to 4, wherein Y is an NH group.

[Claim 6] The process according to any of claims 1 to 5, wherein R_3 is an acetyl group.

[Claim 7] The process according to any of claims 1 to 6, wherein the thiol in the step (c) is thiol represented by the following formula (III):

R_4-SH (Formula III)

wherein R_4 is any one selected from a substituted or unsubstituted benzyl group, a substituted or unsubstituted aryl group, and a substituted or unsubstituted alkyl group.

[Claim 8] The process according to any of claims 1 to 7, wherein the peptide chain is a recombinant protein.

[Claim 9] The process according to any of claims 1 to 8, wherein the peptide chain is the recombinant protein comprising a tag for purification.

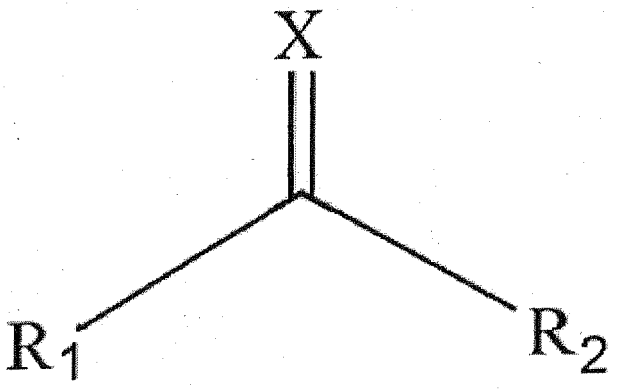
[Claim 10] A process for producing a polypeptide comprising a step of binding the peptide thioester obtained by the process according to any of claims 1 to 9 to a peptide chain having cysteine at a ~~C~~ N-terminal by a ligation method.

C

to an ~~N~~-terminal-side of a recombinant protein, comprising the following steps (a) to (c):

(a) a step of producing a first intermediate by reacting a compound A represented by the following formula (I) with a thiol group of a cysteine residue to eliminate R_2 in a recombinant protein comprising a tag for purification at its C-terminal:

[Chemical formula 5]



(I)

wherein X is a sulfur atom or an oxygen atom, and R_1 and R_2 are leaving groups;

(b) step of reacting a compound B represented by the following formula (II) with said first intermediate in an organic solvent to add a $-NH-C(=Y)NHR_3$ group to a carboxyl group forming a peptide bond between the cysteine residue and an amino acid adjacent to an N-terminal-side of said cysteine residue, and cleaving said peptide bond, thereby obtaining a peptide fragment