Citation List

Patent Literature

[0007]

PTL 1: JP2003-183303A

PTL 2: JP2003-221339A

PTL 3: JP2003-221307A

PTL 4: WO2014/114723

[0008]

NPL-1: CMC Publishing Co., Ltd., "*Wood Chemicals no Gijyutsu* (Techniques of Wood Chemicals)," First Edition 2007, p. 108

Summary

[0008a]

In one aspect of the present disclosure, there is provided a method for producing an active pharmaceutical ingredient including pentosan polysulfate, comprising:

(A) a step for producing an acidic xylooligosaccharide, the step comprising

(i) depolymerizing a plant-derived raw material;

(ii) adding a base to a solution of the product of the depolymerization step to achieve a pH of 11 or higher; and

(iii) obtaining an acidic xylooligosaccharide having an acetyl group content of 0 to 0.7 mass%,

(B) a step for producing the active pharmaceutical ingredient, the step comprising sulfating the acidic xylooligosaccharide.

Technical Problem

[0009]

When an acidic xylooligosaccharide is to be produced, increasing the production process efficiency and promoting cost reduction is one of the important issues. Further, when an acidic xylooligosaccharide is to be used as an intermediate for producing an active pharmaceutical ingredient, the acidic xylooligosaccharide is desirably usable as an intermediate (raw material) for producing an active pharmaceutical ingredient with

a high yield.

[0010]

An object of the present invention is to provide a method for producing an acidic xylooligosaccharide at a reduced cost. Another object of the present invention is to provide an acidic xylooligosaccharide for obtaining an active pharmaceutical ingredient with a high yield.

Means for Solving the Problem

[0011]

As a result of extensive studies to solve the above problem, the present inventors have found that when a method for producing an acidic xylooligosaccharide includes a step of depolymerizing a plant-derived raw material, the production cost

CLAIMS

[Claim 1]

A method for producing an active pharmaceutical ingredient including pentosan polysulfate, comprising:

(A) a step for producing an acidic xylooligosaccharide, the step comprising

(i) depolymerizing a plant-derived raw material;

(ii) adding a base to a solution of the product of the depolymerization step to achieve a pH of 11 or higher; and

(iii) obtaining an acidic xylooligosaccharide having an acetyl group content of 0 to 0.7 mass%,

(B) a step for producing the active pharmaceutical ingredient, the step comprising sulfating the acidic xylooligosaccharide.

[Claim 2]

The method according to claim 1, wherein the depolymerization step (i) comprises at least one step selected from the group consisting of a heat treatment step and an enzyme treatment step.

[Claim 3]

The method according to claim 1, wherein the depolymerization step (i) is a heat treatment step.

[Claim 4]

The method according to claim 3, wherein the heat treatment step is a step of heating to 120°C or higher under non-alkaline conditions.

[Claim 5]

The method according to claim 1, wherein the plant-derived raw material is a wood-derived raw material.

[Claim 6]

The method according to claim 1, further comprising a separation and purification step performed after the depolymerization step (i).

[Claim 7]

The method according to claim 1, further comprising a powdering step performed after the deacetylation step (ii).