C L A I M S

1. A process for producing a particulate composition comprising anhydrous crystalline 2-O-α-D-glucosyl-L-ascorbic acid, said process comprising the following steps (a) to (e):

(a) allowing a cyclomaltodextrin glucanotransferase to act on a solution comprising either liquefied starch or dextrin and L-ascorbic acid as materials, and then allowing a glucoamylase to act on the resulting solution to obtain a solution comprising 2-O-α-D-glucosyl-L-ascorbic acid in a 2-O-α-D-glucosyl-L-ascorbic acid production yield of at least 27% by weight;

(b) purifying the resulting solution comprising 2-O-α-D-glucosyl-L-ascorbic acid to give a 2-O-α-D-glucosyl-L-ascorbic acid content of over 86% by weight, on a dry solid basis;

(c) precipitating anhydrous crystalline 2-O-α-D-glucosyl-L-ascorbic acid from the purified solution with a 2-O-α-D-glucosyl-L-ascorbic acid content of over 86% by weight, on a dry solid basis, by a controlled cooling method or pseudo-controlled cooling method;

(d) collecting the precipitated anhydrous crystalline 2-O-α-D-glucosyl-L-ascorbic acid; and

(e) ageing, drying, and optionally pulverizing the collected anhydrous crystalline

2-O-α-D-glucosyl-L-ascorbic acid without dissolving and recrystallizing it to obtain a particulate composition comprising anhydrous crystalline 2-O-α-D-glucosyl-L-ascorbic acid which comprises 2-O-α-D-glucosyl-L-ascorbic acid in a content of, on a dry solid basis, over 98.0% by weight but below 99.9% by weight, and has a degree of crystallinity for anhydrous crystalline 2-O-α-D-glucosyl-L-ascorbic acid of at least 90%, when calculated based on the powder X-ray diffraction profile of the particulate composition.

2. The process of claim 1, wherein in the step (a) a starch-debranching enzyme is allowed to act on said materials along with said cyclomaltodextrin glucanotransferase.

3. The process of claim 1 or 2, wherein the step (b) comprises a column chromatography using an anion-exchange resin as a column packing material, and a simulated-moving-bed column chromatography using a strong-acid cation exchange resin as a column packing material.

4. The process of any one of claims 1 to 3, wherein said cyclomaltodextrin glucanotransferase is the one which comprises the following partial amino acid sequences of (a) to (d):

(a) Asn-Glu-Val-Asp-X_1-Asn-Asn;

(b) Met-Ile-Gln-X_2-Thr-Ala;

(c) Pro-Gly-Lys-Tyr-Asn-Ile; and

(d) Val-X_3-Ser-Asn-Gly-Ser-Val,

wherein X_1 means Pro or Ala, X_2 means Ser or Asp, and X_3 means Ser or Gly, respectively.

5. The process of any one of claims 1 to 4, wherein said cyclomaltodextrin glucanotransferase is a natural or recombinant enzyme derived from a microorganism of the species *Geobacillus stearothermophilus* or *Thermoanaerobacter thermosulfurigenes*.

6. The process of any one of claims 1 to 5, wherein said cyclomaltodextrin glucanotransferase is the one which comprises any one of the amino acid sequences of SEQ ID NOs: 1, 3, 4 and 5.

7. The process of any one of claims 1 to 6, wherein the obtained particulate composition, comprising anhydrous crystalline 2-O-α-D-glucosyl-L-ascorbic acid, contains L-ascorbic acid and/or D-glucose derived from said materials; contains said L-ascorbic acid in a content of 0.1% by weight or lower, on a dry solid basis; and has a reducing power of the whole particulate composition of less than 1% by weight.

Claims

1. A process for producing a particulate composition comprising anhydrous crystalline 2-O-α-D-glucosyl-L-ascorbic acid, said process comprising the following steps (a) to (e):

(a) allowing a cyclomaltodextrin glucanotransferase to act on a solution comprising either liquefied starch or dextrin and L-ascorbic acid as materials, and then allowing a glucoamylase to act on the resulting solution to obtain a solution comprising 2-O-α-D-glucosyl-L-ascorbic acid in a 2-O-α-D-glucosyl-L-ascorbic acid production yield of at least 27% by weight;

(b) purifying the resulting solution comprising 2-O-α-D-glucosyl-L-ascorbic acid to give a 2-O-α-D-glucosyl-L-ascorbic acid content of over 86% by weight, on a dry solid basis;

(c) precipitating anhydrous crystalline 2-O-a-D-glucosyl-ascorbic acid from the purified solution with a 2-O-α-D-glucosyl-L-ascorbic acid content of over 86% by weight, on a dry solid basis, by a controlled cooling method or pseudo-controlled cooling method;

(d) collecting the precipitated anhydrous crystalline 2-O-α-D-glucosyi-L-ascorbic acid; and

(e) ageing, drying, and optionally pulverizing the collected anhydrous crystalline 2-O-α-D-glucosyl-L-ascorbic acid without

dissolving and recrystallizing it to obtain a particulate composition comprising anhydrous crystalline 2-O-α-D-glucosyl-L-ascorbic acid which comprises 2-O-α-D-glucosyl-L-ascorbic acid in a content of, on a dry solid basis, over 98.0% by weight but below 99.9% by weight, and has a degree of crystallinity for anhydrous crystalline 2-O-α-D-glucosyl-L-ascorbic acid of at least 90%, when calculated based on the powder X-ray diffraction profile of the particulate composition.

2. The process of claim 1, wherein in the step (a) a starchdebranching enzyme is allowed to act on said materials along with said cyclomaltodextrin glucanotransferase.

3. The process of claim 1 or 2, wherein the step (b) comprises a column chromatography using an anion-exchange resin as a column packing material, and a simulated-moving-bed column chromatography using a strong-acid cation exchange resin as a column packing material.

4. The process of any one of claims 1 to 3, wherein said Cyclomaltodextrin glucanotransferase comprises the partial amino acid sequences (a) to (d):

(a) Asn-Glu-Val-Asp-X_1-Asn-Asn;

(b) Met-Ile-Gln-X_2-Thr-Ala;

(c) Pro-Gly-Lys-Tyr-Asn-Ile; and

(d) Val-X_3-Ser-Asn-Gly-Ser-Val,

wherein X_1 means Pro or Ala, X_2 means Ser or Asp, and X_3 means Ser or Gly, respectively.

5. The process of any one of claims 1 to 4, wherein said cyclomaltodextrin glucanotransferase is a *Geobacillus stearothermophilus* or *Thermoanaerobacter thermosulfurigenes* cyclomaltodextrin glucanotransferase.

6. The process of any one of claims 1 to 5, wherein said cyclomaltodextrin glucanotransferase is the one which comprises any one of the amino acid sequences of SEQ ID NOs: 1, 3, 4 and 5.

7. The process of any one of claims 1 to 6, wherein the obtained Particulate composition, comprising anhydrous crystalline 2-O-α-D-glucosyl-L-ascorbic acid, contains L-ascorbic acid and/or D-glucose derived from said materials; contains said L-ascarbic acid in a content of 0.1% by weight or lower, on a dry solid basis; and has a reducing power of the whole particulate composition of less than 1% by weight.