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γ -polyglutamic acid

γ -聚谷氨酸

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γ -polyglutamic acid

1 Scope

This standard specifies the product classification, requirements, test methods, inspection rules and markings, packaging, transportation and storage of γ -polyglutamic acid.

This standard applies to γ -polyglutamic acid, which is produced by microbial fermentation with starch, starch sugar or sucrose as the main raw material and is used as a cosmetic or agriculture raw material. The product form is γ -polyglutamic acid hydrogen-type and sodium-type homolog of different degrees of substitution.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this standard.

GB/T 191 Packaging - Pictorial marking for handling of goods

GB/T 603 Chemical reagent - Preparations of reagent solution for use in test method

GB/T 6284 Chemical products for industrial use - General method for determination of water content - The loss of mass on drying method

GB/T 6679 General rules for sampling solid chemical products

GB/T 6682 Water for analytical laboratory use - Specification and test methods

GB/T 9724 Chemical reagent - General rule for the determination of pH

GB/T 23349 Ecological index of arsenic, cadmium, lead, chromium and mercury for fertilizers

QB/T 4416 Cosmetic ingredients - Sodium hyaluronate

3 Chemical name, molecular formula, structural

The preparations and products required in the test are prepared in accordance with GB/T 603, unless otherwise specified.

6.2 Sensory inspection

At room temperature and no direct sunlight, take the specimen and place it in a clean white porcelain plate; perform the visual inspection.

6.3 Content of γ -polyglutamic acid

6.3.1 Summary of method

The sodium sulfate solution is used as the mobile phase, to detect the ultraviolet absorption values of γ -polyglutamic acid standard solutions of different contents. The content of polyglutamic acid is determined by high performance liquid chromatography.

6.3.2 Reagents and materials

6.3.2.1 Water: Grade I water in GB/T 6682.

6.3.2.2 Anhydrous sodium sulfate: chromatographically pure.

6.3.2.3 Sodium sulfate solution (0.3 mol/L)

Weigh 42.6 g of anhydrous sodium sulfate; use water to dissolve it to make its volume reach to 1 L; use acetic acid to adjust the pH to 4.0; use with microporous membrane filter which has a pore size of 0.22 μm to filter it. Ultrasonically degas it for 15 min.

6.3.2.4 γ -polyglutamic acid standard: content (on a dry basis) $\geq 99.0\%$.

Note: Select polyglutamic acid standards with suitable average molecular weight range according to the product.

6.3.2.5 Standard stock solution of γ -polyglutamic acid (10.0 mg/mL)

Weigh out 1.000 g of γ -polyglutamic acid; use mobile phase to dissolve it and make its volume reach to 100 mL. The shelf life is 1 week at 4 $^{\circ}\text{C}$.

6.3.2.6 Standard working solution of γ -polyglutamic acid (1.0 mg/mL)

Pipette 10.0 mL of γ -polyglutamic acid standard stock solution into a 100 mL volumetric flask; make its volume reach to 100 mL. This standard solution shall be prepared before use.

6.3.3 Equipment

Laboratory and the following instruments are applicable to this standard.

6.6.2 Reagents and materials

6.6.2.1 Water: Grade I water in GB/T 6682.

6.6.2.2 Anhydrous sodium sulfate: Chromatographically pure.

6.6.2.3 Sodium sulfate solution: 0.3 mol/L

Weigh 42.6 g of anhydrous sodium sulfate; dissolve and make its volume reach to 1 L; use acetic acid to adjust the pH to 4.0; use a microporous filter which has a pore size 0.22 μm to filter it; ultrasonically degas it for 15 min.

6.6.2.4 Dextran standards: Chromatographically pure, which has a molecular weight of 5900 u; 11800 u; 22800 u; 47300 u; 112000 u; 212000 u; 404000 u; 788000 u, respectively.

6.6.2.5 Dextran standard solution

Use dextran standards as molecular weight standards. Respectively weigh 8 kinds of chromatographic pure dextran standards of different molecular weights, each 0.05 g. Dissolve it. Transfer it into a 50 mL volumetric flask to make it reach the volume.

6.6.3 Equipment

Laboratory and the following instruments are applicable to this standard.

High performance liquid chromatography: Equipped with a refractive index detector.

6.6.4 Chromatographic reference conditions

6.6.4.1 Chromatographic column: Gel chromatography column (7.8 mm x 300 mm, or a gel chromatography column with equivalent effect and specifications).

6.6.4.2 Detection column temperature: 30 $^{\circ}\text{C}$.

6.6.4.3 Detector: Differential refractive index detector.

6.6.4.4 Flow rate: 0.5 mL/min.

6.6.4.5 Injection volume: 20 μL .

6.6.5 Analytical procedures

6.6.5.1 Drawing of standard curve

The 8 dextran standard solutions of different average molecular weights are filtered through a 0.22 μm microporous filter membrane, respectively. Turn on

6.8.2 γ -polyglutamic acid for agriculture

According to the method specified in GB/T 23349.

7 Inspection rules

7.1 Batch

The products are inspected in batches. The products manufactured by one time production forms 1 batch.

7.2 Sampling

It is performed according to GB/T 6679. The sampling size is 30 g. Mix the sampled products uniformly. Then divide it into two parts. One part is used for inspection; the other part is retained for reference.

7.3 Exit-factory inspection

7.3.1 Each batch of products shall be qualified by the quality inspection department of the manufacturer in accordance with this standard and exit-factory after being attached with a certificate of conformity.

7.3.2 The exit-factory inspection items of γ -polyglutamic acid for cosmetics are sensory indicators, γ -polyglutamic acid content, pH, loss on drying, molecular weight, light transmittance, total number of colonies. The exit-factory inspection items of γ -polyglutamic acid for agriculture are sensory indicators, of γ -polyglutamic acid for content, pH, loss on drying.

7.4 Type inspection

7.4.1 Type inspection items are all items specified in this standard.

7.4.2 Type inspection shall be carried out in one of the following cases:

- a) When there are major changes in raw and auxiliary materials;
- b) When changing critical processes or equipment;
- c) When the production of the new trial product or the normal production product is stopped for 3 months and then resumed;
- d) When there is a large difference between the results of the exit-factory inspection and the last type inspection;
- e) When the national quality supervision agency needs random inspection according to relevant provisions.

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