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National food safety standard - Food additive - Calcium alginate

食品安全国家标准 食品添加剂 海藻酸钙（又名褐藻酸钙）

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1 Scope

This Standard is applicable to the food additive calcium alginate (also known as ca-alginate) extracted and processed from brown algae plants such as Laminaria, Macrocystis and Ascophyllum.

2 Molecular formula, structural formula and relative molecular mass

2.1 Molecular formula

$[C_6H_7Ca_{1/2}O_6]_n$

2.2 Structural formula

2.3 Relative molecular mass

2.3.1 Structural unit: theoretical value is 195.16; actual average value is 219.00.

2.3.2 Typical average value of polymers: 10000~600000 (according to 2013 international relative atomic mass).

3 Technical requirements

3.1 Sensory requirements

Annex A

Inspection methods

A.1 General

Unless otherwise specified, the purity of the reagents used in this Standard shall be higher than analytically-pure. The standard titration solution used, standard solution for impurity determination, preparations and products shall be prepared in accordance with the provisions of GB/T 601, GB/T 602 and GB/T 603. The test water shall meet the requirements of grade 3 water in GB/T 6682. The solution used in the test refers to the aqueous solution when it is not specified which solvent is used for preparation.

A.2 Identification test

A.2.1 Reagents and materials

A.2.1.1 Ethanol.

A.2.1.2 Ether.

A.2.1.3 Hydrochloric acid.

A.2.1.4 Isopropyl ether。

A.2.1.5 Sodium hydroxide solution: 10g/L.

A.2.1.6 Calcium chloride solution: 25g/L.

A.2.1.7 Sample solution (5g/L): Weigh 0.5g of sample. Slowly add 100mL of sodium hydroxide solution (A.2.1.5) under stirring. Continue stirring. Slowly dissolve to a homogeneous solution, for future use.

A.2.1.8 Saturated ammonium sulfate solution: Weigh 78g of ammonium sulfate. Add 100mL of water. Make it dissolved under heating state. Leave overnight. The supernatant shall be saturated ammonium sulfate solution.

A.2.1.9 1,3-dihydroxy naphthalene ethanol solution (10g/L): Weigh about 1g of 1,3-dihydroxynaphthalene and dissolve in 100mL of absolute ethanol. Mix well (prepare when it is required).

A.2.2 Identification

A.2.2.1 Solubility test

A.3.2.2 Mixed acid digestion solution: Nitric acid and perchloric acid are mixed uniformly in a volume ratio of 4:1 for future use.

A.3.2.3 Triethanolamine solution (10%): Measure 10mL of triethanolamine in 90mL of water. Mix well.

A.3.2.4 Calcium red indicator (1%): Weigh 1g of calcium red indicator ($C_{21}O_7N_2SH_{14}$). Add 99g of solid sodium chloride. Mix and grind in a mortar. Place in a brown jar, for future use.

A.3.2.5 Ethylenediaminetetraacetic acid disodium standard titration solution (0.01mol/L).

A.3.3 Instruments and equipment

A.3.3.1 Basic burette: 50mL.

A.3.3.2 Universal resistance furnace.

A.3.3.3 Volumetric flask: 250mL.

A.3.3.4 Triangle flask: 250mL.

A.3.4 Analysis steps

A.3.4.1 Sample digestion

Take the crucible for ash determination together with the remaining residue. Carefully add 25mL ± 5mL of mixed acid digestion solution. Place on the universal resistance stove in the fume hood. Heat with small fire. Add a small amount of mixed acid digestion solution when the acid is too low. Continue heating and digestion until the digestive solution is colorless and transparent. At this time, there may be residual acid digestion solution in the digestive solution. In order to steam it, the digestive solution shall be heated continuously. If there is less digestive solution, it may add 10mL ± 5mL water several times and heat slowly. Steam for about 1h~2h, then take it off. After cooling, carefully transfer the digestion solution in the crucible to the volumetric flask. Use a small amount of water to rinse the crucible repeatedly. Continuously use pH test paper to test until the washing liquid is no longer obviously acidic. The washing liquid is incorporated into the volumetric flask. Set volume.

Take the same amount of mixed acid digestion solution as the digestion sample. Conduct the reagent blank test according to the above operations.

A.3.4.2 Sample and blank titration

Respectively pipette 5mL of sample digestion solution and blank into an Erlenmeyer flask. Add 50mL of distilled water. Mix well. Add 5mL of potassium

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