

SPECIFICATION OF ϵ -POLYLYSINE



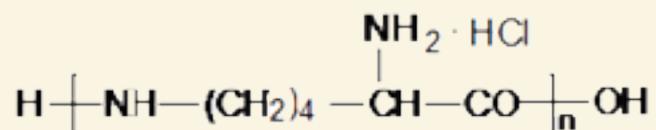
PRODUCTS: ϵ -Polylysine

CAS: 28211-04-03

Molecular weight: 4130 ~ 5776

Molecular formula : $[C_6H_{12}N_2O \cdot HCl]_n \cdot H_2O$

Molecular structural:



ϵ -Polylysine is a natural food preservative and high-efficiency antimicrobial agent manufactured from a fermentation process using *Streptomyces albulus* under aerobic conditions. ϵ -Polylysine is widely used as food preservative. It can inhibit the

growth of Gram-positive and Gram-negative bacteria, yeasts, moulds, bacteria and ect.

ϵ -Polylysine is a homopolymer of L-lysine, one of the essential amino acids. It is linked by peptide bond formed with α -carboxyl of L-lysine and ϵ -azyl from other L-lysine.

ϵ -Polylysine molecular weight is between 4130-5776g/mol (degree of polymerization = 25~35). ϵ -Polylysine is a naturally produced, cationic homopolymer of 25-35 L-lysine, which was connected by ϵ -amido bond compounded by a ϵ -amido of L-lysine and a α -carboxyl of another L-lysine.

ϵ -Polylysine is hygroscopic, light yellow powder. It is soluble in water, slightly soluble in ethanol, insoluble in organic solvent such as ethyl acetate, ether, ect.. The molecular of ϵ -Polylysine is a straight chain polymer of lysine. It can decompose to lysine in human body, and can be completely digested to absorption by the human body. It doesn't have any poisonous side effects and can be regarded as the source of amino acid lysine. ϵ -Polylysine can inhibit the growth of G+ and G- bacteria, yeast, mould, virus and ect, especially inhibit the G- bacteria which can't be easily inhibited by other preservatives, such as *E.coli*, *Salmonella*, and also can inhibit the *thermophilics*, such as *B,stearothermophilus*. Its activity is not affected by PH, and stable when heated (120°C for 20min). Therefore, it can be sterilized along with the

raw material. ϵ -Polylysine is a food preservative which is highly efficient, safe, and has no side-effects.

ϵ -Polylysine is a linear polymer of lysine, it is a light yellow powder and is hygroscopic with a slightly bitter taste. The antibacterial activity is not affected by the pH value and stable to heat (120 °C, 20min), and can inhibit the heat-resistant bacteria. As this result it can be added before heat treatment.

However, ϵ -Polylysine antibacterial activity may be reduced due to the binding with acidic polysaccharides, hydrochlorides, phosphates, copper ions or others. ϵ -Polylysine antibacterial activity can be enhanced with hydrochloric acid, citric acid, malic acid, glycine and higher fatty glycerides. ϵ -Polylysine with a molecular weight between 4130-5776 has the best antibacterial activity. When the molecular weight is less than 1300, it loses its antibacterial activity. Since ϵ -Polylysine is a mixture, there is no fixed melting point, and softening decomposition starts at 250 °C or higher.

ϵ -Polylysine is food grade and meets FAO/WHO specifications. It is certified as GRAS (Generally Recognized As Safe) by the US FDA with US GRAS No.: GRN000135. Currently, ϵ -Polylysine has approval as a food additive in China, Korea, Japan USA and some more countries.

ϵ -Polylysine is consider as safe preservative commercially used as a natural food preservative in Japan, Korea an USA. ϵ -Polylysine is common in food applications like: boiled rice, cooked vegetables, soups, noodles and sliced fish (sushi).

Standard

Items	Standard
Appearance	Cream to yellow light powder
Content	$\geq 95.0\%$
Loss on drying	$\leq 8.0\%$
Ash.	$\leq 2\%$
pH (1% Titrimetric solution)	3.0 ~ 5.0
Pb.	$\leq 2.0\text{mg/Kg}$
Total As.(as As ₂ O ₃)	$\leq 3.0\text{mg/kg}$
<i>E. coli</i>	<3.0MPN/g
<i>Coliforms</i>	$\leq 3.0\text{MPN/g}$
<i>Salmonella</i>	25g Negative
<i>Listeria monocytogenes</i>	25g Negative

Application standards

Food Cat No	Food Category	Maximum Dosage(g/kg)
7.0	Bakery	0.15 g/kg
8.03	Cooked meat	0.25
14.02	Fruit and vegetable juice	0.2 g/L
4.0	Fruits, vegetables, beans, edible fungi and algae	0.3
6.02	Rice products	0.25
6.03	Wheat flour and products	0.3
06.03.02.01	Fresh wheat products (such as : fresh noodl, Wonton skin, Dumpling skin)	0.5
6.05	Starch products	0.5
6.07	Instant Rice, Flour products	0.5
07.04.02	Coarse grain products	0.4
10.02.01	Marinated egg	0.5
8.0	Meat and Cooked meat products	0.3
12.0	Condiment	0.5

14.0

Beverages

0.2

Package

- 500g/bottle , 20 bottles/carton
- 1.0kg/bag , 10kg/carton

Storage

Store unopened under 20°C in dry conditions, away from direct sunlight. When opened, store under 20°C in original container in dry conditions, away from direct sunlight. Shelf life is 18 months when stored according to recommendations.