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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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Test method for non-protein content in silk

蚕丝中非蚕丝蛋白物质含量试验方法

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1 Scope

This document describes a test method for the determination of the content of non-silk protein substances in silk.

This document is applicable to the calculation of silk by determining the content of four main amino acids (serine, glycine, alanine and tyrosine) in silk.

The content of non-silk protein substances in it.

2 Normative references

GB/T 6682

GB/T 8170

GB/T 9995

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Non-protein content

The total amount of substances that have not been decomposed into amino acids after silk is hydrolyzed, including the amount of free NH₄ that exceeds the normal range.

4 Principle

Silk is mainly composed of fibroin and sericin, which can be hydrolyzed into free amino acids in high-temperature acidic solutions. After reacting with phenyl isothiocyanate, The generated amino acid derivatives have strong absorption peaks at ultraviolet wavelengths. After separation by chromatographic column, high performance liquid chromatography was used to analyze the four The main amino acids (serine, glycine, alanine, tyrosine) are determined. Because the amino acid content in silk is relatively stable, The content of amino acids after hydrolysis of silk protein can be calculated to obtain the content of non-silk protein substances in silk.

Note. Currently, the non-protein substances in silk mainly include grafted polymers with methacrylamide as the monomer.

5 Reagents and Materials

5.1 Concentrated hydrochloric acid. high purity.

5.2 Acetonitrile. chromatographic grade.

5.3 Phenyl isothiocyanate. purity $\geq 98\%$.

5.4 Triethylamine. analytical grade.

5.5 n-Hexane. chromatographic grade.

5.6 Acid hydrolysis solution. 6 mol/L hydrochloric acid (5.1) solution.

5.7 Phenyl isothiocyanate x acetonitrile solution (1 mol/L). Pipette 1.3 mL of phenyl isothiocyanate into a 10 mL volumetric flask and dilute to volume with acetonitrile.