



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

**GB 23200.3-2016**

Replacing SN/T 1737.3-2010

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**Food safety national standard -- Methods for the determination of herbicide  
residues -- Part 3: Determination of cyclohexanone herbicides in food by liquid  
chromatography-mass spectrometry / mass spectrometry**

除草剂残留量检测方法 第3部分：液相色谱-质谱 质谱法测定 食品中环己酮类除  
草剂残留量

**(English Translation)**

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### Foreword

This standard replaces SN/T 1737.3-2010 "Methods for the determination of herbicide residues Part 3. Determination by liquid chromatography-mass spectrometry Export of cyclohexene ketone herbicide residues".

Compared with SN/T 1737.3-2010, the main changes are as follows.

- Standard text format is modified to national standard text format for food safety;
- the name of the "import and export food" to "food";

- increase the "other food reference implementation" in the standard range.

This standard replaced the previous version of the standard release.

-SN/T 1737.3-2010.

National standards for food safety Method for determination of herbicide residue Part 3.  
Determination of Cyclohexanone in Food by Liquid Chromatography - Mass  
Spectrometry/Mass Spectrometry Herbs Residue

## 1 Scope

This standard specifies the food in the pyranosone, grass grass, thiadenone, oxadiazone, alkenopyridine, butanone, trimethoprostenone, cyclophen Determination of Ketone Residue by Liquid Chromatography - Mass Spectrometry/Mass Spectrometry.

This standard applies to rice, soybeans, pork, beef liver, chicken liver, milk, oranges, blueberries, spinach, onions, walnuts, tea Determination of the Residual Amount of Pyrrithione, Herbicide, Thiomethoxone, Cenotrocerone, Energeno, and confirmed that other food can refer to the implementation.

## 2 Normative reference documents

The following documents are indispensable for the application of this document. For dated references, only the dated edition applies to this article Pieces. For undated references, the latest edition (including all modifications) applies to this document.

GB 2763 National Standard for Food Safety - Maximum Residue Limit of Pesticides in Foodstuffs GB/T 6682 Analytical laboratory water specifications and test methods

## 3 Principle

The residual cyclohexenone herbicides in the sample were extracted with acidic acetonitrile or acetonitrile, and the extract was treated with N-propyl ethylenediamine (PSA), octadecane (ODS) and graphitized carbon black were purified by liquid chromatography-mass spectrometry/mass spectrometry and quantified by external standard method.

## 4 Reagents and materials

Unless otherwise specified, all reagents are of analytical grade and water is in accordance with the primary water specified in GB/T 6682.

## 4.1 Reagents

### 4.1.1

Acetonitrile ( $\text{CH}_3\text{CN}$ ). Chromatographically pure.

### 4.1.2

Acetic acid ( $\text{CH}_3\text{COOH}$ ) (99.5%).

### 4.1.3

Formic acid ( $\text{HCOOH}$ ) (88.0%).

### 4.1.4

Sodium acetate ( $\text{CH}_3\text{COONa}$ ).

### 4.1.5

Sodium chloride ( $\text{NaCl}$ ).

### 4.1.6

anhydrous magnesium sulfate ( $\text{MgSO}_4$ ). 650 °C burning 4 h, placed in the dryer to spare.

## 4.2 Solution preparation

4.2.1 1% acetic acid acetonitrile solution. take 10 mL of acetic acid, add 990 mL of acetonitrile, mix.

4.2.2 60% acetonitrile aqueous solution. take 60 mL of acetonitrile, add 40 mL of water, mix.

### 4.2.3

Formic acid - Aqueous solution (0.2 999.8, V/V). Take 0.2 mL of formic acid, dissolve with water and dilute to 1000 mL.

### 4.3.1 Cyclohexenone standards. Clethodim, CAS. 99129-21-2, purity $\geq 99\%$ ; pyranone

(Tepaloxymid) CAS. 149979-41-9, purity  $\geq 99\%$ ; thiadenone (Cycloxydim), CAS. 101205-02-1, purity  $\geq 93.5\%$ ; Tralkoxydim, CAS. 87820-88-0, purity  $\geq 93.5\%$ ; Alloxydim, CAS.

55634-91-8, purity  $\geq 98\%$ ; Profoxydim, CAS. 139001-49-3, purity  $\geq 98.5\%$ ; butanone (Butroxydim), CAS. 138164-12-2; Purity  $\geq 99\%$ ; Sethoxydim CAS. 74051-80-2; Purity  $\geq 99\%$ .

## **4.4 Standard solution preparation**

### **4.4.1**

Cyclohexenone Standard Reserve Solution. Accurately weigh the standard amount of cyclohexenone, dissolve with acetonitrile and set to 100 mL of brown Color container, the concentration of 100 µg/mL standard stock solution, the solution stored in dark.

### **4.4.2**

mixed standard intermediate solution. accurate extraction of cyclohexene ketone standard stock solution of 2.5mL in 50mL brown volumetric flask, with acetonitrile Diluted to a concentration of 5.0 µg/mL mixed standard intermediate solution, the solution stored in dark.

### **4.4.3**

Mixing standard working solution. Prepare the appropriate standard working solution with a blank sample matrix prior to use.

## **4.5 Materials**

### **4.5.1**

Graphitized Carbon Black Adsorbent. 120 µm to 400 µm.

### **4.5.2**

N-propyl ethylenediamine (PSA) adsorbent. 40 µm to 100 µm.

### **4.5.3**

Octadecylsilane (ODS) Bonded phase. 40 µm to 100 µm.

### **4.5.4**

Water phase filter. 0.22 µm.

## **5 Instruments and equipment**

### **5.1**

LC-MS/MS. ESI ionization source.

### **5.2**

Electronic balance. 0.01 g and 0.0001 g.

### **5.3**

Crusher.