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SN

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

SN/T 1504.4-2005

**Plastics used for food container and package. Part 4:
Determination of phenolic antioxidants in high density
polyethylene. Liquid chromatography**

食品容器、包装用塑料原料 第4部分：高密度聚乙烯中酚类抗氧化剂的测定 液相色谱法

(English Translation)

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Foreword

SN/T 1504 "Food Containers, Plastic Materials for Packaging" is divided into five parts.

--- Part 1. Determination of phenolic antioxidants and erucamide slip agents in polypropylene homopolymers.

--- Part 2. Determination of phenolic antioxidants and succinic acid slip agents in linear low-density polyethylene - Liquid chromatography;

---Part 3. Determination of butyl-hydroxytoluene (BHT) in ethylene polymers and ethylene-vinyl acetate (EVA) copolymers Phase chromatography

---Part 4. Determination of phenolic antioxidants in high-density polyethylene - Liquid chromatography;

---Part 5. Determination of content of impurity elements in polyolefins by X-ray fluorescence spectrometry.

This part is the fourth part of the SN/T 1504.

This section is modified to use the contents of ASTM D5524-1994, the title of which is changed to "high density of plastic containers for food containers and packaging." Determination of phenolic antioxidants in polyethylene by liquid chromatography".

Appendix A of this section is an informative annex.

This part is proposed and managed by the National Certification and Accreditation Administration.

1 Scope

This part of SN/T 1504 specifies the determination of phenolic antioxidants in high-density polyethylene for import and export food containers and packaging.

method.

This section applies to the separation and determination of phenolic antioxidants in food containers and high density polyethylene for packaging.

2 Method summary

The high density polyethylene sample was ground to 20 mesh and refluxed with cyclohexane. The extract was determined by liquid chromatograph internal standard method.

3 Reagents and solutions

3.1 2(2'-hydroxy-5'-methylphenyl)benzothiazole (Tinuvin-P).

3.2

Cyclohexane. liquid chromatography grade, spectrally pure or chromatographically pure reagent.

3.3

T-P internal standard solution. Tinuvin-P internal standard was added to the cyclohexane reagent to prepare a solution with a mass concentration of 51.8 mg/L.

3.4

Water. Degassing by high-purity helium or degassing by vacuum filtration.

3.5

Acetonitrile. liquid chromatography grade, spectrally pure or chromatographically pure reagent.

3.6 2-propanol. liquid chromatography grade, spectrally pure or chromatographically pure reagent.

WARNING. Cyclohexane and 2-propanol are flammable and the extraction process should be carried out in a fume hood.

4 Instruments

4.1

Liquid Chromatograph. equipped with a UV detector, column heating system and gradient elution unit with a 10 µL sample injection valve.

4.2

Wiley Mill. A 20-mesh screen and water cooling system are installed to prevent thermal decomposition of the antioxidant.

4.3

Reflow extraction device. by condenser tube (20/40 glass grinding port), 125mL flat-bottomed flask (with 24/40 glass grinding port) and with magnetic force Agitated heating plate consists of. The sample extraction device is shown in Figure A. 1.

4.4

Filtration unit. Teflon filter disc for non-aqueous solutions (pore size 0.22 μm) with a 5 mL syringe.

4.5

Analytical balance. accurate to $\pm 0.0001\text{g}$.

5 Liquid chromatograph conditions

5.1

Detector. The UV detector wavelength is set at 200 nm and the absorbance measurement is set to 0.1A.

5.2

Column. Reversed phase C18, 5 μm , 150mm x 4.6mm.

5.3

Gradient elution procedure.

- a) Initial mobile phase conditions. acetonitrile-water (50+50).
- b) Termination of mobile phase conditions. 100% acetonitrile.
- c) Gradient length. 11 min, gradient curve. straight line, flow rate. 1.0 mL/min.
- d) Maintain 100% acetonitrile for 8 min. The mobile phase was adjusted to 19.1 min to acetonitrile:water = 50:50 at a flow rate of 1.5 mL/min.

Hold for 5 min.