



GB 31604.49-2023

National Food Safety Standard

Food Contact Materials and Products Determination of Multi-element and Multi-element Migration

食品安全国家标准 食品接触材料及制品 多元素的测定和多元素迁移量的测定

National Health Commission of the People's
Republic of China
State Administration for Market Regulation

Release Date: Sept. 6, 2023
Implementation Date: Mar. 6, 2024

Translated by ChemLinked

Disclaimer

This is an unofficial document provided by **ChemLinked** (chemlinked.com), a platform of REACH24H Consulting Group, as an informational service to assist non-Chinese companies to better understand the Asia Pacific regulatory environment and importation compliance requirements especially China Chemical, Cosmetic, Food and Agrochemical regulatory issues.

This document should only be used as a reference and in case of any discrepancy between the English and Chinese versions the original Chinese version shall prevail.

Nondisclosure:

You may not disclose this document to anyone else without the written permission of ChemLinked.

For further clarification and questions, you can read our [Privacy Policies](#) or contact us at food@chemlinked.com



National Standard of the People's Republic of China

GB 31604.49-2023
In Replacement of GB 31604.49-2016

National Food Safety Standard
Food Contact Materials and Products
Determination of Multi-element and Multi-element Migration
食品安全国家标准
食品接触材料及制品
多元素的测定和多元素迁移量的测定

Date of publication: 2023-09-06

Date of implementation: 2024-03-06

Issued by:

National Health Commission of the People's Republic of China
State Administration for Market Regulation

Foreword

This standard replaces GB31604.49-2016 "National Food Safety Standard - Determination of arsenic, cadmium, chromium, lead and migration of arsenic, cadmium, chromium, nickel, lead, antimony and zinc in food contact materials and products".

Compared with GB31604.49-2016, the main changes of this standard are as follows:

—The name of the standard was changed to "National Food Safety Standard - Determination of Multi-elements and Determination of Multi-element Migration in Food Contact Materials and Products";

—The scope of the first article has been revised;

—Added inductively coupled plasma optical emission spectrometry as the second method in Part I;

—The second part adds the determination methods of the migration of aluminum, barium, cobalt, copper, iron, lithium, manganese, molybdenum and tin;

—The detection limit and quantitation limit of olive oil simulant were added to the first method of the second part.

National Food Safety Standard

Food Contact Materials and Products

Determination of Multi-element and Multi-element Migration

1 Scope

This standard specifies the determination of arsenic, cadmium, chromium, lead and the determination of the migration of aluminum, arsenic, barium, cadmium, cobalt, chromium, copper, iron, lithium, manganese, molybdenum, nickel, lead, antimony, tin and zinc in food contact materials and products.

The first part applies to the determination of arsenic, cadmium, chromium and lead in paper and paperboard materials and products for food contact, cork stoppers and bamboo and wood products.

Part II applies to the determination of the migration of aluminum, arsenic, barium, cadmium, cobalt, chromium, copper, iron, lithium, manganese, molybdenum, nickel, lead, antimony, tin and zinc in food contact plastic materials and products, food contact paints and coatings, food contact rubber materials and products, inks for food contact materials and products, adhesives for food contact materials and products, paper and paperboard materials and products, pacifiers, enamel products, ceramic products, glass products, food contact plastic resins, and food contact metal materials and products.

Part I Determination of Arsenic, Cadmium, Chromium and Lead

Method 1 Inductively Coupled Plasma Mass Spectrometry

2 Principle

The sample was crushed and digested with nitric acid. The resulting solution was diluted with water and fixed to volume. It was then determined by inductively coupled plasma mass spectrometry. The specific mass number (mass-to-charge ratio, m/z) of the element was used for qualitative analysis, and the external standard method was used for quantitative analysis.

3 Reagents and materials

Unless otherwise specified, all reagents used in this method are of high purity and the water is Grade-1 water as specified in GB/T6682.

ChemLinked Team, REACH24H Consulting Group | <http://food.chemlinked.com>

14F, #3 Bldg., Haichuang Technology Center, No. 1288 Wenyi West Road, Hangzhou, China. PC: 311121

Tel: +86 571 8710 3822 | Fax: +86 571 8700 7566 | Email: food@chemlinked.com

3.1 Reagents

3.1.1 Nitric acid (HNO_3): high purity or higher.

3.1.2 Argon (Ar): Argon gas ($\geq 99.995\%$) or liquid argon.

3.1.3 Helium (He): Helium ($\geq 99.995\%$).

3.2 Reagent preparation

3.2.1 Nitric acid solution (5+95): Measure 50 mL of nitric acid and slowly add it into 950 mL of water and mix well.

3.2.2 Nitric acid solution (1+4): Measure 1L nitric acid and slowly add it into 4L water and mix well.

3.3 Standards

3.3.1 Element standard solution (1000 mg/L or 100 mg/L): Arsenic, cadmium, chromium and lead shall use single element or multi-element standard stock solution certified by the state and awarded with standard material certificate, with a shelf life of 1 year.

3.3.2 Internal standard element solution (1000 mg/L or 100 mg/L): Scandium, germanium, rhodium, indium, rhenium and bismuth shall use single element or multi-element standard stock solution certified by the state and awarded with standard material certificate, with a shelf life of 2 years.

3.4 Preparation of standard solution

3.4.1 Mixed standard working solution: Accurately pipette an appropriate amount of single element or multi-element mixed standard stock solution, and dilute it step by step with nitric acid solution (5+95) to prepare a mixed standard series solution. The concentration of each element is shown in Table A.1 in Annex A. After the mixed standard series solution is prepared, transfer it to a brown glass container and store it at room temperature away from light. The shelf life is 1 month.

Note: The concentration and range of the element in the standard series solution can be appropriately adjusted according to the sensitivity and linear range of the instrument and the actual content of each element in the sample solution.



Free



Free trial



Standard



Corporate



Special

SUBSCRIBE TO CHEMLINKED NOW

REMOVE FOOD REGULATORY BARRIERS EXPEDITE ASIA MARKET ACCESS

- In-time regulatory information and market access requirements
- Supported by local and experienced technically adept technical team
- Strategic partnerships with competent authorities and industrial associations worldwide
- Customized consulting service for complete compliance solutions.

OUR SERVICES



Information & Knowledge

News, Reports, Expert Analysis
Pedia-articles



Databases

Regulatory Database, English Translations
Inventories/Lists



Solutions

Regulatory Compliance Service, On-demand
Translation, Advertisement Service, Tailor-made
Service, E-commerce Solution



Training

Webinars, Online Course
Offline Events