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International Standard



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**Fruits, vegetables and derived products — Determination of arsenic content — Silver diethyldithiocarbamate spectrophotometric method**

*Fruits, légumes et produits dérivés — Détermination de la teneur en arsenic — Méthode spectrophotométrique au diéthylthiocarbamate d'argent*

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## Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 6634 was developed by Technical Committee ISO/TC 34, *Agricultural food products*, and was circulated to the member bodies in June 1981.

It has been approved by the member bodies of the following countries :

Austria	Iran	Portugal
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The member body of the following country expressed disapproval of the document on technical grounds :

Australia

# Fruits, vegetables and derived products — Determination of arsenic content — Silver diethyldithiocarbamate spectrophotometric method

## 1 Scope and field of application

This International Standard specifies a method for the determination of the arsenic content of fruits, vegetables and derived products.

## 2 Reference

ISO 5515, *Fruits, vegetables and derived products — Decomposition of organic matter prior to analysis — Wet method.*

## 3 Principle

Decomposition of a test portion, reduction of arsenic(V) to arsenic(III) with tin(II) chloride and transformation of the arsenic into arsine by the action of nascent hydrogen. Formation of a red coloured complex by the action of the arsine on silver diethyldithiocarbamate and spectrophotometric measurement at a wavelength of 520 nm.

## 4 Reagents

All reagents shall be of recognized analytical purity and shall, in particular, be free from arsenic (with the exception of the standard arsenic solution (4.9)). The water used shall be distilled water or water of at least equivalent quality.

**4.1 Sulphuric acid,**  $\rho_{20} = 1,84$  g/ml.

**4.2 Nitric acid,**  $\rho_{20} = 1,38$  g/ml.

**4.3 Perchloric acid,**  $\rho_{20} = 1,67$  g/ml.

**4.4 Platinized zinc,** prepared as follows.

Place a portion of granulated zinc in a capsule, and pour in a volume of 0,05 g/l platinum chloride solution sufficient to cover the zinc. Leave in contact for 30 min, pour off the liquid, wash with water, leave the platinized zinc to drain on a square

of blotting-paper folded into several layers, and allow to dry. Store in a dry bottle.

The platinized zinc thus prepared shall be submitted to the preliminary test (see 6.1.1).

NOTE — Non-platinized zinc granules may be used if the product is shown to be suitable by the preliminary test.

**4.5 Potassium hydroxide,** in pellets.

**4.6 Tin(II) chloride solution,** prepared as follows.

Carry out a cold attack on 20 g of pure granulated tin with 100 ml of concentrated hydrochloric acid ( $\rho_{20} = 1,19$  g/ml).

Store in the presence of metallic tin, protected from air, in a bottle provided with a security device (to avoid overpressures caused by the liberation of hydrogen).

**4.7 Potassium iodide,** 100 g/l solution.

**4.8 Sodium hydroxide,** standard volumetric solution,  $c(\text{NaOH}) = 1$  mol/l.

**4.9 Arsenic,** standard solution corresponding to 10 mg of arsenic(V) per litre, prepared as follows.

**4.9.1** Dissolve, in a 500 ml flask, 264 mg of pure, dry arsenic trioxide in 10 ml of the sodium hydroxide solution (4.8), make up the volume to about 100 ml with water, add 15 ml of 1 mol/l hydrochloric acid solution and two drops of bromine; heat to boiling in order to expel the excess bromine, cool, transfer quantitatively to a 200 ml volumetric flask and make up to the mark with water.

1 ml of this solution contains 1 mg of arsenic.

**4.9.2** By means of a pipette, transfer 10 ml of the solution (4.9.1) to a 1 000 ml volumetric flask. Make up to the mark with water.

1 ml of this standard solution contains 10  $\mu\text{g}$  of arsenic(V).