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International Standard 6703/3

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Water quality — Determination of cyanide — Part 3: Determination of cyanogen chloride

Qualité de l'eau — Dosage des cyanures — Partie 3: Dosage du chlorure de cyanogène

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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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 6703/3 was prepared by Technical Committee ISO/TC 147, *Water quality*.

Water quality — Determination of cyanide — Part 3: Determination of cyanogen chloride

Attention is drawn to the toxicity of cyanide and to the need to take extreme care when handling cyanides and their solutions.

Carry out all operations in a fume cupboard. Avoid contact with the skin and eyes. When pipetting, always use a safety pipette (pipette by bulb). Detoxify samples and solutions containing cyanides or heavy metals in accordance with local official regulations.

Other chemicals specified in this part of ISO 6703 are also hazardous, for example pyridine.

0 Introduction

Cyanides may be present in water as hydrocyanic acid (prussic acid), as cyanide ions and as complex cyanides. They may be determined as total cyanide or as easily liberatable cyanide. If cyanide compounds are chlorinated, cyanogen chloride (CICN) is produced, and this compound has to be determined separately.

This International Standard comprises four parts as follows:

- Part 1: Determination of total cyanide
- Part 2: Determination of easily liberatable cyanide
- Part 3: Determination of cyanogen chloride
- Part 4: Determination of cyanide by diffusion at pH 6¹⁾

The methods described in parts 1, 2 and 3 are suitable for controlling the quality of water and for the examination of municipal sewage and industrial effluents. They are appropriate to the technology available for the destruction of cyanides in treatment plants, and are based on the separation of liberated hydrogen cyanide (or in the case of this part of ISO 6703, of cyanogen chloride) by stripping with a carrier gas.

The method specified in part 4 is suitable for the determination of smaller amounts of cyanide, depending on the concentrations of copper and nickel.

1 Scope and field of application

This part of ISO 6703 specifies a method for the determination of cyanides, as cyanogen chloride (see clause 2) in water.

The method is applicable for the determination of cyanogen chloride concentrations in the range 0,02 to 15 mg/l.

The ions and compounds listed in the table, if present singly or in combination at concentrations above the specified limiting concentration, interfere with the method (the list is not exhaustive).

The presence of aldehydes, e.g. formaldehyde, may give lower cyanide values because of the formation of cyanohydrin.

Table — Interferences

Interference	Limiting concentration mg/l
Sulfide ion	1 000
Polysulfide ion	300
Sulfide and polysulfide ion	1 000
Sulfite ion	500
Thiosulfate ion	1 000
Thiocyanate ion	1 000
Chlorine (elemental)	250

2 Definition

For the purpose of this International Standard, the following definition applies:

cyanogen chloride: The first reaction product when cyanide compounds are chlorinated.

Cyanogen chloride is a gas and is only slightly soluble in water, but is highly toxic even in low concentrations.

3 Principle

Addition of tin (II) chloride solution to the sample and entrainment of the cyanogen chloride liberated at pH 5,4 and room temperature by means of a current of air into an absorption solution containing pyridine/barbituric acid. Determination of the cyanogen chloride concentration photometrically.

1) At present at the stage of draft.