JIS

JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS K 0312 : 2020

Method for determination of tetra-through octachlorodibenzo-*p*-dioxins, tetra-through octachlorodibenzofurans and dioxin-like polychlorinatedbiphenyls in industrial water and waste water

ICS 13.060.25;13.060.30

Reference number : **JIS K 0312** : **2020** (**E**)

Date of Establishment: 1999-09-20
Date of Revision: 2020-03-23
Date of Public Notice in Official Gazette: 2020-03-23
Investigated by: Japanese Industrial Standards Committee
Standards Board for ISO area
Technical Committee on Chemical Products and Analytical Methods

JIS K 0312:2020, First English edition published in 2021-07

Translated and published by: Japanese Standards Association
Mita MT Building, 3-13-12, Mita, Minato-ku, Tokyo, 108-0073 JAPAN

In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

Printed in Japan

KK/AT

Contents

Page

Introduction 1

1 Scope 1

2 Normative references 2

3 Terms, definitions and abbreviations 3
3.1 Terms and definitions 3
3.2 Abbreviations 5

4 Outline of determination method 5

5 Sample 6
5.1 Selection of sampling time and sampling point 6
5.2 Sampling 7
5.3 Record of sampling 8
5.4 Handling of samples 8

6 Pretreatment of the sample 8
6.1 Outline of the pretreatment of the sample 8
6.2 Reagents and materials 10
6.3 Instrument and apparatus 14
6.4 Pretreatment operations 15

7 Identification and determination 24
7.1 Outline 24
7.2 Reagents and apparatus 24
7.3 Measurement operations 27
7.4 Identification and determination of dioxins 32
7.5 Limit of detection and minimum limit of determination 35
7.6 Confirmation of the recovery 37

8 Report of the results 38
8.1 Methods of expression for analytical results 38
8.2 Unit of concentration 39
8.3 Conversion to toxic equivalents 39
8.4 Handling of numerical values 40

9 Quality control of the measured data 40
9.1 General 40
9.2 Assurance of reliability of measured data 40
9.3 Requirements for measurement operations 42
9.4 Record of measurement operations 45
9.5 Report on the precision control 46

Annex JA (normative) Sampling by a large volume collecting apparatus ····· 47

Annex JB (informative) Example of use of internal standard ····· 49

Annex JC (informative) Examples of measurement conditions of GC-MS and chromatogram ····· 55

Annex JD (informative) Conversion to TEQ ····· 68

Annex JE (informative) Comparison table between JIS and corresponding International Standards ····· 74

Foreword

This Japanese Industrial Standard has been revised by the Minister of Economy, Trade and Industry, through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Act. This edition replaces the previous edition (**JIS K 0312**:2008), which has been technically revised.

Attention is drawn to the possibility that some parts of this Standard may conflict with patent rights, published patent application or utility model rights. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying any of such patent rights, published patent application or utility model rights.

Method for determination of tetra-through octachlorodibenzo-*p*-dioxins, tetra-through octachlorodibenzofurans and dioxin-like polychlorinatedbiphenyls in industrial water and waste water

Introduction

This Japanese Industrial Standard was established in 1999 as "Method for determination of tetra-through octachlorodibenzo-*p*-dioxins, tetra-through octachlorodibenzofurans and coplanar polychlorobiphenyls in industrial water and waste water", and has gone through three revisions including this one. This Standard has been prepared based on **ISO 18073**:2004, Edition 1, and **ISO 17858**:2007, Edition 1, with some modifications of the technical contents.

The vertical lines on both sides and dotted underlines indicate changes from the corresponding International Standards. A list of modifications with the explanations is given in Annex JE. Annex JA to Annex JD are unique to **JIS** and not given in the corresponding International Standards.

1 Scope

This Standard specifies a method for the determination of tetra-through octachlorodibenzo-*p*-dioxins, tetra-through octachlorodibenzofurans and dioxin-like PCBs in industrial water and waste water using a gas chromatograph/mass spectrometer (hereafter referred to as GC-MS). The GC-MS employed in this Standard shall be the double-focusing mass spectrometer (hereafter referred to as MS) where the capillary column of a gas chromatograph (hereafter referred to as GC) is used and its resolution is 10 000 or more.

NOTE The International Standards corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 18073:2004 *Water quality—Determination of tetra- to octa-chlorinated dioxins and furans—Method using isotope dilution HRGC/HRMS*

ISO 17858:2007 *Water quality—Determination of dioxin-like polychlorinated biphenyls—Method using gas chromatography/mass spectrometry* (overall evaluation: MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standards and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

WARNING Since dioxins are very toxic, inhalation, accidental ingestion, direct contact to skin, etc. shall be avoided as much as possible, and ventilation of pretreatment room and analysis room and control of waste liquid and waste shall be sufficiently carried out. Since the health of the measurer may be damaged by inhalation or accidental ingestion