

JIS

JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS K 0102-1 : 2021

**Testing methods for industrial water and
industrial wastewater — Part 1: Test
methods for general physics and
chemistries**

ICS 13.060.25 ; 13.060.30;13.060.50

Reference number : JIS K 0102-1 : 2021 (E)

K 0102-1 : 2021

Date of Establishment: 2021-05-20

Date of Public Notice in Official Gazette: 2021-05-20

Investigated by: Japanese Industrial Standards Committee

Standards Board for ISO area

Technical Committee on Chemical Products and

Analytical Methods

JIS K 0102-1 : 2021, First English edition published in 2022-10

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.

© JSA 2022

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

Printed in Japan

HN

PROTECTED BY COPYRIGHT

Contents

		Page
1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	General requirements	1
4.1	Chemical analysis	1
4.2	Absorptiometry	1
4.3	Repeatability	1
4.4	Water used for tests	1
4.5	Reagents used for tests	3
4.6	Implements used for tests and methods for washing them	4
4.7	Management of quality of test results	4
4.8	Sample	5
5	Flow rate	5
6	Temperature	5
6.1	General	5
6.2	Temperature	5
6.3	Water temperature	6
7	Appearance	7
8	Transparency	7
9	Turbidity	10
9.1	General	10
9.2	Visual-sensation turbidity	10
9.3	Transmitted-light turbidity	12
9.4	Scattered light turbidity	14
9.5	Integrating sphere turbidity	16
10	Chromaticity	18
10.1	General	18
10.2	Method using the stimulus values and chromaticity coordinates	18
10.3	Platinum-cobalt chromaticity	21
10.4	Method using the three wavelengths	22
11	Odour and threshold odour number (TON)	23
11.1	General	23
11.2	Odour	23
11.3	Threshold odour number (TON)	24
12	pH	26

13	Electrical conductivity	31
14	Suspended matter and evaporation residue	36
14.1	General	36
14.2	Suspended matter	37
14.3	Total evaporation residue	39
14.4	Soluble evaporation residue	39
14.5	Ignition residue	40
14.6	Ignition loss	42
15	Acid consumption	43
15.1	General	43
15.2	Acid consumption (pH 4.8)	44
15.3	Acid consumption (pH 8.3)	45
16	Alkali consumption	49
16.1	General	49
16.2	Alkali consumption (pH 8.3)	50
16.3	Alkali consumption (pH 4.8)	54
16.4	Alkali consumption (free acid)	56
17	Chemical oxygen demand (COD)	59
17.1	General	59
17.2	Oxygen demand by acidic potassium permanganate (COD _{Mn})	60
17.3	Oxygen demand by alkaline potassium permanganate (COD _{OH})	63
17.4	Oxygen demand by potassium dichromate (COD _{Cr})	66
18	Biochemical oxygen demand (BOD)	72
19	Total organic carbon	81
19.1	General	81
19.2	Combustion oxidation-infrared TOC analysis method	81
19.3	Combustion oxidation-infrared TOC automatic analysis method	86
20	Total oxygen demand (TOD)	87
21	Dissolved oxygen	90
21.1	General	90
21.2	Iodometry	91
21.3	Miller's modification	95
21.4	Membrane electrode method	96
21.5	Optical sensor method	100
22	Petroleum extracts	106
22.1	General	106
22.2	Sampling	106
22.3	Extraction method	108
22.4	Extraction by extraction container	112
22.5	Collecting-concentration and extraction	113
23	Residual chlorine	115

23.1	General	116
23.2	Diethyl- <i>p</i> -phenylenediammonium (DPD) colorimetry	116
23.3	Diethyl- <i>p</i> -phenylenediammonium (DPD) absorptiometry	120
23.4	<i>o</i> -Tolidine colorimetry	122
23.5	Iodometry	125
23.6	DPD-ammonium iron (II) sulfate titrimetry	128
23.7	Amperometric titration	132
24	Total carbonate	135
24.1	General	135
24.2	Strontium chloride-hydrochloric acid titration method	135
24.3	Infrared analytical method	140
25	Chlorine demand	141
26	Hydroxide ion	143
Annex A (informative)	Expression of chromaticity by dominate wavelength (or complementary wavelength) and excitation purity	145
Annex B (informative)	Temperature correction factor for conversion of electrical conductivity	150
Annex C (informative)	Method for determining salt concentration from electrical conductivity, and relationship between elevation and barometric pressure	152
Annex D (informative)	Nonvolatile mineral oils, and nonvolatile animal and vegetable oils and fats	154
Annex E (informative)	Normative references	157
Annex F (informative)	Comparison table between JIS and corresponding International Standards	161

Foreword

This Japanese Industrial Standard has been established by the Minister of Economy, Trade and Industry, through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Act.

This **JIS** document is protected by the Copyright Act.

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.

JIS K 0102 series consists of the following 5 parts under the general title *Testing methods for industrial water and industrial wastewater*—

Part 1 : Test methods for general physics and chemistries

Part 2 : Anion and cation analysis (to be published)

Part 3 : Metal analysis (to be published)

Part 4 : Organic analysis (to be published)

Part 5 : Methods for acute toxicity test by fish, bacterial test, and biological test (to be published)

Testing methods for industrial water and industrial wastewater — Part 1 : Test methods for general physics and chemistries

1 Scope

This Japanese Industrial Standard specifies the general physical and chemical analysis methods for industrial water and for wastewater discharged from factories (including workplaces) (hereafter referred to as industrial wastewater). Unless otherwise specified in the specific test method subclause, tests given in this Standard are applicable to both industrial water and industrial wastewater.

For test methods in this Standard for which a corresponding International Standard exists, the number of the International Standard and the symbol or degree of its correspondence with **JIS** are shown in relevant test clauses.

Where modifications have been made to the technical contents of the corresponding International Standard, the modifications and their explanations are given in Annex F.

2 Normative references

Part or all of the provisions of the standards listed in Annex E, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated in the said annex shall be applied.

3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in **JIS K 0211** and **JIS K 0215** apply.

4 General requirements

4.1 Chemical analysis

General requirements of chemical analysis are provided in **JIS K 0050**.

4.2 Absorptometry

General requirements of absorptometry are provided in **JIS K 0115**.

4.3 Repeatability

The repeatability of each test method is indicated by the approximate value of the coefficient of variation (%) obtained by performing repetitive tests using the standard solution to be used in the dynamic range of that test method.

4.4 Water used for tests

The water to be used for the tests described in this Standard shall be of A1 to A4 specified in **JIS K 0557**, unless otherwise specified in the particular test clause. Dis-