



JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS K 0305 : 1997

Methods for determination of
trichloroethylene and tetra-
chloroethylene in flue gas

ICS 13.040.40; 71.040.40

Descriptors : exhaust gases, gas analysis, trichloroethylene, tetrachloroethylene

Reference number : JIS K 0305 : 1997 (E)

K 0305 : 1997

This translation has been made based on the original Japanese Industrial Standard established by the Minister of International Trade and Industry through deliberations at Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law.

Date of Establishment: 1997-08-20

Date of Public Notice in Official Gazette: 1997-08-20

Investigated by: Japanese Industrial Standards Committee
Divisional Council on Environment

JIS K 0305 :1997, First English edition published in 1998-01

Translated and published by: Japanese Standards Association
4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN

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Printed in Japan

Methods for determination of trichloroethylene and tetrachloroethylene in flue gas

1 Scope This Japanese Industrial Standard specifies the methods for determination of trichloroethylene and tetrachloroethylene in flue gas which is discharged to ducts or the like.

Remarks 1 In this Standard, the flue gas means the gas discharged from various manufacturing processes where trichloroethylene or tetrachloroethylene is handled in factories and plants. Provided that this gas does not contain the gas exhausted from a burning process.

2 The normative references to this Standard are as follows.

JIS K 0050 *General rules for chemical analysis*

JIS K 0095 *Methods for sampling of flue gas*

JIS K 0114 *General rules for gas chromatographic analysis*

JIS K 0125 *Testing methods for volatile organic compounds in industrial water and waste water*

JIS K 8666 *Trichloroethylene*

JIS K 8848 *Hexane*

JIS Z 8401 *Rules for rounding off of numerical values*

3 The units and numerical values given in { } in this Standard are based on the traditional units, and are appended for informative reference.

2 Matters in common The matters in common shall conform to JIS K 0050, JIS K 0095, and JIS K 0114.

3 Classification of methods for determination and its outline Methods for determination are classified into a gas chromatography using a hydrogen-flame ionization detector and gas chromatography using an electron capture detector, and the classification of methods for determination and its outline are as shown in Table 1.

Table 1 Classification of methods for determination and its outline

Method for determination	Outline of determination	
	Summary	Determination range ⁽¹⁾ volppm (mg/m ³ N) ⁽²⁾
Gas chromatography using a hydrogen-flame ionization detector	Either sample directly the flue gas in a collecting bottle or catch the flue gas in a concentration tube by adsorption method at ordinary temperature, and then determine it with a gas chromatograph equipped with a hydrogen-flame ionization detector.	Case of collecting bottle: Trichloroethylene 1 min. (6 min.) Tetrachloroethylene 1 min. (7 min.) Case of concentration tube: Trichloroethylene 0.01 min. (0.06 min.) Tetrachloroethylene 0.01 min. (0.07 min.)
Gas chromatography using an electron capture detector	Sample directly flue gas in a collecting bottle, and determine it with a gas chromatograph equipped with an electron capture detector.	Trichloroethylene 0.005 to 1 (0.03 to 6) Tetrachloroethylene 0.001 to 1 (0.007 to 7)

Remarks 1 In case of using a hydrogen-flame ionization detector, the upper limit of determination shall be the range where working curve shows straight line.

2 When the measurement by an electron capture detector exceeds determination limit, determine it with a hydrogen-flame ionization detector.

Notes ⁽¹⁾ The lower limit value for determination is the value given when 2 ml of sample gas is introduced (for the case of collecting bottle) and when 200 ml is introduced (for the case of concentration tube).

⁽²⁾ "N" suffixed in the unit is the capital of Normal, and indicates standard condition (0°C, 1 atm).

4 Implements and apparatus Implements and apparatus shall be as follows.

4.1 Gas bottle for working curve ⁽³⁾⁽⁴⁾ As shown in Fig. 1, glass made bottle whose internal capacity has been known (1000 ml).

4.2 Sampling implements for sample gas

(1) Collecting bottle⁽³⁾⁽⁴⁾ As shown in Fig. 1, glass made bottle with 1000 ml internal capacity.

Notes ⁽³⁾ When this is used for an electron capture detector, fill inside of a gas bottle for working curve and collecting bottle with nitrogen in advance, and confirm that this nitrogen does not contain the substance which gives disturbance for determination.

⁽⁴⁾ It is permissible that the gas bottle for working curve at 4.1 is the same as the collecting bottle at 4.2(1).