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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 46434-2025

Determination of purity and trace organic impurities of methanol - Gas chromatography

甲醇纯度及其微量有机杂质的测定 气相色谱法

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1.Structure and Drafting Rules of Standardization Documents". Drafting. Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed by the China Petroleum and Chemical Industry Federation. This document is under the jurisdiction of the National Technical Committee on Chemical Standardization (SAC/TC63). This document was drafted by: Sinopec (Beijing) Chemical Research Institute Co., Ltd., Sinopec Chongqing Chuanwei Chemical Co., Ltd., and the State... Energy Group Ningxia Coal Industry Co., Ltd., Shanghai Huayi Energy Chemical Co., Ltd., Jiangxi Lanxing Xinghuo Organosilicon Co., Ltd., Luxi Chemical Gongda Group Co., Ltd., Hualu Hengsheng (Jingzhou) Co., Ltd., Guoneng Baotou Coal Chemical Co., Ltd., Nanjing Chengzhi Clean Energy Co., Ltd. Limited Liability Company, Shanghai Institute of Metrology and Testing Technology, Sinopec (Shanghai) Petrochemical Research Institute Co., Ltd., SGS-CSTC Standards Technical Services (Shanghai) Limited Liability Company, Jiangsu Sipai New Energy Technology Co., Ltd., China Petrochemical Great Wall Energy Chemical (Ningxia) Co., Ltd., National Oil and Gas Pipeline China Railway Network Group Co., Ltd., Western Pipeline Co., Ltd., China University of Petroleum (Beijing), Nantong Baichuan New Materials Co., Ltd., Jiangxi Yanxun Silicon Materials Co., Ltd., Anhui Carbonxin Technology Co., Ltd., Hebei Jinniu Xuyang Chemical Co., Ltd., Zhejiang Hongyuan Pharmaceutical Co., Ltd. Yankuang Lunan Chemical Co., Ltd., Guangxi Huayi Energy Chemical Co., Ltd., Xinjiang Guanghui New Energy Co., Ltd., and Shaanxi Weihe Coal Chemical Group Limited Liability Company, China Coal Ordos Energy and Chemical Co., Ltd., Shaanxi Pucheng Clean Energy and Chemical Co., Ltd., Zhejiang Juhua Hanzheng New Materials Co., Ltd., Shandong Provincial Traceability Green Chemical Research Institute. The main drafters of this document are. Luo Sha, Huang Yu, Chen Chunyan, He Ju, Hu Xuebin, Wang Jun, Wang Rui, Ang Gao, Yang Qing, Wei Changxin, and Zhang Jingjing. Li Jie, Yu Fuhong, Xing Jun, Song Bingqing, Zhong Jianqiang, Qiu Suqin, Wang Xiaomin, Li Min, Lü Jian, Qiu Shujuan, Jiang Xiaoping, Lian Yunchi, Chen Juan, Gong Bin, Ma Gaoyong, Wu Hong, Sun

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---Some procedures outlined in this document may lead to hazardous situations. Operators are responsible for taking appropriate safety and health precautions. It should comply with the relevant national laws and regulations.

1 Scope

GB/T 46434-2025 is the Chinese national standard covering methanol purity by gas chromatography - the column and the temperature programme that separate the ethanol, acetone and higher alcohols, the internal standard, and the detection limits for the impurities that matter downstream. First edition, in force from 1 May 2026. Issued on 31 October 2025, it has been in force since 1 May 2026.

This document describes a method for determining the purity of methanol products and the content of impurities such as alcohols, ketones, and esters using gas chromatography. This document applies to the determination of methanol products with a mass fraction of not less than 99.0%, where chromatographic conditions 1 are specified for the determination of impurities such as dicarbonate. The detection limit for methyl ester is 4 mg/kg, and the detection limit for other organic impurities is 2 mg/kg; under the conditions specified in chromatographic condition 2, the detection limit for impurity ethylene glycol is [not specified]. The detection limit for alcohol methyl ether is 12 mg/kg, and the detection limits for impurities methyl formate and dimethyl carbonate are 8 mg/kg. For other organic impurities... The detection limit for the substance is 5 mg/kg.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 3723 General Safety Rules for Sampling of Industrial Chemical Products

GB/T 6680 General Rules for Sampling of Liquid Chemical Products

GB/T 9722 General Rules for Gas Chromatography of Chemical Reagents

3 Terms and Definitions

This document does not contain any terms or definitions that need to be defined.

4.Methodology Summary Gas chromatography was used to separate the components in methanol under selected operating conditions via a capillary column, and flame ionization was used for detection. Detection is performed using a field-indicating detector (FID), and quantification is achieved using the internal standard method or the calibration area normalization method.

5 Reagents or materials

5.1 Methanol. mass fraction not less than 99.90%.

5.2 n-Heptane. with a mass fraction of not less than 99.0%, used as an internal standard or reference.

5.3 Ethanol, 1-propanol, 2-propanol, 2-methyl-1-propanol, 1-butanol, 2-butanol, acetone, butanone, 3-pentanone, methyl formate, methyl acetate, butyric acid Methyl acetate, diethyl carbonate, and ethylene glycol methyl ether. mass fraction not less than 99.0%. 5.4 2-Pentanol, dimethyl carbonate, ethyl methyl carbonate. mass fraction not less than 98.0%.

5.5 Nitrogen. Volume fraction not less than 99.99%, and must be purified by silica gel, molecular sieve or activated carbon before use.