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PEOPLE'S REPUBLIC OF CHINA**

GB/T 46880-2025

**Carbon dioxide geological storage - Carbon dioxide test
methods**

二氧化碳地质封存 二氧化碳检测方法

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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 and is under the jurisdiction of the National Technical Committee on Standardization of Environmental Management (SAC/TC207). This document was drafted by: China Huaneng Group Clean Energy Technology Research Institute Co., Ltd., China National Institute of Standardization, and Chinese Academy of Sciences. Wuhan Institute of Rock and Soil Mechanics, Center for Hydrogeology and Environmental Geology Survey of China Geological Survey, China University of Geosciences (Beijing), China University of Petroleum Beijing, National Institute of Metrology, China Coal Geology Research Institute, China Petroleum Pipeline Engineering Co., Ltd. Beijing Huairou Laboratory, Huaneng Qingyang Coal Power Co., Ltd., Shenzhen University, State Energy Group New Energy Technology Research Institute Co., Ltd., Zhengzhou University Universities. China University of Mining and Technology (Beijing), Tsinghua University. The main drafters of this document are. Jing Tieya, Liu Lianbo, Tang Xuan, Yang Yanmei, Peng Bo, Zhao Wentao, Zhou Luli, Diao Yujie, Liu Yang, and Zhang Liwei. Du Song, Wei Ning, Wang Yan, Zhang Chenglong, Xue Huaqing, Xu Liang, Cao Yingqun, Zhang Yufeng, Zheng Zhaofang, Wang Zijian, Zhao Liqian, Gao Yijing, Nie Yaowu, An Senyou, Xu Dong, Xu Ruina, Huang Yibin, Li Yong, Zhou Juan, Zhong Dongyan, Shang Huining, Zhang Jiahang. Carbon dioxide geological storage carbon dioxide detection methods

1 Scope

GB/T 46880-2025 is the Chinese national standard covering analysing the CO₂ stream that will be injected - the purity and the impurities that come with it from capture, the water that makes it corrosive, and the oxygen and sulfur species that affect both the pipeline and the reservoir chemistry. First edition, with the offshore storage standards of the same batch. It was issued on 31 December 2025 and has been in force since 1 July 2026, as a first edition. The document is under the responsibility of the Standardization Administration of China. This page is published from the official record of the 2025 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document describes CO₂ detection methods in carbon dioxide (CO₂) geological sequestration projects, including detection conditions, detection content, and different receptors. Contents include CO₂ detection instruments and procedures, CO₂ leakage flux detection in wells, and detection reports. This document applies to data acquisition on CO₂ concentrations or fluxes in receptors such as groundwater, soil, and atmosphere during terrestrial CO₂ geological sequestration projects. For CO₂ detection methods in geological utilization such as CO₂ enhanced oil recovery and CO₂ enhanced gas recovery, please refer to this document.

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 6682-2008 Specifications and test methods for water used in analytical laboratories

GB 15618 Standard for Risk Control of Soil Pollution in Agricultural Land (Trial) DZ/T 0064.49-2021 Groundwater Quality Analysis Methods Part

49.Determination of Carbonate, Bicarbonate and Hydroxide Ions Titration HJ/T 166-2004 Technical Specification for Soil Environmental Monitoring

HJ494-2009 Technical Guidelines for Water Quality Sampling

HJ870-2017 Determination of Carbon Dioxide in Exhaust Gas from Stationary Sources - Non-dispersive Infrared Absorption Method SL80-1994 Determination of Free Carbon Dioxide (Alkali Titration Method) SL81-1994 Determination of corrosive carbon dioxide (acid titration method)

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1 CO₂ leakage flux (carbon dioxide flux) The mass of CO₂ entering the receptor per unit area through the leakage interface per unit time.

Note. The unit is kilograms per square meter per second [kg/(m²·s)]. [Source: GB/T 35377-2017, 2.9, with modifications]

3.2 The CO₂ content in the atmosphere or a specific environmental space is usually expressed as a volume fraction or mass concentration.

Note. Units are volume fraction (%), mole fraction (%), milligrams per kilogram (mg/kg), or ppm (1ppm = 1×10⁻⁶).

3.3 A device for detecting CO₂ concentration in different environments.