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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 46293-2025

**Determination of total petroleum hydrocarbons in fertilizers -
Infrared absorption spectrometry**

肥料中石油烃总量的测定 红外吸收光谱法

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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 Standardization of Fertilizers and Soil Conditioners (SAC/TC105). This document was drafted by: Yunnan Provincial Chemical Products Quality Supervision and Inspection Station, Shanghai Chemical Industry Research Institute Testing Co., Ltd., and Yunnan Yuntianhua Co., Ltd. Limited Company, Shandong Provincial Institute of Product Quality Inspection, Guizhou Provincial Institute of Product Quality Inspection and Testing, State Development & Investment Corporation Xinjiang Lop Nur Potash Co., Ltd. Shanghai Chemical Industry Research Institute Co., Ltd. The main drafters of this document are: Gui Suping, Zhang Shujuan, Huang Heqing, Ma Hang, Zhang Hui, Zhang Juan, Cheng Shuai, Li Zhou, Wang Lu, Zhu Hairong, and Niu Yanchao. Shao Qingsong. Determination of total petroleum hydrocarbon content in fertilizers Infrared absorption spectroscopy Warning

---Tetrachloroethylene used in the experiment is toxic and harmful to human health. The preparation and determination of standard solutions should be carried out in a fume hood. This procedure should be performed indoors, and protective equipment should be worn as required by regulations to avoid contact with skin and clothing. This document does not specify all possible safety precautions. Problem. Users are responsible for taking appropriate safety and health measures and ensuring compliance with relevant national regulations.

1 Scope

GB/T 46293-2025 is the Chinese national standard covering petroleum hydrocarbons where they should not be - the extraction from a fertiliser matrix, the removal of the polar

interferences, and the infrared measurement, which is how contamination from industrial waste used as a fertiliser feedstock is caught. First edition, in force from 1 May 2026. Issued on 5 October 2025, it has been in force since 1 May 2026.

This document describes a method for determining the total amount of petroleum hydrocarbons in fertilizers using infrared absorption spectroscopy. This document applies to the determination of total petroleum hydrocarbons in fertilizers. The detection limit of this method is 0.003%, and the quantification limit is 0.012%.

2 Normative references

This document has no normative references.

3 Terms and Definitions

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

4. Principles The sample was extracted with tetrachloroethylene, and polar substances such as animal and vegetable oils were removed by adsorption with magnesium silicate. The wavenumber was then measured at 2930 cm^{-1} (CH₂ group), 2960 cm^{-1} (stretching vibrations of the CH bond in the CH₃ group), and 3030 cm^{-1} (stretching vibrations of the CH bond in the aromatic ring). The infrared absorption peak at the stretching vibration of the CH bond was used to calculate the total amount of petroleum hydrocarbons in the sample using the standard curve method.

5 Reagents or materials

5.1 Tetrachloroethylene. Using a dry 40mm empty cuvette as a reference, the determination of tetrachloroethylene at 2930 cm^{-1} was performed using a 40mm cuvette. The absorbance at 2960 cm^{-1} and 3030 cm^{-1} should not exceed 0.34, 0.07, and 0, respectively. The tetrachloroethylene used for sample determination and standard curve plotting... The ethylene should be from the same batch.

5.2 Anhydrous sodium sulfate. analytical grade. Place anhydrous sodium sulfate in a porcelain evaporating dish, heat in a muffle furnace at 550°C for 4 hours, remove and cool slightly, then place... Cool in a desiccator for 30 minutes, then transfer to a ground glass bottle and store in a desiccator for later use.

5.3 Petroleum hydrocarbon standard solution 1 ($\rho=10000\mu\text{g/mL}$). standard sample/standard substance, n-hexadecane.isooctane.benzene = 65.25.10.

5.4 Petroleum hydrocarbon standard solution 2 ($\rho=1000\mu\text{g/mL}$). standard sample/standard substance, n-hexadecane.isooctane.benzene = 65.25.10.

5.5 Magnesium silicate. 100-200 mesh ($150\mu\text{m}$ - $75\mu\text{m}$). Place magnesium silicate in a

porcelain evaporating dish and heat in a muffle furnace at 550°C. After 4 hours, remove and let cool slightly. Place in a desiccator to cool for 30 minutes, then put into a ground glass bottle and store in a desiccator for later use.

5.6 Glass fiber filter membrane. 0.45μm, approximately 100mm in diameter.

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