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

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Water quality. Determination of phosphate. Ion chromatography

水质 磷酸盐的测定 离子色谱法

(English Translation)

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Foreword

To implement the Environmental Protection Law of the People's Republic of China and the Law of the People's Republic of China on Water Pollution Prevention and Control, to protect the environment, this standard is formulated to ensure human health and to regulate the determination of soluble phosphate in water.

This standard specifies ion chromatography for the determination of soluble phosphate in surface water, groundwater and precipitation.

This standard is the first release.

This standard was formulated by the Science and Technology Standards Department of the Ministry of Environmental Protection.

This standard is mainly drafted by. Suzhou Environmental Monitoring Center Station.

This standard is verified by. Suzhou Municipal Center for Disease Control and Prevention, Suzhou Water Supply Company Water Quality Testing Center, China Branch College Ecological Environment Research Center, Taizhou Environmental Monitoring Center Station, Suzhou Water Environment Monitoring Center and Suzhou Environmental Monitoring Central station.

This standard was approved by the Ministry of Environmental Protection on October 25, 2013.

This standard has been implemented since January 1, 2014.

This standard is explained by the Ministry of Environmental Protection.

Water quality - Determination of phosphate - Ion chromatography

1 Scope of application

This standard specifies ion chromatography for the determination of soluble phosphate in water.

This standard applies to the determination of soluble phosphate in surface water, groundwater and precipitation.

When the injection volume is 50 μ l, the detection limit of soluble phosphate (based on PO₄³⁻) is 0.007mg/L.

The lower limit of determination is 0.028 mg/L.

2 Normative references

The contents of this standard refer to the following documents or their terms. For undated references, the valid version applies.

In this standard.

HJ/T 91 Surface Water and Wastewater Monitoring Technical Specifications HJ/T 164 Technical Specifications for Groundwater Environmental Monitoring HJ 493 Technical regulations for the preservation and management of water sampling samples

3 Terms and definitions

The following terms and definitions apply to this standard.

Soluble ortho-phosphate Refers to orthophosphoric acid detected by PO_4^{3-} -formation under the chromatographic conditions specified in this standard by filtration through a $0.45\ \mu\text{m}$ microporous membrane.

Salt (including H_2PO_4^- , HPO_4^{2-} and PO_4^{3-}).

4 Principle of the method

The orthophosphate in various forms in the sample enters the anion column with a strong alkaline eluent to phosphate (PO_4^{3-}). After the form is separated, it is detected by a conductivity detector. According to the retention time qualitative, the external standard method is quantitative.

5 Interference and elimination

Certain metal ions may affect the determination of phosphate and may be removed using a cation exchange column (H type); organic in the sample when the content is high, the C18 column (7.2) is required to remove the interfering substances.

6 Reagents and materials

Analytically pure reagents and conductivity less than $0.5\ \mu\text{S}/\text{cm}$ were used in the analysis and unless otherwise stated.

$0.45\ \mu\text{m}$ microporous membrane filtered deionized water or water of equivalent purity.

6.1

Potassium hydroxide (KOH). excellent grade pure.

6.2

Potassium dihydrogen phosphate (KH_2PO_4). excellent grade pure.

Bake at $105 \pm 5^\circ \text{C}$ to constant weight and store in a desiccator.

6.3

Methanol (CH_3OH).

6.4 Potassium hydroxide solution. $c(\text{KOH}) = 100 \text{ mmol/L}$

Weigh 5.610g potassium hydroxide (6.1) dissolved in an appropriate amount of water, dissolved and transferred to a 1000ml volumetric flask, diluted with water to the standard line, mix. The solution is a stock solution of the eluent and stored in a polyethylene bottle.

6.5 Potassium dihydrogen phosphate standard stock solution.

$\rho(\text{PO}_4^{3-}) = 1000 \text{ mg/L}$

Weigh 1.4329g potassium dihydrogen phosphate (6.2) dissolved in an appropriate amount of water, dissolved and transferred to a 1000ml volumetric flask, diluted with water to Mark the line and mix. The solution was stored in a polyethylene bottle and stored at 4°C for 6 months. You can also buy a commercially available certified standard liquid.

6.6 Potassium dihydrogen phosphate standard use solution.

$\rho(\text{PO}_4^{3-}) = 10.0 \text{ mg/L}$

Accurately measure 1.00ml of potassium dihydrogen phosphate standard stock solution (6.5) in a 100ml volumetric flask, dilute with water to the mark, mix uniform. The solution can be stored for three months at 4°C .

6.7 Acetate microporous membrane. $0.45\mu\text{m}$ pore size (can be used with a syringe).

7 Instruments and equipment

7.1

Ion Chromatograph. An analytical system consisting of an ion chromatograph, operating software, and required accessories.

7.1.1

Column. anion separation column and anion protection column (high capacity alkanol quaternary amine group anion exchange column).

7.1.2

Eluent controller (eluent line generator).