

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

HJ 691-2014

**Ambient air. Sampling technical guideline of semi-volatile
organic compounds (SVOCs)**

环境空气 半挥发性有机物采样技术导则

(English Translation)

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Foreword

To implement the "People's Republic of China Environmental Protection Law" and "People's Republic of China Air Pollution Prevention Law," guard ring Environment, protect human health and regulating ambient air sampling method of semi-volatile organic compounds, the development of this standard.

This standard specifies the semi-volatile organic compounds in ambient air Active sampling requirements.

This standard is the first release.

Appendix A of this standard is an informative annex.

Drafting of this standard. Qingdao Municipal Environmental Monitoring Center, Qingdao Technological University, Qingdao Hengyuan Technology Development Co., the company, Electronic Instrument Factory Co., Ltd. Qingdao Laoshan.

This standard MEP February 7, 2014 for approval.

This standard since April 15, 2014 implementation.

The standard explanation by the Ministry of Environmental Protection.

Semi-volatile organic compounds in ambient air sampling guidelines

1 Scope

This standard specifies the semi-volatile organic compounds in ambient air Active sampling requirements.

This standard applies to the acquisition and development of normative sample ambient air of semi-volatile organic compounds Sampling Method.

2 Normative references

This standard refers to the contents of the following documents or the terms. For undated references, the effective version applies this standard.

HJ 93 ambient air particulate matter (PM₁₀ and PM_{2.5}) sampling technical requirements and test methods HJ 589 Environmental Emergency Monitoring Technical Specifications HJ 664 ambient air quality monitoring sites layout specification (Trial) HJ/T 55 fugitive emission monitoring of air pollutants Technical guidelines Determination of isotope HJ 77.2 Ambient Air and Waste dioxins dilution HRGC - HRMS HJ/T 194 ambient air quality monitoring technical specifications manual HJ/T 374 total suspended particulates sampler technical requirements and test methods HJ/T 375 ambient air samplers technical requirements and test methods

3 Terms and Definitions

The following terms and definitions apply to this standard.

Semi-volatile organic compounds semi-volatile organic compounds (SVOCs) Semi-volatile organic compounds within the meaning of this standard (referred SVOCs) including dioxins, polycyclic aromatic hydrocarbons, organic pesticides, Chlorinated benzenes, polychlorinated biphenyls, pyridine, quinoline, nitrobenzene, phthalates, nitroso amines, aniline, Phenols, polychlorinated naphthalenes and polybrominated diphenyl ethers and other compounds. These organic compounds in ambient air mainly in gas or aerosol Two forms.

Sampling efficiency sampling efficiency (SE) it means the sampling media (filters and sorbent) the ability to target compounds trapped gas. That is greater than or equal with the sample stream sampling After the amount and timing of pumping gas through the sampling media target compounds trapped in the extraction medium to the amount of gas in the actual amount of the target compound Ratio 3.3 Dynamic retention efficiency dynamic retention efficiency (RE) Refers to the extraction medium retains the ability to form a solution of the target compound was added to the sample medium. That is greater than or equal with sample collection After the traffic and time pumping gas through the sampling media, the target compound retention in the extraction medium and added to the sample in solution Medium volume ratio. Dynamic retention efficiency is less than equal to the sampling efficiency.

Static retention efficiency static retention efficiency After the target compound refers to an amount of the extraction medium was added, and the sample stored under the same conditions, the extraction medium of the title compound Material retention.

Desorption efficiency desorption efficiency it refers to the ability of target compound desorption from the extraction medium. After coming quantitative target compound is added

to the extraction medium, according to the sample phase the same extraction conditions, the ratio of the amount of the amount of liquid extracted target compound 3.6 Field blank field blank After the extraction medium as a blank field to the sampling site, and the extraction medium to be sampled at the same time to unpack and install Sampling head, but without sampling, sample After sampling, remove the blank field sampling medium, according to the sample in the same manner and to save, Then shipped back to the laboratory together with the samples, according to the same procedure as sample analysis, the analysis results (ie field blank) for checking Mining Kind of media environment and transport in the field sampling procedure, sampling for contamination.

Laboratory gaps laboratory method blank (LMB) in the laboratory, according to the same procedure as the analysis of the sample and extraction medium samples of the same batch, the measurement result is used to check the real Glassware, reagents, alternatives, internal standards, equipment, solvents, and the extraction medium used during the test for contamination.

Sampler operating point flow Air flow rate of sampler Under working conditions, by sampling the head (or adsorption tube) at the entrance of the gas production flow, called the sampling flow rate operating point, the value remains constant during the sampling process.

Standard state standard conditions of air it refers to the atmospheric pressure 101.325kPa, a temperature of 273K of state.

3.10

Low-flow sampling low-volume sampling Sampling flow sampling 0 ~ 5L/min between.

3.11

The sampling flow middle-volume sampling Operating point flow 100L/min sampling.

3.12

Large volume sampling high-volume sampling Operating point flow 225L/min of sampling.

3.13

Large flow sampling ultra- volume sampling Operating point flow of 800 L/min sampling.

4 Sampling equipment

Sampling large flow, high flow and medium flow mainly for collection in gaseous or aerosol state exists in two forms at the same time, in ambient air concentration is very low, a large volume of enriched SVOCs. For some higher boiling state exists mainly particulate matter the SVOCs, you can only use sampling filter. Low-flow sampling mainly applicable to collect gas state exists SVOCs.

4.1.1 Large flow, high flow and medium flow sampling head and the technical requirements

Large flow, high flow or the flow sampling head consists of sampling cutter, membranes and membrane support portion, filling the adsorbent Sampling tube, sampling tube frame composition and silicone rubber seals, see Figure 1. Material sampling head should be made of stainless steel or Teflon, etc.

Or organic material does not occur with the measured pollutant chemical reaction is not adsorbed. Monitoring purposes should be based on the relevant standards to select cut Cutter, performance parameters indicators should meet the requirements of HJ 93. For sampling, cutting vessel traffic and large flow cut Point should be used 100L/min and 225L/min, using a sampling tube filled with adsorbent by an inner diameter of 60mm, length of 125mm borosilicate Glass, support for the adsorbent pore diameter 1.2mm (16 mesh) stainless steel screen. Commonly used adsorbent density 0.022g/cm³ Polyurethane foam (referred PUF), macroporous resin or a combination of two adsorbents. For large volume sampling, the sampling tube Dimensions shall comply with the relevant standards. Membrane filters using fine glass or quartz fiber filters having a diameter of 102mm. Filters for when 0.3μm standard particle holdout efficiency of not less than 99%, the air flow velocity of 0.45m/s, single membrane resistance is not greater than 3.5kPa.

1 large flow, high flow and medium flow sampling head structure diagram

4.1.2 Low flow sampling tube

Low-flow sampling tube filled according to the way of the adsorbent can be divided into three types, FIG. 2A is a single-fill mode, FIG. 2B is a three-fill Charge mode, wherein, a sorbent and sorbent b may be the same or different. 2C is around two fill mode. sampling Usually the pipe length 10cm, inner diameter of 20mm borosilicate glass. In establishing sampling method, select the fill in the form adsorbent Mainly it depends on the nature and properties of adsorbent test compound, no matter what form filling options, which should reach the sampling efficiency from 65% to 125%.

C Figure a- front-end sampling tube; rear end b- sampling tube; 1- wool; 2- tip adsorbent; 3- backend adsorbent; 4 - glass fiber filters.

Figure 2 a schematic view of low flow sampling tube

Technical Requirements 4.2 sampler

4.2.1 General technical requirements

SVOCs for large flow sampling, large or medium-volume sampler flow performance shall meet HJ 93, HJ/T 194 and HJ/T 374 requirements. Sampler shall have a cumulative sample