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

GBZ/T 300.106-2018

**Determination of toxic substances in workplace air -- Part 106:
Chloroacetone
(English Translation)**

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Foreword

This part is the 106th part of GBZ/T 300 "Determination of Toxic Substances in Workplace Air".

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This section is mainly drafted by. Shanghai Minhang District Center for Disease Control and Prevention, China Center for Disease Control and Prevention, Occupational Health and Poison Control Institute, Shanghai Municipal Center for Disease Control and Prevention, Anhui Provincial Center for Disease Control and Prevention.

1 Scope

This part of GBZ/T 300 specifies solvent desorption-gas chromatography for the determination of chloroacetone in the air of the workplace.

This section applies to the detection of vapor phase chloroacetone concentration in the workplace air.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the dated version applies to this document.

For undated references, the latest edition (including all amendments) applies to this document.

GBZ 159 Sampling specification for monitoring of hazardous substances in the workplace air
GBZ/T 210.4 Guide to the development of occupational health standards - Part 4.
Methods for the determination of chemical substances in the workplace air

3 Basic information on chloroacetone

The basic information of chloroacetone is shown in Table 1.

Table 1 Basic information of chloroacetone

Chemical material

Chemical Abstracts

(CAS number)

Molecular formula relative molecular mass Chloroacetone (Chloroacetone) 78-95-5
C3H5ClO 92.52

4.1 Principle

The vaporized chloroacetone in the air is collected by a silicone tube, and the acetone-n-hexane solution is desorbed and injected, separated by a gas chromatography column, and electron-trapped.

Detector detection, qualitative for retention time, peak height or peak area quantitation.

4.2 Instrument

4.2.1

Silicone tube, solvent desorption type, containing 100mg/50mg silica gel.

4.2.2

Air sampler, flow rate from 0mL/min to 500mL/min.

4.2.3

Solvent desorption bottle, 2mL.

4.2.4

Microinjectors.

4.2.5

Gas chromatograph with electronic capture detector; instrument operation reference conditions.

- a) Column. 30m x 0.32mm x 0.25 μ m, 5% phenyl-1% vinylmethyl siloxane;
- b) Column temperature. initial temperature 60 ° C, kept for 0.5 min, heated to 80 ° C at 20 ° C/min, held for 3 min;
- c) gasification chamber temperature..200 ° C;
- d) detector temperature. 300 ° C;
- e) carrier gas (nitrogen) flow rate. 2mL/min;
- f) Split ratio. 10.1.

4.3 Reagents

4.3.1

Desorption solution (acetone-n-hexane solution). Dilute to 100 mL with 40 mL of acetone and n-hexane, and chromatographically identify the interference-free peak.

4.3.2

Standard solution. Add the desorption solution to the volumetric flask. After weighing accurately, add a certain amount of chloroacetone, then accurately weigh it, add the solution.

To the scale; the concentration of the solution is calculated from the difference between the two weighings, which is a standard stock solution and stored in a refrigerator at 4 °C. Dilute with desorbent before use 24.0 μ g/mL chloroacetone standard solution. Or formulated with a nationally recognized standard solution.

4.4 Sample collection, transportation and storage

4.4.1

On-site sampling shall be performed in accordance with GBZ 159.

4.4.2

Short-time sampling. At the sampling point, a ≤ 10 min air sample was collected with a silicone tube at a flow rate of 200 mL/min. Immediately after sampling Close the ends of the silicone tube and store and store in a clean container. The sample can be stored for 3 days at room temperature.

4.4.3

Sample blank. At the sampling point, open both ends of the silicone tube and immediately close it, then transport, store and measure with the sample. Each batch sample is not less than 2 sample blanks.

4.5 Analysis steps

4.5.1

Sample treatment. Pour the front and back silica gel into two solvent desorption bottles, add 1.0mL desorption solution, and then desorb for 30min.

Shake from time to time. The sample solution is for measurement.

4.5.2

Preparation of standard curve. Take 4 to 7 volumetric flasks, dilute the standard solution with desorbent solution to a concentration range of 0.0μg/mL to 24.0μg/mL.

The standard series of chlorine acetone; according to the operating conditions of the instrument, adjust the gas chromatograph to the best measurement state, inject 1.0μL, respectively Peak height or peak area for each concentration of the standard series. Draw a standard curve or the peak area to the corresponding concentration of chloroacetone (μg/mL) or Calculate the regression equation and its correlation coefficient should be ≥ 0.999 .

4.5.3

Sample determination. The peak height or peak area value measured by measuring the sample solution and the sample blank solution using the operating conditions of the standard series.

The concentration of chloroacetone (μg/mL) in the sample solution was obtained from a standard curve or a regression equation. If the concentration of chloroacetone in the sample solution exceeds the measurement range, After dilution with a desorbent, the measurement is multiplied by the dilution factor.

4.6 Calculation

4.6.1

Convert the sample volume to the standard sample volume according to the method and requirements of GBZ 159.

4.6.2

Calculate the concentration of chloroacetone in air according to formula (1).

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