



US EPA Methods

- ☁ US EPA TO-15A Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially Prepared Canisters and Analyzed by Gas Chromatography–Mass Spectrometry (GC-MS)
- ☁ US EPA TO-14A Determination Of Volatile Organic Compounds (VOCs) In Ambient Air Using Specially Prepared Canisters With Subsequent Analysis By Gas Chromatography

UK Standards & Methods

- ☁ UK Environment Agency Technical Guidance Note M16 – Monitoring volatile organic compounds in stack gas emissions
- ☁ UK Environment Agency Technical Guidance Note M8 – Monitoring ambient air



Mainland China Standards & Methods

☁ HJ 759-2015 、气相色谱-质谱法

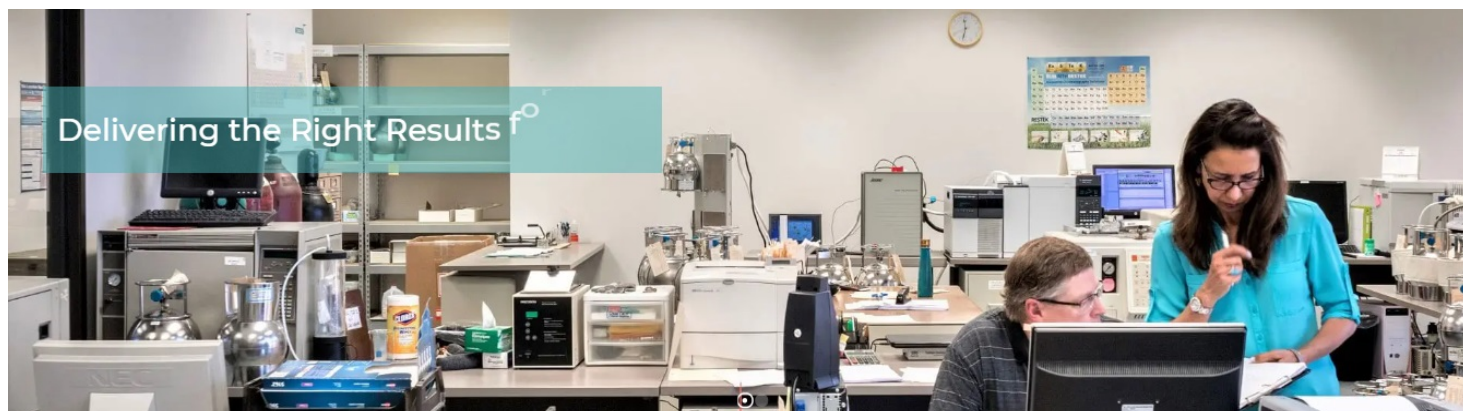
Taiwan China Standards & Methods

☁ NIEA A715.15B -空氣中揮發性有機化合物檢測方法-不銹鋼採樣筒 / 氣相層析質譜儀法

ISO Standards & Methods

☁ To be update

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Delivering the Right Results for

> Nutech Instruments Profile

> Nutech Projects & Cases

> Catalogs | Leaflets | Manuals

> Nutech Services

> VOCs Related Standards & Methods

> Technical Articles *

> Air Lab Sample Prep Products

> Air/Gas Sampling Products

> Online VOCs Analysis Products

> Portable VOCs Analysis Products

> Accessories & Consumables

* > Application Note by Using Nutech Preconcentrator System for TX 85 Target Compounds in Lab Analysis

> Not all 3.2 L air sampling canisters are 3 liters. Wait... what!?

> Application Note by Using Nutech Preconcentrator System for PAMS Compounds in Lab Analysis

* > Nutech Instruments Presents New Products on Guangzhou IE Expo 2019

* > Nutech Perfect First Show in IE Expo China 2019

* in Chinese

Air Lab Sample Prep Products

8910 Preconcentrator

3610 Autosampler

2104 Canister Cleaning System

2203 Precision Static Dilutor

7000 NMHC Analyzer

Air/Gas Sampling Products

2703 Automatic Air Sampling Device

2600ST Multifunctional Automatic Air Sampling System

2600GT Carry-on Automatic Multifunctional Sampling System

Online VOCs Analysis Products

6000-C NMHC Online Analyzer

6000-5D VOCs Online Analyzer

PCGC-TOF VOCs Online Analysis System

N20 TVOC Online Analyzer

7000 NMHC Analyzer

Portable VOCs Analysis Products

3000 Portable NMHC Analyzer

Accessories & Consumables

SUMMA Sampling Canister & Standard Gas & Tedlar Bag

Nutech's Product Lines

We offer the most comprehensive VOCs analysis products on the market.

Air Lab Products



Air / Gas Sampling Products



Online VOCs Analysis Products



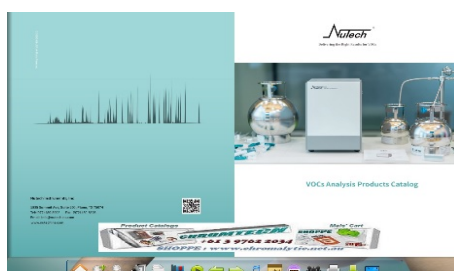
Portable VOCs Analysis Products



Accessories & Consumables



Chromtech's FlipPAGE HTML
Quick Overview
Nutech 2020 Catalog (18p)



* **US EPA METHOD TO-15A (Sept 2019)**
Determination of Volatile Organic Compounds (VOCs) in Air
Collected in Specially Prepared Canisters
and Analyzed by Gas Chromatography–Mass Spectrometry (GC-MS)





US EPA Methods PDF (ASK for the **actual** references !)

Compendium Method **TO-15** Determination Of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/ Mass Spectrometry (GC/MS)

METHOD 25A - DETERMINATION OF TOTAL GASEOUS ORGANIC CONCENTRATION USING A FLAME IONIZATION ANALYZER

Method **325B**—Volatile Organic Compounds from Fugitive and Area - Sampler Preparation and Analysis

Method **325A**—Volatile Organic Compounds from Fugitive and Area - Sampler Deployment and VOC Sample Collection

Compendium Method **TO-17** Determination of Volatile Organic Compounds in Ambient Air Using Active Sampling Onto Sorbent Tubes

Compendium Method **TO-16** Long-Path Open-Path Fourier Transform Infrared Monitoring Of Atmospheric Gases

Compendium Method **TO-14A** Determination Of Volatile Organic Compounds (VOCs) In Ambient Air Using Specially Prepared Canisters With Subsequent Analysis By Gas Chromatography

Compendium Method **TO-13A** Determination of Polycyclic Aromatic Hydrocarbons (PAHs) in Ambient Air Using Gas Chromatography/ Mass Spectrometry (GC/MS)

METHOD TO-12 METHOD FOR THE DETERMINATION OF NON-METHANE ORGANIC COMPOUNDS (NMOC) IN AMBIENT AIR USING CRYOGENIC PRECONCENTRATION AND DIRECT FLAME IONIZATION DETECTION (PDFID)

Compendium Method **TO-11A** Determination of Formaldehyde in Ambient Air Using Adsorbent Cartridge Followed by High Performance Liquid Chromatography (HPLC) [Active Sampling Methodology]

Compendium Method **TO-10A** Determination Of Pesticides And Polychlorinated Biphenyls In Ambient Air Using Low Volume Polyurethane Foam (PUF) Sampling Followed By Gas Chromatographic/Multi-Detector Detection (GC/MD)

Method **TO-9A** Determination Of Polychlorinated, Polybrominated And Brominated/ Chlorinated Dibenzo-p-Dioxins And Dibenzofurans In Ambient Air

METHOD TO-8 METHOD FOR THE DETERMINATION OF PHENOL AND METHYLPHENOLS (CRESOLS) IN AMBIENT AIR USING HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

METHOD TO-7 METHOD FOR THE DETERMINATION OF N-NITROSODIMETHYLAMINE IN AMBIENT AIR USING GAS CHROMATOGRAPHY

METHOD TO-6 Revision 1.0 September, 1986 METHOD FOR THE DETERMINATION OF PHOSGENE IN AMBIENT AIR USING HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

METHOD TO-5 Revision 1.0 April, 1984 METHOD FOR THE DETERMINATION OF ALDEHYDES AND KETONES IN AMBIENT AIR USING HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC)

Compendium Method **TO-4A** Determination of Pesticides and Polychlorinated Biphenyls in Ambient Air Using High Volume Polyurethane Foam (PUF) Sampling Followed by Gas Chromatographic/Multi-Detector Detection (GC/MD)

METHOD TO-3 REVISION 1.0 April, 1984 METHOD FOR THE DETERMINATION OF VOLATILE ORGANIC COMPOUNDS IN AMBIENT AIR USING CRYOGENIC PRECONCENTRATION TECHNIQUES AND GAS CHROMATOGRAPHY WITH FLAME IONIZATION AND ELECTRON CAPTURE DETECTION

METHOD TO-2 Revision 1.0 April, 1984 METHOD FOR THE DETERMINATION OF VOLATILE ORGANIC COMPOUNDS IN AMBIENT AIR BY CARBON MOLECULAR SIEVE ADSORPTION AND GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)

METHOD TO-1 Revision 1.0 April, 1984 METHOD FOR THE DETERMINATION OF VOLATILE ORGANIC COMPOUNDS IN AMBIENT AIR USING TENAX® ADSORPTION AND GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)





Application Note by Using Nutech Preconcentrator System for 117 VOCs Lab Analysis Nutech : G Dai etc PDF

Using Summa or silica coated canister to take ambient air samples to the lab and using a three-stage cryogenic preconcentration system + GC/MS to analyze air VOCs is an approved reliable technology.

US EPA published EPA TO-15 method in 1999 and has been continuously used labs in USA, from then on.

The major target compounds are 65 listed VOCs.

According to USA EPA. China published HJ759-2015 in 2015 and the technology is similar with US EPA. In USA the TO-15 method is also used for Photochemical fog Air Monitoring System (PAMS) which includes 56 hydrocarbon compounds.

In addition, US EPA also published EPA TO-11 and listed 13 aldehyde compounds by DNPH cartridge/HPLC method.

The US EPA's latest publication TO-15A is still using the preconcentration method to handle more VOCs in ambient air.

The new TO-15A increased 17 targeted compounds and make it to a total of 82 target compounds.

Much of the research or new instrument development is focusing on combining all targeted compounds together and analyzed them by using same method and/or technology.

This research is trying to develop this kind of technique to cover all 117 VOC compounds in a single method.

The Nutech teams in both USA and China tried in their labs by using Nutech preconcentration (8910) system with GC/MS. application note is their recent results.

The recent approach by some vendors using the **Deans Switch** technology with GC/FID/MSD is used for testing all 117 compounds. In our approach, testing all 117 target compounds can be successfully accomplished without using the Deans Switch and FID, this is the major purpose for this application.

Our results show that we achieved this and this is also a cost-effective method for the current TO-15 and PAMS application.

Our results show that in a relative wide concentration range (0.5-10.0ppb), the analysis precision, accuracy, blank, initial calibration, continue calibration verification etc. all meet the QA/QC control requirements in EPA TO-15. indicates for those labs who now using GC/MS without Deans Switch and FID may also do their 117 compounds combined analysis with a good data quality.

The **Nutech** preconcentrator may be more widely used successfully in a broader range of air VOCs analysis