

# Total Organic Halogen Analyzer Model TOX-300

- *Cost effective solution for environmental analysis*
- *Matrix independent soot free combustion program*
- *Improved lower measuring limit*



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**Nittoseiko Analytech Co., Ltd.**

Advanced database software and the reputed coulometry methods allow measurement of chlorine and sulfur content in solid, liquid and gaseous samples down to the ppm level – to be fully utilized at various plants.

(Conforms to US EPA9020B, 9021, 9076, ISO9562, 11480, DIN38414-17, 18 etc.)

## Features

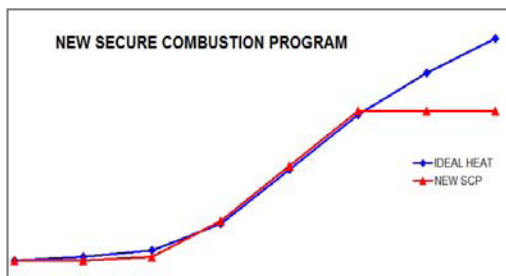
### 1 High-Speed Analysis Using the Auto Boat Controller

Measurement is performed automatically in 6 to 12 minutes simply by placing a sample boat and starting measurement. Since the sample boat inlet box is provided with a cooling function (electronic cooling), the boat can be cooled in a short period of time for faster repetitive measurement.



### 3 Matrix Independent, unique single program for all samples.

Secure Combustion Program (SCP) enables ideal pyrolysis of substances in sample.



### 2 Application-Oriented System Configuration

The use of various options according to the particular sample make it possible to construct a system that precisely matches the application.

#### Basic Configuration

Electric furnace & Detector (horizontal type)  
Control unit (PC and printer)



Control unit (PC and printer)



Electric furnace & Detector unit TOX-300

#### Options (Injector, Sampler, Other)



Auto Boat Controller ABC-210



Liquid Sample Changer ABC-210+ASC-250L



Solid Sample Changer ASC-240S



Gas Injector GI-210

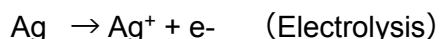
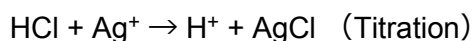
TOX-300 uses the same ABC and autosamplers as NSX-2100H. Customers can upgrade to high performance NSX-2100H by purchasing HF-210 and MCD-210.

## Measuring Principle

### ■ Chlorine Analysis

#### Standard Set with Chlorine Titration Cell Unit

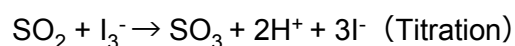
Samples are burned in an Argon/Oxygen atmosphere. The resulting chloride is lead into a titration cell where it is automatically titrated by silver ions generated coulometrically. The amount of chlorine is then calculated from the quantity of electricity required for the titration.



### ■ Sulfur Analysis

#### Standard Set with Sulfur Titration Cell Unit

Samples are burned in an Argon/Oxygen atmosphere. The resulting sulfur dioxide is lead into a titration cell where it is automatically titrated by triiodide ions generated coulometrically. The amount of sulfur is then calculated from the quantity of electricity required for the titration.



# Applications

## ■ Chlorine Analysis

Sample Name	Sample Size(mg)	No.of Measurements	Measured Value(ppm)	RSD(%)
Tap Water (AOX)	40ml	3	150ppb	2.4
Waste Water (AOX)	10ml	3	600	3.3
Polycarbonate Resin	30	3	8.5	1.3
Rubber	2	3	8.4	4.1
Cement	30	3	34	0.4

## Mode AOX

### ■ Absorbable Organic Halogen Measurement (AOX)

Easy, rapid and accurate Absorbable Organic Halogen measurement in environmental and industrial waste water by Mitsubishi adsorption and coulometry technique based on ISO9562, EPA9020 etc.

#### Adsorption module TXA-04

Optional unit for automatic AOX adsorption and inorganic halogen washing.



Syringe	Disposable syringe 20ml
Flow method	Automatic syringe system
Maximum Flow Volume:	
Syringe for flowing samples	300ml (10 × n ml (n=1 to 30))
Syringe for washing	50ml (5 × n ml (n=1 to 10))
Syringe quantity	5 pcs (for flowing samples or washing inorganic halide)
Column	3mm φ × 40mm, two-stage glass column
Power	AC 100V to 240V, 50/60Hz, 50VA
Dimensions / Weight	Approx. 480(W) × 270(D) × 530(H) mm / 13 kg

## ■ Sulfur Analysis

Sample Name	Sample Size(mg)	No.of Measurements	Measured Value(ppm)	RSD(%)
Polycarbonate Resin	20	3	270	3.7
Carbon	30	3	5.4	9.7
Surface Activator	5	3	883	0.5
Zinc Oxide	30	3	14	0.7
Natural Gas	10ml	3	3.7	15

## Mode POX

### ■ Purgeable Organic Halogen Measurement (POX)

With the option POX-100, volatile Organic Halogens in environmental and industrial waste water are measured.

#### POX Spurper Model POX-100

Optional unit for spurging purgeable Organic Halogen with easy operation



Sample volume	100ml
Heater temperature	From room temperature to 60degC
Power supply	AC100/115/230/240V, 50/60Hz, 150VA
Dimensions	Approx. 290(W) x 130(D) x 195(H) mm
Weight	Approx. 6kg

## Options



MODEL	ASC-240S Solid Sample Changer
Sample	Solid, Liquid (manual)
Amount of sample	Solid 30mg Liquid 100μl
Number of sample	Ceramic, 40 pos.
Sample injection	Auto boat control
Boat cooling	Peltier
Power	AC100V to 240V, 50/60Hz, 80VA
Dimensions / Weight	480(W)×460(D)×520(H) mm / 31kg



MODEL	ABC-210 Auto Boat Controller
Sample	Solid, Liquid
Amount of sample	Solid 30mg Liquid 100μl
Boat	Quartz, disposable ceramic
Boat cooling	Peltier
Power	AC100V to 240V, 50/60Hz, 40VA
Dimensions / Weight	445(W)×250(D)×180(H)mm / 9 kg



MODEL	ASC-250L Liquid sample changer
Sample	Liquid (non-aqueous, aqueous)
Injection	Max 100μl (depend on sample)
Injection speed	0.4 - 50μl/sec (depend on sample)
Number	50pos in each 2, 4, 6ml vial tray
Power	AC100V to 240V, 50/60Hz, 180VA
Dimensions / Weight	460(W)×320(D)×470(H)mm / 16 kg



MODEL	GI-210 Gas injector
Sample	Non-pressurized gas, Volatile liquid
Injection	10μl for liquid, 10ml for gas
Carrier	Argon
Heat	80℃ for liquid
Power	AC100V to 240V, 50/60Hz, 20VA
Dimensions / Weight	220(W)×200(D)×110(H)mm / 4 kg

## Standard Specifications

Models	Chlorine and Sulfur Analyzer / Total Organic Halogen Analyzer Model TOX-300
Analysis methods	Oxidative pyrolysis / Coulometric titration
Oxidation decomposition	Quartz tube combustion method
Samples	Liquids, solids and gaseous (Use the gas injector Model GI-210.) samples
Sample Injection	Automatic sample boat injection with Auto Boat Controller
Heater furnace	Horizontal furnace: Up to 1100 degrees Celsius
Detection method	Oxidation-reduction potential (potentiometric detection by potential)
Detection electrode	Chlorine measurement: Silver electrode Sulfur measurement: Platinum electrode
Titration control	Automatic control of electrolytic current
Measurement range	Refer to Table "Measurement Ranges".

### Measurement Ranges

Absolute volume	Solid samples	Liquid samples	Gas samples
Chlorine: 0.05 $\mu$ g to 50 $\mu$ g	2 $\mu$ g/g (30mg)	0.5 $\mu$ g/ml (100 $\mu$ l)	5mg/m <sup>3</sup> (10ml)
Sulfur: 0.05 $\mu$ g to 50 $\mu$ g	2 $\mu$ g/g (30mg)	0.5 $\mu$ g/ml (100 $\mu$ l)	5mg/m <sup>3</sup> (10ml)

(Usual samples: Samples which are combustile under 1100 degrees Celsius and have no interference.)

Sample volume	Liquid sample: 100 $\mu$ l or less, Solid sample: 30mg or less
Measurement Time	Within 10 minutes / one measurement (at 2 $\mu$ g measurement)
Gas	Oxygen (purity : 99.7 % or more) and Argon (purity : 99.98 % or more)
Power	TOX-300 main unit: AC100/115/230/240V, 50/60Hz, 980VA
	ABC-210 unit: AC100/115/230/240V, 50/60Hz, 40VA
Dimensions and weight	TOX-300 main unit: 550(W) x 360(D) x 437(H)mm , approx. 36kg
	ABC-210 unit: 440(W) x 250(D) x 180(H)mm, approx. 11kg
Computer	OS: Microsoft Windows® 7 Professional (32/64 bit)
	Drive: One CD-ROM disk drive
	Port: One USB port
Printer	Windows®-compatible printer

