NIST No. 1616b (Sulfur in Kerosene (Low Level))

Sheet No.: **NSX2100H-PE-003E** Petroleum chemistry

Measurement model: **TS-2100H System** Relevant standard: ASTM D5453
ABC-210/HF-210/SD-210 JIS K 2541

Detection method: Ultraviolet Fluorescence method

The sulfur content in heating oil becomes sulfur oxide (SOx) during combustion and directly affects the atmospheric air pollution as substance of concern. For this reason, it needs to be low concentration and the quantitation method complying it is required. The sulfur analysis device (**TS-2100H**) of Mitsubishi Chemical Analytech Co., Ltd. can analyze the sulfur in heating oil quickly with accuracy.

Sample name	Sulfur in Kerosene (Low Level)
Analytical item	Quantitative analysis of sulfur in combustion method
Standard	**ASTM-D5453**: standard testing method for measuring sulfur contained in carbon hydride and fuel using an ultraviolet fluorescence detector **JIS K 2541**: raw petroleum and petroleum product – sulfur content testing method – ultraviolet fluorescence method
Analytical principle	Ultraviolet fluorescence method: Sample is burned in argon / oxygen stream and the generated sulfur dioxide is introduced to the cell of ultraviolet irradiation. The fluorescence intensity generated by ultraviolet irradiation is measured and the amount of sulfur is calculated based on the standard curve that has been created using the standard sulfur sample. Organic-S + O_2 → SO_2 + CO_2 (combustion) SO_2 + hv → SO_2 + hv_2 (ultraviolet fluorescence)
Result of sulfur analysis Horizontal combustion method	
Required analysis time Horizontal type	Pretreatment (---) minutes, Measurement (9) minutes Total (9) minutes/ (1) measurement

Sample name	**TS-2100H** analysis value (S mg/kg)				
	1	2	3	**Average**	RSD (%)
Sulfur in Kerosene (Low Level)	8.28	8.21	8.19	**8.23**	0.55

*This sheet is provided as a reference and does not guarantee analytical values. Optimal conditions may vary depending on external factors, such as the analysis environment, and the nature of the sample.

Conditions of sulfur analysis

Horizontal combustion method

Measurement condition

Reaction tube ... double tube for ABC

Temperature of electric furnace

Inlet Temp 800°C

Outlet Temp 1,000°C

PMT Range High (for Low concentration)

Gas flow rate

Ar..... 300mL/min

O_2 ..... 300mL/min

[ABC program]

Sample name	1st		2nd		3rd		End Time (sec)	Cool Time (sec)	Delay Time (sec)
	Pos (mm)	Time (sec)	Pos (mm)	Time (sec)	Pos (mm)	Time (sec)			
Lubrication oil	105	20	125	80	140	20	100	60	200

Boat Speed: 20mm/sec Ar Time: 30sec O_2 Time (sec): 600sec

Standard sample for standard curve: S_Dibutyl disulfide / toluene
0, 1, 10, 50µg/mL × 20µL

Amount of introduced sample: 20µL

- The sample was not diluted, but was introduced directly.