NIST No. 1619b (Sulfur in Residual Fuel Oil (0.7%))

Sheet No.: **NSX2100V-PE-006E** Petroleum chemistry

Measurement model: **TS-2100V System** Relevant standard: ASTM D5453
ASC-250L/VF-210/SD-210 JIS K 2541

Detection method: Ultraviolet Fluorescence method

The fuel oil residue is purified using catalyzer for reuse. If the amount of sulfur in this fuel oil residue can be analyzed with accuracy, the devulcanization can be efficiently carried out using the proper amount of catalyzer. The sulfur analysis device (**TS-2100V**) of Mitsubishi Chemical Analytech Co., Ltd. can analyze the sulfur in fuel oil residue quickly with accuracy.

Sample name	Sulfur in Residual Fuel Oil (0.7%)
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. $Organic\text{-}S + O_2 \rightarrow SO_2 + CO_2$ (combustion) $SO_2 + hv \rightarrow SO_2 + hv_2$ (ultraviolet fluorescence)
Result of sulfur analysis Vertical combustion method	

Sample name	**TS-2100V** analysis value (S %)				
	1	2	3	**Average**	RSD (%)
Sulfur in Residual Fuel Oil (0.7%)	0.713	0.716	0.717	**0.715**	0.30

Required analysis time Vertical type	Pretreatment (---) minutes, Measurement (4) minutes Total (4) minutes/ (1)measurement

*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 Vertical combustion method	**Measurement condition** Temperature of electric furnace Inlet Temp 900°C Outlet Temp 1,000°C PMT Range Low (for High concentration) **Gas flow rate** Ar..... 100mL/min O_2 ..... 500mL/min Ar time: 30sec O_2 time: 120sec Standard sample for standard curve: S_Dibutyl disulfide / toluene 0, 1, 10, 50, 100µg/mL × 30µL Amount of introduced sample: 30µL - For the sample for measurement, the sample diluted to 1% with toluene was used. The obtained measurement value multiplied by dilution rate was set to the sulfur quantitative value.