Absorption Spectrum of Humic Substance (Suwannee River)

INTRODUCTION

The fluorescence spectrum of humic substance, the organic substance contained in river and lake water, was measured. The fluorescence properties of humic substance varies depending on the environment in which the substance is produced and thus, the 3D fluorescence spectrum is currently used as the main method to identify the fluorescence properties of humic substance. F-7000 obtains data at 60,000 nm/min by the ultra-high speed scanning. Thus, even when there is a large number of samples, the fluorescence properties can be confirmed easily. This time, the standard of the humic substance in natural water was used to measure the humic substance concentration in river water. By using the standard, it is possible to compare the result with the reported value.

SAMPLE

SAMPLE NAME : Humic substance
(SUWANNEE RIVER Humic Acid Standard II) (IHSS)

CONCENTRATION : 10 mg/L

INSTRUMENT CONDITIONS

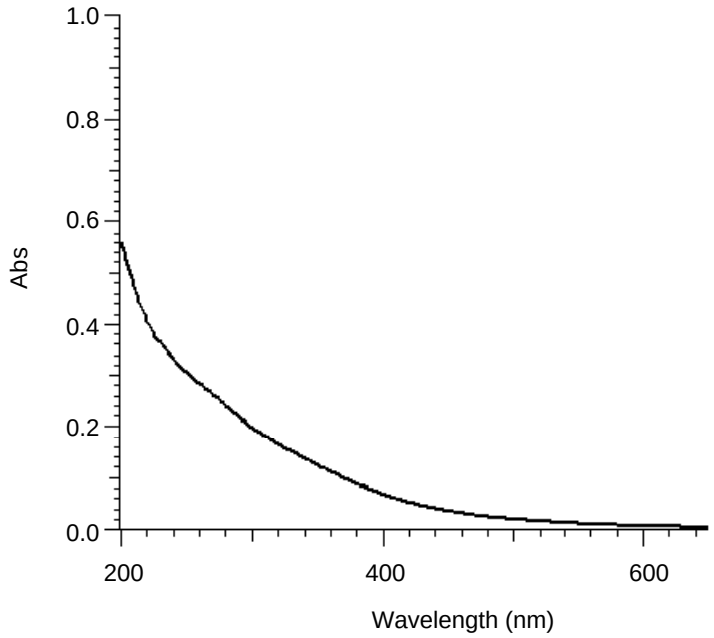
INSTRUMENT : U-5100

SCAN SPEED : 300 nm/min

BANDPASS : 5 nm

Preparation

Humic substance 10 mg
↓ ← Purified water (add a little amount of 1 mol/L NaOH)
Dissolution
↓
0.1 mol/L $NaClO_4$ 10 mL
↓
Make up the volume to100 mL
↓
Filtration
↓
Adjust the pH to 8
↓
100 mg/L humic substance standard solution



KEY WORDS
Environmental Analysis Related, Environmental Water, Humic Substance, River Water, Lake, Absorption Spectrum, River, Natural Water, Environmental, UV, U-5100, FL, F-7000

Fluorophotometer (FL)

Sheet No. FL100004-01

Excitation Spectrum of Humic Substance (Suwannee River)

INTRODUCTION

The fluorescence spectrum of humic substance, the organic substance contained in river and lake water, was measured. The fluorescence properties of humic substance varies depending on the environment in which the substance is produced and thus, the 3D fluorescence spectrum is currently used as the main method to identify the fluorescence properties of humic substance. F-7000 obtains data at 60,000 nm/min by the ultra-high speed scanning. Thus, even when there is a large number of samples, the fluorescence properties can be confirmed easily. This time, the standard of the humic substance in natural water was used to measure the humic substance concentration in river water. By using the standard, it is possible to compare the result with the reported value.

SAMPLE

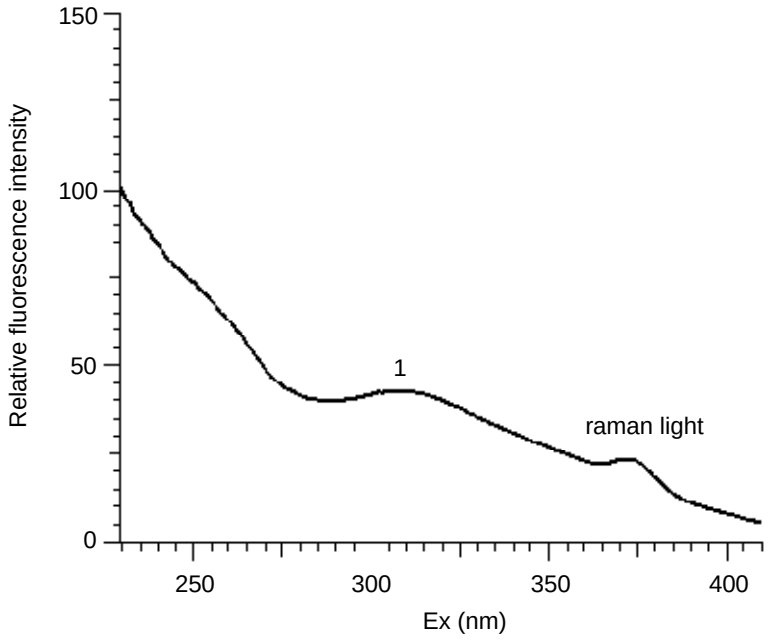
SAMPLE NAME : Humic substance
(SUWANNEE RIVER Humic Acid Standard II) (IHSS)

CONCENTRATION : 10 mg/L

INSTRUMENT CONDITIONS		PEAKS (nm)
INSTRUMENT	: F-7000	1 : 309
EM WAVELENGTH	: 430 nm	
EX BANDPASS	: 10 nm	
EM BANDPASS	: 10 nm	
SCAN SPEED	: 1200 nm/min	
RESPONSE	: Auto	
PHOTOMULTIPLIER	: R3788	
PHOTOMULTIPLIER VOL.	: 400 V	

Preparation

Humic substance 10 mg
↓ ← Purified water (add a little amount of 1 mol/L NaOH)
Dissolution
↓
0.1 mol/L $NaClO_4$ 10 mL
↓
Make up the volume to100 mL
↓
Filtration
↓
Adjust the pH to 8
↓
100 mg/L humic substance standard solution



[Corrected spectrum]

KEY WORDS
Environmental Analysis Related, Environmental Water, Humic Substance, River Water, Lake, Excitation Spectrum, River, Natural Water, Environmental, FL, F-7000

Fluorophotometer (FL)

Sheet No. FL100004-02

Hitachi High-Technologies Corporation

Fluorescence Spectrum of Humic Substance (Suwannee River)

INTRODUCTION

The fluorescence spectrum of humic substance, the organic substance contained in river and lake water, was measured. The fluorescence properties of humic substance varies depending on the environment in which the substance is produced and thus, the 3D fluorescence spectrum is currently used as the main method to identify the fluorescence properties of humic substance. F-7000 obtains data at 60,000 nm/min by the ultra-high speed scanning. Thus, even when there is a large number of samples, the fluorescence properties can be confirmed easily. This time, the standard of the humic substance in natural water was used to measure the humic substance concentration in river water. By using the standard, it is possible to compare the result with the reported value.

SAMPLE

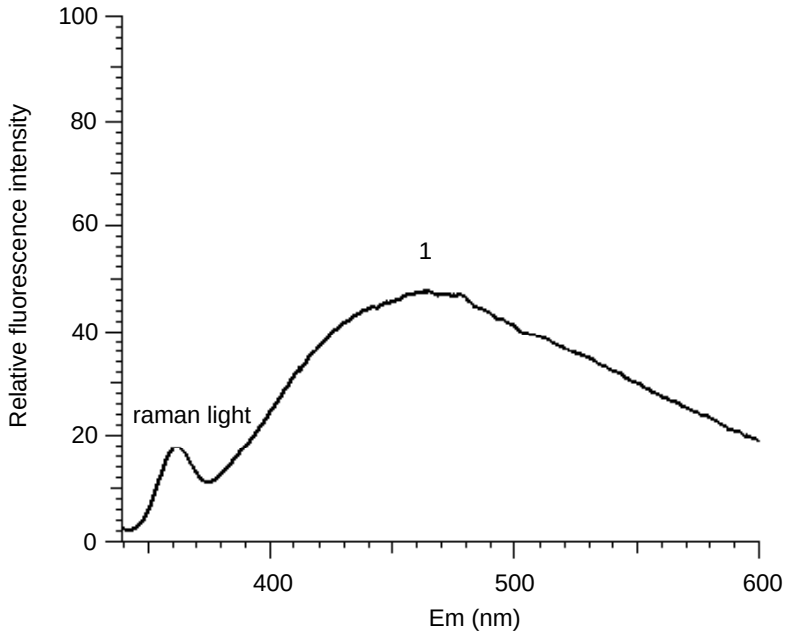
SAMPLE NAME : Humic substance
(SUWANNEE RIVER Humic Acid Standard II) (IHSS)

CONCENTRATION : 10 mg/L

INSTRUMENT CONDITIONS		PEAKS (nm)
INSTRUMENT	: F-7000	1 : 460
EX WAVELENGTH	: 320 nm	
EX BANDPASS	: 10 nm	
EM BANDPASS	: 10 nm	
SCAN SPEED	: 1200 nm/min	
RESPONSE	: Auto	
PHOTOMULTIPLIER	: R3788	
PHOTOMULTIPLIER VOL.	: 400 V	

Preparation

Humic substance 10 mg
↓ ← Purified water (add a little amount of 1 mol/L NaOH)
Dissolution
↓
0.1 mol/L $NaClO_4$ 10 mL
↓
Make up the volume to100 mL
↓
Filtration
↓
Adjust the pH to 8
↓
100 mg/L humic substance standard solution



[Corrected spectrum]

KEY WORDS
Environmental Analysis Related, Environmental Water, Humic Substance, River Water, Lake, Fluorescence Spectrum, River, Natural Water, Environmental, FL, F-7000

Fluorophotometer (FL)

Sheet No. FL100004-03

Hitachi High-Technologies Corporation

3D Fluorescence Spectrum of Humic Substance (Suwannee River)

INTRODUCTION

The fluorescence spectrum of humic substance, the organic substance contained in river and lake water, was measured. The fluorescence properties of humic substance varies depending on the environment in which the substance is produced and thus, the 3D fluorescence spectrum is currently used as the main method to identify the fluorescence properties of humic substance. F-7000 obtains data at 60,000 nm/min by the ultra-high speed scanning. Thus, even when there is a large number of samples, the fluorescence properties can be confirmed easily. This time, the standard of the humic substance in natural water was used to measure the humic substance concentration in river water. By using the standard, it is possible to compare the result with the reported value.

Sample

SAMPLE NAME : Humic substance
(SUWANNEE RIVER Humic Acid Standard II) (IHSS)

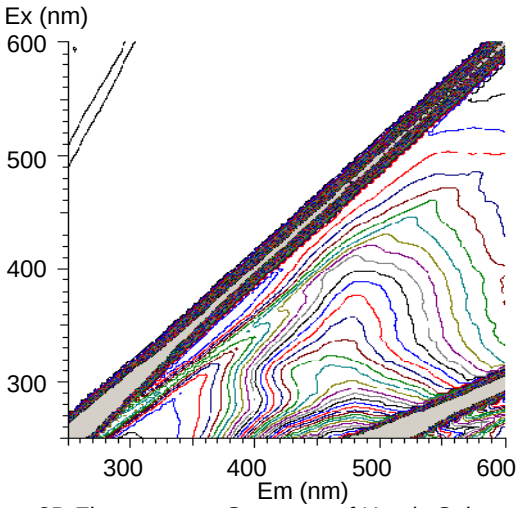
CONCENTRATION : 10 mg/L

Preparation

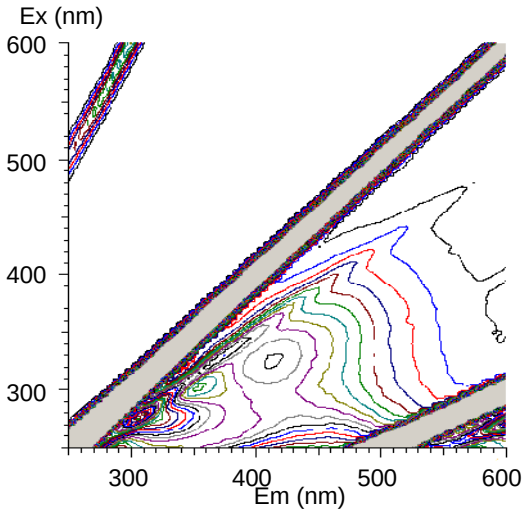
Humic substance 10 mg
↓ ← Purified water (add a little amount of 1 mol/L NaOH)
Dissolution
↓
0.1 mol/L $NaClO_4$ 10 mL
↓
Make up the volume to100 mL
↓
Filtration
↓
Adjust the pH to 8
↓
100 mg/L humic substance standard solution

INSTRUMENT CONDITIONS

INSTRUMENT	: F-7000	RESPONSE	: Auto
EX WAVELENGTH	: 320 nm	PHOTOMULTIPLIER	: R3788
EX BANDPASS	: 10 nm	PHOTOMULTIPLIER VOL.	: 400 V
EM BANDPASS	: 10 nm	FULLSCALE	: 100
SCAN SPEED	: 1200 nm/min	DIVISION NUMBER	: 2.5



3D Fluorescence Spectrum of Humic Substance



3D Fluorescence Spectrum of River Water (4 times dilution)

NOTE

- By using fluorescence standards such as quinine sulfate, the analysis results between different instruments can be compared. This time, the relative fluorescence intensity (QSU) of the sample was calculated by using 10 QSU as the fluorescence intensity of 10 μg/L in 0.05 mol/L sulfuric acid solution at the excitation wavelength of 350 nm and fluorescence wavelength of 455 nm.
- The fluorescence intensity of quinine sulfate is 66.89 and the fluorescence intensity of river water (peak wavelength: Ex 320 nm, Em 410 nm) is 28.49, and thus, the relative fluorescence of the sample was found to be 4.26 QSU.
- The analysis was performed using p.376, Analysis of Water (5th ed.), Japan Society of Analytical Chemistry, Hokkaido Branch, Kagaku Dojin as the reference.

KEY WORDS

Environmental Analysis Related, Environmental Water, Humic Substance, River Water, Lake, 3D Fluorescence Spectrum, 3D, River, Natural Water, Environmental, FL, F-7000

Fluorophotometer (FL)

Sheet No. FL100004-04

Hitachi High-Technologies Corporation

Calibration Curve of Humic Substance (Suwannee River)

INTRODUCTION

The fluorescence spectrum of humic substance, the organic substance contained in river and lake water, was measured. The fluorescence properties of humic substance varies depending on the environment in which the substance is produced and thus, the 3D fluorescence spectrum is currently used as the main method to identify the fluorescence properties of humic substance. F-7000 obtains data at 60,000 nm/min by the ultra-high speed scanning. Thus, even when there is a large number of samples, the fluorescence properties can be confirmed easily. This time, the standard of the humic substance in natural water was used to measure the humic substance concentration in river water. By using the standard, it is possible to compare the result with the reported value.

SAMPLE

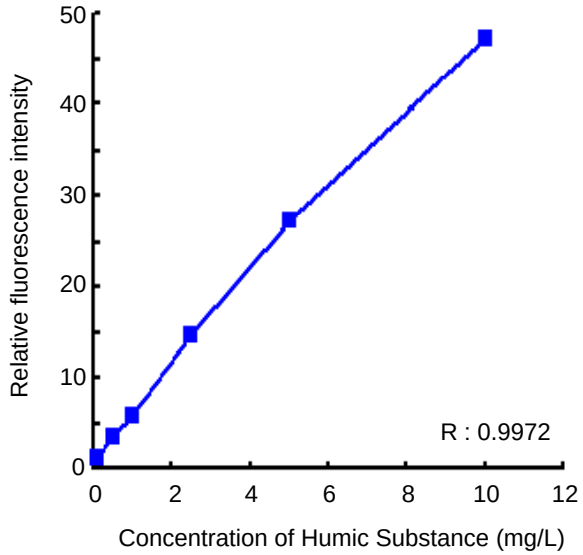
SAMPLE NAME : Humic substance
(SUWANNEE RIVER Humic Acid Standard II) (IHSS)

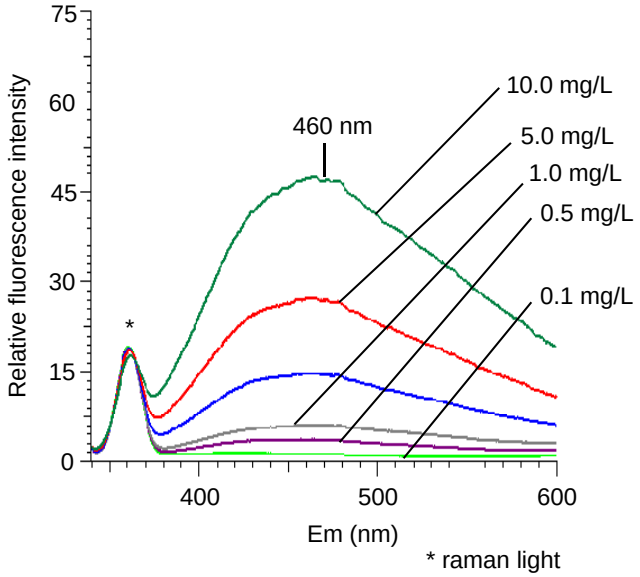
CONCENTRATION : 10 mg/L

INSTRUMENT CONDITIONS		PEAKS (nm)
INSTRUMENT	: F-7000	1 : 361
EX WAVELENGTH	: 320 nm	2 : 460
EX BANDPASS	: 10 nm	
EM BANDPASS	: 10 nm	
SCAN SPEED	: 1200 nm/min	
RESPONSE	: Auto	
PHOTOMULTIPLIER	: R3788	
PHOTOMULTIPLIER VOL.	: 400 V	

Preparation

Humic substance 10 mg
↓ ← Purified water (add a little amount of 1 mol/L NaOH)
Dissolution
↓
0.1 mol/L $NaClO_4$ 10 mL
↓
Make up the volume to100 mL
↓
Filtration
↓
Adjust the pH to 8
↓
100 mg/L humic substance standard solution





Humic Substance in River Water (4 times dilution)

	Intensity	Concentration of river water (4 times dilution) (mg/L)
Sample	20.37	3.99

KEY WORDS
Environmental Analysis Related, Environmental Water, Humic Substance, River Water, Lake, Calibration Curve, River, Natural Water, Environmental, Working Curve, FL, F-7000

Fluorophotometer (FL)

Sheet No. FL100004-05

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