Measurement of Uranium Glass (Excitation Spectrum)

INTRODUCTION

The fluorescence properties of uranium glass used for craft goods, etc. were analyzed. Uranium glass containing hexavalent uranyl ion (UO_2^{2+}) compounds has the property to emit fluorescence when irradiated by UV ray. When the excitation spectrum of uranium glass was measured at the fluorescence wavelength of 530 nm, a peak was observed at around 330 nm, an UV ray wavelength. By performing the spectral correction, which allows the corrections for the wavelength properties characteristic to the instrument, an accurate excitation spectrum can be obtained (See FL TD No.47 for the spectral correction method).

SAMPLE

Sample : Uranium glass

Under fluorescent light

Under UV ray

ACCESSORY

Solid Sample Holder
(P/N: 650-0161)

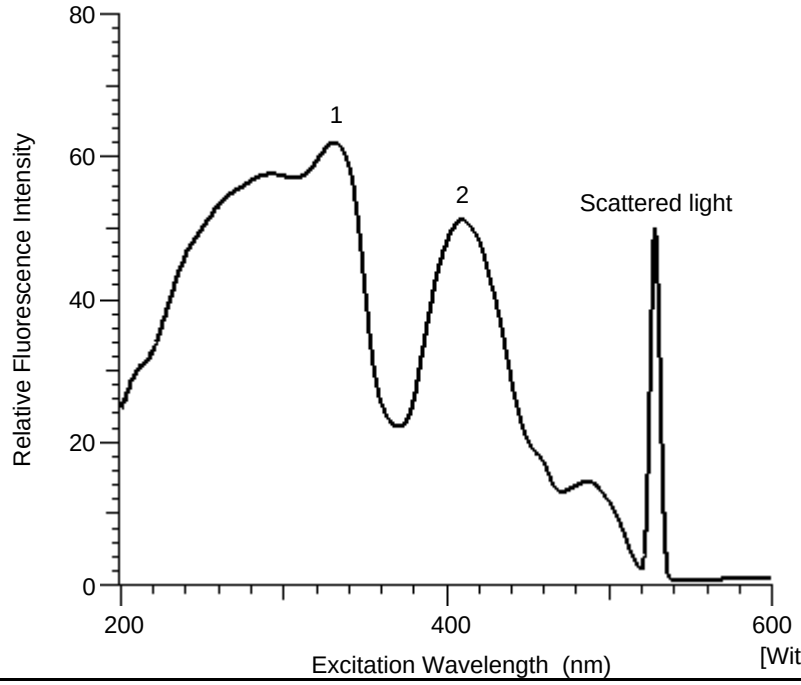
ANALYSIS CONDITIONS

Instrument	: F-7000		
Fluorescence wavelength	: 530 nm	Response	: Automatic
Slit on excitation side	: 5 nm	Filter	: GG395
Slit on fluorescence side	: 5 nm	Detector	: R928F
Scan speed	: 240 nm/min	Photomultiplier Vol.	: 250 V

WAVELENGTH (nm)

1.331

2.409



[With Spectral Corrections]

Note

Uranium analysis is being performed for the search of resources, health management of people working in nuclear industry, or environmental monitoring. In general, ICP-MS is used for the assay of uranium, but fluorophotometer can also be used for the analysis by preparing uranium concentrate (cake) in the preparation step (See FL TD No.15 for the uranium analysis by fluorophotometer).

KEY WORDS

Material/Processing Material Related, Glass/Ceramics, Uranium, Uranium Glass, Uranyl Ion, Nuclear Energy, Environmental Problem, Craft Good, Uranium Analysis, Excitation Spectrum, Spectral Correction, Corrected Spectrum, FL, F-7000

Fluorophotometer (FL)

Sheet No. FL110006-01

Measurement of Uranium Glass (Fluorescence Spectrum)

INTRODUCTION

The fluorescence properties of uranium glass used for craft goods, etc. were analyzed. Uranium glass containing hexavalent uranyl ion (UO_2^{2+}) compounds has the property to emit fluorescence when irradiated by UV ray. When the fluorescence spectrum of uranium glass was measured at the excitation wavelength of 330 nm, a peak was observed at around 534 nm, an UV ray wavelength. By performing the spectral correction, which allows the corrections for the wavelength properties characteristic to the instrument, an accurate fluorescence spectrum can be obtained (See FL TD No.47 for the spectral correction method).

SAMPLE

Sample : Uranium glass

Under fluorescent light

Under UV ray

ACCESSORY

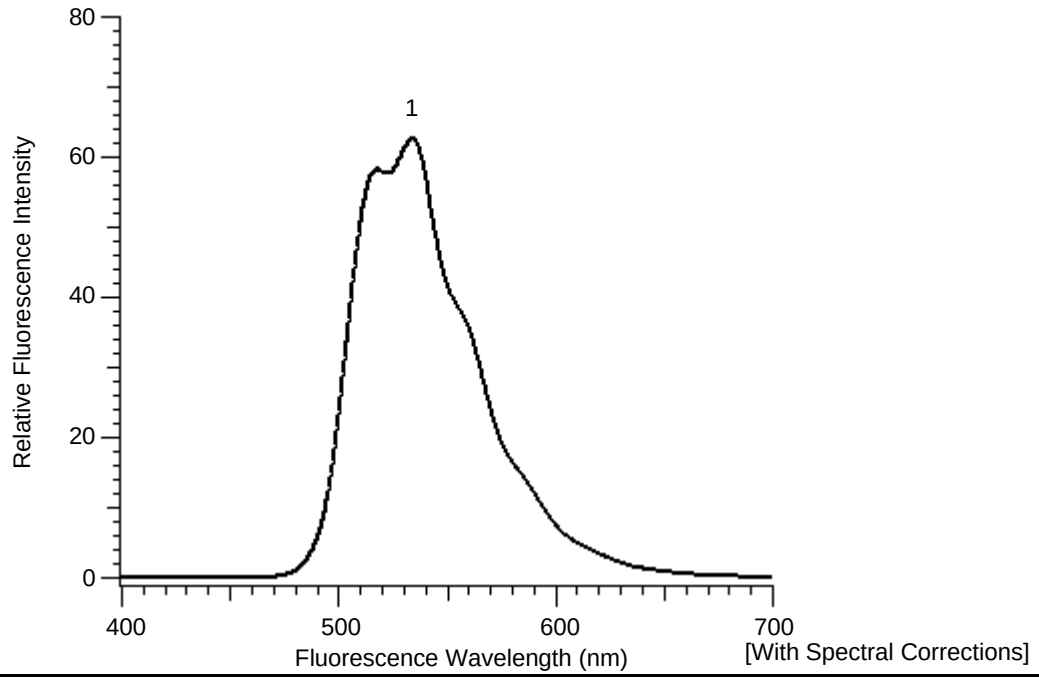
Solid Sample Holder
(P/N : 650-0161)

ANALYSIS CONDITIONS

Instrument	: F-7000		
Excitation wavelength	: 330 nm	Response	: Automatic
Slit on excitation side	: 5 nm	Filter	: GG395
Slit on fluorescence side	: 5 nm	Detector	: R928F
Scan speed	: 240 nm/min	Photomultiplier Vol.	: 250 V

WAVELENGTH (nm)

1.534



Note

Uranium analysis is being performed for the search of resources, health management of people working in nuclear industry, or environmental monitoring. In general, ICP-MS is used for the assay of uranium, but fluorophotometer can also be used for the analysis by preparing uranium concentrate (cake) in the preparation step (See FL TD No.15 for the uranium analysis by fluorophotometer).

KEY WORDS
Material/Processing Material Related, Glass/Ceramics, Uranium, Uranium Glass, Uranyl Ion, Nuclear Energy, Environmental Problem, Craft Good, Uranium Analysis, Fluorescence Spectrum, Spectral Correction, Corrected Spectrum, FL, F-7000

Fluorophotometer (FL)

Sheet No. FL110006-02

Measurement of Uranium Glass (3D Fluorescence Spectrum)

INTRODUCTION

Uranium glass containing hexavalent uranyl ion (UO_2^{2+}) compounds has the property to emit fluorescence when irradiated by UV ray.
The 3D spectrum was measured by F-7000 fluorophotometer.
F-7000 fluorophotometer enables world's fastest scan speed of 60000 nm/min and this time, the measurement was possible in about 100 seconds.
In addition, by using a cut filter, the scattered light can be cut and the analysis without the interference of the secondary light is possible. The cut filter used this time is GG395 and the excitation lights at 395 nm or shorter were cut. By doing so, the secondary light that was overlapping with the spectrum was removed and the sample spectrum became easier to examine. A rich lineup of filters is available and a filter can be selected depending on the wavelengths to be cut.

SAMPLE

Sample : Uranium glass

Under fluorescent light

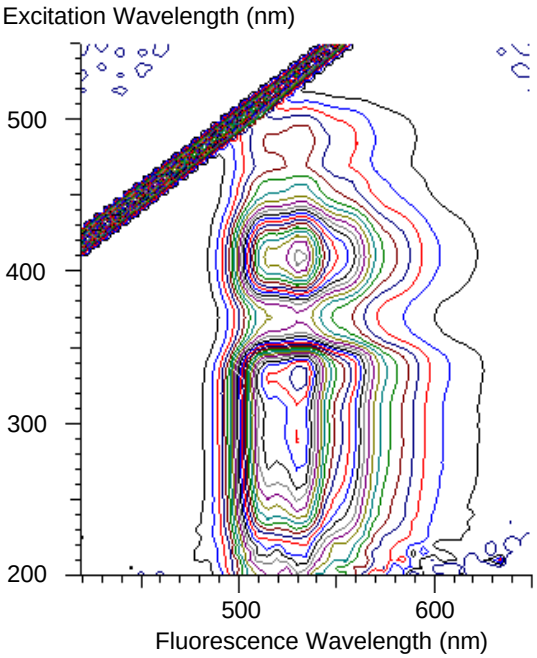
Under UV ray

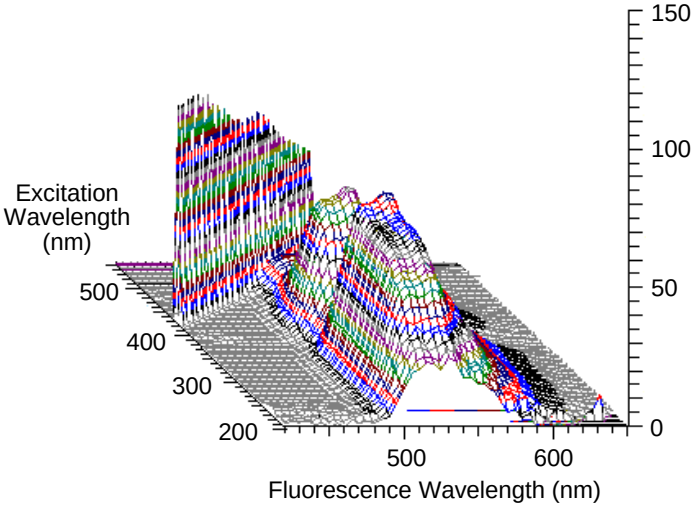
ACCESSORY

Solid Sample Holder
(P/N : 650-0161)

ANALYSIS CONDITIONS

Instrument	: F-7000	Response	: Automatic		
Slit on excitation side	: 5 nm	Filter	: GG395		
Slit on fluorescence side	: 5 nm	Detector	: R928F	Full scale	: 150
Scan speed	: 60000 nm/min	Photomultiplier Vol.	: 250 V	Contour line interval	: 2.5





[With Spectral Corrections]

KEY WORDS
Material/Processing Material Related, Glass/Ceramics, Uranium, Uranium Glass, Uranyl Ion, Nuclear Energy, Environmental Problem, Craft Good, Uranium Analysis, 3D Fluorescence Spectrum, 3D, Spectral Correction, Corrected Spectrum, FL, F-7000

Fluorophotometer (FL)

Sheet No. FL110006-03