

## Measurement of Rice (3D Fluorescence Spectra)

### INTRODUCTION

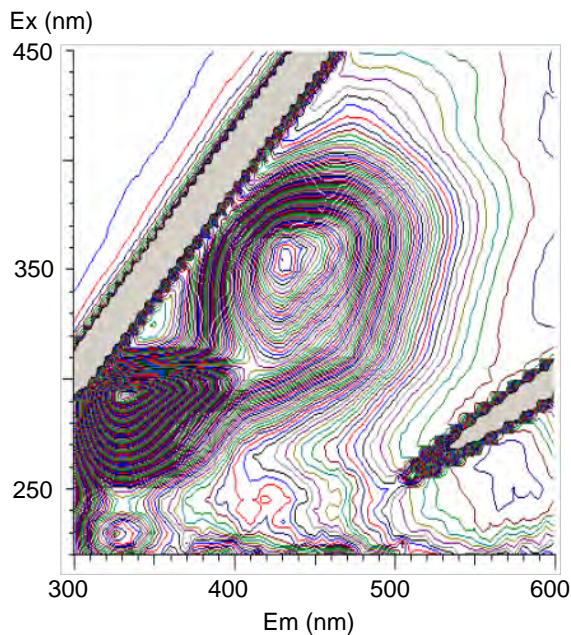
Rice, when irradiated by ultraviolet ray, emits a blue fluorescence originating from fat, etc. The fluorescence intensity from rice increases as the oxidation progresses due to the deterioration of rice and therefore, the fluorescence is recently expanding its use as the index to evaluate the freshness. The measurement results of fluorescence spectra of new rice and old rice are introduced here. By measuring the 3D fluorescence spectrum, the difference in the fluorescence properties of new and old rice was found.

F-7000 fluorophotometer, with the fastest scan speed for the instrument class, allows the high-throughput measurement of the 3D fluorescence spectrum.

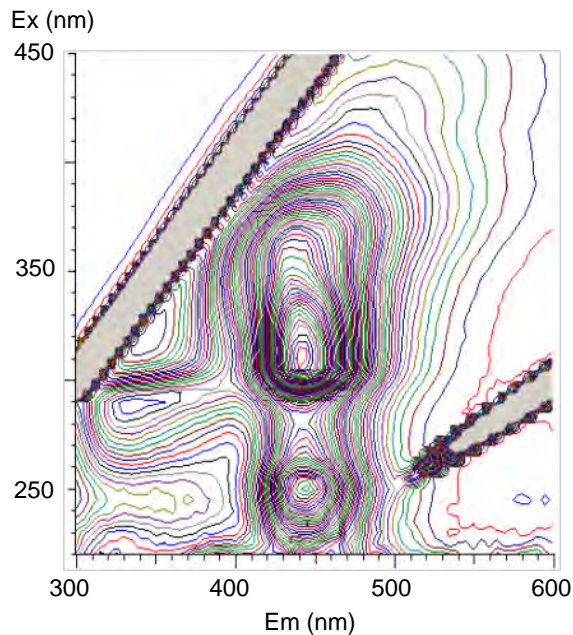
SAMPLE	ACCESSORY
SAMPLE NAME : Rice	Solid Sample Holder (P/N : 650-0161)  S20 Standard Cells with U-Shape Bottom Products of GL Sciences Inc. (GL Sciences Cat. No. 6210-21203)

### INSTRUMENT CONDITIONS

INSTRUMENT	: F-7000	RESPONSE	: Auto	FULLSCALE	: 150
EX BANDPASS	: 5 nm	EM FILTER	: 290	DIVISION NUMBER	: 1
EM BANDPASS	: 5 nm	PHOTOMULTIPLIER	: R3788		
SCAN SPEED	: 60000 nm/min	PHOTOMULTIPLIER VOL.	: 400 V		



3D Fluorescence Spectrum  
of New Rice



3D Fluorescence Spectrum of  
Old Rice

#### KEY WORDS

Bio/Medical Science/Food/Pharmaceutical, Food, Food Chemistry, New Rice, Old Rice, Freshness, 3D Fluorescence Spectrum, 3D, FL, F-7000

Fluorophotometer (FL)

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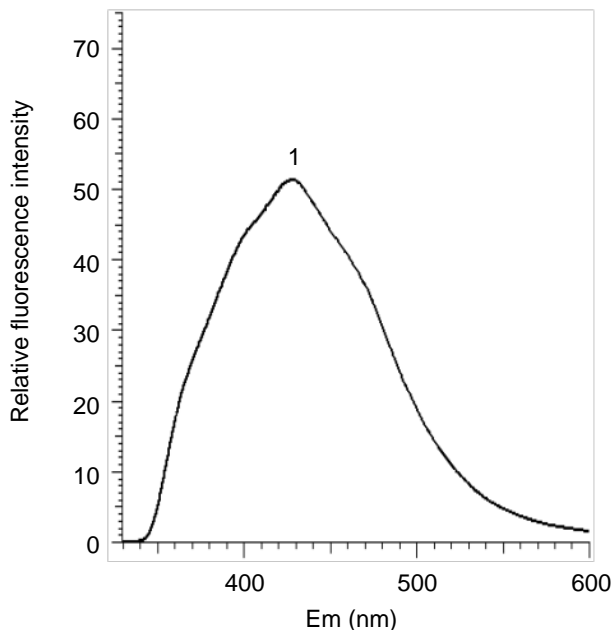
## Measurement of Rice (Fluorescence Spectra)

### INTRODUCTION

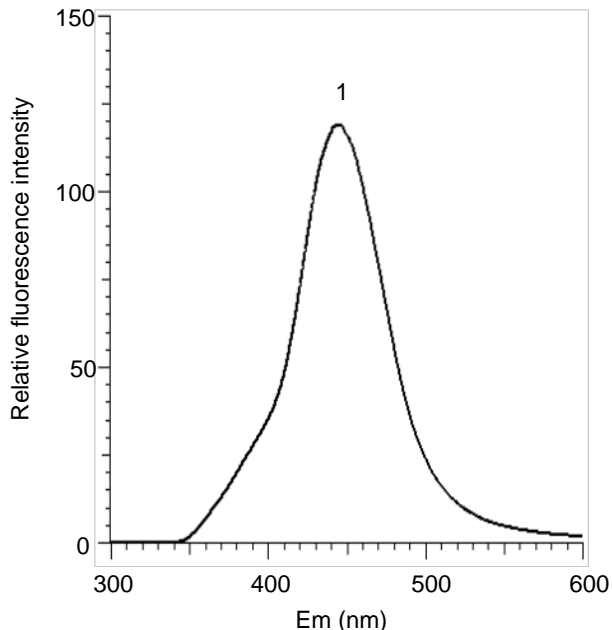
When new rice and old rice were compared, it was found that the fluorescence peak of the old rice at the excitation wavelength of 310 nm shifted to a longer wavelength of 444 nm from 428 nm, the fluorescence peak wavelength of new rice. The peak shape of the old rice was also found to be sharper than that of new rice. The measurement was performed by placing about 10 grains of the rice in a wide width standard cell with U-shaped bottom (20 mm × 40 mm × 10 mm) and mounting the cell on the solid sample holder.

SAMPLE	ACCESSORY
SAMPLE NAME : Rice	Solid Sample Holder (P/N : 650-0161) S20 Standard Cells with U-Shape Bottom Products of GL Sciences Inc. (GL Sciences Cat. No. 6210-21203)

INSTRUMENT CONDITIONS	PEAKS ( nm )
INSTRUMENT : F-7000      RESPONSE : Auto	New rice 1 : 428  Old rice 1 : 444
EM WAVELENGTH : 310 nm      EM FILTER : 350	
EX BANDPASS : 5 nm      PHOTOMULTIPLIER : R3788	
EM BANDPASS : 5 nm      PHOTOMULTIPLIER VOL. : 400 V	
SCAN SPEED : 240 nm/min	



Fluorescence Spectrum  
of New Rice



Fluorescence Spectrum  
of Old Rice

#### KEY WORDS

Bio/Medical Science/Food/Pharmaceutical, Food, Food Chemistry, New Rice, Old Rice, Freshness, Fluorescence Spectrum, Excitation Spectrum, FL, F-7000

Fluorophotometer (FL)

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## Measurement of Rice (Comparison of Accessories)

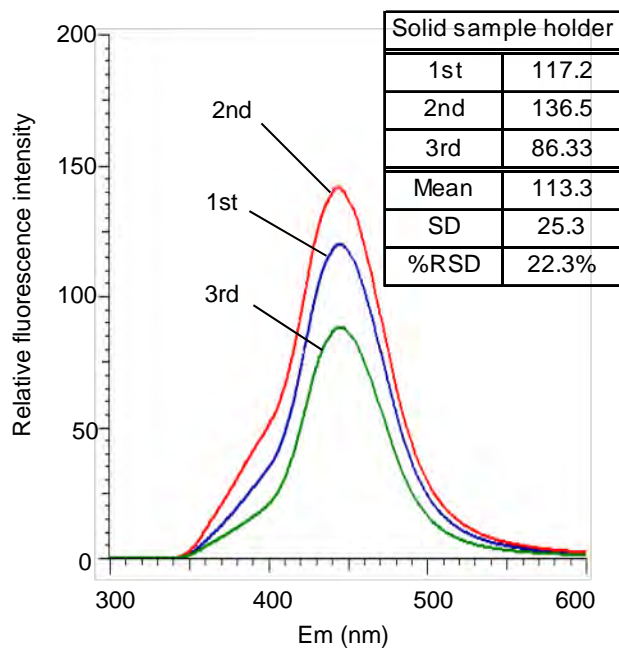
### INTRODUCTION

The surface conditions of large grain samples such as rice are not uniform and thus, there is a large variation in the intensity when the solid sample holder for the fluorescence measurement on the sample surface is used. When the repeatability for the setting was checked by repeating the sample setting three times, the standard deviation of 22.3% was obtained. On the other hand, for the analysis of samples with a non-uniform surface such as rice, the repeatability for the setting can be improved by using an integrating sphere. An integrating sphere has the effect to make the light uniform by diffusively reflecting the fluorescence diffused into various directions with the high reflective material plated inner surface of the integrating sphere. By using the integrating sphere, a good setting repeatability with the relative standard deviation of 3.8% was obtained.

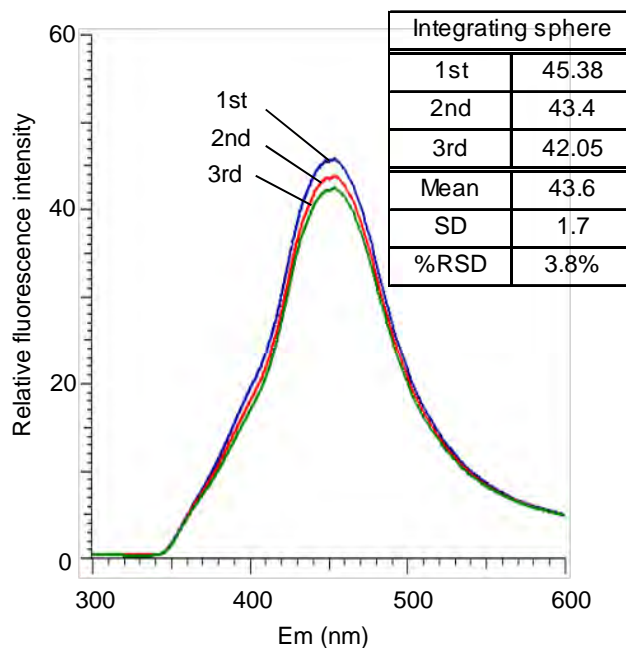
SAMPLE	ACCESSORY
SAMPLE NAME : Rice	Solid Sample Holder (P/N : 650-0161) φ60 integrating sphere accessory (Special Order) S20 Standard Cells with U-Shape Bottom Products of GL Sciences Inc. (GL Sciences Cat. No. 6210-21203)

### INSTRUMENT CONDITIONS

INSTRUMENT	: F-7000	RESPONSE	: Auto
EM WAVELENGTH	: 310 nm	EM FILTER	: 350
EX BANDPASS	: 5 nm	PHOTOMULTIPLIER	: R3788
EM BANDPASS	: 5 nm	PHOTOMULTIPLIER VOL.	: 400 V
SCAN SPEED	: 240 nm/min		



Solid Sample Holder (Old Rice)



Integrating Sphere Accessory  
(Old Rice)

#### KEY WORDS

Bio/Medical Science/Food/Pharmaceutical, Food, Food Chemistry, New Rice, Old Rice, Freshness, Integrating Sphere, Fluorescence Spectrum, Excitation Spectrum, FL, F-7000

Fluorophotometer (FL)

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