Starna scientific
'Setting the Standard'

Spectrofluorometer Sensitivity & Signal to Noise Ratio

High Purity Water Reference

Purpose

This Reference Material can be used to qualify the Signal to Noise Ratio of a spectrofluorometer near the limit of detection and hence indicate its ultimate sensitivity.

Description and Discussion

10mm far UV quartz fluorometer cuvette with polished faces at 90°, containing ultra-high purity water, permanently sealed by heat fusion.

Traditionally, the performance of spectrofluorometers has been tested using dilute solutions of known fluorophores such as Quinine Sulfate or Rhodamine to determine spectral response factors. Starna Certified Reference Materials are available for this purpose. To use this approach at or near the detection limit of a high-performance instrument however, is impractical because the necessary sample concentrations are so low that sample preparation becomes difficult and error-prone and there is high potential for sample contamination.

An alternative approach, employed in this Reference, is to use the phenomenon of Raman scattering. When radiation interacts with a molecule, some of the incident energy can be scattered. Most will be normal (Rayleigh) scattering, where the scattered radiation is at the same wavelength as the incident radiation. A very small proportion of the scattered photons (about 10-7) however, will exhibit Stokes Raman scattering and be emitted at a lower energy (i.e. longer wavelength) in a manner analogous to fluorescence. Because of the very small number of photons involved, the signal levels are very low and comparable to those produced by very low analyte concentrations in normal fluorescence measurements. Pure water exhibits a Raman shift of tens of

nanometers when excited by UV or visible radiation, so the Raman peak can be readily identified. Uncontaminated, pure water is relatively straightforward to obtain and is therefore an ideal reference material.

The signal –to-noise ratio for a given excitation wavelength may be calculated using the instrument software.

Note that the calculated ratio will depend on the calculation protocol employed by the instrument manufacturer and therefore 'compliance to specification' limits will be specific to the spectrofluorometer type under test.

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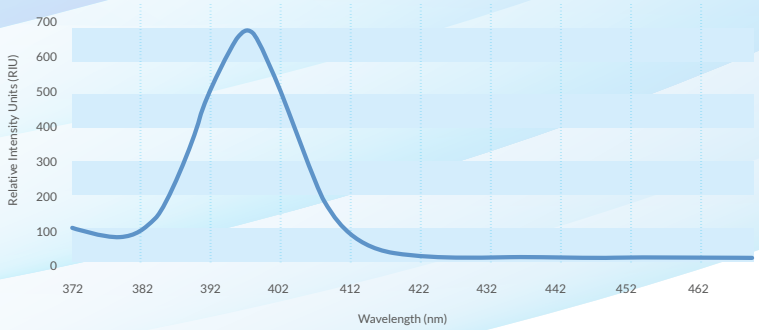
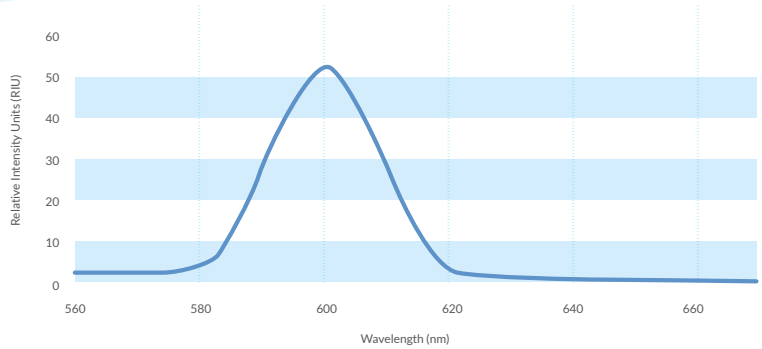
Raman Water Sensitivity
Excitation: 350 nm Emission Peak: 398 nm



Raman Water Sensitivity
Excitation: 500 nm Emission Peak: 600.4 nm



Certification and Documentation

A Certificate of Validation and full instructions for use are provided with each Reference Material. The certificate is supplied in electronic format, on a USB drive in the same box as the references, allowing hard copy to be produced on demand and giving easy interface to the user's own IT systems. Certification measurements are made on a reference spectrophotometer.

Accreditation

Starna Scientific is accredited to both ISO 17034 as a Reference Material producer, and ISO/IEC 17025 as a Calibration Laboratory for optical reference measurements.

Starna Scientific's manufacturing facility is accredited to the ISO 9001 Quality Management System with BSI. For details see www.starna.com/accreditations..

Warranty

STARNA offers a Lifetime Guarantee on all Starna reference materials, unless otherwise stated, such that any reference material that moves outside its published uncertainty budget will be replaced free of charge. This guarantee is subject to the reference materials being re-certified at least every two years and that the references have not been physically, thermally or optically abused. The STARNA UKAS accredited calibration laboratory aims to re-certify and despatch references within five working days from receipt.

How to Order

	CATALOGUE NUMBER
Water (Raman) Fluorescence Senitivity Reference	**RM-H2O**

For more information visit www.starna.com

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