



Starna scientific  
'Setting the Standard'

## Quality Assurance in the Analytical Laboratory

# Spectrofluorometer Spectral Response and Linearity

## Starna Quinine Sulfate References

### Purpose

This Reference Material can be used to calibrate the spectral response of a spectrofluorometer over the range 375 nm to 675 nm. It can also, over a limited concentration range, be used as a linearity check.

### Description and Discussion

10mm far UV quartz fluorometer cuvettes with polished faces at 90° containing Quinine Sulfate solvated in perchloric acid, permanently sealed by heat fusion. The reference can be supplied with or without a perchloric acid blank. It is also available as sets of solutions with concentrations up to 1.0 mg/l for use as a linearity check.

Quinine Sulfate Dihydrate in perchloric acid was one of the first reference materials developed for use in fluorescence spectroscopy, and is designated SRM 936a by NIST.

The data supplied with the reference is based on its corrected fluorescence emission spectrum using an excitation wavelength of 347.5 nm:

**Note: "Uncorrected" or raw spectra direct from the measurement system are rarely suitable for calibration purposes or inter-instrument comparisons, as they may be distorted by instrumental factors such as variations in source intensity, optical reflectivity and detector efficiency with changing wavelength. "Corrected" spectra are obtained by removing these effects instrumentally or by software techniques.**

In the Calibration Certificate supplied, the relative emission intensity  $E_{\lambda}$  is tabulated at 5 nm intervals.

For the instrument under test, the correction factor  $S$  at wavelength  $\lambda$  is then given by

$$S = R_{\lambda}/E_{\lambda}$$

Where

$R_{\lambda}$  is the instrument reading at wavelength  $\lambda$  and

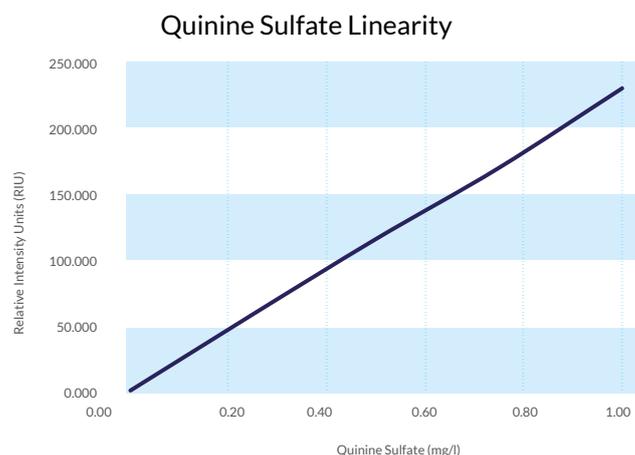
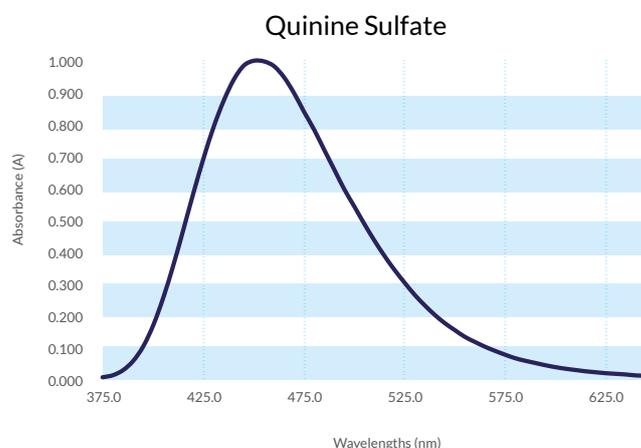
$E_{\lambda}$  is the certified relative intensity value at wavelength  $\lambda$  from the table.

The corrected emission value at a given wavelength for other fluorescent materials, under the same measurement conditions and in the same spectral region, can then be determined by

$$E = R/S$$

Where  $R$  is the instrument reading and  $S$  is the correction factor at the measurement wavelength.

At low concentrations (up to 1 mg/l, this material can also be used to check the linearity of response of a spectrofluorometer, and a set of references with concentrations 0.25, 0.5, 0.75 and 1 mg/l is available for this purpose.



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## Starna Quinine Sulfate References

### 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 spectrofluorometer.

### 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](http://www.starna.com/accreditations).

### How to Order

	CATALOGUE NUMBER
<b>Quinine Sulfate Spectral Response &amp; Linearity Set (4 concentrations)</b> 0.25, 0.5, 0.75 and 1 mg/l Quinine Sulfate in perchloric acid + perchloric acid blank cell	<b>RM-4QS00</b>
<b>Quinine Sulfate Spectral Response &amp; Linearity Set (3 concentrations)</b> 0.25, 0.5 and 1mg/l Quinine Sulfate in perchloric acid + perchloric acid blank cell	<b>RM-3QS00</b>
<b>Quinine Sulfate Spectral Response &amp; Linearity Set (2 concentrations)</b> 0.5 and 1 mg/l Quinine Sulfate in perchloric acid + perchloric acid blank cell	<b>RM-2QS00</b>
<b>Quinine Sulfate Spectral Response Cell</b> 1 mg/l Quinine Sulfate in perchloric acid	<b>RM-1QS</b>
<b>Quinine Sulfate Spectral Response Cell + Blank</b> 1 mg/l Quinine Sulfate in perchloric acid + perchloric acid blank cell	<b>RM-1QS00</b>

### 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.



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