Starna scientific
'Setting the Standard'

Spectrophotometer UV Bandwidth (Resolution) Qualification

Toluene in Hexane Reference

Purpose

This Reference Material can be used to qualify the Spectral Bandwidth, in the ultra-violet region of the spectrum (265 nm – 270 nm), of spectrophotometers with spectral bandwidths of 3 nm or less.

It is accepted for this purpose by most Pharmacopoeias and Standardisation Bodies, including:

European Pharmacopoeia

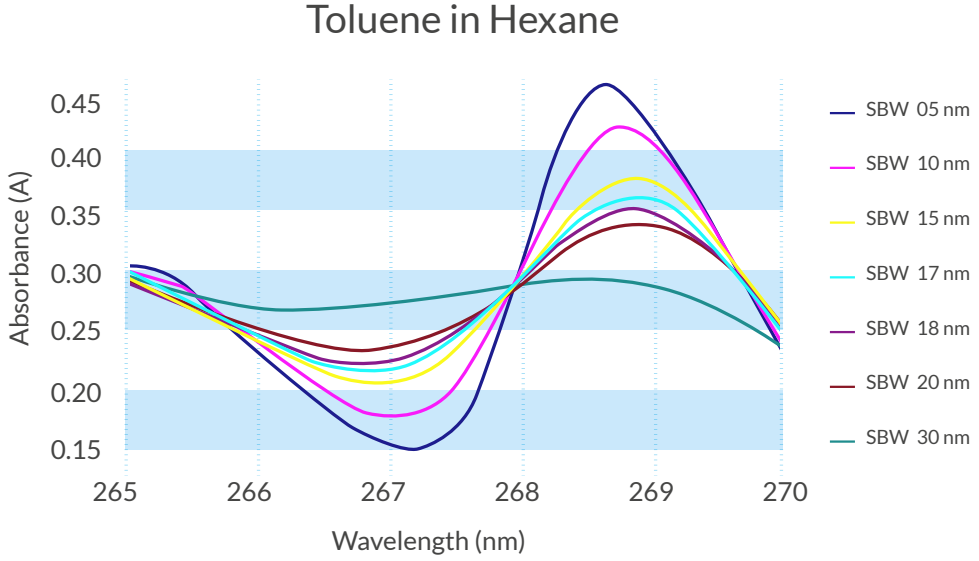
Deutsches Arzneibuch (German Pharmacopoeia).

United States Pharmacopeia

American Society for Testing and Materials

Therapeutic Goods Administration (Australia)

British Pharmacopoeia



Spectrophotometer UV Resolution (Bandwidth) Qualification for Derivative Spectroscopy

Toluene in Methanol Reference

Description and Discussion

This reference comprises two far UV quartz cells, one filled with a 0.020% v/v solution of toluene in hexane and the other a blank, filled with hexane only. Both have been permanently sealed by heat fusion.

Resolution is the ability of the instrument to discriminate between two adjacent absorbance bands. This is usually described in terms of the Spectral Bandwidth (SBW) of the instrument, which describes the range of wavelengths coming from the exit slit of the instrument's monochromator. The accuracy of the measured absorbance will depend on the ratio of the SBW to the natural bandwidth (NBW) of the absorbing substance. The most widely used reference for qualifying the bandwidth of a spectrophotometer is a solution of toluene in hexane.

When scanned in an ultraviolet spectrophotometer, the spectrum shows a maximum absorbance at 269 nm and a minimum at 267 nm.

The ratio of the peak maximum at 269 nm to the minimum at 267 nm gives a measure of the resolution of the instrument. Typical ratios for different bandwidths (at 20°C) are:

Spectral Bandwidth (nm)	0.5	1.0	1.5	2.0	3.0
Ratio	2.4 – 2.5	2.0 - 2.1	1.6 – 1.7	1.3 – 1.4	1.0 – 1.1

Note: The ratio values given in this document are for guidance only. The Calibration Certificate accompanying the Reference material gives the actual value measured at a bandwidth of 1.50 nm. Guidance is also given on the values to be expected at different bandwidths (0.5, 1.0, 1.5, 2.0 and 3.0 nm) and temperatures (20, 25 and 30 °C). To comply with Pharmacopoeia requirements, the instrument to be tested should have a spectral bandwidth not exceeding 1.8 nm.

Certification and Documentation

A Certificate of Calibration and Traceability 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 that has been qualified using Standard Reference Materials certified by the National Institute of Standards and Technology (NIST) in the USA, or against primary physical references such as elemental emission lines.

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 Certified 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
Toluene in hexane cell with hexane blank cell	**RM-TX**

Starna scientific
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