Starna®

Certified Reference Materials for UV and Visible Spectroscopy

Starna®

Resolution

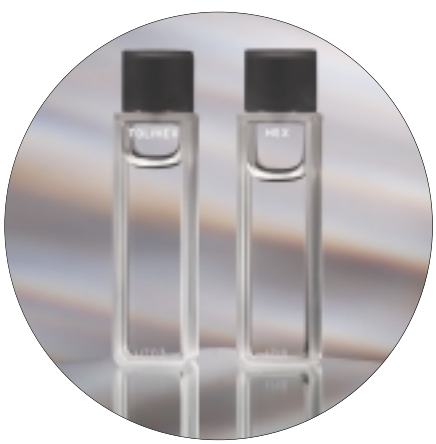
Accurate absorbance and wavelength measurements can only be achieved if due consideration is given to the resolution of the monochromator in use. In modern instruments with grating monochromators, the resolution relates directly to the slitwidth chosen. The smaller the slit and associated spectral bandwidth, the greater the resolution, but the corresponding reduction in energy means the signal-to-noise ratio falls. When measuring an absorbance band in a high-resolution instrument, it is recommended that the spectral bandwidth (SBW) should not exceed 10% of the natural bandwidth (NBW) of the band.

Therefore, simple checks on the resolution power of a spectrophotometer will ensure, for example that adjacent peaks will be fully resolved and not be blended into a combination peak with the associated wavelength, and absorbance errors.

For the measurement and checking of this fundamental parameter, Starna® offers you the choice of either a sealed liquid cell (0.02% v/v solution of toluene in hexane), or a sealed benzene vapour cell.

Toluene in Hexane

Description: 0.020% v/v solution of toluene in hexane.
Primary Usage: Determination of spectral bandwidth (SBW) in the UV region.
Useable range: 265 nm to 270 nm, instruments with a SBW of less than 3 nm.
Physical Configuration: Far UV quartz cells that have been permanently sealed.



Toluene in Hexane

Product Description RM-TX:

This formulation is described and used in the European Pharmacopoeia where the ratio of the peak maximum at 269 nm to the minimum at 266 nm gives a measure of the resolution of the instrument.

Ratio table:

SBW (nm):	0.5	1.0	1.5	2.0	3.0
Ratio:	2.5	2.1	1.6	1.4	1.0

Suggestions for Use:

Resolution determinations are run against the hexane blank supplied with each Certified Reference Material, and the procedure is similar for all spectral bandwidths.
- Scan the 265-270 nm region, and calculate the peak maxima and minima.
- Calculate the peak/trough ratio and compare to the reference values.

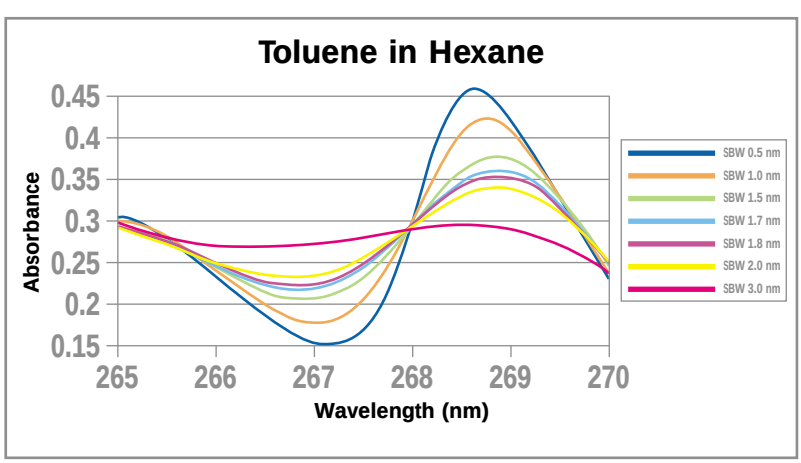
Calibration procedure:

Traceability:

- Primary instrumental linearity is established using the Double Aperture method.
- Primary instrumental wavelength calibration is established using the emission lines from mercury and deuterium sources.
- Additional traceability links to NIST primary materials are established using SRM 2034 holmium oxide (4% m/v) in perchloric acid (10% v/v), SRM 930e and SRM 1930 neutral density glass filters.

Use:

- All appropriate fundamental parameters and procedures relating to measurement, handling and storage are fully documented on the certificate supplied with each Certified Reference Material.



Benzene Vapour

Product Description UR-BZ:

At spectral bandwidths less than 1 nm, the benzene vapour spectrum provides a useful reference that has characteristic features that may or may not be displayed – dependent upon the current spectrophotometer SBW.

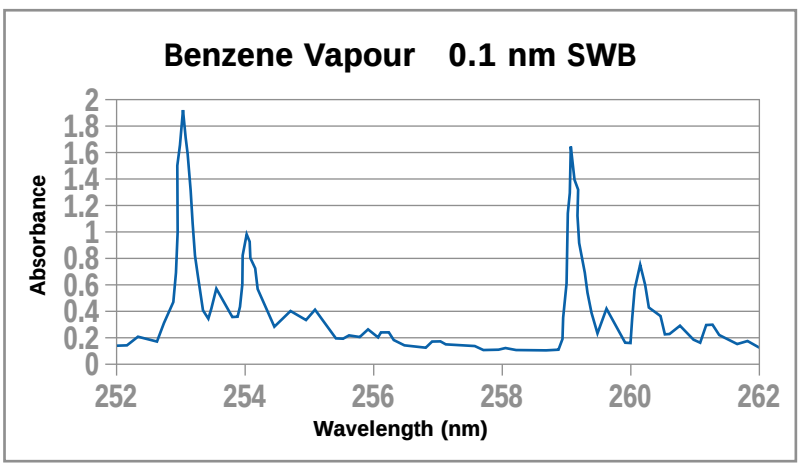
Benzene vapour will not work well with a photodiode array spectrophotometer as this instrument type does not measure a continuum and the peaks will not be resolved well enough to be useable.

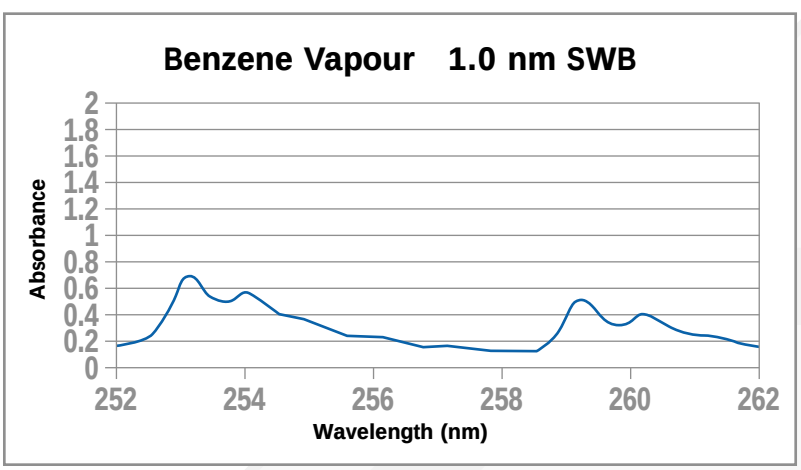
Suggestions for Use:

- Scan the 252-262 nm region, and observe the spectral changes with SBW.
- The 253.49 nm and 259.56 nm peaks should be visible at a SBW of 0.2 nm or less.

Benzene Vapour

Description: 0.1 ml benzene in the vapour state.
Primary Usage: Determination of spectral bandwidth (SBW) in the UV region.
Useable range: 230 nm to 270 nm, instruments with a SBW of less than 1 nm.
Physical Configuration: Far UV quartz cells that have been permanently heat sealed.





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