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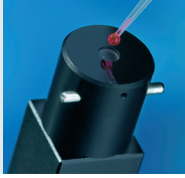
Precision in Spectro-Optics. Worldwide.

FAQ

TrayCell



FAQ: TrayCell

1. What is the advantage of the TrayCell over a plastic cell?

There is a significant higher precision and reliability of the path length compared to cells made of plastic due to the high-quality manufacturing of the optical quartz parts of the TrayCell. This leads to an excellent reproducibility of the measurement setup.

The well known chemical resistance of quartz against solvents allows a wide range of applications. The unique design of the TrayCell results in the need of a fraction of sample volume than usual and a dilution of the sample is not necessary, so samples can be retrieved after the measurement for further processing.

2. Which is the appropriate TrayCell for my instrument?

Hellma offers the TrayCell in two different heights. The short version, catalogue no. 105.810-UVS, is suitable for instruments which have to be closed with a lid. The longer version, catalogue no. 105.800-UVS, facilitates pipetting within instruments with a deep sample chamber. Just give us the name of your instrument if not sure which TrayCell to use. We'll give you a suggestion. In other respects, the features of both versions are identical. You can adjust the centre height of both versions at your option by means of a spacer, so the TrayCell can be very easily used in different instruments with different centre heights.

3. What care must be taken when inserting the TrayCell into the instrument?

As with the use of cells, you have to pay attention that the TrayCell stands straight and stable in the beam of your instrument. To enable a preferably high reproducibility of the measured values, we do not recommend taking it out of the cell holder between measurements.

4. When do I use which cap?

The smaller the light path, the higher the absorption and therefore the concentrations which can be measured in line with the linearity of the instrument. Please refer to the table shown in the TrayCell brochure giving information on the recommended concentration range for each cap. Compared to the usually used cell with 10 mm light path, the 1 mm cap generates a “virtual dilution factor” of 10, the 0.2 mm cap even generates a “virtual dilution factor” of 50. This factor can be seen as a measure for the dilution which would be necessary when using conventional cells.

5. What is the best way to clean the TrayCell?

We recommend lint free swabs or lint free wipes. It is possible to retrieve the sample for further processing. The rest of the sample can be wiped away with a swap or a wipe. If required, the TrayCell may be wiped clean with the solvent which was used to dissolve the sample. Our cell cleaning concentrate Hellmanex II is also suitable for efficient cleaning of the TrayCell.

6. Over which wavelength range is it possible to carry out measurements?

The Hellma TrayCell features optical fibres which are solarisation resistant. The measuring range runs from 190 nm to 1100 nm.

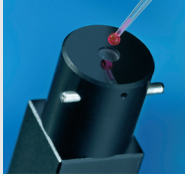
7. How do I use the TrayCell in a double beam spectrophotometer?

It is not advisable to use a second TrayCell for reference measurements in a double beam spectrophotometer. This is because of the measurable differences between the optical characteristics from fibre to fibre. This property rules out a background correction using two optical matching TrayCells. But since a background correction is not necessarily required for standard measurements, a baseline correction is sufficient in most cases.

If there is the need to improve the signal-to-noise ratio due to the discrepancy of light intensity from measurement to reference beam, it is recommended to weaken the reference beam at about 20% of its intensity. That can be done very easily with a simple pinhole, set in the reference beam. As a result, the area of the hole should be about 20% of the measuring beam area. Furthermore, an extension of the integration time may have a positive influence on the signal-to-noise ratio.

8. Which concentration range is covered?

Depending on the sample to be analysed (double-strand or single-strand DNA or RNA, Oligos, etc) different concentration ranges are resulting, running from 15 ng/µl to 4,250 ng/µl (see data sheet). These specifications refer to a spectrophotometer with a linear measuring range up to 1.7A. Spectrophotometers have a greater linear measuring range allow correspondingly higher maximum concentrations.



9. Up to which absorption is it possible to measure?

Maximum measurable absorption is defined by the range of linearity of the spectrophotometer used (see question 7). Spectrophotometers with the greatest linear range found on the market allow measurements up to 10A. Information on higher absorptions, which can occasionally be found in literature concerning these applications, has to be looked at as reference values. They just state the equivalent theoretical values which would occur when measuring an undiluted sample in a cell with a light path of 10 mm. When using a spectrophotometer with a linear measuring range of up to 1.7A, it would equate to a theoretical absorption of 85A when using a TrayCell with 0.2 mm path length, compared to a cell with 10 mm light path.

10. Is it possible to measure with other path lengths?

You'll get your TrayCell with two caps, so it is possible to measure with 0.2 mm or with 1 mm light path. Thus it is possible to cover a very wide range of absorption and concentration.

11. Is it possible to measure proteins in very high concentrations?

The measuring of very highly concentrated samples is conditional upon the linear absorption range of the spectrophotometer used. The higher the maximum absorption, the higher concentrated samples can be measured with the TrayCell.

12. Is it possible to measure samples with low surface tension?

Yes. For the best results, we recommend to use the 0.2 mm cap (if possible).

13. The measured values are varying. What can be done?

Is there a sufficient amount of sample pipetted onto the TrayCell? Please check if the amount of sample is within the recommended range for the used path length. Some pipettes are not suitable for very small sample volumes, because they are not exact enough. When in doubt, just increase the sample volume a little.

Check if the spectrum shows noise which makes the measured values unsteady. If the concentration and/or absorption are within the measuring range, increase the integration time to improve the measurement..

14. The price seems very high for a cell. Why is that so?

The Hellma TrayCell is a fibre optical measuring device for micro volumes which has been designed to fit within the dimensions of a traditional cell. This means complex design and the use of high-quality parts (quartz fibres, lenses and prisms). The result is a high-precision device. The advantages of the well-known cell format are a self-explanatory usage and a wide range of applications with nearly all spectrophotometers which are suitable for using cells. However, the similarity of the TrayCell to a traditional cell is only because of its shape.