

Purity control in buffer and cell culture media production

Measuring Optical Rotation, Refractive Index and Density in Buffer and Cell Culture Media Production

Buffers and cell culture media are essential components used in biological research and biotechnological applications. Buffers help maintain a stable pH, while cell culture media provide the necessary nutrients and environment for the growth and maintenance of cells in vitro.

Measuring the optical rotation, refractive index, and density are important aspects of quality control before and during buffer and cell culture media production. They help ensure the consistency and reproducibility of buffer and cell culture media formulations, which are critical for maintaining optimal growth conditions for cells and reproducible experimental outcomes.

Optical Rotation

In the context of buffer and cell culture media production, optical rotation measurements help assess the presence and purity of chiral components, such as amino acids or sugars. During production, optical rotation measurements can be performed at different stages, including after the addition of specific nutrients or after the final formulation is prepared. By comparing the measured optical rotation with reference values or previous batches, any deviations or inconsistencies can be identified, indicating potential issues with the composition or quality of the buffer or cell culture media.

Optical rotation measurements are particularly important when controlling the chiral integrity of a product. They help to ensure that the desired chiral form is present in the buffer or cell culture media, which is crucial for maintaining the integrity and functionality of biological molecules and ensuring consistent results in downstream applications.

Refractive Index

In buffer and cell culture media production, the refractive index can provide valuable information about the concentration and composition of the solution. Refractive index measurements are used to monitor and control the concentration of components in buffer and cell culture media.

By establishing a correlation between the refractive index and the desired concentration, manufacturers can ensure that the formulation falls within the specified range. Deviations from the expected refractive index may indicate errors in concentration, variability in raw materials, or potential contamination.

Density

While optical rotation and refractive index provide information about the composition and concentration of the solution, density measurements also offer insights into physical properties and potential variations in the manufacturing process. Density measurements can be used to monitor the homogeneity and consistency of buffers and cell culture media. Deviations in density may indicate variations in the formulation, such as inconsistent mixing, presence of undissolved solids, or differences in temperature or pressure during production.

In all measurements, it is important to establish appropriate reference values, standards, and specifications for comparison. In combination, optical rotation, refractive index, and density measurements provide comprehensive information about the composition, concentration, and physical properties of buffer and cell culture media. These measurements, along with other quality control tests and analytical techniques, help manufacturers maintain high-quality standards, consistency, and performance of their products in research and biotechnological applications.



Solution from SCHMIDT + HAENSCH

Using our VariFamily with complete 21 CFR part 11 compliance and a high reproducibility, the quality control of buffers and cell culture media can be guaranteed. Only small volumes are needed to conduct the measurements. Specific customer scales can directly show the concentration of added ingredients. Configuring specific methods within the software will enable the user to have direct visual feedback if the values are within a specified range.

Advantages of using the VariFamily

- Time and space saving
- Non-destructive and simple to perform
- Rapid temperature control
- All devices controlled via display or remote (PC, Smartphone, Tablet)
- Collected evaluation of data



Product packages

Product

ID-N°

| Product packages | Product | ID-N° |
|------------------|----------------------------|-------|
| VariPol | e.g. VariPol B 101 P | 31006 |
| | + Display | 16700 |
| | + 100 mm Flow through tube | 13885 |
| VariRef | e.g. VariRef B 101 P | 32006 |
| | + Display | 16700 |
| | + Compartment door | 16350 |
| | + Flow through insert | 16443 |
| VariDens | e.g. VariDens B 100 P | 33003 |
| | + Display | 16700 |

Benefits

- Cost and time savings
- Accurate, fast and precise measurement
- Product quality securing

Typical Industries

- Pharmaceutical industry
- Biotechnology industry
- R&D

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