

Measurement of pH During Production of Immunoassay Solutions



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YSI IoLine pH Electrode

Application Note A617

Bioanalysis with immunoassays has drastically improved in recent years due to advancements in modern technology. Newly developed stabilizers, blockers and interference reducing assay diluents have increased the reliability and reproducibility of immunoassays.

CANDOR Bioscience has significantly contributed to these advancements with their immunoassay solutions. These solutions are used in ELISA, Western blotting, lateral flow assays, immunohistochemistry, protein arrays, and other immunoassays.

Challenges:

In order to protect the integrity of immunoassay results, it is critically important these solutions be produced with the highest possible level of precision. Raw materials such as salts, buffers, proteins, and other organic and inorganic components must always be prepared in the same manner.

In order to achieve batch-to-batch consistency, these preparation procedures must constantly be verified and the resulting solutions inspected.

Importance of pH measurement:

pH is an important parameter to monitor during the production of immunoassay solutions, as it allows personnel to ensure unexpected phenomena do not occur. When scaling up from the lab scale to the production scale, issues such as altered chemical reaction equilibrium, clumping together of coarser chemicals, and other unexpected results can occur. If pH is not controlled and the amount of dissolved substances is not well understood, major differences in scaling up may significantly impact the quality of the final product.

Solution to measurement challenges:

CANDOR Bioscience manufactures buffer in developmental batches of 1 L up to regular production batches of 1200 L. In order to ensure accurate measurement of pH, CANDOR has collaborated with Xylem Analytics to utilize the benefits

of the IoLine electrode, an advanced triple-junction pH electrode with a unique iodine/iodide reference system now available from YSI. The stability of this reference system even at changing temperatures is the key to the IoLine electrodes' superior measurement stability.



The IoLine pH electrodes are characterized by rapid measurement results, unparalleled stability, high accuracy, and the ability to be used in a variety of challenging aqueous samples, including Tris buffer and protein solutions.

The iodine/iodide system is also metal ion free, a feature that is especially useful when measuring in Tris buffer and protein solutions. Reference systems with metal ions (e.g. Ag/AgCl) will interact with these solutions, ultimately resulting in the reference junction becoming clogged.

Another major advantage of the IoLine, especially for CANDOR Bioscience, is the rapid response time of the electrode, ultimately resulting in a reduction of solution production time and temperature sensitivity of measurements.

Solution to documentation challenges:

Due to stringent documentation requirements with the development and production of immunoassay solutions, CANDOR Bioscience has also chosen to partner with Xylem Analytics in order to equip their facilities with advanced pH and conductivity instruments. These instruments have the capability to automatically print a record with the measured value, date, time, temperature, and instrument ID, ensuring traceability for all measurements and calibrations. With the release of the MultiLab and TruLab, YSI has expanded their offering of laboratory products to include such advanced instruments with the capability of easily providing detailed documentation.

For more information on YSI lab instrumentation, visit: ysi.com/laboratory

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