



GLASS ENCAPSULATED OSMOLALITY STANDARDS For In Vitro Diagnostic Use

THE IMPORTANCE OF ACCURATE STANDARDS

The accuracy of reported osmolalities can be no better than the accuracy of the standards solutions used to calibrate your osmometer. Wescor ampule osmolality standards provide uncompromising accuracy to satisfy the most stringent laboratory quality assurance regimens. Calibration integrity is assured because ampules provide fresh solution with each use. Ideal as reference standards, our new ampules are so economical they can be used for routine osmometer calibration. Wescor ampule standards are manufactured under strict quality control and sealed in glass to preserve accuracy for a minimum storage life of 36 months.

AMPULES ARE CONVENIENT TO USE

Each ampule contains 0.4 mL of solution. This volume adequately mitigates evaporative concentration for a few hours after the ampule is broken. The aim is to provide an amount sufficient to ensure accuracy without being wasteful. Please note that these ampules are intended for one-time use of no more than a few hours duration. Discard any solution that remains after you have finished your calibration procedures.

NOTE: Capillary action will tend to hold a portion of the solution in the top of the ampule. "Flip" the top or tap the bottom of the ampule against a hard surface to clear solution from the top after opening.

Each Wescor ampule is fitted with a safety breaker sleeve for protection from the fractured edge. To open an ampule, place the ampule body in a holder or hold the body of ampule firmly in one hand. Grasping the top firmly between the thumb and forefinger of the other hand, snap the neck of the ampule.

SAMPLE DIRECTLY FROM THE AMPULE

Aspirate no more than the volume required for measurement directly from the ampule. Use a fresh micropipettor tip each time to avoid contamination of the solution. The aim is to leave as much solution as possible in the container so as to maintain a low concentration rate.

STORAGE

Store ampules at room temperature. While they generally are able to withstand freezing without breaking, we nevertheless recommend that freezing temperatures be avoided if possible.

STANDARD INTERNATIONAL (SI) UNITS OF OSMOLALITY

Osmolality, by definition, is an expression of the total number of solute particles dissolved in one kilogram of solvent without regard for particle size, density, configuration, or electrical charge.

Traditionally, osmolality has been expressed as milliosmoles per kilogram, with various abbreviations such as mOs/kg, mOsm/kg, and mOsmol/kg. The letters "Os" were included to signify that osmolality is defined as the concentration, expressed on a molal basis, of the **osmotically active** particles in true solution. Thus, one mole (1000 mmol) of sodium chloride dissolved in a kilogram of water would have an ideal osmolality of 2000 mOsm/kg, since a molecule of sodium chloride dissociates in solution to produce two ions, that is, two osmotically active particles.

The foregoing example assumes ideal conditions for the sake of clarity. In fact, a molal solution of sodium chloride will have an osmolality value slightly less than the ideal because the residual mutual attraction of the hydrated ions reduces their mutual independence by a factor called the osmotic coefficient. Since the coefficient varies with the solute concentration, the relation between osmolality and concentration of solute is not linear. **For this reason, measurements of osmolality made on laboratory-diluted specimens, with subsequent multiplication by the dilution factor to calculate the original solution osmolality, will not give valid results.**

With complex solutions, such as biological fluids, analytical variables are universally expressed as the concentration of specific ions and of undissociated solute particles. It follows that a molal solution of NaCl can be analytically expressed as a combination of a molal solution of sodium ions and a molal solution of chloride ions. The total concentration of solute particles (the osmolality) is therefore 2000 millimolal. Hence the osmolality can be expressed simply as 2000

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mmol/kg without the necessity of introducing the "osmole" concept.

The commission on Clinical Chemistry of the International Union of Pure and Applied Chemistry (IUPAC) and the International Federation of Clinical Chemistry (IFCC) have recommended that the unit of osmolality be mmol/kg, and this has been adopted by the American Journal "Clinical Chemistry" as part of its general acceptance of Standard International (SI) units. Wescor led the industry as the first osmometer manufacturer to adopt Standard International (SI) units.

QUALITY ASSURANCE

Wescor calibration solutions are manufactured using reference data on the concentrative properties of sodium chloride in water from the Handbook of Physics and Chemistry, CRC Press. For quality assurance, each lot is compared by replicate osmolality measurements to reference solutions prepared from dried, high-purity sodium chloride obtained from the National Institute of Standards and Technology. Wescor guarantees the accuracy of its calibration solutions within the combined overall accuracy of the reference solution formulations and the control measurements: 100 ± 2 mmol/kg; 290 ± 3 mmol/kg; $1,000 \pm 5$ mmol/kg.

REORDERING INFORMATION

Standards are packaged in 60 ampule cartons designed for convenient shipment and storage. Reorder by catalog number:

Catalog Number	Osmolality
OA-010	100 mmol/kg
OA-029	290 mmol/kg
OA-100	1000 mmol/kg

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