



VP-DSC Differential Scanning Calorimeter

Differential Scanning Calorimetry (DSC) is unsurpassed as a method to determine the stability of biological systems. DSC directly measures heat changes that occur in biomolecules during a controlled increase or decrease in temperature, making it possible to study materials in their native state.

The MicroCal VP-DSC is the most sensitive, easy to use differential scanning calorimeter available to study samples in solution. It can be used to measure the intramolecular stability of a broad spectrum of biomolecules, including proteins, nucleic acids, lipids and detergent micellar systems. The VP-DSC provides fast, accurate transition midpoint (T_m) determination. In addition, a thermodynamic profile can be generated, providing insight into the factors that affect conformation and stability.

Other applications include: determination of protein stability and folding, antibody domain structure determination, characterization of membranes and lipids, and the measurement of ultra-tight molecular interactions.

MicroCal instruments are found at major pharmaceutical, biotech, academic and government institutions worldwide.

Why DSC?

- Save time and money in stability testing.
- Study molecules in their native state without labeling. Can be used with solutions that interfere with optical methods including turbid or colored solutions or particulate suspensions.
- Provides insights into mechanisms of unfolding and refolding.
- Determine ultra-tight binding constants not able to be measured by other techniques (up to $10^{20}M^{-1}$).
- Easy to use: Unattended operation after sample loading.
- Complete system: No additional accessories to purchase. No reagents or consumables are required.



Differential Scanning Calorimetry (DSC) measures enthalpy (ΔH) of unfolding due to heat denaturation. A biomolecule in solution is in equilibrium between the native (folded) conformation and its denatured (unfolded) state. The higher the transition midpoint (T_m) when 50% of the biomolecules are unfolded, the more stable the molecule. DSC is also used to determine the change in heat capacity (ΔC_p) of denaturation. DSC can elucidate the factors that contribute to the folding and stability of native biomolecules, including hydrophobic interactions, hydrogen bonding, conformational entropy, and the physical environment.

The VP-DSC is controlled by an intelligent user-interface (VPViewer™ software) and data analysis is performed with Origin®, a market-leading data analysis package.



VP-DSC Features:

- Non-reactive Tantalum™ cells for excellent chemical resistance
- Fixed-in-place cells for reproducible ultrasensitive performance with low maintenance
- Three user selectable response times (US Patent #5,967,659) for maximum performance
- User selectable temperature scan rates and range for application versatility
- Self-contained pressurization system (0-45 psi) for studying solutions above their boiling point
- Pressure Perturbation Calorimetry accessory available for determination of partial specific volumes
- Peltier element for precise temperature control
- Includes ThermoVac® sample preparation and cleaning device

SPECIFICATIONS

Operating Temperature Range	-10°C to 130°C
Cell Design	Coin-shaped, fixed-in-place
Cell Material	Tantalum™
Cell Volume	0.5 ml
AC Power Requirements	Cell: 15A/110-240 VAC/50-60Hz
Weight	Cell: 10 kg/23 lbs
Dimensions	Cell: 43 x 20 x 16.5 cm 17 x 8 x 6.5 inches

Full instrument specifications are available upon request.



Ultrasensitive Calorimetry for the Life Sciences™

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