Fully-Automated Ultrasensitive Differential Scanning Calorimeter for High-Throughput Studies of Biopharmaceutical Formulations and Drug Discovery

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Ultrasensitive DSC is used to characterize the structure and stability of proteins down to concentrations of 0.1 mgm/ml and below. With existing instruments, sample throughput can be a limiting factor for certain applications, including: biopharmaceutical formulation stability studies; characterization of mutant protein stability; ligand binding studies. The VP-Capillary DSC has been developed for applications requiring higher throughput. The instrument scans effectively at rates up to 250 ºC/hr, about 3 times faster than conventional ultrasensitive DSCs. The instrument is mated to a fully-integrated autosampler which allows for unattended operation. VPViewer software controls all cell cleaning, cell filling, and scanning operations, and Origin® software is used for post-run data analysis. Maximum throughput is up to 50 samples during 24 hours of continuous, unattended operation. The sample and reference cells have working volumes of ~130 microliters which permit rapid equilibration consistent with the fastest scan rates. Instrument response time is software-selectable to maximize performance at all scan rates. An improved adiabatic mode is used for upscanning over the temperature range –10 to +130 ºC.