

CHEM 475 Connexions Project Outline

DSC

- Introduction
 - History
 - E.S. Watson and M.J. O'Neil in 1962
 - Basic summary of technology
 - Summary and brief history of general calorimetry
 - More specific basic summary of DSC
- Theory of DSC
 - Phase transitions
 - DTA vs Calorimetry
 - Important equations
- Applications
 - Composition analysis
 - Sample purity
 - Material properties
 - Food analysis
 - Pharmaceutical drug testing
 - Medical diagnostics
 - Proteome/Biomarker Discovery
- Instrumentation
 - Equipment
 - Diagram/scheme of equipment
 - Picture of equipment
 - Modes of operations
 - Calibration
- Obtaining Measurements
 - Sample Preparation
 - Data/curves obtained
 - Graphs of example data
 - Calculations
 - Sources of error
- Examples
 - Polymer composition
 - Liquid crystals
- Bibliography
 1. A Differential Scanning Calorimeter for Quantitative Differential Thermal Analysis. E. S. Watson, M. J. O'Neill, Joshua. Justin, and Nathaniel. Brenner. Analytical Chemistry 1964 36 (7), 1233-1238
 2. Calorimetry Outside the Box: A New Window into the Plasma Proteome Garbett, Nichola C.; Miller, James J.; Jenson, Alfred B.; Chaires, Jonathan B. Biophysical journal doi:10.1529/biophysj.107.119453 (volume 94 issue 4 pp.1377 - 1383)
 3. Hohne, G., Hemminger, W., Flammersheim, H. Differential Scanning Calorimetry, 2nd ed.; Springer: New York, 2003.

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4. Utilization of differential scanning calorimetry as a screening technique to determine the compatibility of ketoprofen with excipients
5. Berstein, V., Egorov, V., Differential scanning calorimetry of polymers: Physics, chemistry, analysis, technology. Ellis Horwood: New York, 1994.
6. Dean, J., The Analytical Chemistry Handbook. McGraw Hill: New York, 1995.