

## TECHNICAL NOTES

### DIFFERENTIAL THERMAL ANALYSIS OF THE HELIX-COIL TRANSITION IN SOLUBILIZED COLLAGEN

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Differential thermal analysis (DTA) has proven useful in the absolute measurement of the shrinkage temperature of hides and leathers (1, 2). The macroscopic shrinkage of leather in water is an outward manifestation of the helical-to-coil transition (melting) of collagen (3). We have now used DTA to measure this transition directly on solubilized collagen in buffer solution. A variety of other physical-chemical methods (4-8) have been employed to measure thermal transitions in proteins and polypeptides, but the DTA method is rapid and extremely sensitive. The transition is detectable by the DTA method with less

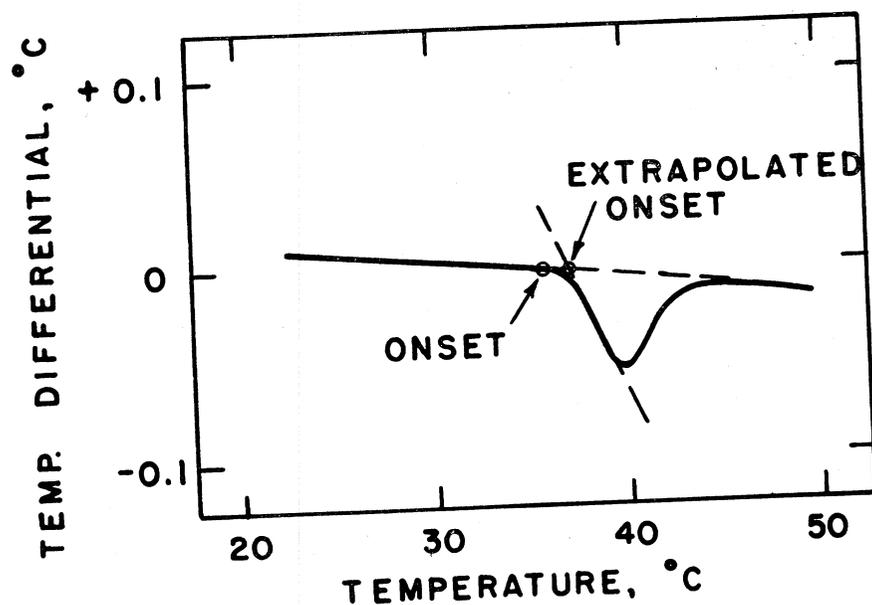


FIGURE 1.—Typical DTA Thermogram of a 1% Collagen Solution.

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than 0.3 mg. of solubilized calfskin collagen in citrate buffer. Measurements were made with the du Pont 900 Differential Thermal Analyzer† using 4 mm. sample tubes and a 10°/min. heating rate. Figure 1 illustrates a typical thermogram obtained from a 1 percent collagen solution. The range of the transition (from onset to peak temperature) was from 35.8°C. to 39.3°C. The extrapolated onset temperature (the starting temperature for the major portion of the transformation) was 36.7°C. These values are in the range reported in the literature for acid-soluble collagen (9-12). Studies are under way to determine the effect of pH and ionic strength on the transition temperature.

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