

DENSITY, CIRCULAR DICHROISM, AND CALORIMETRIC STUDIES OF THE REVERSIBLE STRUCTURAL TRANSITION IN PF 1 FILAMENTOUS BACTERIAL VIRUS.

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The macromolecular structural transition of Pf 1 filamentous bacterial virus detected by X-ray diffraction analysis (1) has been studied in virus solutions by density, circular dichroism, and microcalorimetric measurements. The reversible structural change occurring between 5°C and 25°C has a calorimetrically determined transition enthalpy $\Delta H_{t,cal}$ of $14.5 \pm 1.5 \text{ kJ(mole protein)}^{-1}$. The transition curves resulting from the density, circular dichroism, and calorimetric measurements have been analysed in terms of a two-state process to extract the van't Hoff enthalpy. Comparison of the effective transition enthalpy and the calorimetric $\Delta H_{t,cal}$ values gives about 26 protein subunits as the size of the cooperative unit. Parallel heat capacity and density measurements on fd virus show no such transition, in agreement with X-ray diffraction studies.

1. Nave, C., Fowler, A.G., Malsey, S., Marvin, D.A., Siegrist, H., and Wachtel, E.J. (1979) *Nature*, 281, 232-234.