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Archives of Biochemistry and Biophysics

Volume 35, Issue 1, January 1952, Pages 216-228

Investigations on proteins and polymers. VII. The denaturation of egg albumin

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Summary

The denaturation of egg albumin, in the pH range of 0.9–3.4, over the temperature range 25.0–44.4°C., has been found to follow first-order kinetics, over a wide range of initial protein concentrations and for a wide range of the total denaturation process. Two distinct ways of denaturation have been detected. The first involves the suppression of the dissociation of one hydrogen ion in the protein molecule, while the second involves two such suppressions. In a moderately acid solution, only the first such dissociation is of significance, while the second dissociation enters into prominence in more acid regions. From the respective rate constants, the apparent heats of activation, ΔH^* , were found to be 36.7 and 50.0 kcal./mole.

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- 1 Predoctoral Fellow of the U.S. Atomic Energy Commission.
- 2 Communication No. 240. For a preliminary communication see GIBBS, R. J., BIER, M., AND NORD, F. F., *Arch. Biochem. Biophys.*, **33**, 345 (1951). For previous communications of this series see TIMASHEFF, S. N., AND NORD, F. F., *Arch. Biochem. Biophys.* **31**, 309, 320 (1951). This study was carried out under the aegis of the Atomic Energy Commission. Presented in part before the Division of Biological Chemistry of the American Chemical Society, Boston, Mass., April, 1951.

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