The Absence of Fatty Acids Associated with Potato Starch

BY LEO LEHRMAN AND ELVIN KABAT

In the course of some work on potato starch[1] it was necessary to know the amount of fatty acid, if any, associated with the starch. Though 0.04% "fat by hydrolysis," has been reported in this starch,[2] Taylor and other workers in this field now believe that it is fat free.

To establish this point definitely we extracted a 50-g. sample of potato starch with petroleum ether for several hours and found 0.02% extraneous extractable material. Then we hydrolyzed[3] 2000 g. of the starch and found approximately 0.02% "fat by hydrolysis."

Thus potato starch does not contain fatty acids associated with it and is the best whole starch to use as carbohydrate.

(1) The authors wish to thank Stein Hall & Co., Inc., N. Y. C., for their kindness in supplying this material.

(2) Taylor and Nelson, THIS JOURNAL, **42**, 1726 (1920).

(3) Lehrman, *ibid.*, **51**, 2185 (1929).

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COMMUNICATIONS TO THE EDITOR

AN EQUATION RELATING DENSITY AND CONCENTRATION

Sir:

Redlich and Rosenfeld [*Z. physik. Chem.*, **A155**, 65 (1931)] have shown on the basis of the Debye–Hückel theory that the partial molal volume of an electrolyte in dilute aqueous solution is proportional to the square root of the normality. This gives a theoretical basis for Masson's empirical rule [*Phil. Mag.*, (7) **8**, 218 (1929)] connecting the apparent solution volume of a salt with its concentration in the solution.

$$\phi = \phi_0 + K\sqrt{N}$$

The relation between the concentration and density of a salt solution and the apparent solution volume of the salt can be shown to be

$$\phi = \frac{\text{Eq. Wt}}{D_{\text{H}_2\text{O}}}\text{ salt} - \frac{1000}{D_{\text{H}_2\text{O}}}\left[\frac{D_{\text{soln.}} - D_{\text{H}_2\text{O}}}{N}\right]$$

By combining these two equations one obtains for the equation relating the density and normality of a solution of a strong electrolyte in water

$$D = D_0 + c_1 N + c_2 N^{3/2}$$

where c_1 and c_2 are constants, and D_0 is the density of pure water.