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X-Ray Diffraction in Water 2° to 98°C: The Nature of Molecular Association

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2. The quality or color of the light makes practically no difference in the minimum intensity required.

3. A person wants highest intensity of that kind of lighting which he uses most commonly. It is for that reason that the requirements for the C_1 lamps in the indirect system were low. The indirect system is used much less than the direct and we get along with a lower intensity.

To be sure, the degree of diffusion was greater with the indirect system and hence a greater intensity might be demanded on that score, but evidently this was not sufficient to offset the lesser intensity required by the indirect system because it is used less.

The illumination intensity demanded by people is increasing from year to year. This is largely due to the increasing intensities we have been getting in artificial lighting and our desire to approach the intensities of the out of doors which we use most.

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X-RAY DIFFRACTION IN WATER 2° to 98°C: THE NATURE OF MOLECULAR ASSOCIATION

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X-ray diffraction ionization curves of water show (1) the presence of two definite peaks corresponding to the separation of diffraction planes of 3.27 A.u. and 2.11 A.u.; (2) the practically constant diffraction intensity of one peak over the temperature range, 2° to 98°C as compared with the gradual disappearance of the second peak with increasing temperature; (3) correspondence in angle of diffraction between these peaks and the chief diffraction intensities with ice crystals; and (4) the increase of peak width increasing temperature with a movement to indicating less distance of planes. It is difficult to reconcile these results with what was formerly regarded as the alteration, in complexity of the water molecule. The simplest explanation, emphasized by all the experiments in x-ray diffraction in liquids, is that the so-called molecular complexity is the arrangement of molecules in more or less orderly groups with intermolecular forces of distinct magnitude. With temperature increase the nature of the group changes, one set of planes becoming more poorly defined because of more slippage and less orderly arrangement. The alteration in grouping is also shown by the decrease in distance between planes. The group arrangement (cybotactic condition) describes the nature of what

has formerly been termed "association" and what is now called by Langinescu "molar concentration."

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ABSORPTION SPECTRUM OF VITAMIN A CONCENTRATES

JAY W. WOODROW AND J. B. PHILIPSON

This is a continuation of the work previously reported by Woodrow and Cunningham (Phys. Rev., vol. 35, p. 125, Jan. 1930) on the absorption spectrum of several common sources of vitamin A. Through the kindness of Dr. Morton of the University of Liverpool, it has been possible to investigate the absorption spectra of much more concentrated sources of vitamin A. Slight changes which have been made in the arrangement of the photoelectric spectrophotometer have given more dependable results, partly because they have greatly reduced the destruction of the vitamin A by the ultra-violet light used in taking the measurements. Prominent bands have been found at 310 and 328 mμ. with minor bands at 323 and 340 mμ. The 328 mμ band was much stronger than the same band with weaker sources of vitamin A.

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THE COLOR OF MEATS AND OF THE MUNSELL COLOR CHARTS COMPARED

A. A. BENEDICT

At the present time the most common method of measuring the color of meats consist in a comparison of the surface with a Munsell Color Disc, or a Munsell Color Chart. This method is considered quite satisfactory by some authorities, but its reliability is seriously questioned by others.

This paper is a continuation of the work reported at the Academy meeting a year ago. A great many more readings have been made in which cuts were used that varied quite widely in quality. Also, a comparison has been made between the various Munsell Color Charts, and between cuts of meat and the Color Charts set to match them.