

COMMUNICATION TO THE EDITOR

Properties of Dimethyl Sulfoxide-Pretreated Amylomaize Starch

DEAR SIR:

Amylomaize starch (Amylon VII¹) pretreated by dispersion in dimethyl sulfoxide (DMSO) and quantitatively precipitated with alcohol has increased water-solubility, a property desired in the preparation of undegraded amylose film (1). Such high water-solubility suggested that other characteristics of the pretreated starch might be similar to fractionated amylose (2). The pretreated starch absorbed 95 mg. of iodine per g. in 4 days and showed a good V X-ray diffraction pattern. In contrast, native amylomaize starch absorbed only 6 mg. of iodine and exhibited a B pattern.² Evidence therefore exists for a crystalline helical structure for DMSO-pretreated amylomaize starch.

The starch in films prepared by casting hot aqueous dispersions of DMSO-pretreated amylomaize starch has two structural forms depending upon the temperature at which the wet film is dried. Films cast and dried at temperatures above the gel point (about 50°C.) have an amorphous pattern and might be compared with the amorphous amylose of Katzbeck and Kerr (3). Films dried at 25°C. have the B pattern that is typical for retrograded starch. Such films (as well as extensively retrograded corn amylose) can be converted to a water-soluble product showing a V pattern by repetition of the DMSO pretreatment.

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Literature Cited

1. MARK, A. M., ROTH, W. B., MEHLTRETTER, C. L., and RIST, C. E. Physical properties of films from dimethyl sulfoxide-pretreated amylomaize starches. *Cereal Chem.* **41**: 197-199 (1964).
2. FRENCH, D. Physical properties of starch. *In Chemistry and industry of starch* (2nd ed.), ed. by R. W. Kerr, chap. VII, pp. 159-161. Academic Press: New York (1950).
3. KATZBECK, W. J., and KERR, R. W. Amylose complexes. *J. Am. Chem. Soc.* **72**: 3208-3211 (1950).

¹A product of National Starch and Chemical Corporation, New York, N. Y., with 71% apparent amylose content. Mention of firm names or trade products does not imply that they are endorsed or recommended by U.S. Dept. Agr. over other firms or similar products not mentioned.

²Potato amylose precipitated from dimethyl sulfoxide solutions also gives a V diffraction pattern as demonstrated recently by Germino and Valletta, *J. Polymer Sci., Part A*, **2**: 4757-4763 (1964).