PHYSICOCHEMICAL PROPERTIES OF BANANA STARCH OXIDIZED UNDER DIFFERENT CONDITIONS.

ABSTRACT

Starch isolated from unripe bananas was oxidized under different conditions and the physicochemical properties of the oxidized banana starches were characterized. It was found that pH was the dominating factor in the formation of carboxyl groups. Higher yields of carboxyl groups were found when oxidized starch was prepared at pH 11.5 as compared with 7.5. Longer reaction time also produced a higher carboxyl value. Maltese crosses were still visible in the polarized light micrographs of oxidized banana starch, indicating that the ordered arrangement of starch molecules was not altered. The diffraction pattern of both native and oxidized banana starches was a mixture of A- and B-types. No difference was noted in the absorbance ratio as measured by infrared spectroscopy between the oxidized banana starches at both pHs. The onset and peak gelatinization temperatures increased and gelatinization range decreased with increasing pH during the oxidation. For pasting properties, viscosity significantly decreased during heating and cooling with the most drastic reduction noted for the sample oxidized at pH 11.5. All starches showed a non-Newtonian shear-thinning behavior. The oxidation reaction that incorporated chemical groups produced a softer system in banana starch due to the possible incorporation of more water molecules in its structure..

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