EFFECT OF LOW AND HIGH ACETYLATION DEGREE IN THE MORPHOLOGICAL, PHYSICOCHEMICAL AND STRUCTURAL CHARACTERISTICS OF BARLEY STARCH.

ABSTRACT

Barley starch was acetylated at two levels (low degree: LD (0.9), and high degree: HD (2.7)) substitution and the morphological, physicochemical and structural of the resultant acetylated barley starch were determined. The acetylated barley starches presented the signal at 1226 cm^{-1} that corresponds to the C–O stretching of acetyl groups. The morphological study showed fusion of starch granules in the acetylated starch with HD. This effect was evident in the pasting test, because the viscoamylograph profile of HD starch showed the absence in peak viscosity, viscosity breakdown and viscosity setback. The peak gelatinization was similar for native and LD and decrease in the HD acetylated starch. The gelatinization enthalpy value showed difference among the samples, indicating that the loss of the ordered double helices more than the crystallinity loss was higher in the HD acetylated barley starch. In the retrogradation test, acetylation affected both retrogradation and enthalpy value, because acetylated barley starch with HD substitution at three storage days had 3.2 j/g and with LD 4.8 j/g. The molecular weight and z-average radius of gyration values decreased due to the acetylation process, indicating depolymerization of starch components as it was evidenced by the increase in short chains level in the acetylated samples.

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