EFFECT OF THE CROSS-LINKED REAGENT TYPE ON SOME MORPHOLOGICAL, PHYSICOCHEMICAL AND FUNCTIONAL CHARACTERISTICS OF BANANA STARCH (*MUSA PARADISIACA*).

ABSTRACT

Cross-linked starches have increased their importance due to their applications such as adsorbents of heavy metals. In this work the effect the reagent used in the chemical modification of banana starch and its impact on some morphological, physicochemical and functional characteristics was evaluated. The reagent used in the cross-linked of starch decreased the fat and protein content, whereas ash level were higher. The morphology of the granules, observed by scanning electron microscopy, was more affected when a blend of sodium trimetaphosphate (STMP)/sodium tripolyphosphate (STPP) and epichlorohydrin (EPI) were used in the modification. The cross-linked starches presented a bimodal distribution and the effect was more conspicuous in those starches modified with STMP/STPP and EPI. The swelling value (60°C) increased with the cross-linking and the highest value was obtained in those starches modified with STMP/STPP and EPI. However, at higher temperatures the swelling values of cross-linked starches with STMP/STPP and EPI decreased as temperature increased (80°C), and there after the value was constant. The cross-linked starches with STMP/STPP and EPI showed the lowest solubility values. The cross-linked starch with $POCl_3$ (phosphorous oxychloride) showed a slight decrease in the onset and peak temperatures compared with its native counterpart, but those modified with STMP/STPP and EPI presented an increase in the three transition temperatures, but a decrease in enthalpy value. The results obtained can be used to determine the type of reagent used for cross-linked in order to obtain a starch with specific characteristics.

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