EFFECT OF ACID TREATMENT ON THE PHYSICOCHEMICAL AND STRUCTURAL CHARACTERISTICS OF STARCHES FROM DIFFERENT BOTANICAL SOURCES.

ABSTRACT

Starch and starch derivatives (maltodextrins) are used as encapsulating materials. Starch for use as encapsulating material could be subjected to mild acid treatment. However, the granule size and organization of starch components (AM and AP) play an important role in the acid treatment. The aim of this research was to produce modified starch that might be used as encapsulate material, applying moderate acid-treatment with 3 N sulphuric acid in a ratio 1:5 w/v for 3 h at 60°C, in starches from different granule size, evaluating their morphological, physicochemical, and structural features. Acid treatment has an effect in the AM content and the outcome was higher in starch with larger granule size. Bimodal granule size distribution was found in acid-treated rice and maize starches. Erosion and exo-corrosion were observed in acid-treated starches with SEM. The XRD pattern did not change with the acid treatment, the native and acid-treated samples showed similar crystallinity values, except rice starch. The branching degree was higher for modified potato starch, showing higher branching points, modified starches had shorter chains with increased A-chains, and decreased B3+ chains, and the effect was higher in cereal starches; modified starches had a higher degree of retrogradation and they did not show pasting properties. The internal organization given by the granule size is an important parameter in the acid treatment of starches as it affected their physicochemical and structural features, and in the end, their functionality as encapsulate agent.

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