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Influence of amylose content and oxidation level of potato starch on acetylation, granule structure and radicals' formation

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Highlights

- > **The level of oxidised starch influenced on acetylation process.**
- > **The waxy potato starch was more susceptible to the dual modification than the potato starch**
- > **The degree of oxidation and acetylation influenced on the granule structure of dual modified starch**
- > UV irradiation of dual modified starches lead to formation of carbohydrate radicals.

Abstract

This study was aimed at determining the effect of the amylose content of starch and oxidation level of potato starch on the structure of starch granules, and susceptibility to chemical modification (acetylation) and subsequent generation of radicals. Potato starch and waxy potato starch were oxidised with sodium hypochlorite applied in doses corresponding to 10, 20, and 30g Cl/kg starch, and then acetylated with acetic acid anhydride. The carboxyl, carbonyl, acetyl groups were determined in modified starches. Structural properties of starch granules were evaluated based on gelatinisation, crystallinity, specific surface, intrinsic viscosity, and microphotographs by SEM microscope. The electron paramagnetic resonance (EPR) measurements were carried out to establish starch susceptibility to radical creation upon chemical modification and UV radiation. The amount of formed radicals was treated as a measure of the starch structure stability. The higher amount of amylose and the highest level of oxidation led to strong starch structure destruction and consequently facilitated radical

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