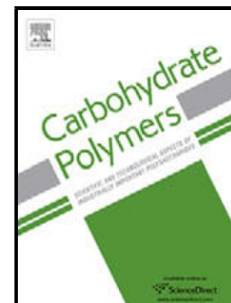


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EFFECTS OF HYDROPHOBIZED STARCHES ON THERMOPLASTIC STARCH FOAMS MADE FROM POTATO STARCH

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Highlights

- Article: "Effects of hydrophobized starches on thermoplastic starch foams made from potato starch"
- Bruno Felipe Bergel, Samara Dias Osorio, Luana Machado da Luz, Ruth Marlene Campomanes Santana
- - Starch biodegradable foams with different amounts of modified starch were studied.
- - Two modifications were studied: acetylation and esterification with maleic anhydride.
- - Samples with 6.67% and 13.34% of modified starch improved the foams properties.
- - Foams with 26.67% of modified starch showed irregular structures and weak properties.

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Abstract

Single use food packaging made from expanded polystyrene (EPS) is generally discarded after use and, since it is a difficult material to recycle, generates a large amount of waste. The EPS can be replaced by thermoplastic starch (TPS) foams, which are made from renewable sources and are biodegradable. However, TPS foams are hydrophilic and absorb large amounts of water, which makes it difficult to use. An alternative to this problem is to chemically modify the starch to make it more hydrophobic. Two modifications for potato starch were evaluated: acetylation and esterification with maleic anhydride. Foams with 6.67%, 13.34%, 20% and 26.67% (modified starch weight/ total starch paste mass) of modified starch were prepared. While TPS foams without modified starch absorbed 75g water /100g solids, foams with 13% acetylated starch and 20% esterified starch presented lower absorption results (42g and 45g water/100g solids, respectively), which represents an improvement in water resistance.

Keywords: TPS foam; acetylated starch; esterified starch

1. Introduction

Starch is one of the most abundant natural polymers and is the main form of storage of carbohydrates in plants. It is used in the food industry, where it has several applications, such as in the manufacture of cakes, breads and biscuits. It also has applications in the cosmetics, pharmaceutical and textile industries. Recently, starch has been widely used in the production of environmentally correct materials, such bags, cups, cutlery and food packaging (López, Castillo, Garcia, Villar, & Barbosa, 2015; Masina et al., 2017; Soykeabkaew, Thanomsilp,

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