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Potato Starch Polymeric Films : Environment-Eco-Friendly Waste Alternative to Petroleum-Based Polymers

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Abstract

There are several benefits to commonly used synthetic plastics; however, their resistance to biodegradtion has a negative effect on the environment. Therefore, due to growing interest in sustainability and environmental concerns, the use of biodegradable polymeric films will become widespread. Over the past two decades researchers have made great efforts to grow naturally-based ingredients that improve starch texture and nutritional values. Besides its uses in other foods, Starch has other non-food applications, ranging from body care to medicinal applications. Because starch is a renewable and environmentally friendly material, it can serve as a good replacement for fossil-fuel components in many chemical applications, including plastics, detergents, and glues. This research aims at developing edible potato starch film by mixing potato starch (PSS) with sodium starch glycolate (SSG) and silica nanoparticles (SiO2) substantially controls its swelling and mechanical behavior. Potato starch film was prepared using glycerol as a plasticizing agent in aqueous gelatinous solution containing different quantities of SSG with and without SiO2. UV-vis spectroscopic technique was used to investigate the edibility of films in aqueus salt solution pH 7.4 at 25 oC. The rheological and mechanical properties of films have showed the different respenses of the films to SSG content and loading of SiO2. It has been determined that SSG's cross-linking capability plays a critical role in starch's mechanical and rheological properties.

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Biography:

Fateh Eltaboni received the B.Sc. degree in Chemistry from University of Benghazi (Libya) in 2003 and M.Sc. degree in Physical Chemistry from the same university in 2006, then he received the PhD degree in Physical Chemistry from the University of Sheffield (UK) in 2013 he worked as a post-doc researcher in bacterial polymers (Kroto Research Institute (UK) until the end of 2013. He is now with the Laboratory for Polymeric Materials & Nanocomposites.