

Starch-based biodegradable composite materials with polypropylene and plasticisers

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Among the great number of natural polymers starch generates more interest. Owing to its complete biodegradability, low cost and renewability in plants, starch is considered as a promising candidate for developing biodegradable composite materials. In view of this, many efforts have been exerted to develop starch-based polymers for conserving the petrochemical resources and searching new applications. By combining the individual advantages of starch and synthetic polymers, starch-based biodegradable polymers are potential for applications in biomedical and environmental fields.

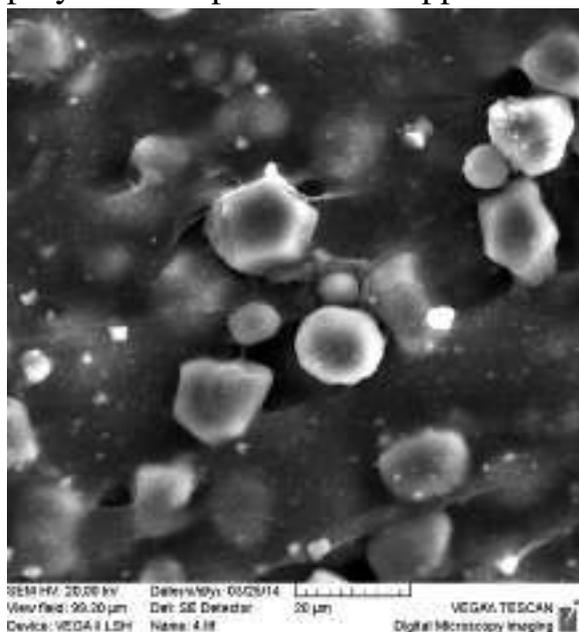


Fig. Biodegradable composite material starch-PP

In this presentation the new preparation method of biodegradable starch-based polymers via physical and chemical modification using sorbitol and ethylene glycol plasticisers and a mixture of polypropylene (PP) homopolymer powder with 50% starch with processing additives is discussed.

The product in the form of strip is made by cold mixing of components and reactive twin-screw compounding in which a chemical coupling occurs between the starch and PP matrix, which accounts for the material's excellent properties. At last, some examples for various compositions of starch-based composite materials have been presented. The biodegradable

composite material starch-PP was characterized by X-ray diffraction (XRD), scanning electron microscopy (SEM) and IR-spectroscopy. Bioplastic has higher stiffness, strength, and heat resistance than un-filled PP but also has lower elongation and impact toughness.