CEBA-TIC: Bioplastic Generated with Biopolymers of Hordeum vulgare

Gutierrez Aguilar, Uriel (School: Colegio de Estudios Científicos y Tecnologicos del Estado de Hidalgo)
Dominguez Ayala, Alejandro (School: Colegio de Estudios Científicos y Tecnologicos del Estado de Hidalgo)

Because plastics are contaminated by oil, the main pollutant in the world, we look for a new alternative of polymers that don´t harm the environment. The main objective is to obtain a biodegradable plastic with the combination of seeds and straw of Hordeum vulgare in combination of starch of Zea mays in a ratio of 1:1. The adequate proportions of additives for plasticization were also sought (acetic acid and glycerin). The solubility of the bioplastic in (toluene, benzene, hydrochloric acid, sodium hydroxide and water was tested, in the effects of heat it was observed that it is molded according to the applied heat, by the relative density we obtained that it doesn´t float in the isopropyl alcohol, vegetable oil and water, but in glycerin it does. By Infrared Spectroscopy (FT-IR) the structural chemical composition of the main components was determined, and according to the movement of the vibration bands and their intensity, it could be inferred that the OH groups present in the raw material reacted by giving flexible form to the membranes that were also checked with the Scanning Electron Microscopy, obtaining images showing the presence of fibers, modified starches, rod formation and the connection between the layers that form the macroscopic structure of the membrane. By the analysis it was deduced that we obtained different plastics by two different methods, similar to those of a thermoplastic. Keywords: plastics, polymers, plasticization, fibers, starches, biodegradable.

Awards Won: