SAMIS: Corn Cob to Replace Polystyrene, Year II

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Improper disposal of expanded polystyrene (EPS) can cause major environmental and social problems, as it takes 150 years or more to degrade. Knowing that there is no way to inhibit its consumption, some methods have been sought to partially replace it, reducing its impact. Taking into account that the State of Paraná/Brazil is considered the largest producer of corn in the country and that the cob is the least used part of this plant in industrial processes, this research aims to propose a replacement of EPS in the packaging of electronics, with a product based on corn cob, which is associated with polyether polyol and diphenylmethane diisocyanate, reagents used for polyurethane foam (PU). The goal was to obtain a more sustainable packaging, with lower cost, resistance to compression and similar characteristics to the material commonly used. The products were analyzed through the tests of impermeability, porosity, flammability, swelling against organic solvent, biodegradation, density, techniques of Fourier-transform infrared spectroscopy (FTIR), scanning of electron microscopy (SEM) and compression tests. The results showed that the biodegradation increased in relation to pure PU, as well as the growth of the foam was faster and the swelling when in contact with a solvent was similar. In relation to SEM, the similarity in morphology between pure PU and the product was noted, demonstrating positive qualities. Nevertheless, some compression characteristics must be improved, so that the final product achieves higher goals when compared to EPS and not only the PU foam. Thus, it can be concluded that the alternative product based on corncob was viable and can be applied in the market of protective packaging for electro-electronic products.

Awards Won: