

DETERMINATION OF COMPOSTABILITY AND/OR BIODEGRADABILITY IN COMMERCIAL POLYMERS

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Given the environmental impact caused by the SARS-CoV-2 pandemic, the Government of Mexico City published the Solid Waste Law (09/25/2024). It established the prohibition of the commercialization, distribution, and delivery of plastic bags to the consumer at the points of sale of goods or products, except if they are compostable; starting in 2020. However, the extensive commercial exchange in Mexico City is characterized by the custom of using single-use plastic bags for the transportation of goods, and consequently, products with “new or ecological compositions” have emerged. This project was born in response to the need for scientific evidence of this legislation to detect unauthorized compounds, in collaboration with SECTEI and SEDEMA. The internal research group developed a rapid testing methodology for compositional, thermal, and spectroscopic analysis in three stages: 1) sample reception, 2) measurement by FTIR, Raman, TGA, DSC; and finally, 3) processing and analysis of results. The compostability/biodegradability of 59 bags, randomly collected in 6 municipalities of Mexico City, was evaluated, and compared with 12 unauthorized polymer standards (potentially non-compostable). A database of colorimetric and spectroscopic analyses of commercially available standards and products was created. A thin film TGA-DSC measurement method was also designed/implemented. Record: sample code, product description, producer, batch, collection date, standards declared in compliance. It was demonstrated that the classification of samples based on a visual-sensory inspection (color-texture) is not useful as a first approximation to the chemical composition of the bags. This methodology was made available to SECTEI to be replicated in any laboratory with the characterization equipment used for this project. In the medium term, it helps these tests to be available to the authorities, producers and marketers, and society in general, since a compostability test that lasts 4 months would be too expensive for small merchants.

Keywords: Compostable, Biodegradable, Reciclable

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