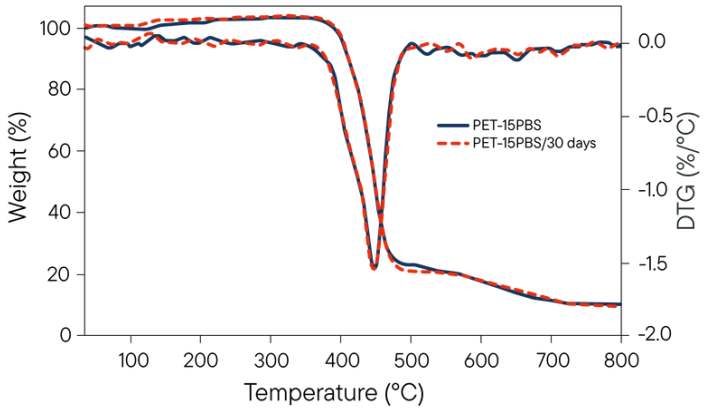
Thermal Stability of PET/PBS Recyclates After Composting Exposure

TGA Analysis of Recycled PET Containing Biodegradable PBS Contaminants

Thermogravimetric analysis (TGA) enables the evaluation of thermal stability and degradation behavior in recycled polymers. In this application example, PET/PBS recyclates were investigated using the Linseis TGA L83 (former designation: TGA PT 1000). The measurement provides valuable insights into the influence of composting exposure on recycled polymer materials.

Measurement Setup

- Instrument: Linseis TGA L83 (former designation: TGA PT 1000)
- Sample: PET/PBS recyclate (15 wt.% PBS)
- Temperature Range: 30 °C to 600 °C
- Measurement: Thermogravimetric Analysis (TGA)
- Application: Polymer recycling and recyclate characterization



The TGA measurement reveals the influence of composting exposure on the thermal stability of the investigated PET/PBS recyclate.
Key observations include:

- Nearly identical degradation profiles before and after composting
- Thermal decomposition starts around 400 °C in both samples
- Maximum degradation rate remains at approximately 445–446 °C
- Only minor differences in total mass loss after composting
- No significant reduction of thermal stability after 30 days exposure

The results demonstrate that short-term composting exposure has only a negligible influence on the thermal degradation behavior of the investigated PET/PBS recyclate.

Interpretation

The observed thermal degradation behavior can be attributed to:

- Stable PET matrix structure
- Limited influence of PBS contamination
- Minor effects of composting exposure

This results in:

- Stable thermal performance
- Reliable recyclate quality
- Improved material assessment

Industrial Relevance

TGA measurements are widely used for:

- Recycling quality control
- Detection of material degradation
- Assessment of thermal stability
- Evaluation of recycled polymer streams

Conclusion

The measurements performed with the Linseis TGA L83 demonstrate that the investigated PET/PBS recyclate maintains its thermal stability after 30 days under composting conditions. The results confirm the suitability of thermogravimetric analysis for evaluating recycled polymers and monitoring the influence of biodegradable contaminants on material performance.

Source:
Pavon, C., Aldas, M., Bertomeu, D., de la Rosa-Ramírez, H., Samper, M.D., López-Martínez, J.
Influence of the Presence of Poly (Butylene Succinate) in the Poly (Ethylene Terephthalate) Recycling Process.
Adapted from thermogravimetric measurements performed using a Linseis TGA L83 (former designation: TGA PT 1000).