

[Thermoanalytical characterization of polymers: A comparative study between thermogravimetry and evolved gas analysis using a temperature-programmable pyrolyzer](#)

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Polym. Test. 42 (2015) 54–61

Abstract:

Evolved gas analysis (EGA) was carried out on 15 synthetic polymer samples using a temperature programmable pyrolyzer as a heating unit which was on-line coupled with a MS detector. A deactivated stainless steel tube and a vent free adapter were used to couple the pyrolyzer with the MS detector, and they were placed in a GC oven at 300°C to avoid condensation of evolved gases with high boiling point. Thermograms of polystyrene measured by this system (Py-EGA-MS) showed shifts of the peak temperature to the higher temperature region as the sample mass increased. It was found that the S/N ratios of EGA thermograms were 420-fold superior to those of differential thermogravimetry (DTG) thermograms for the same sample mass of 0.20 mg. Since a good linear relationship was obtained between peak temperatures obtained by Py-EGA-MS and DTG, it can be concluded that Py-EGA-MS can be used to obtain reliable data on thermal properties of samples with high sensitivity and using less sample.

* Excerpted from online journal website (Click the title)

Frontier Labs products used:

Multi-Shot Pyrolyzer, UADTM-2.5N