

[Comparative study of thermal desorption and solvent extraction-gas chromatography–mass spectrometric analysis for the quantification of phthalates in polymers](#)

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Abstract:

For the quantitative analysis of phthalates in polymers, a thermal desorption (TD)-GC–MS method was compared with solvent extraction (SE)-GC–MS methods which require the long pretreatment procedures using large amount of harmful organic solvents. Calibration curves of TD-GC–MS showed good linearity ($r^2 > 0.9997$) and low method detection limit (<30 mg/kg with 9.0% RSD). Quantification results for three kinds of test phthalate polymer samples (test PTPSs) showed an RSD below 7.4% and acceptable recoveries (78.3–117.4%) as in the standard method of International Electrotechnical Commission. Even in a sample with a high concentration of phthalates (PTPS #3), the method also showed good recovery with low RSD values. The TD-GC–MS results were comparable with those results by SE-GC–MS methods, indicating that TD-GC–MS method also can be used for the quantification of phthalates in polymers. The average recovery (92–103%) and RSD (<20%) values obtained from international inter-laboratory study for TD-GC–MS performed in six laboratories also indicated that TD-GC–MS can be used as an international standard method for the quantification of phthalates in polymers.

* Excerpted from online journal website (Click the title)

Frontier Labs Products used:

Multi-Shot Pyrolyzer (EGA/PY-3030D), AS-1020E, UA-PBDE