

## Reduction of solvent consumption in polyolefin characterization techniques

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Some of the most relevant polyolefin characterization tools are those based on separation techniques, which work on dilute solutions of the polymer, for instance gel permeation chromatography (GPC) for molar mass distribution and crystallization-based techniques (CRYSTAF, TREF, CEF) for chemical composition distribution analysis, among others. Different techniques are also combined to realize two-dimensional separations, such as TREF x GPC (cross-fractionation chromatography, CFC) or SGIC x GPC (2D solvent gradient interaction chromatography, SGIC 2D).

The standard solvents used are in general hazardous for the environment besides being toxic for humans. Some other “*greener*” substances have been proposed as alternatives for performing such analysis, without a clear industrial acceptance due to historical data consistency, IP support requirements or other reasons.

The overall reduction of solvent consumption per analysis and the more efficient recovery of the waste are also complementary measures towards reducing the impact of the current methods. Here we discuss optimization of the analytical methods, in several techniques taken as study cases, which prove to be quite effective for solvent consumption reduction, with assessment of lack of deleterious impact on the results.

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