

CRYSTAF-TREF

CRYSTAF AND TREF TECHNIQUES IN ONE INSTRUMENT



CRYSTAF and TREF techniques in the same hardware to obtain complete CCD information.

CRYSTAF and TREF techniques are intended to measure the Chemical Composition Distribution in Polyolefins; CRYSTAF analyzes it in the crystallization cycle and TREF in the dissolution cycle.

The analysis of complex PP-PE combinations has been shown to require both TREF and CRYSTAF to unequivocally characterize unknown samples, due to the differences in the undercooling between both resins. Such a case is the analysis of samples containing both HDPE and Ethylene-Propylene copolymer (EP) for instance. In TREF the two components will not be well resolved but CRYSTAF will be capable of getting a very good separation. An opposite case is the analysis of samples containing both HDPE and Ziegler type PP homopolymer, which will be separated better with TREF than with CRYSTAF.

Therefore, the CRYSTAF-TREF instrument is a very convenient option to analyze the CCD in Polyolefins, because either CRYSTAF or TREF techniques can be performed by changing the configuration of the equipment.

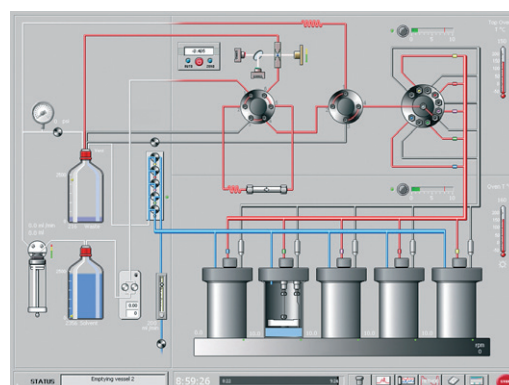
Additional information can be obtained about comonomer content if a composition sensor is incorporated into the IR4 detector or about the Molar Mass tendency by adding Viscometer and/or Light Scattering detectors.

The virtual instrumentation software controls the full process either by CRYSTAF or by TREF, so no manpower is required. Samples are put into the vessels and the instrument performs the whole process including a final cleaning automatically.

KEY POINTS

- ▶ Possibility of running CRYSTAF or TREF techniques in the same instrument.
- ▶ Full automation of the CRYSTAF and TREF techniques to measure the CCD:
 - No manpower required.
 - No solvents handling.
 - Low solvent consumption.
 - Automated cleaning at the end of the analysis.
- ▶ 5 samples can be analyzed with no supervision required; sequentially in TREF mode with an analysis time of 6 hours per sample, and at a time in CRYSTAF mode with an analysis time of 8 hours per 5 samples.
- ▶ Possibility of subambient operation (down to -20°C) for low crystallinity samples.

Possibility of running CRYSTAF or TREF techniques in the same instrument.



The broadest range of instruments for Polyolefin Characterization.

- **CRYSTAF**: an instrument designed for intensive use in the analysis of the Chemical Composition Distribution in Polyolefins.
- **TREF**: a completely automated apparatus for the analysis of the Chemical Composition Distribution in Polyolefins by TREF. It provides complementary information to CRYSTAF data in the analysis of some complex resins.
- **CRYSTAF-TREF**: CRYSTAF and TREF techniques are available in the same equipment for a full Chemical Composition Distribution characterization.
- **CRYSTAF QC**: a simple and robust apparatus for the precise and fast analysis of the Chemical Composition Distribution in a Quality Control environment.
- **CEF**: a high throughput equipment to analyze the Chemical Composition Distribution in polyolefins, using a new approach which combines CRYSTAF and TREF separation mechanisms.
- **CFC**: a fully automated Cross Fractionation Chromatograph (TREF+GPC) for the analysis of the Bivariate distribution in Polyolefins.
- **CRYSTEX**: an apparatus specially designed for the analysis of Xylene Solubles in polypropylene in a Quality Control environment with no solvents handling.
- **GPC_{IR}**: a new High Temperature GPC for the analysis of MWD in Polyolefins. Fully automated sample preparation and filtration. Triple detector+composition.
- **GPC One Software**: the most comprehensive GPC Calculations Software available in the market integrating all detectors signals in the same package.
- **Data Unit 200**: Versatile signals acquisition device to link any vendor GPC instrument with Polymer Char's GPC acquisition and calculations unit.
- **PREP mc²**: an automated instrument to perform semipreparative fractionation of polymers according to composition or molar mass.
- **IR4**: a reliable IR detector that can work with up to four simultaneous wavelengths to measure concentration and composition.
- **IR5 MCT**: a modern IR detector with a sensitive MCT element (thermoelectrically cooled) for the analysis of low number of branches in HDPE pipe resins by GPC_{IR}.
- **Additional Detectors**: in some of its instruments Polymer Char offers Light Scattering (DAWN[®]HELEOS[™] II of Wyatt Technology), Viscometry and Composition (by Polymer Char) to perform Triple Detector+Composition analysis.

Company Profile

Polymer Char, the world's leading Polyolefin Characterization Company, is devoted to the development of state-of-the-art instrumentation for Polyolefin Analysis.

Polymer Char goes as far as Polyolefin Analysis techniques and Engineering Technology and advancement is concerned, with the broadest and most modern range of products for Polymer Analysis and more specifically, for Structural Characterization of Polyolefins, such as Chemical Composition Distribution (CCD), Molar Mass Distribution (GPC/SEC), Bivariate Distribution, Xylene Solubles, Preparative Fractionation or Infrared Detection.

The company is well known also by its advanced approach into virtual instrumentation software, that together with excellent Remote Control capabilities and its strong commitment to Customer success, places the company in the leading edge on instrumentation Diagnostics and Technical Support.

Polymer Char was formed as Polymer Characterization, S.A. in 1992 at the Valencia Technology Park in Spain with the initial goal to develop a commercial CRYSTAF instrument. Now, after almost two decades in the Polyolefin Characterization industry, backed with unmatched technical expertise and insights, Polymer Char maintains the highest levels of Quality and Service that go with the needs of the Petrochemical, Research and Academic industries.

Today, Polymer Char provides to the leading Petrochemical firms, as well as to prestigious R&D Institutes and Universities from all around the world. Its instruments are present in over 20 countries, within the Americas, Europe, Africa, Middle East and Asia.

Polymer Char's knowledge investments are backed by years of R&D and have led to the creation of state-of-the-art Polyolefin lab in Valencia in 2008 from where the company supplies Analytical Services in over 30 countries.



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