

PREP C20

COLUMN-BASED PREPARATIVE FRACTIONATION



Fully Automated Column-based Preparative Fractionation Equipment for Polymers.

PREP C20 is a fully-automated preparative pilot-plant-type equipment designed to fractionate, in a column's support, high amounts of polymer according to its chemical composition by a Temperature Rising Elution Fractionation (TREF) process, or according to its Molar Mass, by modifying the solvent power through a solvent-non solvent combination, typically in isothermal conditions.

A dry sample is put in a vessel and filled with solvent for dissolution. The sample solution is then loaded into a column where the fractionation takes place. The equipment fractionates the sample following the selected method's conditions and number of fractions, which can be eluted at the volumes desired. At the end, the vessel is rinsed and ready for the following fractionation.

The main steps in the preparative fractionation process (dissolution, column loading, crystallization, elution, and fraction collection) are performed in an automatic mode, thus, avoiding the need for handling hot and large amounts of solvent. It is precisely in its capacity of fully automating the fractionation of large amounts of polymer where the system holds its major benefit.

PREP C20 facilitates cross-fractionation studies (fractionation through TREF or Molar Mass and follow up analysis through GPC/SEC or TREF), that have been demonstrated to be a necessary tool to fully characterize resins. The fractions obtained can be further analyzed by spectroscopic techniques and can be used for micromechanical testing as well.

Polymer Char References

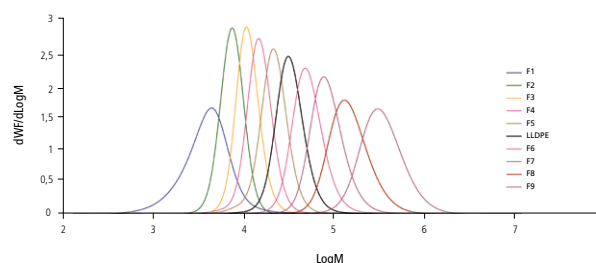
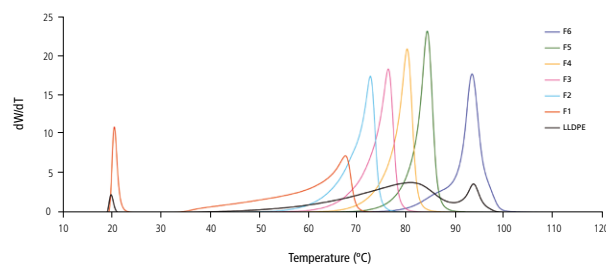
- App. Note: "Fully automated preparative column-based fractionation by composition or molar mass."
- App. Note: "Column-based Preparative Fractionation for Polyolefins". Published in LCGC 2014.
- Poster: "Column-Based Preparative Fractionation for Polyolefins" (ICPC 2014, Valencia, Spain).

Find out more at www.polymerchar.com/PREP_C20

This information is subject to change without notice. ©2025 Polymer Char.

KEY FEATURES

- ▶ Fully-automated preparative fractionation:
 - ▶ Up to 20 grams of polymer, depending on the sample.
 - ▶ Column-based fractionation.
 - ▶ Unlimited number of fractions (up to 9 fractions without exchanging bottles).
 - ▶ No handling of hot solvents.
- ▶ Fractionation modes by TREF technique or by Molar mass through solvent-non-solvent approach.
- ▶ Subambient operation thanks to an integrated compressor (no need for liquid coolants).
- ▶ By exchanging the column, the fractionation can be performed by Thermal or Solvent Gradient Interaction Chromatography.



Same sample fractionated by TREF (plot1) and by Molar Mass (plot2)

Solutions 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. 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.

CEF: A high throughput equipment to analyze the Chemical Composition Distribution in Polyolefins, using a new approach combining CRYSTAF and TREF separation mechanisms.

PREP mc²: An automated instrument to perform semipreparative fractionation according to composition by TREF or CRYSTAF, or molar mass.

PREP C20: New column-based preparative fractionation instrument, capable to fractionate up to 20 grams of polymer.

CRYSTEX[®] QC: A truly automated system based on TREF-separation concept for soluble fraction measurement, ethylene content and intrinsic viscosity in PP/PE plants control.

CRYSTEX[®] 42: A high-throughput and easy-to-use system for simultaneous measurement of the soluble fraction, ethylene content and intrinsic viscosity in a fully automated process for up to 42 samples.

IVA: Reliable and automated instrument for Intrinsic Viscosity Analysis of polymers with dissolution temperature up to 200°C.

GPC-IR[®]: Advanced High Temperature GPC for the analysis of Molar Mass Distribution in Polyolefins. Fully automated sample preparation and filtration. Triple detector (IR, VS, LS) plus composition.

GPC-QC: High Temperature GPC instrument for Quality and Process Control in Polyolefin production plants.

CFC: A fully automated Cross Fractionation Chromatograph (TREFxGPC or TGICxGPC) for the analysis of Bivariate distribution.

One Software: The most comprehensive Calculations Software integrating all detectors' signals.

TGIC: An adsorption high temperature HPLC technique for the analysis of low crystallinity Polyolefins.

SGIC 2D: An adsorption high temperature HPLC technique combined with GPC and infrared detection for the analysis of composition and molar mass interdependence of Polyolefin resins.

IR4: Integrated, reliable and simple to use infrared (IR) detector to measure concentration and composition.

IR6: Enhanced sensitivity and stability to analyze molecular weight and chemical composition (SCB/1000TC) and the additional capability of measuring carbonyls group in the band of 1740 cm⁻¹.

Analytical Services: Polymer Char laboratory, a global reference in the field, counts on the latest technologies for Polyolefin Characterization.

Company Profile

Polymer Char is devoted to the development of state-of-the-art instrumentation for Polyolefin Analysis.

The company offers the broadest and most modern range of instruments and services for polymer analysis and more specifically, for the structural characterization of Polyolefins, such as Molar Mass Distribution (GPC-IR[®], GPC-QC), Chemical Composition Distribution (CRYSTAF, TREF, CEF), Bivariate Distribution by Cross-Fractionation Chromatography (CFC), High Temperature HPLC (TGIC, SGIC 2D), Soluble Fraction Determination (CRYSTEX[®], CRYSTEX[®] QC and CRYSTEX[®] 42), Preparative Fractionation (PREP mc², PREP C20), Intrinsic Viscosity (IVA, IVA Versa) or integrated Infrared Detection (IR4, IR6).

Polymer Char is also well known for its advanced approach to virtual instrumentation software that, together with excellent remote control capabilities and its strong commitment to Customer success, places the company at the leading edge on instrumentation diagnostics and technical support.

Together with its global network of partners and distributors, Polymer Char supplies, trains and supports Customers worldwide. The company provides analytical services in 35 countries and its instruments are present today in over 20 countries within the Americas, Europe, Africa, Middle East and Asia Pacific, predominantly serving Polymer Producers and Processors, Government and Academic Research Laboratories, Contract Research Organizations, Analytical and Testing Laboratories, and Chemical Instrumentation Manufacturers.

In the last three decades and with an annual investment of up to 20% of its manpower resources on R&D, Polymer Char has played a key role in the development of most of the existing Polyolefin analysis technologies, such as CRYSTAF, CRYSTEX[®], CEF, CFC, and GPC with IR detection. Each new project, each new analysis, underpins Polymer Char as the Polyolefin Characterization Company.



IMPIVA



EUROPEAN UNION
European Regional
Development Funds