GPC-QC

HT GPC INSTRUMENT FOR QUALITY CONTROL / PROCESS CONTROL

Simplified and fully-automated high temperature GPC instrument aimed at control laboratories in the polyolefin industry.

GPC-QC is a compact, high-temperature GPC instrument for quality control in polyolefin manufacturing lines. The instrument has a simple and reliable approach based on Polymer Char's recently developed QC platform, to provide robust and precise Molar Mass Distribution for process control.

For quality control purposes, the industry has traditionally relied on physical parameters related to an average of the MMD, such as melt flow index (MFI) and density. These parameters are not enough when producing complex multiple reaction products, some of them having multimodal MMD. It is in these occasions when GPC-QC can provide significant value by measuring the whole MMD.

GPC-QC delivers the complete Molar Mass Distribution for one sample through a simplified workflow, while keeping a fully automated sample preparation and an analysis free of manual solvent handling throughout the entire process. The complete analysis takes 30 minutes including dissolution.

The IR detection, implemented in the instrument through Polymer Char's integrated IR4 or IR5 MCT detectors, is highly stable, contributing to the overall reliability of the instrument. The IR detector also provides simultaneous chemical composition information, which is key for controlling the production of heterogeneous resins.

Moreover, for a truly complete analysis, the instrument can also measure intrinsic viscosity by means of a built-in dual-capillary viscometer that can be incorporated as an additional feature.

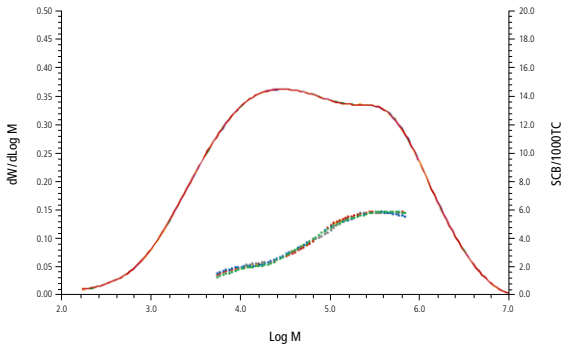
Important applications for GPC-QC are:

- Pilot plants.
- Plant start-ups.
- Monitoring grade changes in multi-reactor processes.
- Monitoring the microstructure of pipe resins.
- Processors' laboratories.

Find out more at **www.polymerchar.com/GPC-QC**

KEY FEATURES

- Full automation of the entire analytical process.
- One sample analyzed in 30 minutes including dissolution.
- IR4 or IR5 MCT detectors for Concentration and Short Chain Branching information.
- Optional incorporation of a dual-capillary viscometer.
- Simple and reliable design for Quality Control environments.
- Comprehensive results (MMD, SCB, IVD).
- Outstanding precision thanks to the full automation and the detectors' robustness.



MMD and SCB results of a bimodal HDPE sample. Overlay of 5 injections

Dissolution

Polyethylene
M_w=200,000 g/moL
d=0.940 g/cm³

Polymer Char References

- App. Note: "Gel Permeation Chromatography (GPC) for Process Control and Quality Control".
- Article: "Is your polyolefin resin performing as expected?". Published in Plastics Engineering, May 2018.
- Poster: "Analysis of Ultra-High Molecular Weight Polyethylene (UHMWPE) by GPC-IR and Viscometer (GPC Conference 2015, Washington D.C., USA)."

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Polymer Char

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 200ºC.

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 (TREF x GPC or TGIC x GPC) for the analysis of Bivariate distribution.

GPC One® Software: The most comprehensive GPC/SEC Calculations Software integrating all detectors' signals.

Data Unit 200: Versatile signals acquisition device to link any vendor GPC instrument with Polymer Char's GPC One®.

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.

IR5 MCT: Integrated and modern IR detector with an MCT element (thermoelectrically cooled) for high sensitivity analysis.

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, GPC One®), 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) or integrated Infrared Detection (IR4, IR5 MCT).

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 two 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.

GENERALITAT VALENCIANA IMPIVA MINISTERIO DE CIENCIA E INNOVACIÓN MINISTERIO DE INDUSTRIA, TURISMO Y COMERCIO EUROPEAN UNION European Regional Development Funds

Several Polymer Char's R&D projects have counted on the financial support of IMPIVA, the Spain's Ministries of Science and Innovation and of Industry and Trade; and the European Union, with its Funds for Regional Development within the FEDER operational program of the Valencian Community 2007-2013.