GPC-IR®

Fully-automated high temperature GPC/SEC system with highly sensitive Infrared Detector for Molar Mass Distribution and chemical composition analysis of Polyolefins.

With over 20 years of experience in the development of high temperature instruments for polyolefin analysis, Polymer Char offers the GPC-IR® instrument, a reliable multiple detector Gel Permeation Chromatography (GPC) system dedicated to the characterization of polyolefins. It incorporates high-stability infrared (IR) detectors with outstanding baseline and simultaneous detection of total concentration and chemical composition, which adds a new dimension to the GPC analysis. The built-in IR detection provides the most comprehensive characterization of polymers such as HDPE, PP, LDPE, LLDPE, EP copolymers, EVA, EBA and others in the group of polyolefins.

Two different infrared detectors are available: the most modern IR5 MCT, with enhanced sensitivity and stability to measure concentration and chemical composition (SCB/1000TC); and the classic IR4, which offers a broader spectral range enabling analysis of the carbonyl group containing copolymers. Other detectors that can be coupled to the GPC-IR® system are Polymer Char's four-capillary bridge viscometer and a Multi-Angle Light Scattering (DAWN® HELEOS II™ by Wyatt Technology®), for the determination of absolute molar mass and study of Long Chain Branching (LCB). Thus, becoming the most complete, four-detectors, instrument for polyolefin analysis.

Polymer Char's GPC-IR® automatically performs all sample preparation steps including the initial filling of vials with solvent and in-line filtration. As a result, neither vial transfer nor manual handling of solvent is required throughout the whole analytical process. Other key automation features are incorporated to overcome historical problems usually arisen when working with high temperature GPC/SEC analysis, including the company's Sample Care protocols that preserve the sample integrity along the whole analytical cycle.

Finally, data processing becomes simple and powerful thanks to the GPC One® Software, a comprehensive calculations software package developed in collaboration with the industry leaders that integrates all detectors' signals.

Polymer Char's GPC-IR® represents a new generation of instruments for polyolefin characterization in terms of repeatability, automation, and reliability.

Find out more at **www.polymerchar.com/GPC-IR**
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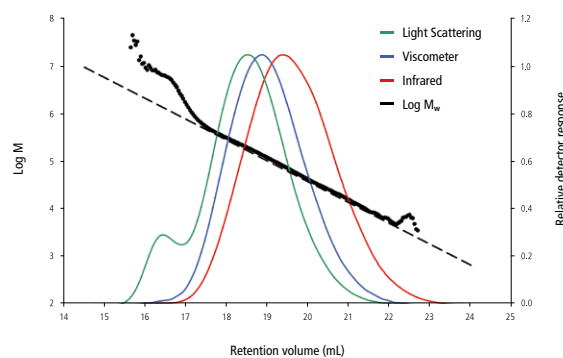
Triple Detection Analysis. The triple detector GPC-IR® results of a 1476 LDPE resin.
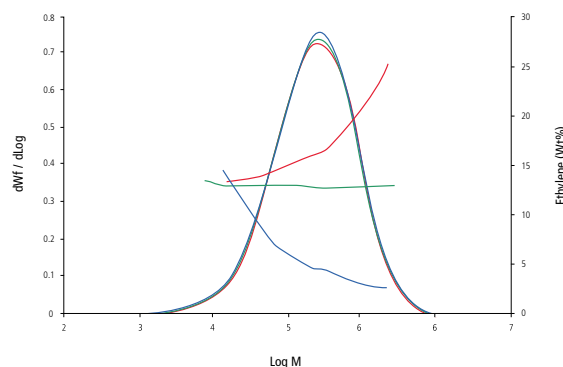
Molar Mass-Composition interdependence of three diferent Ethylene-Propylene copolymers with similar MWD.

Polymer Char

GPC-IR® Features

Comprehensive Detection for Polyolefins:

The full characterization of polyethylene and polypropylene polymers demands HT GPC/SEC analysis with specific detectors. GPC-IR® incorporates infrared detectors, demonstrated to be the best option for this kind of polymers. The two models available, IR4 and IR5 MCT (for high sensitivity), can measure both concentration and composition (SCB/1000TC). Triple detector configuration is completed by a four capillary bridge built-in Viscometer (developed by Polymer Char) and a multi-angle Light Scattering (DAWN® HELEOS™ II 8 or 18 angles by Wyatt Technology®).

Automated Sample Preparation:

Every step needed from sample preparation to the injection into the columns is automated with GPC-IR®: vials filling, dissolution with shaking, and in-line filtration with backflush cleaning. Therefore, analyzing samples with GPC-IR® only requires weighing the sample and starting the software. Neither vial transfer nor manual solvent handling will be needed throughout the entire process.

Sample Care:

Sample degradation has been present historically in SEC analyses due to long dissolution times, the use of stirrers, and the presence of oxygen in the vials. However, when using GPC-IR®, sample degradation is significantly minimized thanks to the exact time of dissolution for each sample, gentle shaking, and a purge with nitrogen into the vials. Furthermore, dissolution time can now be shorter due to an efficient and homogeneous heat transfer to the vials.

GPC One® Comprehensive Calculations Software:

The GPC One® Calculations Software was developed with the leaders in the industry in order to meet the needs of both, highly experienced users and new ones as well. All the detectors' signals are integrated to become the most comprehensive calculations software package available in the market. The GPC One® Software is complemented with built-in customizable reports and statistical quality control tools.

Columns Care:

GPC/SEC columns are fragile and need to be isolated from temperature changes. For this purpose, GPC-IR® was designed with a dedicated and precise (0.01°C) oven to hold the columns only. The columns can remain at high temperature even when the detectors and injector oven need to be cooled down for maintenance tasks.

Reliability:

During the last 20 years, Polymer Char's philosophy for developing instrumentation has been strongly focused on reliability and continuous improvement to overcome the historical maintenance problems usually arisen when handling polymer solutions at high temperatures. Polymer Char has been optimizing process performance and minimizing downtime through meticulous designs, and rigorous internal quality and testing procedures. As a result, GPC-IR® has become a robust system that is being successfully used today all around the world.

Service and Support:

Today, you can count on the experience and dedication of Polymer Char and its global network of partners and distributors. We are committed to support your GPC-IR® with efficient remote and on-site service. We offer a close collaboration to ensure the highest performance of the equipment, and the best quality of the analyses' results provided.

Leadership in Polyolefin Characterization:

With two decades of experience in the characterization of polyolefins, Polymer Char offers a portfolio of high quality and reliable instrumentation, responsive service and comprehensive training; thus, delivering exceptional longterm value to your laboratory.

About Polymer Char

Polymer Char 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).

With installations in leading petrochemical companies, government laboratories and universities in over 20 countries and analytical services provided to 35 countries, Polymer Char has clearly become the leader in research, engineering, software and service in polyolefin characterization. A close collaboration with the most advanced laboratories in the world during the last two decades has made this possible.