HAAKE MARS Rheo-Raman System

Deepen materials understanding through multi-modal analysis

Applications

- Advanced polymeric materials
- Pharmaceutical hotmelts
- Food and cosmetic emulsions
- Coatings
- Adhesives

Key benefits

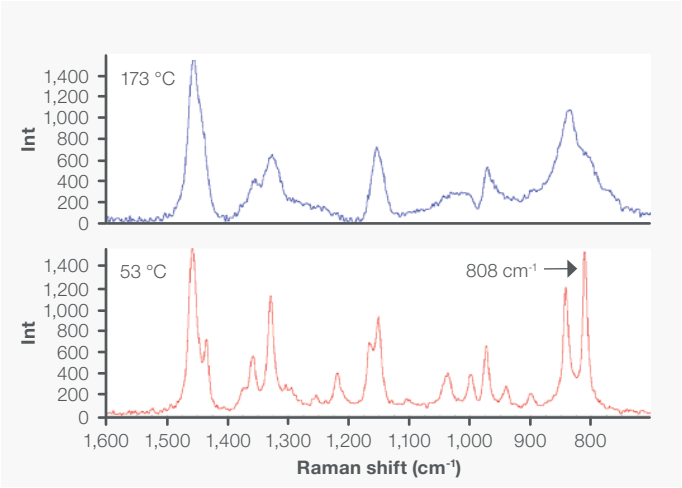
- Obtain real time insight into molecular changes that drive a shift in rheological behavior
- Obtain deeper insight into phase transitions, crystallization, and product stability
- Correlate rheological properties and molecular changes on the same sample under identical conditions
- Increase information content while saving time

Product description

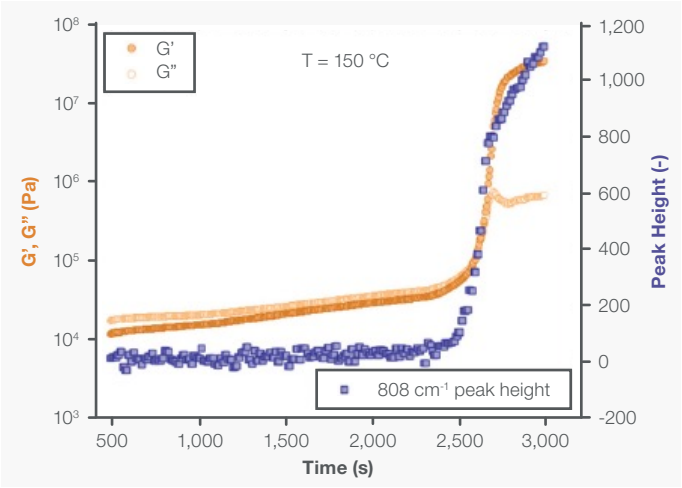
- Thermo Scientific™ HAAKE™ MARS™ Rheo-Raman System integrates the Thermo Scientific HAAKE MARS Rheometer and the Thermo Scientific DXR3 Flex Raman Spectrometer
- Collect simultaneous rheological and Raman data
- Rheometry tells us what, while Raman spectroscopy tells us why
  - The rheometer discloses how a sample behaves under a given stress or strain
  - Raman spectroscopy provides positive chemical identification and a spectral fingerprint unique to a material while also revealing morphology and structural changes during phase transitions
- Unambiguous correlation of results because they are collected on the same sample, at the same time, under the same conditions
- Saves time compared to sequential measurements on two different instruments

HAAKE MARS Rheo-Raman System.

Tracking high-density polyethylene crystallization using the HAAKE MARS Rheo-Raman System



Raman spectrum of the molten (top) and crystalline (bottom) states of polypropylene, obtained on the MARS Rheo-Raman System during a rheological measurement. The band at 808 cm^{-1} is due to the skeletal deformation of helical chains within the crystal, and its intensity can be used as a measure of crystallinity of polypropylene.



Shear storage modulus (G'), shear loss modulus (G"), and the 808 cm^{-1} Raman-shift peak height as a function of time during the isothermal recrystallization of polypropylene, measured on the MARS Rheo-Raman System. G' and G" were obtained by the MARS Rheometer, and the 808 cm^{-1} peak height was determined from the DXR3 Flex Raman spectra.

DXR3 Flex Raman Spectrometer.

Ordering information	
912A1150	DXR3 Flex Raman Spectrometer
840-294300	HAAKE MARS Rheo-Raman Interface Kit

Select at least one of the following:		
840-285900	785 nm high brightness	Laser kit
840-286000	785 nm high power	Laser kit
840-285600	532 nm high brightness	Laser kit
840-285500	455 nm high brightness	Laser kit

HAAKE MARS Rheometer.

Ordering information	
379-0600	HAAKE MARS Rheometer
222-2313	Rheo-Raman Module
222-1817	20x long working distance objective
222-1812	Lower glass measuring plate
222-2089	Plate 35 mm with ceramic shaft (or alternate rotor if required)
222-1897	Temperature module power supply (2 required for high temperature version)

For high temperatures:	
222-2172	Electrical temperature module TM-EL-H
222-1902	Holder for TM-EL-H

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