BrightSpec

Molecular Rotational Resonance Spectrometers

Breakthrough Molecular ID

A New Level of Research

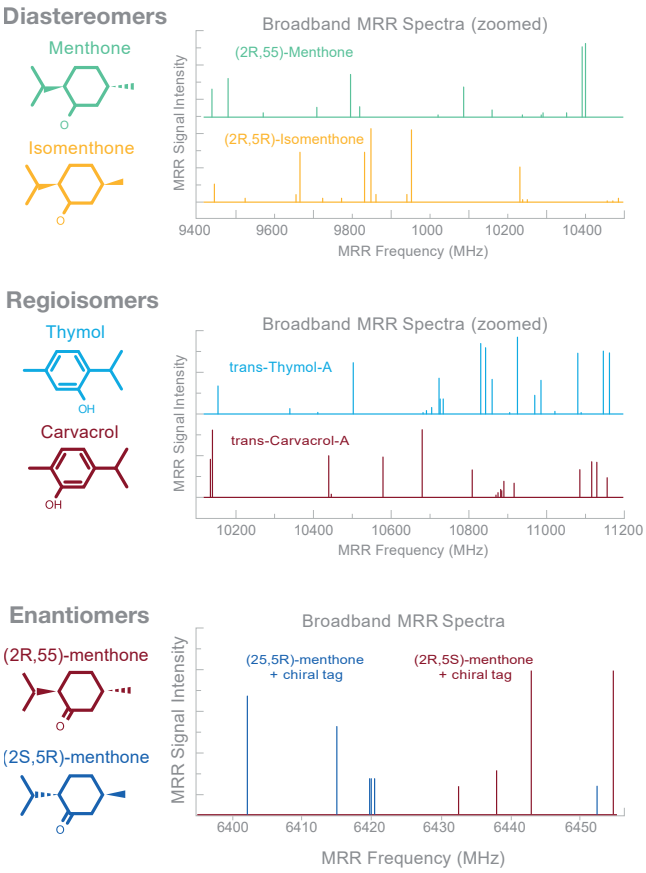
For the past several decades, structural characterization has been limited to a few techniques, with only minor breakthroughs. Researchers are now learning of the power that Molecular Rotational Resonance (MRR) has to offer. MRR provides the next level of structural elucidation and process monitoring.

From Outer Space to Your Lab

Whether discovering molecules on distant planets and stars, or fundamentally understanding molecules here on earth, rotational spectroscopy has found use across many laboratories. Researchers at the University of Virginia and BrightSpec have transformed the technique; drastically increasing both the speed and the sensitivity of analysis. BrightSpec proudly offers a line of MRR spectrometers for both targeted and untargeted analysis.

Structure Determines Function

Unlocking the structure of a molecule has never been easier. MRR provides a unique spectral fingerprint that is extremely sensitive to the slightest change in molecular structure. From crude samples, to complex mixtures, MRR enables the direct measurement of samples; providing unequivocal structural elucidation without the need for reference standards.



MRR Resolves All Isomers

Diasteromers, Enatiomers, Regioisomers, Isotopologues, and Isotopmers

MRR Capabilities

Structural Elucidation, Quantitation, Enantiomeric Excess, Reaction Process Monitoring

A Faster Way to Identify

Determine your information within minutes. BrightSpec's targeted isoMRR rapidly delivers both identification and quantitation without the need for front-end purification or hyphenation. The isoMRR is designed for continuous process monitoring, including chiral, diastereomer and enantiomer quantification.

Targeted Capabilities

Steroisomer Purity

Reaction monitoring

Impurity analysis

Continuous process monitoring

Diastereomer and enantiomer quantification

Measure on-line, at-line, or off-line

Results	
DHAA	58.18%
DHAA-Epi	19.88%
AA	8.48%
THAA	13.46%

Targeted Process Monitoring

Optimizing the production of Artemisinin by rapidly focusing on compounds of interest. BrightSpec's Edgar Analysis software automatically returns quantitative results, without user intervention.

BrightSpec's MRR Spectral Database

Thousands of molecular spectra are at your fingertips with BrightSpec's Spectral Database. Adding a new compound is as easy as drawing a molecular structure. DFT simulations and in-house software quickly create theoretical MRR spectra that can be added to the database.

Database Features

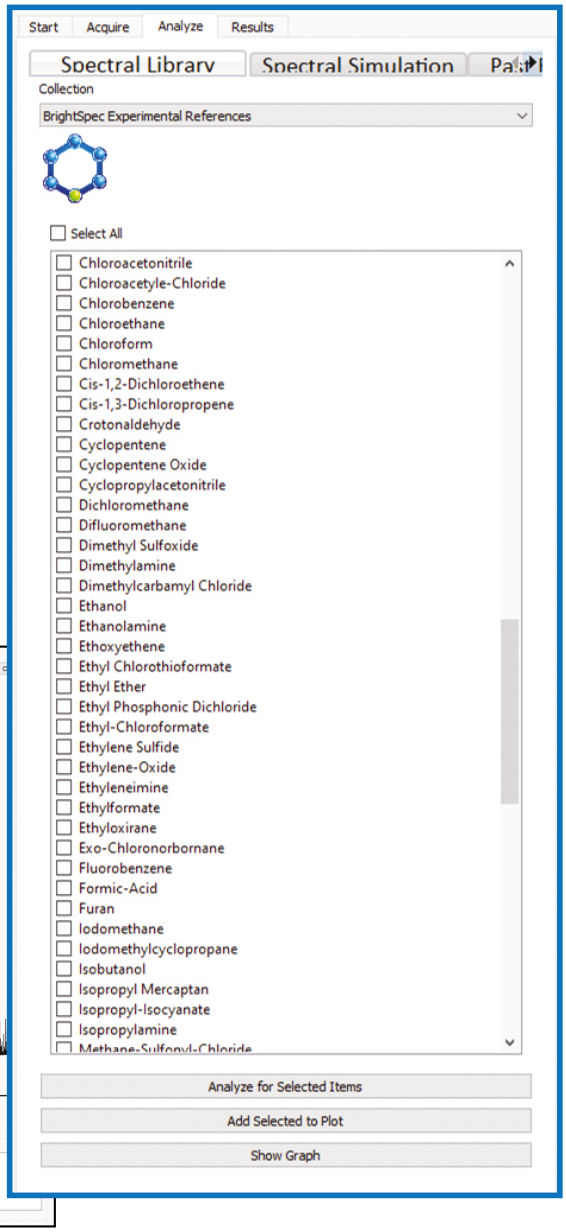
> 12,000 unique spectra

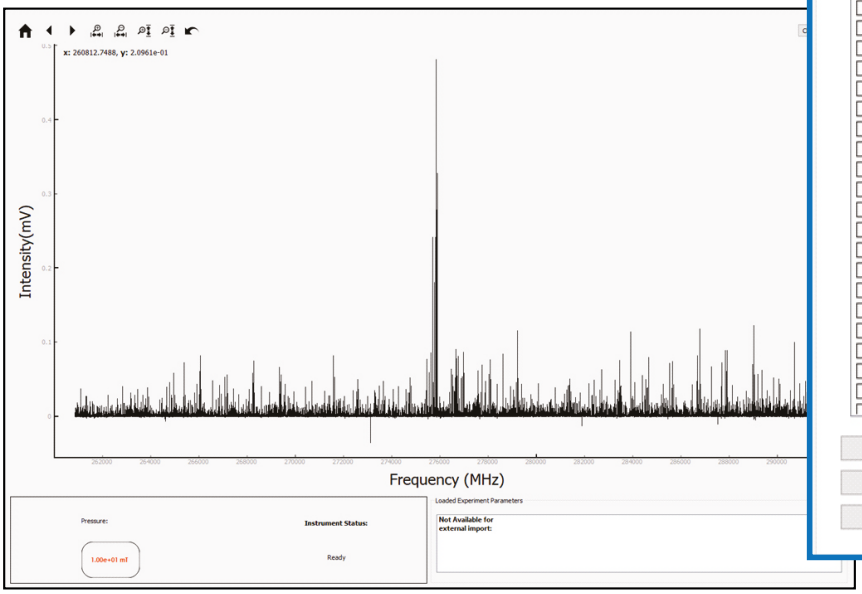
~ 400 experimental spectra

Factory curated

Customization

Thousands of published spectra





Broadband MRR Spectrometer

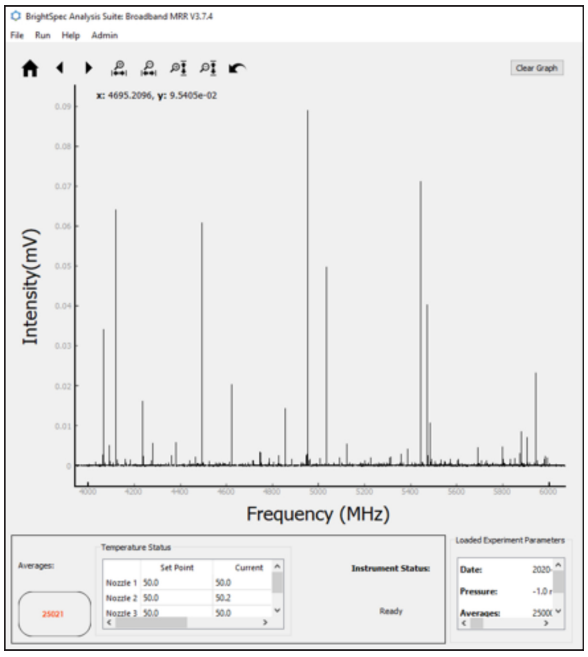
From unknown structural elucidation to comprehensive sample profiling, BrightSpec's broadband MRR is the complete tool for untargeted analysis. With unmatched resolution and sensitivity, a single measurement will characterize all the polar compounds in a sample.

Broadband MRR

Structural Elucidation and Research

Typical Applications	Structural Elucidation Enantiomeric Excess Quantitative Mixture Analysis
Frequency Range	2–8 GHz, 6–18 GHz
Analyte Range	100–400 amu
Analysis Time	60+ minutes
Sample Type	Solids, Liquids and Gases
Sample Amount	5–5 0 mg (typical)

*Specifications are sample dependent



Broadband Analysis Suite

isoMRR Spectrometer

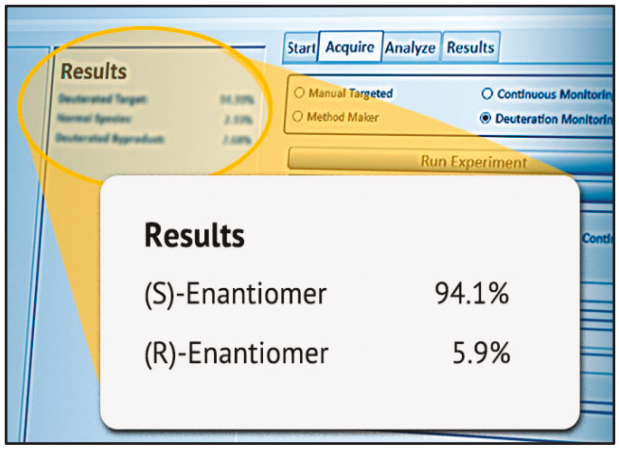
Generate results within minutes with the isoMRR. The extreme resolution and unique sensitivity revolutionizes application areas that have “plagued” researchers for decades. Now, a single instrument that can be used to perform analyses on a wide range of chemical systems.

isoMRR

Routine and Targeted Analysis

Typical Applications	Isomeric Impurity Quantification Enantiomeric Excess Continuous Process Monitoring
Frequency Range	6–18 GHz
Analyte Range	100–400 amu
Analysis Time	5–20 minutes
Sample Type	Solids, Liquids and Gases
Sample Amount	0.5–5 mg (typical)

*Specifications are sample dependent



Advanced software provides EE results in minutes

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"The power of rotational spectroscopy has long been appreciated yet underutilized. Our development of the broadband chirped-pulse Fourier transform spectrometer has transformed the field of microwave spectroscopy. This enabling technology allows BrightSpec to deliver the most incisive tool available for the structural determination of gas-phase molecules."

Brooks Pate
Inventor of CP-FT-MRR
William R Kenan, Jr. Professor of Chemistry
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