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E65XX-21XX

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IRT-7200/7100

Multichannel Infrared Microscope / Infrared Microscope



New-generation Imaging System

Imaging measurements in infrared spectroscopy have become an indispensable tool for visualizing and analyzing the chemical structure of a sample. IRT-7200 / 7100 are equipped with IQ IR NAV and other advanced tools to make micro IR analysis smarter and provide results in less time than conventional systems.



FT/IR-IRT-7200 System

IRT-7200



IRT-7200 / Multi-channel Infrared Microscope

Equipped with a 16-channel MCT-type linear array detector and combined with a high-speed automated stage, the measurement time is reduced to about 1/100 of that of conventional mapping measurements.

- Smarter measurements with IQ IR NAV
- Two detectors as standard, a linear array detector and a single element detector (IRT-7200)
- ATR imaging in combination with IQ Mapping
- Simultaneous implementation of image observation and measurement using IQ Monitoring
- Analysis Wizard makes it easy to create chemical images
- Upgradeable to a linear array detector (IRT-7100)
- Vacuum type available

IRT-7200/7100

Multichannel Infrared Microscope/Infrared Microscope

IRT-7100



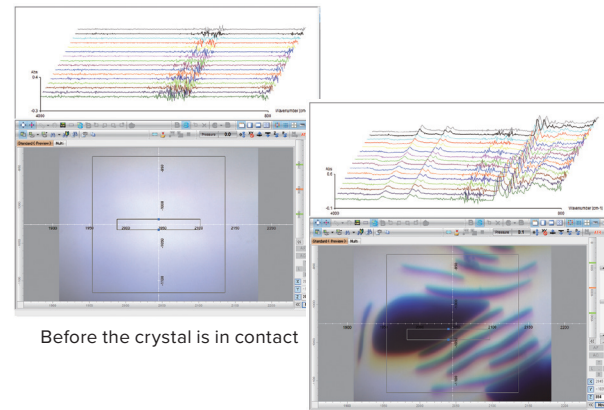
IRT-7100 / Fully Automated FT-IR Microscope

This model is equipped with a single-element MCT detector same as the IRT-5200, but combination of rapid scan measurement, high-speed automated stage, and high-speed data acquisition reduce the measurement time to about 1/10 of that of conventional mapping measurement.

JASCO's unique ATR imaging measurement

ATR imaging measurements can be performed by combining microscopic ATR and IQ Mapping (patented by JASCO*). IQ Mapping scans the infrared light on the sample, so the mapping measurement can be performed while the crystal and sample are in contact, eliminating the possibility of cross contamination. The ATR-5000-SD (diamond crystal) allows observation of the sample through the crystal during in contact, and in combination with IQ Mapping, provides reliable measurement of the target area. With the wide area ATR-5000-WG (Ge crystal), imaging measurements cover a wide area of 1600 μm square can be performed in one contact. Due to the effect of the refractive index of the crystal, the pixel resolution with the ATR-5000-G (Ge crystal) is approximately 2.2 μm per 1 channel of the linear array detector.

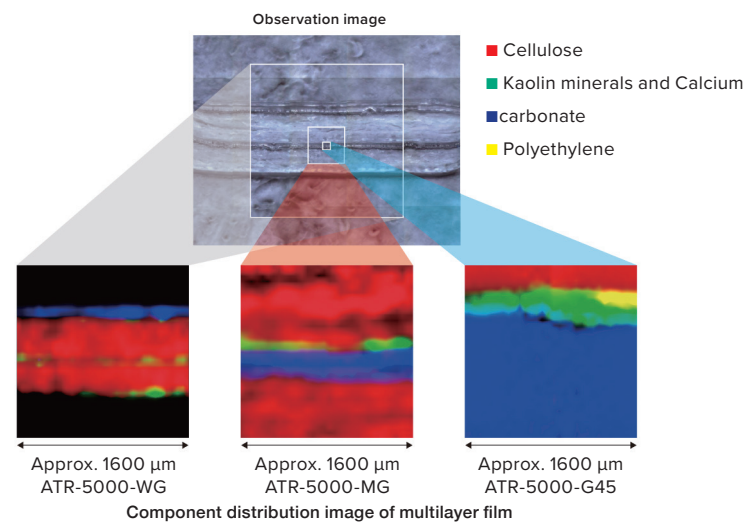
* Patent No. 4246599



Before the crystal is in contact

After the crystal is in contact

ATR imaging measurements with the ATR-5000-SD



Approx. 1600 μm
ATR-5000-WG

Approx. 1600 μm
ATR-5000-MG

Approx. 1600 μm
ATR-5000-G45

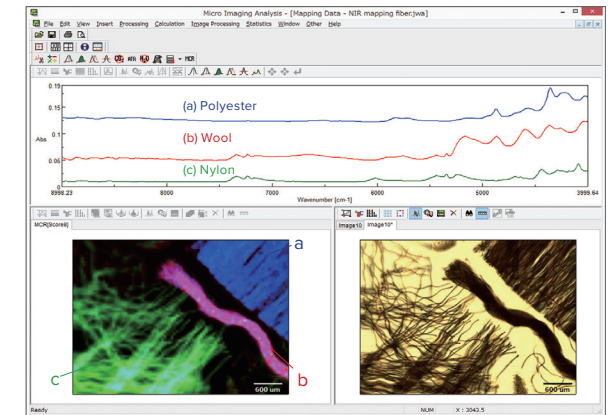
Component distribution image of multilayer film

Various detectors for various measurement purposes

IRT-7200 is equipped with a single-element mid-band MCT detector and linear array detector, can be switched from the software. The linear array detector is also available for near-infrared region, and narrow-band MCT detector and DLATGS detector are also available. Those single element detector can be replaced by the user easily using the exchangeable second detector unit. IRT-7100 is equipped with a single-element mid-band MCT detector, however it is possible to add the linear array detector.



Replace the detector by using exchangeable second detector unit



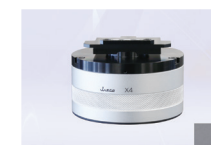
Imaging result

Observation image

Imaging measurements in the NIR region using InGaAs detector (sample: fibers)

Measuring a wide area in a short time

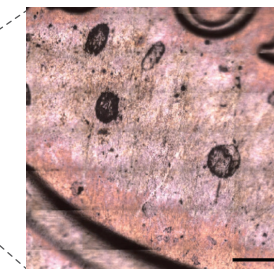
The RFO-5000-4R wide area measurement unit (for reflection measurement only) has 4x magnification, the pixel resolution per element of the linear array detector is 50 μm square, and a wide area can be measured in a short time. In case of a defective product analysis, detailed data can be efficiently obtained by screening with the wide area measurement unit first, and next measuring specified points with high magnification.



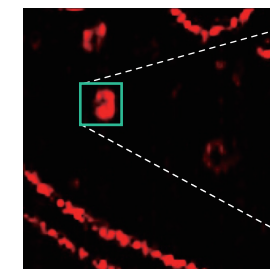
RFO-5000-4R



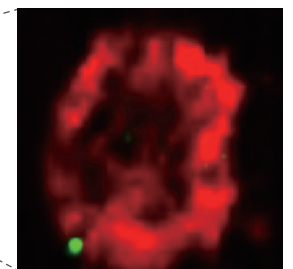
Coin



Observation image of the



Wide area measurement unit



16x Cassegrain

■ Carboxylate ■ Carboxylate + silicone

Wide area screening and detailed measurement using 16x Cassegrain

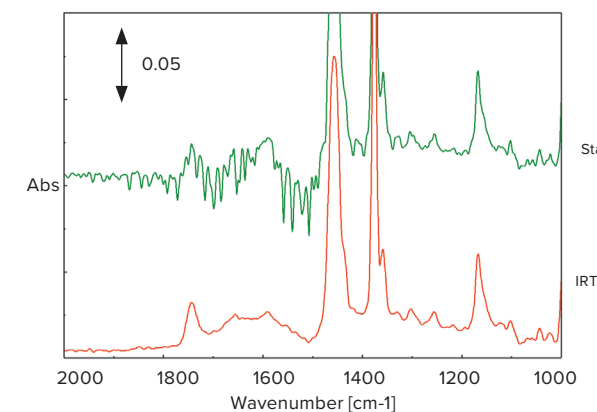
High-precision measurement of minute samples with vacuum system

In the case of IR spectroscopy, water vapor and CO₂ in the air may affect the measurement data. In general, nitrogen gas or dry air is used to reduce the effects. JASCO has the only* vacuum-compatible IR microscope on the market, and combining it with a vacuum-compatible FTIR effectively eliminates the effects of the atmosphere to obtain more accurate data.

* according to our research (April, 2021)



Vacuum system (FTIR main unit with microscope)



Standard IRT-7200
model

IRT-7200VC vacuum
system

Improvement of spectral quality with vacuum system

Supports high-precision measurement

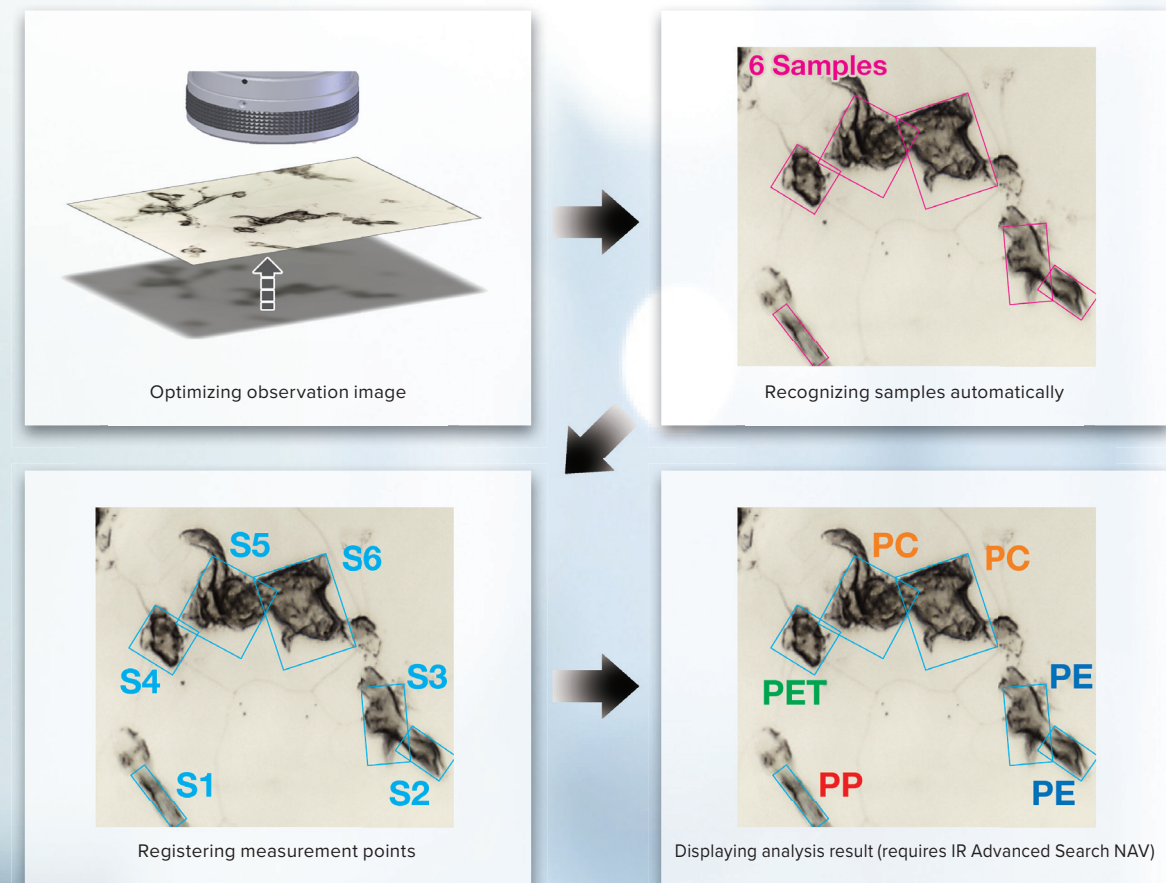
The IRT-7100/7200 have various functions to support accurate measurements. It has IQ IR NAV automatically recognizes the measurement sample, IQ Mapping using of infrared beam scanning method, auto focus, auto brightness and automatic condensing mirror adjustment mechanism that corrects the focus error of infrared light due to the influence of sample thickness and refractive index, 4-hole electric revolver that switches objective lens with high accuracy and each menu can be operated through control panel of microscope as standard function.

IQ IR NAV (JASCO patent)

The IQ IR NAV* obtains a high quality image by auto focus, auto brightness, and auto correct. Then finds out samples automatically with image analysis from obtained observation image. In addition, the IR Advanced Search NAV (option) enables narrowing down the samples with various parameters such as size, circularity, etc..., and setting optimal aperture sizes for each target. It also displays searching result of measured data on the observation image simultaneously.

*IQ IR NAV is available only with single element detector.

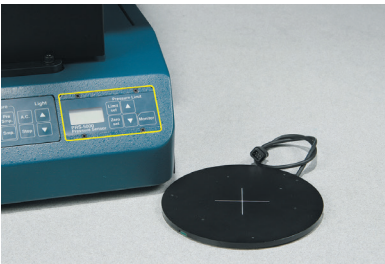
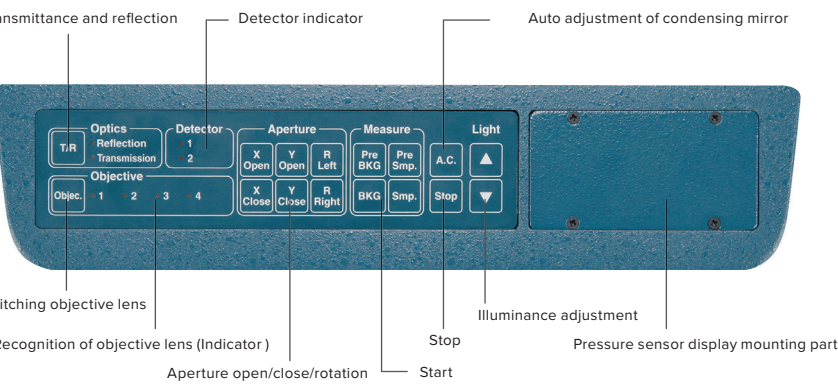
Measurement flow of IQ IR NAV



Patent No. 6778451

Control panel

Microscope unit itself has switching mechanism of transmittance and reflectance, and open/close mechanism of aperture and measurement start button, which can operate it without PC operation with ease.



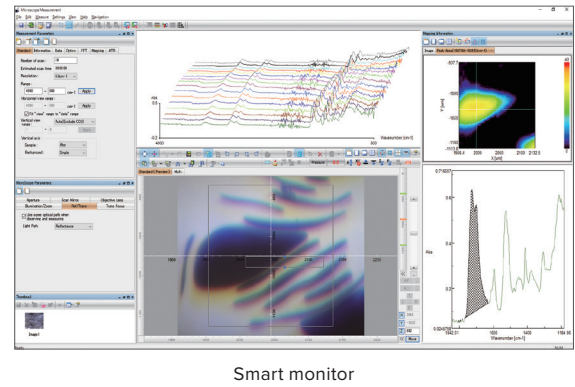
Pressure sensor: PRS-A-5000 (option)

Innovative Observation Function

A high-resolution CMOS camera with 3.0 megapixels and optical zoom (0.6 to 2 times) are standard, and digital zoom (up to 5 times) can be used for further magnification. IRT-7200 is equipped with an auto brightness function that adjusts the brightness automatically and a direct-through function that allows observation of areas obscured by apertures. The IQ Monitoring allows the user to determine the measurement point while checking the sample image and spectrum simultaneously. In addition, the IRT-7200 can be equipped with the polarization, differential interference, and fluorescence observation function, therefore it is easy to observe the foreign materials and samples with unclear contrast. Furthermore, by using IQ Frame, measurement areas can be shared with Raman microscope measurement and it makes it possible to have multilateral analysis results about sample.

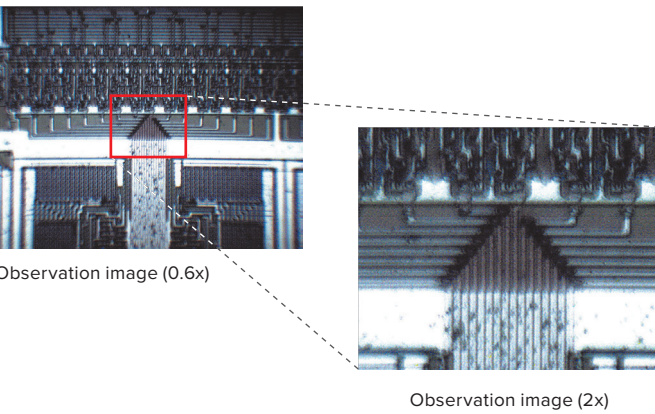
IQ Monitoring

Spectra could be obtained during observation, target point can be measured certainly.



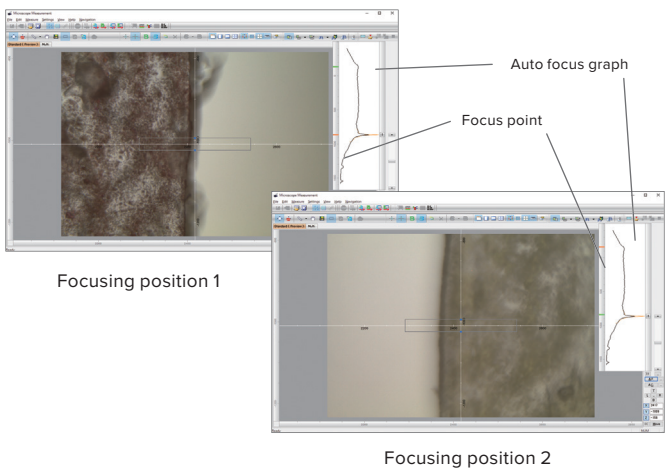
Optical zoom

Spectra could be obtained during observation, target point can be measured certainly.



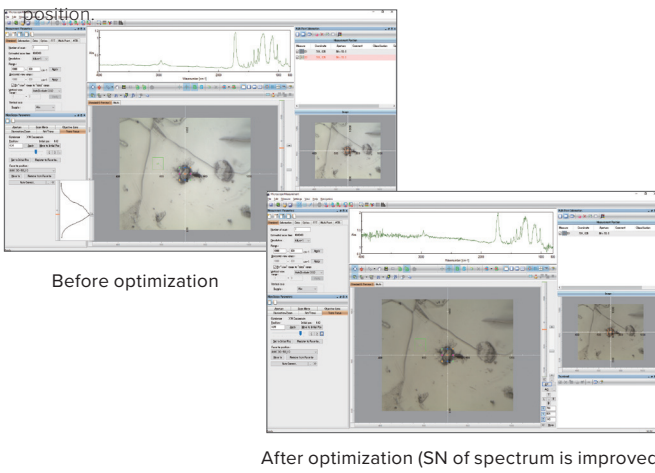
Auto focus

It enables focusing on believed difficult which has multi focus points such as KBr plate and diamond anvil cell.



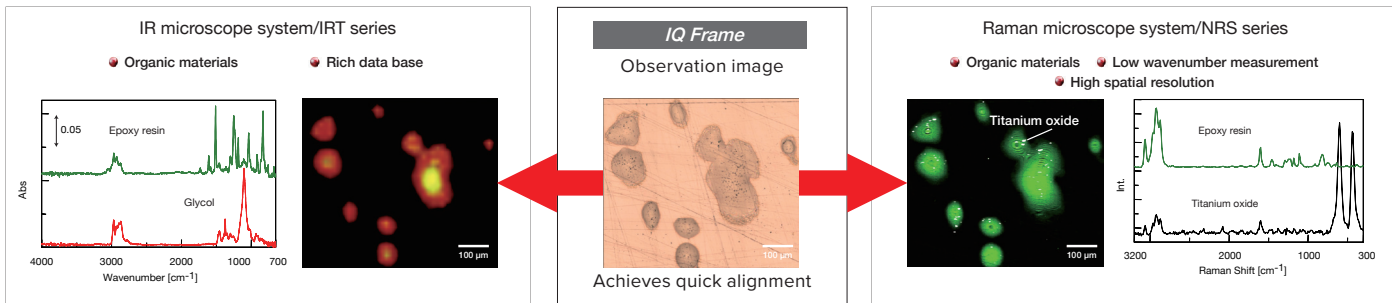
Automatic condensing mirror adjustment

In case of transmittance mode, focus point of infrared light might be shifted because of thickness and refractive index of sample. This function adjusts the condensing mirror automatically to the optimal



Higher accurate sample analysis by using IQ Frame

Using the automatic XYZ stage and IQ Frame, the same area of sample can be measured in micro IR spectroscopic analysis, micro Raman spectroscopic analysis, and micro ultraviolet-visible near-infrared spectroscopic analysis. Especially IR and Raman analysis are complementary, obtaining both spectra enable to analyze more precisely.



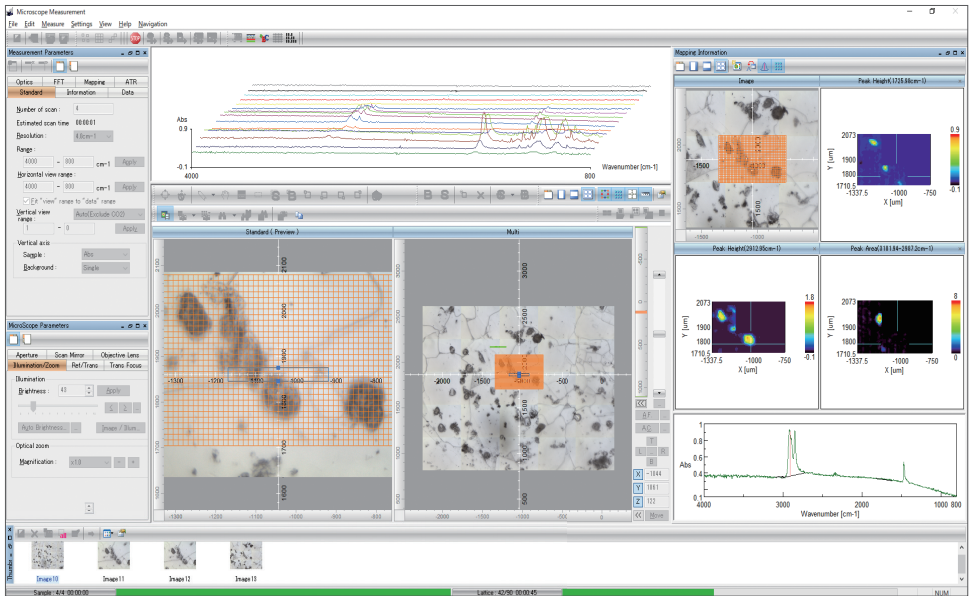
High usability imaging software

Imaging data is obtained easily via IQ IR NAV and Analysis Wizard in the Microscope Measurement program.

Microscope Measurement program

The Microscope Measurement program is consist of observation image, measured spectra, chemical image and so on, multi information windows are displayed simultaneously. Spectra for each channel of the linear array detector* and a chemical image could be displayed during measurement. A wide area observation image also can be displayed with a connected multi screens, measurement area is set by dragging on the image.

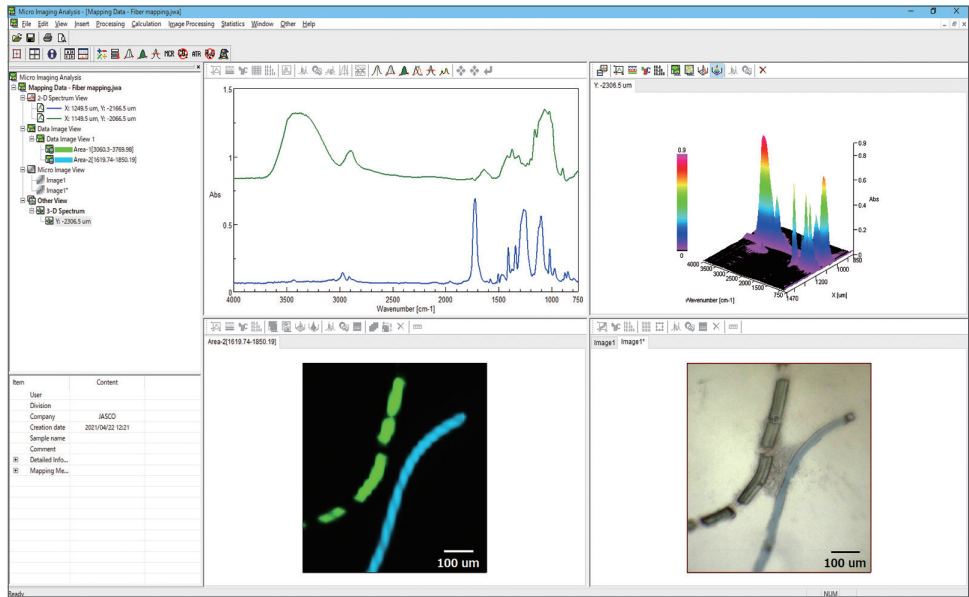
*Data of single element detector is displayed in case of the IRT-7100.



Measurement program

Micro Imaging Analysis program

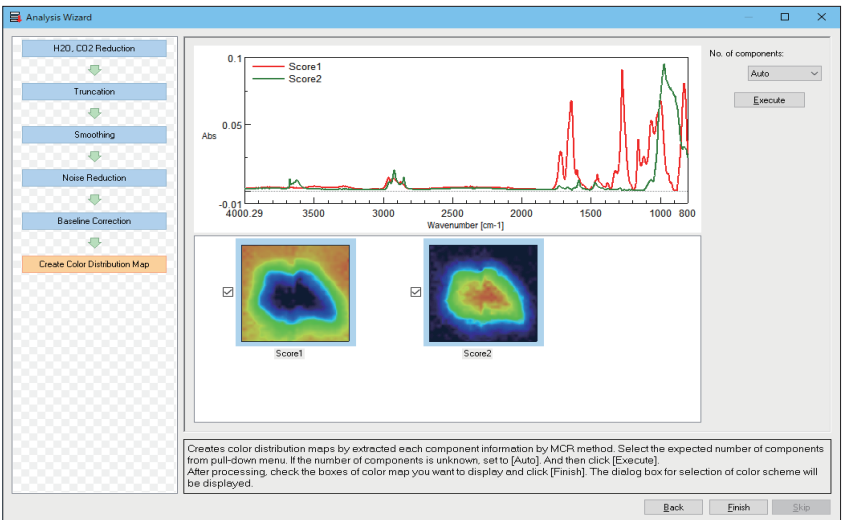
Using Micro Imaging Analysis program, high quality images are created easily not only from peak height or area, but also from MCR model analysis by Analysis Wizard. Manners for displaying the chemical image are selectable, so that it meets to various requirements.



Analysis program

Analysis Wizard

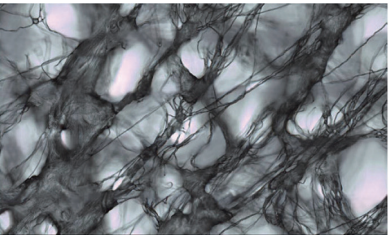
Performing from data processing to MCR model analysis according to a flow chart, color map based on the PCA analysis can be created easily for every operator.



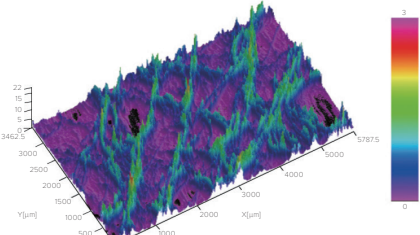
Measurement program

Chemical Image

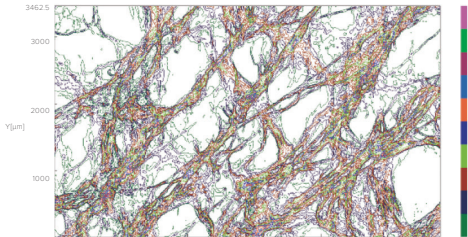
Chemical images are displayed with various patterns. Overlaying with observation image can be also displayed in addition to Color 3D image, Color map and Contour map.



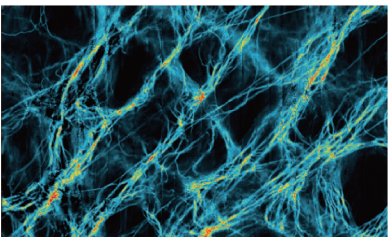
Observation image



Color 3D image



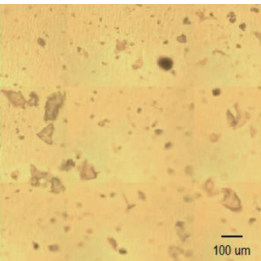
Contour image



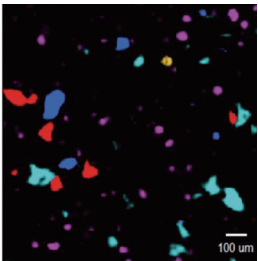
Overlaid observation image and color map

JASCO Particle Analysis (Option)

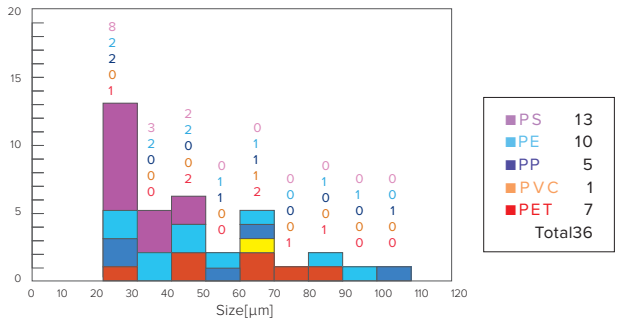
It creates histograms, frequency distribution tables, and correlation distributions by analyzing the size, area, circularity, aspect ratio, etc. of each particle based on observation images and chemical image information.



Observation image (Left)



Chemical image (Right)



Stacked histogram for each component (X axis: Particle size)

Particle size analysis for plastic particles

Data provided by TOSOH Analysis and Research Center Co., Ltd.