Introduction to new FT/IR microscope
Irtron IRT-3000
The requirements for FT/IR

**Hardware**
- Able to acquire accurate spectra
  - FT/IR 4000, 6000
  - Irtron

**Software**
- Easy to use
  - Spectra Manager II

**Application**
- Development of analysis methods
  - SFE-FT/IR, EG-ATR

**Quality of Diamonds**
- Color
- Cut
- Carat
- Clarity

**New**
Development Concept

- New IR microscope is developed under the following concept
  - A fully automated system
  - Improvement of the operativeness
  - Cost reduction
New features of Irtron

- Up to 2 detectors available
- CCD camera observation
- Up to 4 objectives with revolver
- Auto aperture
Optical System of Irtron

Direct through optics

Eye piece (option)
Irtron hardware features

- Observation: CCD camera as standard
- Auto aperture as standard
- Manual sample stage
- Cassegrainian objective
- Direct through optics
- Up to 2 detectors available
- Up to 4 objectives available with revolver
- Up to 4 objectives available with revolver

Eye piece (option)
System configuration

- **Objectives**
  - x10, x16 or x32 Cassegrainian objective, std.
  - ATR Cassegrainian objectives (option)
  - Au optics (option)

- **Detectors**
  - mid band MCT with N₂ Dewar (15hr, std.)
  - narrow / wide band MCT (option)
  - DLATGS, InSb (option)
  - Auto aperture (x, y, θ), std.

- **Stages**
  - Manual type, std.
  - Auto X-Y-Z type (option : IR Profile)
Dialog for aperture setting
One point micro-measurement

Measured result of IR microscope

Sample: Stein on metal plate
Size: 30 x 25 um

It became clear for this stain to be the oil-based ink from the IR spectrum (reflection method).

Result of Peak Picking

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<th>No.</th>
<th>Position</th>
<th>Intensity</th>
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<td>7</td>
<td>719.32</td>
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### Measurement Condition

- **FTIR**: FTIR-4200
- **Objective**: x16
- **Method**: Transmission
- **Measurement area**: 100x100 mm
- **Scan times**: 180 times (2 min)
Polystyrene Spectra using different detectors

**TGS**
- Abs
- Size: 50 x 50 um
- Accumulation: 540

**MCT**
- Abs
- Size: 10 x 10 um
- Accumulation: 50
"IR Profile System" supporting Irtron

- Auto stage
- Mapping
- IR Profile System
- Stress sensor
- Easy operation
- ATR Mapping
- Auto validation
- Reliability
Dialogs of IR Profile System
Position adjustment
Dialog for mapping measurement setting
Multi point measurement
New ATR Cassegrainian objectives

- Tip shaped ATR prism: 0.7 mm φ
- ATR-J CZ
  - ZnSe
- ATR-J CG
  - Ge
- ATR-J CD
  - Diamond
Summary I. Irtron

- Detectors
  - up to 2 detectors available
- Observation
  - CCD camera as standard
- Objective
  - X 10, x16 or x32 Cassegrainian objective
- Up to 4 objectives with revolver
- Auto aperture as standard
- Manual sample stage
Summary II. IR Profile

- Auto X-Y-Z stage with software
- Auto focus
- Multi point auto measurement
- Mapping and line analysis
- ATR Mapping with stress sensor
  - ATR Cassegrainian (option) will be required