

Pieces of advice for the preparation of samples for analyses with the infrared microscope (ID21)

The microscope looks like a classical optical microscope (Figure 1). Two infrared objectives are available ($\times 15$ and $\times 32$). Other visible objectives are available for the observation of the samples.

The motorized table can be lowered up to around 2 cm, for the analysis of large samples.



Figure 1: the infrared microscope at ID21

Sample preparation

The acquisition with the IR microscope can be performed following two configurations:

- reflection
- transmission

Reflection mode

The recommendation is to get a surface as plane as possible. The presence of grains or scratches significantly alter the signal quality.

Transmission mode

When possible, the transmission mode is highly recommended. It enables to avoid various difficulties that can be encountered with reflection mode (noisy spectra, distorted spectra, differences of the reflection of mineral and organic compounds, Reststrahlen bands...).

Cf. <http://www.ijvs.com/volume1/edition5/section1.html#feature2>

The transmission mode requires a careful preparation of the samples. The sample thickness is crucial as the beam must not be completely absorbed while crossing the sample.

For biological samples, a thickness of **5 μm** is usually recommended.

Before coming to ESRF, it is highly recommended to test samples with an other IR microscope (running with a Globar source). This can enable to check the sample thickness. Otherwise, users may prepare cuts of different thicknesses

If the sample is not stiff enough to be placed on a grid or a hole, it must be put onto infrared-transparent supports. Materials usually used are ZnS, ZnSe, BaF₂, KBr. The spectral, mechanical and chemical properties can be found at <http://infrared.als.lbl.gov/IRwindows.html>

Support

The supports available at ID21 are shown in Figures 2A and B. As an example, support A is mounted with a glass slide and a 3 holes metal slide.

The standard sample holders are pellet of 1.3 cm-diameters. Largest samples can be analyzed by developing special supports and using support A or B. Support C was designed to enable the use of the plates commonly employed on the X-ray microscope (D).

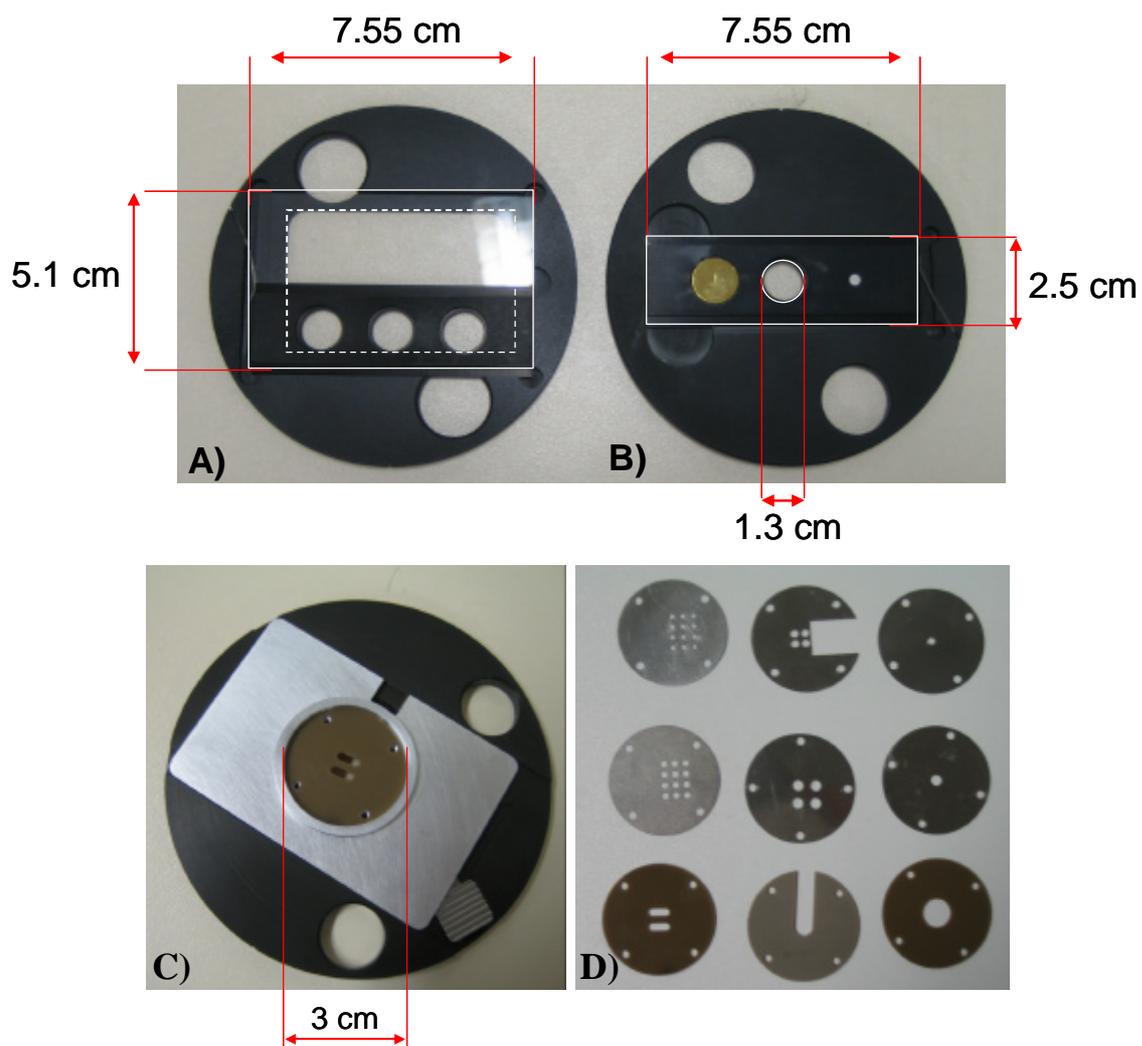


Figure 2: supports used for infrared microscopy.