Sample preparation for XPS endstation

V 2.0

At the IPE beamline, we provide a range of holders, plates, tools, tapes, and glues for sample preparation. If you require any additional equipment, please contact the IPE staff.

Standard mounting

Typically, we attach the samples to stainless steel plates that are supported on dovetail carriers made of stainless steel. (Figure 1)

The small sample plates can accommodate up to 5 samples with an area of less than 5 x 5 mm^2.

The large sample plates can accommodate up to 3 samples with an area of less than 10x10 mm^2.

The carrier for small plates can hold 5 plates on each side, allowing for a total of 50 samples.

The carrier for large plates can hold 2 plates on each side, allowing for a total of 12 samples.

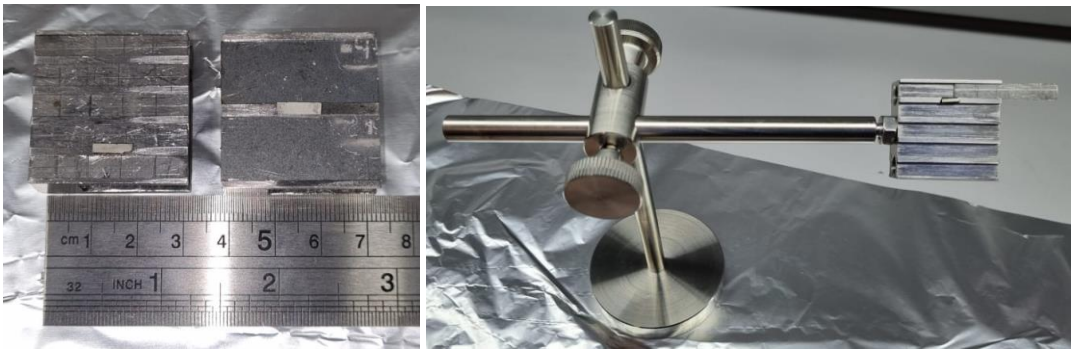

Figure 1 – (left) Standard atainless steel carriers for sample plates used at the XPS endstation of the IPE beamline. (right) Sample carrier attached the support.

Good practices

Use gloves to manipulate all samples, holders, and tools. Moisture and grease from fingers will limit the pumping speed to ultra-high vacuum and cause delays to your experiments. CAUTION!!

Before manipulating samples with tweezers, limit the length of movements by positioning the sample containers as close as possible to the sample plates.

Center the samples with the marks on the sample plates to facilitate the sample alignment.

Attach the samples to the plates outside the carrier. Use the support to assist in the attachment of the plates on both sides (figure 1 right).

Pace your work. If you are not directly loading the assembled carriers, store them in a dry box.

Take photos with a scale reference and/or annotate sample sizes and distances.

Powders at room temperature

Preferably press powders into pellets and attach them to the sample plates with carbon tape.

Use anvils with 5mm diameter to press the pellets with the hydraulic press a the Sirius Chemistry lab

Make the pellets as thin as possible while still being mechanically stable enough to be manipulated with tweezers.

Glue a small (4x4 mm) piece of carbon tape on the support place the pellet on top. Gently press the pellet to adhere it to the tape.

Place a small strip of carbon tape over the edge of the pellet to form a conductive bridge from the pellet surface to the sample plate (figure 2 left)

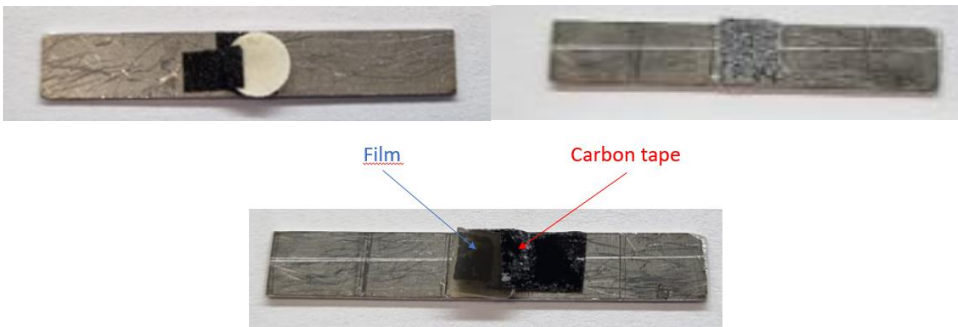

Figure 2 – powder pellet and sprinkled powder on carbon tape attached to the sample plate.

Alternatively, powders can be **sprinkled directly over carbon tape**

First glue a square of approximately 5x5 mm carbon tape on the sample. Then sprinkle the powder over the tape and press it with a spatula.

Ensure to remove all excess and loose powders by firmly knocking the plate to the table.

Be careful; this is procedure is prone to cross-contamination when dealing with small areas and lightweight powders.

Foils, polycrystals and films at room temperature

Attach the samples to the plates with a carbon tape roughly the size of your sample.

Gently press the samples, avoiding touching the regions of interest for measurements, and that all samples are firmly attached to the plates.

For films over poorly conducting or insulating substrates, place a small strip of carbon tape over the edge of the sample to form a conductive bridge from the film surface to the sample plate (figure 3 bottom)