

APPLICATION NOTE | Sample mounting for XPS analysis

Sample mounting is an important aspect of surface analysis. Improper mounting can cause erroneous results. Some types of samples present difficulty in mounting and this note is intended to show examples of solutions for the XPS analysis technique. Many samples can be easily mounted with double sided sticky carbon tabs or tape. The carbon is conductive to reduce sample charging. Powders can be easily mounted by pressing a thin layer of the powder into the tape. One must be careful to remove loose powder by tapping the edge of the holder on a hard surface. Loose powder in the analysis chamber must be avoided.

The XPS analysis area for our instrument is large (~ 3mm in diameter) and a porous sample such as a mesh (Figure 1) cannot be analyzed without also analyzing the sample holder. Figure 2 shows how the analysis area would include the sticky tab or sample holder along with the sample. Figure 3 shows a mounting method that has been successful. By putting down several mesh layers (may need about 5 layers) with the mesh of each layer slightly misaligned

with the previous layer, then the entire surface of the analysis region is covered with mesh. The top layer of mesh should extend beyond the lower layers and is held down on the edges with carbon sticky tape.

Thin fibers can also be approached in a similar manner. The fibers are laid side by side to form a mat and are held down at the edges with sticky tape. A second map of fibers can then be placed at right angles over the first to provide an analysis region that is completely covered with the material of interest.

Because XPS uses x-rays instead of electrons or ions for analysis, sample charging is less of an issue but can still occur, partly because of the charging due to emitted electrons. By mounting the sample on conductive carbon tape and also placing some carbon tape to cover one of the sample edges and come just onto the sample surface, a conductive path is provided. This is depicted in Figure 4.

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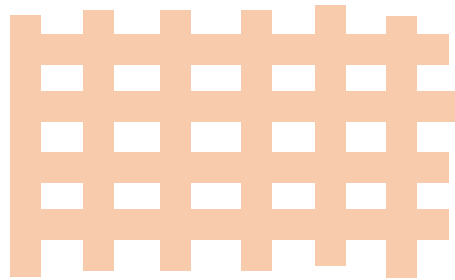


Fig. 1 Mesh sample – top view

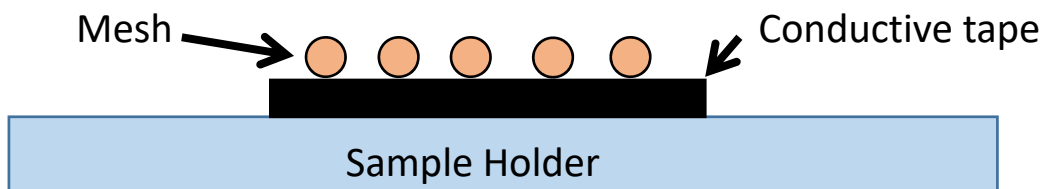


Fig. 2 1 layer Mesh Sample – cross section view

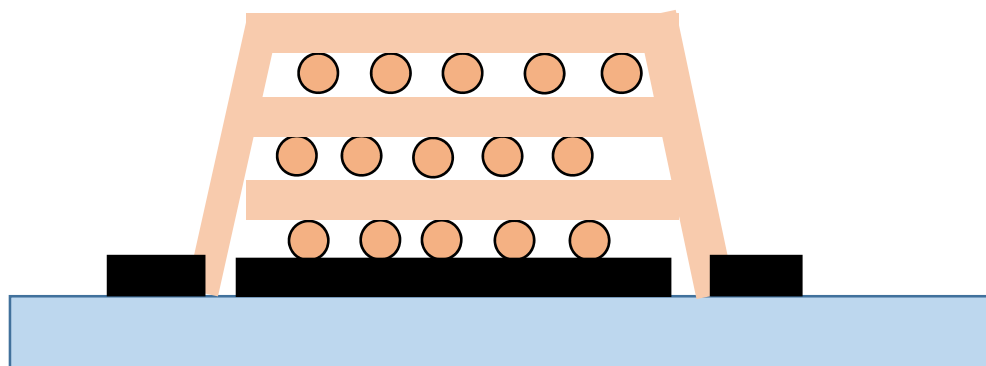


Fig. 3 Layered Mesh Sample



Fig. 4 Insulating Sample