THE UNIVERSITY OF SOUTHERN MISSISSIPPI

Request for XPS Analysis

Name: Date (mm-dd-yy):

Email: Faces Username:

Affiliation: PI:

Budget String (USM internal):

Provide sample details and expected elemental composition. This information will help with data analysis and is required to understand any associated hazards. **Safety data sheets must be provided for hazardous materials.**

Sample type (film, powder, etc.):

Nanoparticles? ☐ Yes ☐ No Conductive? ☐ Yes ☐ No ☐ Unsure

Can the samples be cut, modified, or broken? ☐ Yes ☐ No

Are your samples stable under high vacuum (10^{-9} mBar)? ☐ Yes ☐ No

Survey scan? ☐ Range if different than default (0-1350eV):

High-resolution scans? ☐ List elements below:

Angle-resolved measurements? ☐ MAGCIS sputter-depth profiling? ☐

Describe any special sample analysis requests or special sample handling:

Are your samples clearly labeled? Please describe how you would like your sample files named

Do you need your samples returned after analysis: ☐ Yes ☐ No

☐ Pick up samples from PSRC

☐ Return shipping - UPS or FedEx shipping account number:

XPS Frequently Asked Questions

Q: How do I submit samples for analysis?
A: Submit samples (and Safety Data Sheets for any hazardous materials) along with this form. If internal to USM, you may submit samples with the XPS facilities manager. External analyses, please ship samples via UPS or FedEx to:

SPSE XPS Facilities
Attn: Derek Patton
111 Charles Lane Drive
Hattiesburg, MS 39406

Q: I am a USM researcher by I don't have a Faces account. Can I still have XPS analysis done?
A: A Faces account is required for XPS calendar reservation and analysis. Request an account by emailing derek.patton@usm.edu.

Q: Can users outside of USM have samples run?
A: Yes. External users should complete the sample request form and request a quotation. Email the completed request form to derek.patton@usm.edu. Prior to analysis, a purchase order is required. Purchase orders should be emailed to derek.patton@usm.edu.

Q: How long will it take to run my samples after I submit them?
A: It depends on the availability of the spectrometer. If you need more specificity, you can coordinate in advance with the XPS operator.

Q: Do you offer XPS training?
A: We do not recommend or allow infrequent users to run the XPS instrument unsupervised. Full training may be beneficial to frequent XPS users. Fully-trained users will learn how to independently prepare and load samples, set up the instrumentation and analysis experiments, and export and analyze data. Less frequent users can be trained to perform analysis**,** which will reduce charges associated with staff time.

Q: When I publish XPS data, how do I acknowledge the SPSE XPS facilities?
A: All publications, presentations and patents (including applications) resulting from research supported by the SPSE XPS facilities must include the following acknowledgment or a brief version thereof including the NSF grant number: **"This research was supported in part by a Major Research Instrumentation grant from the National Science Foundation (Award DMR-1726901)."**

Q: What is the recommended sample size?
A: The source defined x-ray spot size ranges from 200-900μm^2. A 1 cm^2 sample is easy to analyze, but samples can be smaller or larger depending on the sample, sample mounting technique, and the sample holder. The maximum sample thickness (including substrate if applicable) is 5 mm when mounted on a standard sample holder. Samples can be mounted with clips, screws, carbon tape, etc. Some mounting techniques may limit the number of samples that can be mounted on one sample holder. Powder samples require special handling for mounting.

Q: How do I prepare my samples?

- *Label samples and sample containers well.* Containers should indicate the contents, your email, and the date. Identify samples with some kind of ID for analysis. Do not use pens, markers, or scotch tape on samples, as these materials will outgas under vacuum. If the front and back of your sample look identical, make sure to identify which surface is to be analyzed. If a particular region on your sample needs to be analyzed, include a drawing or picture.
- *Cleanliness and sample handling are critical for XPS analysis:* Avoid contacting the surface of your sample with anything (fingers, gloves, tweezers, breath, canned air, acetone, alcohol, etc.). Do not put your samples in plastic bags or aluminum foil. XPS is extremely sensitive to contaminants introduced via contact with the surface of your sample (including adventitious carbon that deposits when surfaces are exposed to air).
- *Conductivity is good:* If possible, choose smooth, conductive substrates like doped silicon wafers. Conductive films on insulating substrates can be grounded with double-sided carbon tape.