Sample Compatibility and Analysis for Major Tools of Characterization Group

The nanoFAB offers a wide variety of material characterization capabilities. For many, data is often required for only a few infrequent samples. This can often mean training is impractical for both the user and staff. In these cases the nanoFAB offers sample analysis services. Along with equipment time for analysis, a staff processing fee is charged. For continuous analysis needs the nanoFAB can arrange for a contract for services for external groups.

For **external groups**, who are interested in learning more about this capability, please contact Peng Li for more information.

Sample Compatibility and Analysis for XPS, UPS, Auger, SIMS, SEM and HIM

Technique	**XPS(Ultra)**[1]	**XPS(PHI)**[1]	**UPS**[1,2]	**AES**[1]	**SIMS**[1]	**SEM**	**HIM/FIB**
Training	*no*	*special*[3]	*no*	*no*	*no*	*yes*	*yes*
Max size (LxWxH) (mm) for bulk sample	12x12x4 10x5x10	15x15x8 15x6x13	12x12x4	12x12x4	20x20x3 20x10x6	Sigma SEM max height 17.5, EDX max height 13.5 mm. EVO 10 SEM max height 30, EDX max height 25 mm. No special for size[4]	10x10x4
Min size (LxWxH) (mm) for bulk sample	4x4x0.2	2x2x0.2	10x10x0.2	2x2x0.2	2x2x0.1	No special[4]	No special[4]
Volume for powder sample (mm^3)	> 5	> 5	> 5	> 5	> 5	> 5	> 5
Composition	yes	yes	no	yes	yes	yes	no
Depth profile or surface cleaning	no	yes	no	yes	yes	no	no
Magnetic[5]	Sensitive	Sensitive	Sensitive	Sensitive	Sensitive	Sensitive[6]	Sensitive
Conductive	yes	yes	yes	yes	yes	yes	yes
Insulator	yes	yes	no	no	yes	yes, need coating or LV mode[7]	yes[8]
Dry	yes	yes	yes	yes	yes	yes	yes
Liquid	no	no	no	no	no	no	no
Pressure compatible (Torr)	10^{-9}	10^{-9}	10^{-9}	10^{-9}	10^{-9}	10^{-6}	10^{-7}

1. These tools are sensitive to the sample surface. Make sure the samples are not flipping inside the container during transfer and indicate the interested surface.
2. Sample surface has to be uniform in terms of conductivity and coverage.
3. PHI XPS training is selective to the special users for the depth profile experiment.
4. Sigma FESEM max height 13,5alk to nanofab staff for detailed information.
5. Data quality from magnetic samples might not be satisfied.
6. Sigma FE-SEM is the best choice for magnetic materials.
7. Low vacuum mode is only in Tescan and EVO 10.
8. Need Au coating ~50 nm for FIB. No Au coating for HIM.

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