

## **DEVELOPMENT OF A 3D ELEMENTAL REFERENCE MATERIAL FOR CONFOCAL MICRO X-RAY FLUORESCENCE**

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Confocal micro X-ray fluorescence (CMXRF) is a unique characterization tool for materials. CMXRF offers the ability to not only characterize the elemental composition of a material but to translate the spatial distribution of the element in three dimensions nondestructively. This approach offers micrometer spatial distribution of elements below the surface of the material under investigation.

A major issue currently facing CMXRF is how to quantify elements at depth. Clearly this is a significant issue since both the exciting beam and the emitted fluorescence signal are affected by the elemental composition above the confocal probe volume. While a model to correct for the absorption effects can be relatively straightforward, a reference material would be useful in refining the model.

Small spot deposition of known masses of known spatial dimensions offers a custom fabrication capability in developing such 3D as well as 2D reference materials to both characterize the X-ray probe beam and provide analytical parameters to modify confocal models.

This work will demonstrate our initial attempts in fabricating 3D confocal reference materials which can be used for both probe beam characterization as well as depth references for elemental quantification.