

Sampling, Ambient Mass Spectrometry, and the Philosophy of Damage in a Museum Setting

Material analysis is needed to support all manner of research at the Smithsonian, but it may be more important to the museum and other interested parties that rare, precious, or culturally sensitive objects remain un-damaged. Mass spectrometry in its various forms presents a powerful tool, but it is inescapably destructive at some level. As the sensitivity of modern instrumentation grows, the sample mass that must be collected and ionized shrinks, perhaps to the point where it becomes debatable whether the amount removed constitutes “damage”. Ambient mass spectrometry methods offer particular opportunities for sensitive object analysis because they can theoretically be performed without cutting material from a whole or preparing the surface. I will present several recent projects that pertain to different forms of minimally-invasive, ambient sampling from materials such as wood, parchment, textiles, and synthetics, among others. I will also show recently-developed instrumentation methods that accommodate intact objects too large to fit immediately adjacent to the mass spectrometer.