Standard Protocol for Preparing Carbonized Archaeological Plant Remains

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Carbonized archaeological plants remains are processed using a H2O, HCL, NOH, H2O cleaning technique. This technique is used in most isotopic laboratories that prepare carbonized samples that have been in the ground. The technique I use was the protocol developed at the AMS laboratory at CAMS-LLNL, taught to me by Dr. John Southon. The primary purpose is to remove all carbon sources in the sample that are not part of the carbonized matrix, such as carbonates, humic acids, and other substances the sample may have absorbed from the soil. The following protocol should be used to process all carbonized archaeological plant matter and sherd scrapings for anyone one of a number of isotopic measurement techniques.

1. An adequate amount of carbon (0.1 to 0.5 g) is selected for preparation and placed in a borosilicate or quartz test tube, labeled with a sample number and recorded on a sample sheet.

2. The sample is first wet with enough distilled H2O to cover the sample, this solution is then aspirated and discarded in an acid waste disposal container.

3. The sample is then incubated with 1-5 ml of 1N HCL acid for 15 to 30 minutes, this solution is then aspirated and discarded in an acid waste disposal container. The sample may fizz, this is due to calcium carbonates dissolving. This is process should be repeated until the wash solution is clear to a weak yellow and does not fizz anymore, typically 2 to 3 times. The sample may dissolve completely during this treatment, if this happens start over but use .5 N HCL acid to do the washing. If the sample emits significant quantities of gas or color the sample can be warmed in a heating block during the incubation.

4. The sample is now incubated with 5 ml of 1N NOH for 15 to 30 minutes, this solution is then aspirated and discarded in the basic waste disposal container. This process should be repeated until the wash solution is clear. The sample should emit significant quantities of brown pigments and it may take many repeated washing to remove all the humic acids in this step.

5. The sample is now brought back to neutral by washing with distilled water, this solution is then aspirated and discarded in the basic waste disposal container. At this point the sample can be sonicated if the sample is a large piece of wood, but is not necessary or if the sample is small or primarily particulate matter. This should be repeated until the wash water is clear.

6. The sample is then dried by heat, vacuum or in an dehydrating silica gel cabinet. The samples should be handled as little as possible at this point and kept dry.
The sample can now be used for a variety of isotopic procedures, such are radiocarbon dating, or stable isotope determinations.

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Sample Record Sheet

Tube number	Sample name	H2O	HCl	HCl	HCl	NaOH	NaOH	NaOH	H2O	H2O	H2O	Quantity
1												
2												
3												
4												
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Comments and Remarks about Preparation: