

Trying to Foil Aluminum Contamination

Because aluminum is ubiquitous in the environment, it is very easy for an aluminum result to be falsely elevated due to contamination that occurs either during specimen collection or during the analytic phase of testing. Supplemental questions that were included in the R-B 2009 mailing were intended to assess current practices of Survey participants.

Approximately one third of participants who answered question #1 accept containers other than royal blue tubes for aluminum analysis. To minimize pre-analytic contamination, it is important for the laboratory to inform clients of proper collection techniques, including the use of an appropriate collection container. The ideal container is a manufacturer-certified trace element-free tube. Another option is to test each lot of sample tubes prior to providing them to clients, comparing results from a representative sample of tubes from a particular lot with those obtained using a certified container. Labs should recommend the use of royal blue tubes and, if a sample is received in another sample tube, document this on the report to indicate the possibility of contamination.

Approximately one third of participants who answered question #2 perform aluminum testing in a clean room. Because many building materials, including ceiling tiles, contain aluminum, sample contamination by dust is a serious concern. The best way to minimize contamination during the analytic phase is to perform testing in a clean area that is dedicated to aluminum testing and regularly cleaned by wet wiping flat surfaces. Another way to minimize contamination is to perform all phases of the testing process in a clean room with removal of particulate matter from the air. If a dedicated clean room is not available, the use of dust covers to protect specimen aliquots on autosamplers or bench tops should be considered. The ISO 7 standard of <10,000 particles/ft.³ was the most commonly used clean room specification by respondents to question #3.

Half of participants who answered question #4 routinely wash samples tubes, caps and/or pipet tips with nitric acid. Glassware and plastic ware should either be washed with 10% nitric acid or disposable materials verified to be contamination-free should be used. About one third of respondents to question #5 reported using dedicated pipets and nearly half use dedicated standards and/or quality control materials for aluminum testing. A variety of different responses to question #6 were reported for what other precautions were taken to minimize contamination.

In summary, although a variety of pre-analytic and analytic processes are used by Survey respondents, most recognize the importance of minimizing contamination when performing aluminum testing. We hope that this discussion will spur a review of your laboratory's processes and procedures to further minimize the potential of contamination and provide more accurate aluminum results.

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