Podium Session 112: Sampling and Analysis 1 — Traditional and Nontraditional Sampling Techniques and Analysis

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81.
A COMPARISON OF X-RAY FLUORESCENCE AND WET CHEMICAL ANALYSIS OF AIR FILTER SAMPLES FROM A LEAD-ACID BATTERY RECYCLING PLANT (SECONDARY LEAD SMELTER).

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Recycling operations allow for the recovery of lead from used lead-acid batteries that can then be sold back to battery manufacturers to form a closed loop, significantly reducing environmental contamination. Personal samples were taken for analysis for the principal airborne metal, which is lead, although several other metals were present including antimony, tin, and copper. Samplers used in this study included the closed-face, 37-mm filter cassette (the current U.S. standard method for lead sampling), the 37-mm GSP or "cone" sampler, the 25-mm Institute of Occupational Medicine inhalable sampler, the 25-mm button sampler, and the open-face, 25-mm cassette. The mixed cellulose-ester filters from these samplers were analyzed after sampling for their content of various metals, particularly lead, using a portable X-ray fluorescence (XRF) analyzer, and then were extracted with acid and analyzed by inductively coupled plasma optical emission spectroscopy (ICP-OES). The 25-mm filters were analyzed using a single XRF reading, whereas three readings on different parts of the filter were taken from the 37-mm filters. For lead, all five samplers gave good correlations ($r^2 > 0.92$) between the two analytical methods over a very wide range above the permissible exposure limit enforced by OSHA. Linear regression on the results from most samplers gave almost 1:1 correlations without additional correction, indicating an absence of matrix effects from the presence of other metals in the samples. Even though very high concentrations of lead were encountered (up to almost 6 mg/m^3) no saturation of the detector was observed. A negative bias was found for the slope of the button sampler regression. All samplers performed well, with > 90% of XRF results within ±25% of the corresponding ICP results for the optimum configurations. The OSHA algorithm for the CFC worked best without including the backup pad with the filter.

82.
PERSONNEL EXPOSURE TO ISOFLURANE BEFORE AND AFTER PLACEMENT OF ACCESSORY ANESTHESIA SYSTEM.

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