

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

Papers 81–88

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).

M. Harper, B. Pacolay, NIOSH, Morgantown, WV; P. Hintz, M. Andrew, NIOSH, Spokane, WA.

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 $\pm 25\%$ 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.



ce 2006 Abstract Index by Session Topic

[2006 Abstracts Author Index \(both AIHce and VENT\)](#)

[2006 Abstracts Keyword Index \(both AIHce and VENT\)](#)

AIHce

- [Aerosol Technology](#) 179-184
- [Agricultural Health and Safety](#) 192-202
- [Biosafety and Infection Control](#) 1-6
- [Community Exposure: What You Don't Know Might Hurt You](#) 133-138
- [Computer Applications and Auditing EHS Systems](#) 19-25
- [Emergency Preparedness and Response](#) 89-97
- [Engineering and Control Technologies](#) 145-151
- [Environmental Microbiology](#) 61-66
- [Ergonomics Program Management](#) 98-106
- [Exposure Assessment Strategies Modeling 1: Bayesian, Mathematical and More](#) 67-72
- [Exposure Assessment Strategies Modeling 2: Bayesian, Mathematical and More](#) 127-132
- [Exposure Assessment Strategies and Risk Assessment](#) 107-115
- [General Indoor Environmental Issues](#) 221-228
- [Human Biological Monitoring and Dermal Exposure](#) 213-220
- [Industrial Hygiene General Practice](#) 50-60
- [International Occupational Hygiene Issues](#) 73-80
- [Laboratory Health and Safety](#) 13-18
- [Management and Communications](#) 152-159
- [Mold: What is Normal?](#) 116-126
- [Mold: Dearth to Disaster](#) 169-178
- [Occupational Epidemiology: Modeling and Characterizing Exposures](#) 7-12
- [Occupational Ergonomics and Biomechanics](#) 26-32
- [Occupational Health — Characterizing Exposures and Their Health Effects](#) 185-191
- [Physical Agents](#) 203-212
- [Protective Clothing and Equipment](#) 139-144
- [Respiratory Research and Regulatory Implications](#) 41-49
- [Safety](#) 33-40
- [Sampling and Analysis 1 — Traditional and Nontraditional Sampling Techniques and Analysis](#) 81-88
- [Sampling and Analysis 2 — Field Sampling Strategies and Techniques](#) 160-168

Poster Sessions

- [Poster Session 401 — Emergency Preparedness/Response](#) 229-240
- [Poster Session 402 — Risk Assessment \(Risk Management\)](#) 241-257

- Poster Session 403 — Aerosols 258-270
- Poster Session 404 — Engineering and Control Technology 271-285

VENT

- Air Cleaning, Education, Miscellaneous Ventilation 7-12
- CFD and R&D 13-23
- Dilution, Air Quality, Thermal Consideration 45-53
- Energy Considerations 54-62
- Industrial Process Control, System Design Issues 63-73
- LEV Systems, Hoods 36-44
- Standards and Codes 1-6
- Testing, Balancing, Measurement, Air Distribution 24-35
- Poster Session PS1 and PS2 74-102