# Laboratory and Ambient Air News

December 2008

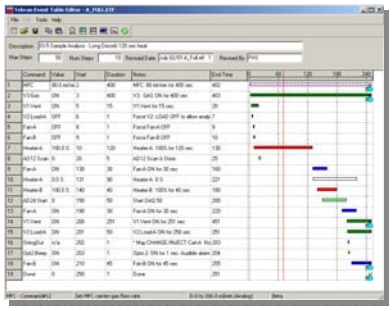
## Technical and Sales Support Team

We have added a new email address, **lab-air-info@tekran.com**, that is specific for Tekran laboratory and ambient air products (2600, 2500, 1100 instrument series). This email is distributed to a team of instrument application specialists, including our newest team members, Lucas Hawkins and Philip Kilner. These two highly experienced mercury research technicians joined Tekran last April. As always, please feel free to contact us anytime by phone at 1-888-5-TEKRAN (toll free in Canada and the US) or 416-449-3084.

## NEW - Tekran Air Dryer 1102A

The newly designed 1102A Air Dryer connects to the air inlet of the 1130 pump module to provide a more robust source of moisture-free air (dew point below -40° C). When the 1130 pump is generating zero air by compression, there is the potential for condensation to form in the zero air canisters if the source air dew point is too high. Condensation in the zero air canisters may release halogen species which can foul sample lines as well as harm gold cartridges. Recent advances to the Tekran 1102A system include better timer control, active back-flushing of the drying canisters during regeneration cycles and an indicating Drierite column as a polishing step. Ask for our upgrade kit to modify your original 1102 to current manufacturing specifications.

## TEK-MDS 2.0 Software



Our TEK-MDS 2.0 Software for the Tekran 2600 system has been available for some time now. It has many great new features including the lamp hardware wizard, easy to use templates and an improved event table editor (shown here). It allows the addition or deletion of samples to your active run at any time as well as providing "auto-flush" capability. (If a high sample is encountered, the system will temporarily suspend the run and run blank samples until backgrounds return to normal.). TEK-MDS 2.0 allows unparalleled analytical flexibility, so if you are currently running older software on your 2600, contact Tekran for your **free upgrade.** We have many custom event tables for unique applications, such as multiple sample loadings to a single gold trap. For technical specifications or your free upgrade please contact us.

## NEW - Soda Lime for Ambient Air Speciation

Soda lime is essential in Tekran 2537-1130-1135 speciation systems. It scrubs deleterious compounds that may be generated when the denuder and regenerable particulate filter are heated during the analytical cycle. Soda lime quality, and trap construction in a clean environment is very important. In response to some

users' struggle for soda lime traps that perform properly, Tekran R&D is offering a **new, low-cost, disposable soda lime trap** for use with the model 1130/1135. Enquire with Tekran for further information.

## *NEW - Gold-Quartz Trap*

Tekran has designed a new gold-quartz cartridge with significant improvements over our previous model. Packed with custom made *quartz* beads, this high quality gold-quartz cartridge will deliver better accuracy and precision, lower carryover, and longer life time. In order to have full control over cartridge manufacture, all coating, production and performance testing is carried out in the research and development laboratory in Toronto. The trap is used as the analytical trap in the Tekran 2600 Series instrument, for air sampling using Method IO-5 and for natural gas sampling using ASTM Method D-6350. Enquire with Tekran for further information.

## *Tekran Instrument Training*

Tekran's intensive training courses for our **Laboratory and Ambient** product lines are designed to provide our customers with in-depth information regarding the operating principles and features of our instrumentation. These courses complement the instrument manual and allow users to progress more efficiently into confident and competent operators. Courses are catered to the individual background and interest of the trainee. There are three options for training: 1) at our Toronto R&D facilities free of charge, 2) at the customer location and 3) at the customer location with a full independent assessment of the operations and measurement program. All persons completing the training course receive a Tekran operator certificate.

## *Recent Mercury Workshops (contact us for details)*

A **National Mercury Monitoring Workshop** was convened in May by several federal agencies with representatives from state agencies, academic institutions, tribes and non-governmental organizations. Approximately 45 attendees, including Dr. Eric Prestbo of Tekran, gathered to further refine the needed measurements and mechanisms for inter-governmental and scientific collaboration to build "MercNet".

Tekran was represented at a fall 2008 workshop organized by the Korean Society for Atmospheric Environment (KOSAE) in Seoul on October 2nd. The theme of the meeting is **"New Trends in Atmospheric Measurements."** Tekran's Chief Scientist, Dr. Eric Prestbo gave an invited presentation entitled *Atmospheric Mercury Speciation Methods and Important Observational Discoveries in the Last Ten Years*

This past summer Tekran participated in a **Mercury Dry Deposition Workshop** and field intercomparison study organized by the University of Michigan. A total of 5 full Tekran ambient air mercury speciation systems (2537-1130-1135) were in operation during the intercomparison. A presentation by Dr. Prestbo covered the justification and overview of the Atmospheric Mercury Initiative of the National Atmospheric Deposition Program (http://nadpweb.sws.uiuc.edu/amn/).

In October, the National Science Foundation supported a workshop in Seattle organized by Dr. Daniel Jaffe (U. of Washington) and Dr. Mae Gustin (U. of Nevada-Reno). The workshop **"Reducing the Uncertainty in Measurements of Atmospheric Mercury"** explored the technical details of analytical measurements of atmospheric mercury and mercury species, with an emphasis on aircraft measurements. Approximately 35 atmospheric mercury experts contributed to the workshop, including Tekran's Dr. Eric Prestbo

## Tekran Laboratory and Ambient Air Instrument Knowledge

- ***New Leak Check Adapter for the 1130***
  Tekran has developed an assembly used for performing leak checks on a 2537-1130 or 2537-1130-1135 system. The adapter is made up a zero air filter and DFU particulate filter with a special fitting that attaches to the inlet (after removing the elutriator). This assembly creates negative pressure at the inlet while allow zero air to be pulled though the system. If leaks are present, the user will not be able to obtain zero values. This provides a more realistic leak check conditions rather than using the high vacuum of complete inlet blockage. It also protects the instrument from large pressure surges when releasing the vacuum after a leak check.

- ***Lamp Wizard for the Tekran 2600***
  One overlooked feature of our Tekran MDS2 software is the ***Lamp Hardware Wizard***. This feature (found under the ***System*** tab) makes lamp changes and lamp optimizations a snap. Thanks to the interface between the software and lamp stabilization board, all lamp parameters are displayed on screen eliminating the need for voltmeters or other test equipment. On-screen directions guide you through the entire process for: 1) Lamp voltage adjustment, 2) Lamp replacement and 3) Physical lamp position optimization.

## Tekran Customer Photos

This picture of an NADP Atmospheric Mercury Initiative Site was provided by Gary Conely of Ohio University, Athens Ohio. For more information about the NADP Atmospheric Mercury Initiative go to the following link http://nadpweb.sws.uiuc.edu/amn/

This picture of a Tekran ambient air speciation system at Churchill, Manitoba is courtesy of Jane Kirk and Vince St. Louis of the University of Manitoba. Research results are listed in the link below.

## Recent Laboratory Mercury Studies

**Total mercury concentrations in lakes and fish of western Maryland, USA,** M. S. Castro, E. N. McLaughlin, S. L. Davis, R. P. Morgan II**.,** URL: http://www.ncbi.nlm.nih.gov/pubmed/11994787?dopt=Abstract

**Mercury cycling in litter and soil in different forest types in the Adirondack region, New York, USA,** J. D. Demers, C. T. Driscoll, T. J. Fahey, J. B. Yavitti**,** URL: http://www.ncbi.nlm.nih.gov/pubmed/17708212?dopt=Abstract

**Dissolve gaseous mercury distribution in a wetland: Influence of macrophyte beds**
E. Garcia1, J. Laroulandie1, M. Amyot, X.R. Saint-Simon,
URL:http://jp4.journaldephysique.org/index.php?option=article&access=standard&Itemid=129&url=/articles/jp4/abs/2003/05/jp4pr5p509/jp4pr5p509.html

**Factors that influence methylmercury flux rates from wetland sediments,** J. Holmes , D. Lean, Sci Total Environ. 2006 Sep 1;368(1):306-19**,** URL: http://www.ncbi.nlm.nih.gov/pubmed/16410019?dopt=Abstract

**Wet and dry deposition fluxes of trace elements in Tokyo Bay**
M. Sakata, Y. Tani, T. Takagi., URL: http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VH3-4S4TP1T-2&_user=10&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_acct=C00005022 1&_version=1&_urlVersion=0&_userid=10&md5=9f6f6b4cf4e9768ee33995fc071bd2af

## Recent Atmospheric Mercury Studies

**A comparison of speciated atmospheric mercury at an urban center and an upwind rural location**. Andrew P. Rutter, James J. Schauer*, Glynis C. Lough, David C. Snyder, Catherine J. Kolb, Sara Von Klooster, Todd Rudolf, Helen Manolopoulos and Mark L. Olson, URL: http://www.ncbi.nlm.nih.gov/pubmed/18175023?dopt=Abstract.

**Atmospheric mercury in the Great Smoky Mountains compared to regional and global levels.** Ralph J. Valente*, Catherine Shea, K. Lynn Humes, Roger L. Tanner, URL: http://cat.inist.fr/?aModele=afficheN&cpsidt=18509213.

**Ambient elemental, reactive gaseous and particle-bound mercury concentrations in New Jersey, U.S.: Measurements and associations with wind direction.** Michael L. Aucott, Adriana D. Caldarelli, Rudolph R. Zsolway, Charles B. Pietarinen, Randy England**,** URL: http://www.ncbi.nlm.nih.gov/pubmed/18951140.

**A synthesis of atmospheric mercury depletion event chemistry in the atmosphere and snow.** A. Steffen, T. Douglas, M. Amyot, P. Ariya, K. Aspmo, T. Berg, J. Bottenheim, S. Brooks, F. Cobbett, A. Dastoor, A. Dommergue, R. Ebinghaus, C. Ferrari, K. Gardfeldt, M. E. Goodsite, D. Lean, A. J. Poulain, C. Scherz, H. Skov, J. Sommar, and C. Temme, URL: http://www.atmos-chem-phys.org/8/1445/2008/acp-8-1445-2008.pdf.

**Effect of Dissolved Organic Carbon on the Photoproduction of Dissolved Gaseous Mercury in Lakes: Potential Impacts of Forestry.** N . J . O'Driscoll*, D. R. S. Lean, L . L . Loseto, R . Carignan, and S . D . Siciliano, URL: http://lib.bioinfo.pl/pmid:15180063.

**Rapid Reduction and Reemission of Mercury Deposited into Snowpacks during Atmospheric Mercury Depletion Events at Churchill, Manitoba, Canada.** Jane L . Kirk*, Vincent L . St. Louis, and Martin J. Sharp**,** URL: http://cat.inist.fr/?aModele=afficheN&cpsidt=18367292.

**Analytical artifacts produced by a polycarbonate chamber compared to a Teflon chamber for measuring surface mercury fluxes.** Anthony Carpi*, Allan Frei, Daniel Cocris, Rachel McCloskey, Elisabeth Contreras and Kylie Ferguson, URL: http://www.springerlink.com/content/v16r64t77285p074/.

**Trans-Pacific transport of mercury.** Strode, S.A., L. Jaegle, D.A. Jaffe, P.C. Swartzendruber, N.E. Selin, C.D. Holmes, R.M. Yantosca, URL: http://www.as.harvard.edu:16080/ctm/publications/strode2007/Strode_Revised_2007.pdf.