McCampbell Analytical Inc.

McCampbell News- January, 2009

McCampbell Analytical Announces Our Latest Addition…
Dioxins by LRMS

MAI will have completed its HRGC-LRMS (quadrapole MS or QMS) dioxin & dibenzofuran certification by end of February. This includes EPA method 8280A for soils, groundwater & hazardous waste & EPA 613 for effluent.

These are not HRGC-HRMS methods. HRMS, for example magnetic sector MS, has two advantages over LRMS, for example QMS. One being its much greater sensitivity due to much higher ion thruput efficiencies, & secondly, its four decimal precision in mass accuracy. The first advantage is by far the most important because regulatory limits cannot be met by conventional operation of QMS. MAI's special technical skills, combined with this year's Agilent QMS, have allowed us to meet the ppq sensitivity required for dioxins.

Our **water RL** is 5 x 10^{-6} ug/L, or **5 pg/L**= 5 ppq for 2378-TCDD, which is the ESL, SIP and DW reporting limit.
Our **soil RL** is 4 x 10^{-6} mg/kg or **4 ng/kg** = 4 ppt for 2378-TCDD, which is lower than the most stringent CA ESL & CSSHL limits.

Many HRMS labs have difficulty in meeting these limits, but our S:N is still >10 at 5 pg/L. MAI meets or exceeds the sensitivities required for other dioxins & dibenzofurans relative to TCDD based on CA & EPA TEFs. These low RLs are verified by MAI every 12 hours by analysis of the RL standard.

HRMS has two pronounced disadvantages. Labs are slow, often 21d TAT, with no ability to do rush TAT, and expensive, typically $1000-1300 for all 17 target compounds at best sensitivity. MAI will be much faster & cheaper.

We can test for all 17 target analytes on the 8280A target list, which are the same compounds on the HRMS target lists. EPA 613 applies only to TCDD as written, but we are submitting an application in to the EPA to permit its formal use for the full 17 compound standard target list. Approval is expected by end of March or sooner.

One essential difference in testing for dioxins as opposed to other organic groups is that dilutions are never done for dioxins. Full sensitivity is required in all cases, and in fact even food & biological extracts are analyzed undiluted. This is allowed by the 'perfect' clean up that has been developed for dioxins. Every sample extract must be cleaned up by this technique, and this is one of the reasons for the slowness & costliness of dioxin testing. MAI has automated the heart of the clean up procedure & this allows us to offer 48 hour TAT. Essentially no interferents remain after the clean up. Our chromatography system provides definitive resolution amongst the tetrachloro- & hexachloro- isomers, & this is verified every 12 hours by analysis of a resolution check standard.

Who can benefit from our faster, lower cost dioxin analysis? Everyone in the fields of effluent, soil, ground water & hazardous waste! It is not a permitted technology for drinking water, yet. We know of no disadvantages of using QMS now that the sensitivity issue has been resolved. On the plus side, cost is lower, TAT is much faster (10d initially moving to 5d TAT shortly thereafter), & there is the quality, competence & care that you expect from McCampbell Analytical. Give us a chance with your dioxin-dibenzofuran testing & I am sure that you will be satisfied.

MAI has added NICI (Negative Ion Chemical Ionization) GC-MS

MAI has added **NICI (Negative Ion Chemical Ionization) GC-MS** instrumentation to our lab. This allows chlorinated & some other functional group organics to be determined at very low sensitivities, often pg/L. Some examples are Pyrethrins-Pyrethroids (N J Robinson, *Pyrethroid Working Group*) and Toxaphene degradation products (EPA Ombudsman Reports 2005-P-00022, 2006-P-0007). Currently this is primarily an R&D tool but it is available for commercial work.

Protonatable Nitrogen compounds by CIC

MAI now has the ability to test for **Protonatable Nitrogen compounds** by CIC (Cationic Ion Chromatography). Amines & Ethanolamines (mono- & tri- methylamine & ethylamine, mono- & di- ethanolamine, ethylenediamine), Cyclo-amines (morpholine & cyclohexylamine), the Melamine Group (melamine, ammeline, ammelide), & biogenic amines (histamine, putracene, cadaverene, others) are amongst others can be analyzed. Typical sensitivity is 1-10 ppm.

Pharmaceutical / endocrine disruptor capabilities have been

Expanded our **pharmaceutical / endocrine disruptor** target compounds to include: Acetaminophen bisphenol-a, carbamazepine, 17?-estradiol, estrone, fluoxetine, naproxen, & progesterone. This list continues to grow.

Recently added or improved methods

*** Cyanide** in water with **1ppb** reporting limit

*** Bromate** to **2ppb** sensitivity in water with up to 100ppm Cl^-, by EPA 300.1

* **Geosmin & MIB** (taste & odor compounds) in water with **5 ppt** reporting limits

* **GPC** preparative chromatography, useful in the separation of fats & lipids from smaller organic molecules

* **TO-15 & TO-3** analysis from summas or tedlars. Extended target list includes all ESL VOCs. Excellent sensitivity for soil gas & indoor air.

* Expanded Microbiological Capabilities, including **Hydrocarbon degraders** (culture), **Iron & sulfur utilizers** (microscope ID & culture), **Legionella** (culture w/ fluorescence), **Salmonella (**culture, genus ID), **Klebsiella** (MF).

*Expanded our TCLP & STLC extraction capability to ~20 TCLP or 40 STLC samples simultaneously.

* Our Fish Toxicity capabilities have been expanded to include **Fathead minnow, Sheepshead minnow & Rainbow Trout.**

New Hours For Our New Drop Off Locations

We have a new **drop-off location in Rancho Cordova** at 11275 Sunrise Gold Circle, Stes S&T, 916 852-8856. Like our location in Martinez, this one is also partnered with EnviroTech.

Please note that both the **Martinez & Rancho Cordova** drop-off locations now close at **6:00pm** while our **lab in Pittsburg** still receives samples until **9:00pm**