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# The WCAS Analytical Digest

WEST COAST ANALYTICAL SERVICE, INC.

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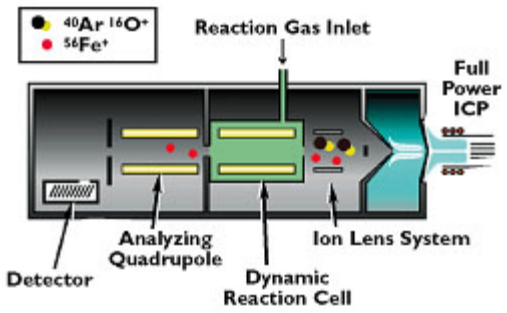
## ICPMS with DRC

The ELAN 6100 DRC (Dynamic Reaction Cell) is the latest model of ICPMS from PerkinElmer. The instrument was installed in our lab in October 2000. This new model features a Dynamic Reaction Cell (DRC) with Dynamic Bandpass Tuning which removes polyatomic interferences, lowers sample matrix backgrounds, and improves detection limits for many elements.

The argon plasma can contain polyatomic ions. Two examples of these polyatomic ions are ions generated by argon itself (argon dimer $Ar_2^+$) and argon oxide ($ArO^+$) produced when water is present. With a mass of 80, $Ar_2^+$ is an interference for the major isotope of selenium (Se). With a mass of 56, $ArO^+$ is an interference for the major isotope of iron (Fe). In traditional ICPMS, these interferences are the reasons that less abundant isotopes of Se and Fe are used.




Using isotopes with lower abundances results in lower sensitivities and thus higher detection limits. With traditional ICPMS, detection limits for both Fe and Se were approximately 2-20 µg/L due to the argon plasma background and these polyatomic interferences.

The Dynamic Reaction Cell (DRC) is part of the ion optics bench which is under vacuum between the focusing lenses and the analyzing quadrupole (where the isotopes are separated). The cell contains a separate quadrupole to keep the ions focused, and the cell is slightly pressurized with a reaction gas.

In the case of Fe and $ArO^+$, the interference is removed by using a reaction gas of ammonia: $ArO^+ + NH_3 \longrightarrow ArO + NH_3^+$. With the ArO+ removed in the reaction cell as a neutral species, $^{56}Fe^+$ can be determined with much better sensitivity and lower detection limits.

Please give Mike Hovanec or Dr. Jack Northington a call if you have any questions about our new ICPMS. If you are in our area and would like to see the ICPMS DRC give us a call and we can arange a tour.

## Quick Quotes

The best way to keep children home is to make the home a pleasant atmosphere - and let the air out of the tires.
*Dorothy Parker*

A man in love is incomplete until he has married. Then he is finished.
*Zsa Zsa Gabor*

After all, what is a pedestrian? He is a man who has two cars - one being driven by his wife, the other by one of his children.
*Robert Bradbury*

## Hexavalent Chromium - New Certification -

### Drinking & Ground Water

WCAS is now certified for Hexavalent Chromium (Cr(VI)) in ground water and drinking water! Due to the current excitement surrounding Cr(VI) in ground water and drinking water, the California Department of Health Services (DOHS) conducted a Round Robin performance evaluation study for EPA Method 218.6 (Cr(VI) by IC with Post-column derivatization achieving extremely low detection limits) during November, 2000. Based upon passing those tests, WCAS has been granted interim certification by California DOHS for Cr(VI) in drinking water and ground water by EPA 218.6.

Our DOHS Certification now lists Cr(VI) under the category "Analysis of Toxic Chemical elements in Drinking Water." If you would like a copy of our certification please contact us at 562-948-2225, ext. 300.

WCAS has been performing Cr(VI) testing by IC for over 12 years and has also been certified by the DOHS for Cr(VI) in hazardous waste and waste water for many years. DOHS is just now offering certification in ground water and drinking water. Information about the test method and our experience is available on our web site at:

**http://www.wcas.com/tech/hexchrom2.htm**

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# WCAS Laboratory Tidbit

*For more information call 562-948-2225.*

**We will be moving to a larger building** in the near future! Thanks to your help we have outgrown our present facility. The new building will only be a couple of blocks away and as such there should not be any disruption in our services to you. We will keep you informed as to the new shipping address and phone/fax numbers. All groups will be expanding. We have been purchasing new equipment over the last 12 months to facilitate the move. As always you are welcome to come and visit. Just give us a call and we will schedule you in.

**We have 20 SUMMA canisters that we would like to sell.** If you are interested please call Eric at 562-948-2225, ext. 300.

## New OVI GC

We have purchased a new Agilent 6890 Gas Chromatograph to expand our USP <467> capacity. This GC is equipped with dual flame ionization detectors and both liquid and headspace autosamplers. This instrument will be dedicated to residual solvent analyses, which will allow us to improve our turnaround times for all <467> methods. Please call if you have any questions about this instrument and how it can help you with your analytical needs. We also have a technical article on USP <467> on our web site. Just search for "467." (see picture above)

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## New Developments in HPLC and IC

We've hired additional chemists and made recent purchases of additional equipment to improve turnaround time and capabilities in the HPLC and IC area. In terms of personnel, Dr. Daniel Chan has joined our staff as Group Leader in the Chemistry Group which includes HPLC and IC. Dan has a pharmaceutical methods development background most recently from Dura Pharmaceuticals. Dr. Richard Meller joined our staff as a Senior Chemist HPLC analyst. Richard has experience in analytical chemistry in the atmospheric environmental chemistry area. Joe Richman continues to be our mainstay in the IC area, our expert on Cr(VI), perchlorate, and all those other environmental hot topics. Kevin Heinrich, who is an expert in wet chemical analysis, is assisting and training in the IC/HPLC area. Other experienced personnel have been added to GCMS, GC, and metals analysis groups.

New equipment includes an HPLC electrochemical detector (ECD). We have a large project for monitoring sucrose in a pharmaceutical product. In addition, the ECD can be used for other easily oxidized organic materials like sugars, aromatic amines, and glycols. We hope to explore these applications in the near future.

We have purchased a new Dionex HPLC with Pickering post column chemistry capability. While most of our HPLCs have post column capability, this new one was purchased because we have needed more capacity for carbamate pesticides. Post column derivatization converts analytes with weak chromophores to those which absorb or fluoresce strongly, greatly improving sensitivity. Examples are glyphosate, Cr(VI), and carbamates, to name a few. The new HPLC also came with a new fluorescence detector having a high power xenon source which should increase sensitivity for things like PNAs. (see picture above)