

ASI TODAY

A newsletter for customers of Analytical Sensors & Instruments Ltd.

Fall 2005

From the EVP's Desk



Brian Williams
Executive Vice President

Dear Customers & Friends:

Since Peter Cai is in China at our Aurora Branch conducting training and team development this month, I will fill in with an article. As you have heard by now, Hurricane Rita missed Houston and left the ASI building, employees and families safe and sound.

The team at ASI has been working around the clock on new products, like our soon to be released chlorine electrode, our large body twistlock industrial sensor and a number of projects that are under wraps until they are completed.

Why the secrecy, that is a great question. ASI is a leading original equipment manufacturer in 10 different industries that use electrochemical products. You (our customers) value our ability to maintain your trade secrets and not pass them out like candy on Halloween. I have the ability to say that ASI has never in 16

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Turn up the heat, *Winter is coming*

I think it is appropriate at this time of the year to talk a little about winterization of sensors and buffers. Every year we get calls from customers asking about winterization procedures, chemicals that are not harmful to the electrodes and proper storage and shipping procedures.

First, let's all agree that sub-zero Celsius temperatures for long periods of time are not good for any electrode, no matter how it is stored if it is exposed to that temperature. As Dr. Barone notes in his article, we would rather you store electrodes in your refrigerator than expose them to continuous sub-zero Celsius conditions (*the same is true for solutions*).

Now on to the meat of the matter: how do you properly store your sensor during the winter months?

1. Use a pH/ORP storage solution (for pH /ORP/REF sensors) that has 4M KCl and pH 4 buffer in a 1:1 concentration for temperatures above -10° C.

Note: It is suggested that you do not store pH/ORP/Reference sensors in sub-zero Celsius temperatures, as the internal parts are not warranted against internal fractures due to frozen parts.

2. Store conductivity, dissolved oxygen and mono Solid State ISE electrodes dry.
3. Store PVC Membrane ISE electrodes dry and it is suggested that they not be exposed to sub-zero Celsius.

Once you are through your hibernation period, you will want to revive your sensor to its previous operating capacity. Follow these steps in 'waking' up your sensor:

1. Allow the sensor to equilibrate to its new environment temperature, this can take up to 1 day depending on the temperature difference from storage to operation.
2. Soak the sensor in a low concentration standard, or pH/ORP storage solution, depending on the type of sensor you are 'waking' up, for a minimum of 2 hours.
3. Calibrate the sensors like normal, if it is still sluggish, soak it over night in the low standard and repeat.
4. If your electrode will still not calibrate, it may be time to replace it with a new one.

There are other methods to establish a lower storage temperature, but they can cause other issues that you will not want to experience, such as damaging the reference, glass, or membrane. We have also had cases of customers soaking their electrode in home made solutions that have distorted the body material - so please be careful (**do not use anti-freeze**).

While I did not get permission in time to reprint the article in this newsletter, I would recommend Ian Verhappen's 1993 article from the Instrument Society of America Conference (ISA) titled *The Effects of "Winterization" pH buffers*. This article is very helpful in determining the proper chemical use in winterizing your buffers for cold application calibration.

If you have any question about winterization, please feel free to contact Dr. George Barone at ASI for his recommendation on your specific application (gbarone@asi-sensor.com).



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Probing For Success

People in the industry contact ASI routinely for help with specific problems in dealing with their electrochemical sensors. This quarter we would like to cover some of the questions that we have encountered during the last few months.

Question: Do you plan to offer an economically priced Chlorine sensor this year?

Answer: Yes, we are current testing our beta models with 6 different membranes to determine what is the best fit. Dr. Barone, our staff senior research Chemist, has been hard at work for the last six months perfecting our new chlorine sensor. Our next step is to send out prototypes to six different companies for testing and evaluation of the design. We are optimistic that the chlorine sensor will release in November of this year.

Question: How do I select the appropriate reference half-cell junction for my application.

Answer: As every application presents its own unique challenges for electrodes, we like to find out as much information up front in suggesting a junction. We offer several different junction materials:

- Porous Teflon
 - » A good choice for heavy industrial applications
- Ceramic Pin/Fiber
 - » A good choice for environmental and clean water applications
- Ceramic Pin
 - » A good choice for ultrapure water and research applications
- Ceramic/Glass
 - » A good choice for general purpose glass electrodes
- Porous Pin
 - » A good choice for general purpose plastic electrodes

- Ground Glass Joint
 - » A good choice for research applications requiring easy cleaning

Question: Why do you have two refillable models for ISE's (model 03 and 12), and why are only your solid states available in the 03 model?

Answer: The model 03 ISE was our first redesign for the original model 44 refillable ISE electrode. We found that users like the ability to replace the PVC membrane module and that a replaceable module on the 03 model was protected by a patent. We went back to the drawing board and designed the model 12 with a replaceable membrane tip for PVC and solid state.

Question: My electrodes froze last year during the winter while in storage, how can I avoid that problem this year?

Answer: Please read our article on winterization, and/or contact ASI directly for more information.

Question: I am having problems with my customers getting mold in their storage solution after they start using the electrode, how can this be avoided.

Answer: When you buy your storage solution, ask your sales representative or customer service agent for storage solution with mold inhibitor. ASI uses 4M KCl in pH 4 buffer (with mold inhibitor) for storage solutions.

Question: Can you build industrial ISE electrodes?

Answer: In a word, yes. But a word of caution in using ISE electrodes in industrial settings, they are not designed to work in every application like a pH electrode. There are many variables when selecting an ISE for industrial applications, and they all have to be considered. Many ISE's have serious interferences that will not allow it to read or even function properly. Our best advice is to talk with Dr. Barone at ASI (gbarone@asi-sensors.com) to determine if it is possible for you.

Question: I am having trouble with my high purity water application, what advice can you offer?

Answer: High purity applications can be daunting, to say the least. Many problems can be presented when measuring in high purity (low conductivity) solutions. Symptoms and ways to avoid them can include:

- carry over of pH buffer into the sample
 - » one method would be to rinse the electrode in DI water thoroughly before making your measurement, another would be to use your samples as a wash before making the measurement as well
- differences in reference junction potential due to high buffer conductivity or sweeping action of ions at the reference in flow applications
 - » use a low conductivity buffer that closely matches your sample for the best results and maintain a constant flow rate will minimize the effect

Question: I wish to measure phosphate. Is there an ISE for phosphate?

Answer: We know of no commercially available ISE for the direct determination of phosphate. However, phosphate can be measured using the fluoride ISE as the endpoint detector in a titration for phosphate.

people propHiles

This month we would like to introduce Yuzhen Ying, ASI's production manager. She reports to the Director of Operations (Frank Zheng). Yuzhen is the floor leader who not only supervises all production employees, but also coordinates the monthly production process for every order.

Yuzhen has been with ASI since 1994, when she started at Aurora Scientific Instruments in Shanghai as a manufacturing employee. She worked for four years as the manufacturing supervisor at Aurora before transferring to ASI (US) to work in the R&D group for three years. Yuzhen took over the manufacturing supervisor position at ASI in 2003.



Yuzhen Ying
Production Manager

Yuzhen is married to Jian Xing Zhao, and they live in Sugar Land, TX, with their son who attends High School in Sugar Land.



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Warranty Question

Over the last several years one question has appeared more often than any other: do you warranty your electrodes?

Yes, ASI warranties all work against manufacturing defects and failure to meet specification outlined and approved by the customer and ASI.

Generally speaking, ASI warranties lab products for 12 months, industrial products for 6 months and ISE products for 6 months.

To determine the exact warranty on your electrode, contact ASI customer service.



Dr. George Barone working on his chlorine project.



Hello again everyone. A lot has changed since my last writing. I am putting the final touches on my chlorine probe, I hope to have it finished by the time this gets published. We are in a suburb of Houston, Texas, where so many of the victims of Katrina have found refuge and care. A lot of our time is spent thinking about and helping the victims of hurricane Katrina. Living in a hurricane zone as we do it makes us think about the preparations for a storm.

Every day I travel to work on a

hurricane evacuation route, it makes me think about what we need to do in case of a big storm.

Speaking about preparations, in another section of this issue we have an article about the winterization care of probes. I cannot stress enough that the proper storage solutions and conditions are important for the probes that you use.

The pH probes like to be stored in pH 4 buffers and the reference part of the pH probes likes to be in high concentration KCl solutions. A 4 molar KCl solution should not freeze until -15°C or so. Our pH soaking solution should not freeze until -10°C . I take this time to indicate to you that if you store probes at very low temperatures, you will eventually damage the probe. The pH probes will freeze internally and crack the glass, making it useless.

The references of all other probes will eventually freeze and they will break the probes or destroy the junction, either case will make the probe useless. Even our probes without a reference may get serious issues when frozen solid. So my recommendation for low temperature storage is: **DON'T DO IT!**

If you must ship a probe in cold climates ship it in a Styrofoam box with a chemical heating element in it. If it is

very cold then put the Styrofoam box inside another Styrofoam box along with adding more insulation. Finally if you must store a probe in a room where the temperature may get below -10°C or -15°C then put the probe in the refrigerator. The temperature of the refrigerator is about $+4^{\circ}\text{C}$ to $+2^{\circ}\text{C}$, which is quite warm compared to -15°C .

Now some of you readers may think that I have totally flipped, I live in Texas now (born and raised in Buffalo, NY though) and it doesn't get that cold here! Well we have some customers who ship probes way up north, where it does get that cold, so we must prepare them for proper shipment to the cold climates.

Well, there I go again, my thoughts are wandering all over the place. I started thinking about the hurricane relief and wind up thinking about storing probes at -15°C , maybe I need a vacation! Let's see, the high today will be 91°F or I can go somewhere it is 5°F (equals -15°C), I wonder! Oh well, I look forward to writing to you next quarter. Have a good, safe, and colorful fall season.

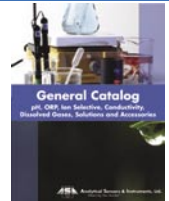


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RETURN SERVICE REQUESTED

Winter is around the corner, look inside for helpful tips to prepare!



*From the EVP's Desk
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years passed along a trade secret or any other information from one customer to another without their expressed approval or request. That is our commitment level to our customers.

I would also like to thank all of our customers for their kind words on the ASI catalog. I am currently working on a Chinese version of the catalog for distribution in the Asian market.

I look forward to your calls over the next quarter, happy selling!

Sincerely,

Brian Williams



Model 61 is the product of the quarter around ASI. This new design is replacing the older polypropylene design for 3/4" NPT Inline/Submersible products. Molded out of rugged Ryton plastic, it can be used under the harshest conditions. In addition, ASI can customize the probe with up to four sensors (pH, ORP, Temperature with solution ground and reference) for your process. Other electrodes are available.

Specifications:

- Wetted Materials: Ryton (*body*), Teflon (*junction*), Glass (*sensing element*)
- Dimensions: 6.9" L x 1.29" W
- Maximum Pressure: 100 PSI
- Maximum Temperature: 100° C
- Electrodes: pH, ORP (REDOX), 3-in-1 pH/ORP/Ref, Conductivity, Galvanic and Polarographic Dissolved Oxygen, ISE

