

## New Techniques to Identify Low Level Metals in Reactive Gas

At SPWCC, Dr. Dan Cowles, Gas Lab Manager for Air Liquide-Balazs Analytical Services will present a paper on "Reactive Gas Sampling and Analysis for Metals." Reactive, liquefied gases, such as dichlorosilane, trichlorosilane (TCS), anhydrous ammonia, and anhydrous HF are a class of chemicals widely used in semiconductor processing. Delivery of these corrosive gases to the point-of-use (POU), in a manner that avoids contamination by metallic elements, is an ongoing challenge. In addition, the metal impurity specifications for these chemicals are increasingly stringent. For example, in liquid-phase trichlorosilane, iron is specified as low as 2 ppbw, and dopant impurities at 10 to 500 pptw.

**Delivery of corrosive gases to the POU while avoiding metallic contamination is an ongoing challenge.**

At SEMI's Technical Symposium on Innovations in Semiconductor Manufacturing at Semicon West 2002, Dr. Cowles presented details of the lab-based method for sampling corrosive gas based on hydrolysis of TCS in aqueous HF.

Dr. Cowles has furthered his research, and at this year's SPWCC, he will describe an approach that has been applied to sample collection of corrosive, liquefied gas at a client site, followed by metal impurity analysis using a proprietary sample-handling procedure to avoid loss of volatile metal compounds.

Using this method, the lab obtained excellent recoveries for critical contaminants.

Dr. Cowles presents results for an on-site sampling campaign to qualify a newly installed TCS bulk supply system.

In addition, Dr. Cowles compares this new direct sampling and analytical method to wafer measurement techniques, some of which represent indirect but highly sensitive methods for assessing TCS purity.

In addition to reactive gas sampling and analysis, Air Liquide - Balazs analyzes a wide range of inert gases and mixed inert gases for atmospherics, contaminants, metals, dopants and moisture.

To find out more about the new on-site reactive gas sampling method, attend SPWCC.

**Using this method, the lab obtained excellent recoveries and pptw DLs for most trace metals in chlorosilane gases**

For more info about Balazs' complete reactive and inert gas analysis capabilities, contact your local Sales Manager.



*Inert gas cylinders and sample bombs for sample collection and inert gas analysis.*