



MEETING of the
Sensors Chapter of the IEEE Richland Section
Wednesday, 27 August 2008

Dr. Wassana Yantasee, PNNL
presenting

**Next-generation metal analyzers based on nanomaterials for
biomonitoring and environmental monitoring**

Abstract: Large numbers of industrial workers are regularly exposed to toxic heavy metals like mercury (Hg), cadmium (Cd), and lead (Pb), which are known to induce various diseases that are detrimental to human health. In order to monitor workers for multiple toxic metal exposures and to ensure that these exposures are below a threshold for inducing permanent damage to various organ systems, real-time, non-invasive tools for monitoring of workplace and workers for toxic metal exposure is highly desirable. The portable metal analyzers are also highly beneficial to environmental monitoring of these toxic metals (e.g., in surface water, ground water, drinking water, industrial wastes). We have utilized new technologies for developing portable sensor systems that are capable of quantitatively detecting Hg, Cd, Pb, Cu, Tl, and Ag. The portable sensor systems will be based upon the voltammetric analysis of metal ions with a built-in preconcentration of the target metal ions at the functional nanomaterials, specifically the self-assembled monolayers on mesoporous supports (SAMMS) and superparamagnetic nanoparticles (NPs), making them sensitive and selective for analysis of toxic metal ions in complex samples. The sensors do not use toxic mercury for metal preconcentration, require no pretreatment of sample, offers the detection limits at 1 microg/L (ppb) of metal ions, and are robust in biological samples. The systems represent the next-generation of metal ion analyzers because they are more affordable, are highly portable and programmable, and are more easily operated than the more traditional analytical methods like AAS or ICP-MS. This project is funded by CDC/NIOSH.

WSU-TC, East 212, Richland, WA

Agenda: 5:45-6:15 PM Social (pizza and soft drinks will be provided for free.)
6:15-7:00 PM Technical Program (no charge)

RSVP by COB Aug 26th : Reservations are not required but a headcount would be appreciated. For more information contact: Xiao-Ying Yu at 372-4524 or xiaoying.yu@pnl.gov.

**** ADVANCED MEETING NOTICES ****

IEEE Richland Section Sensors Chapter
Wednesday, September 10th, Dr. Jay Grate, PNNL
Wednesday, October 8th, Dr. Margret Greenwood, PNNL

To RSVP or for more information on Sensor Chapter meetings contact:
Xiao-Ying Yu – 372-4524 xiaoying.yu@pnl.gov
Evelyn Hirt – 375-4425 e.hirt@ieee.org

For more information about the IEEE or other Section events go to <http://ewh.ieee.org/r6/richland>