

NANO HOUR

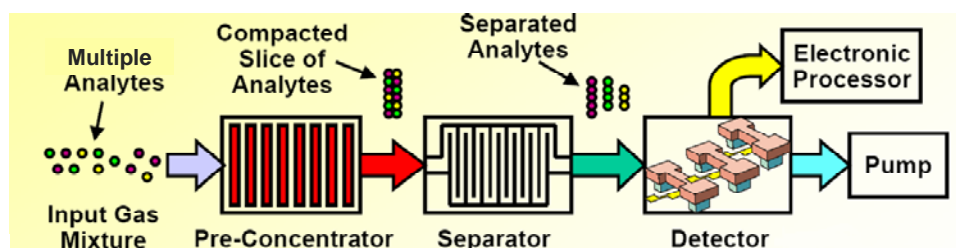
Wednesday, April 7, 2010 3:00 pm
Beckman Institute - Room 3269

Micro-Gas Chromatography Analyzers Enabled by Micro/Nanotechnology

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Timely identification and measurement of gas constituents are essential in many areas of science and technology, and the micro gas chromatograph (μ GC) analyzer are being developed around the world for myriad applications ranging from detecting undesirable compounds in air for security and safety, facilitating process control in industry, and sensing compounds in breadth for health monitoring and diagnosis. Key drivers for the miniaturization efforts include speed (less than a few seconds), cost ($< \$1000$), portability (PDA size), energy consumption (< 10 J), sensitivity (< 1 ppb), and reduction in false positives (< 1 in 10^6).



In the first half of my talk, I will present at the system level the design, fabrication, and assembly of the Cbana μ GC system and the characterization of the individual components

(micro preconcentrator, microvalves, microcolumns, and micro/nano gas sensors). An emphasis will be placed on how the micro/nanotechnologies help us to improve the device performance and address the challenges associated with the scale-up fabrication. The other half of my talk is about micro/nanomanufacturing technologies that enabled the low-cost, high-rate, scale-up fabrication of the μ GC components. Based on soft lithographic printing and transfer, called detachment lithography, we have built multilayer, 3D microstructures on flat or curved substrates. This new lithographic technique also allows us to develop (i) a top-down/bottom-up hybrid method for integrating nanomaterials into functional devices and (ii) nanofluidic elements that are difficult to be made otherwise.

Junghoon Yeom is a senior scientist, working towards commercializing micro gas analytical system at Cbana Labs Inc. and serves as a principle investigator for NASA – lunar surface analysis project. He is also a visiting scholar in the Department of Mechanical Science and Engineering and affiliated with nano-CEMMS center to develop unconventional nanomanufacturing platform for nanofluidic devices and applications. He received the Ph.D. degree in mechanical engineering in 2007 at University of Illinois.

Coffee and cookies will be served

<http://nanohour.beckman.uiuc.edu>