THE CHROMATOGRAPHY FORUM OF DELAWARE VALLEY

May Meeting
Thursday, May 15, 2008

Characterization of HPLC Columns-Which Approach is Best?

***Professor* Gert Desmet**
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Abstract: In the past decade, instrument and column manufacturers have made tremendous progress in their pursuit of ever faster or ever better separations. New developments such as the introduction of sub 2- m particles, monolithic columns, high temperature-stable supports, compact heat exchangers and column ovens, increased pump pressures (up to 1000 bar), etc… have all lead to performances that were unachievable 10 years ago.

Most of these developments have become great commercial successes, and the burning questions now is: which technology is most promising and what's next ? Do we need even smaller particles and can we make them sufficiently uniform? Would a further pressure increase be really worth the extra cost and trouble? Can monolithic columns really contribute to achieving fast separations ? Is temperature a better tool than pressure? Are the current instruments sufficiently adapted to the high performance of the columns?

These questions can be answered in a very comprehensive way using band broadening (Van Deemter curve) and flow resistance data obtained on commercial columns, using two simple equations to transform the Van Deemter plot into one or more kinetic plots. After this transformation, a curve is obtained that represents the best kinetic performance one can ever expect for the tested support or physicochemical operating condition (elevated T or P) as a function of the required plate number or peak capacity. Because this type of plot compares all chromatographic systems in the same "currency" (i.e., time needed for N plates or n peaks), the comparison different chromatographic systems becomes very straightforward.

The complementarities and the differences with the more customary Van Deemter plot will be discussed and illustrated with a number of timely examples.

About the Speaker: Gert Desmet (°1967) is a chemical engineer and obtained his PhD in Chemical Engineering from the Vrije Universiteit Brussel, Brussels, Belgium and is the current head of the department of chemical engineering of that same university. He is professor in chemical engineering and analytical chemistry and more specifically teaches courses on industrial separation processes in the biotech-industry, bioreactor design, chemical reactor engineering, nano- and micro-biotechnology and chromatography.

His research focuses on the miniaturization of separation methods and on the investigation and the modeling of flow effects in chromatographic systems. More specifically, he is leading a research group working on the practical demonstration of the separation speed of shear-driven and pressure-driven flow devices for ultra-fast chromatography and for DNA hybridization enhancement. On the theoretical side, his group aims at a better understanding of the relation between the packing structure and the performance of HPLC supports to suggest rules to optimize their shape and the external porosity. He is the first or senior author of 70 peer reviewed papers

and 5 patent applications, a member of the editorial board of J Chrom A and a member of the scientific committee of several international conferences. He is frequently invited to present key-note lectures or chair topical sessions at international conferences. He and his students already received several awards at international conferences for their oral or poster presentations: Nanotech Montreux (1999), Hyphenated Techniques in Chromatography conference (2004), HPLC Conference series (2004, 2006, 2007), and the Desty Memorial award (2006). Recently he also received the "Emerging Leader in Chromatography"-award from LC-GC North America. Gert Desmet is currently also leading a 2.6 million Euro initiative of the Flemish Government on the fabrication of micro-machined chromatographic columns.

Location:

Christiana Hilton

100 Continental Drive

Newark, DE 19713

Tele.302-454-1500

Times:

Executive Mtg - 5:00 pm

Social "Hour" - 5:45 pm

Dinner - 6:30 pm

Presentation - 7:30 pm

Directions:
Below

Cost of Dinner:
$30 or MC/Visa /AmEx

NOTE TO STUDENTS: Full-time students with valid ID may attend dinner meetings at half price. **Faculty members at colleges and universities are urged to bring one or more students to the meeting. If they do, they also can attend at half-price.**

*** Call for Nominations *** Chromatography Forum Award

This award is announced annually and given to a member of the **Chromatography Forum of the Delaware Valley** who has distinguished himself/herself in service to the Forum and contributions to chromatography. Each year the **Forum** seeks to select a deserving awardee.

Nominations should include an accurate statement of the nominee's contributions to the Forum and the contributions to separation science. A seconding letter is not required but strongly recommended. There is no restriction on the length of or content of submission. The deadline for submission is July 31, 2008. Send nominations to:

Dr. Matthew Przybyciel
ES Industries
701 South Route 73
West Berlin, NJ 08091
or email przybyciel@earthlink.net

Dinner Choices: This evening we will be offering the delicious buffet from the Christian Hilton

For Reservations:
Please register/call before 4 p.m., **Monday, May 12, 2008**. Please note that "no-shows" will be billed for the dinner.
Late reservations: We still want you to attend, so call now. However, we cannot guarantee your entrée selection for dinner.
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Contact: We strongly recommend online registration http://www.cfdv.org/meetings.php but you can also e-mail sheree@cfdv.org, or FAX 610-485-9467. For FAX/e-mail, please include your name, employer, work telephone & meal choice. Alternatively, call Ms. Sheree Gold at 610-485-3479 and provide same information.

Directions to the Christiana Hilton

From the North (Philadelphia, New York, New Jersey):
Follow I-95 South to Delaware. Take Delaware exit #4B (Churchman's Road). Bear right at the top of the exit ramp and proceed on Churchman's Road (Route 58) to the fourth traffic light. Make a left onto Continental Drive. The Hilton Wilmington / Christiana will be the first driveway on the left.

From the South (Baltimore, Washington, DC):
Follow I-95 North to Delaware. Take Delaware exit #4B (Route 7 North). Stay in the right-hand lane and proceed to exit #166 (Churchman's Road, Churchman's Crossing). Turn right at the bottom of the exit ramp (first traffic light), follow to the second traffic light, and make a left onto Continental Drive. The Hilton Wilmington / Christiana is the first driveway on the left.
http://www.hiltonestate.com

Check out our new and improved CFDV website at:
http://www.cfdv.org