学 术 报 告

High Throughput and High Resolution HPLC: Smaller Particles and Faster Separations

WU CHEN, Ph.D

Agilent Technologies

报告地点：生物楼学术报告厅

报告时间：2007年4月20日下午2：30

报告人简介：

EDUCATION

·Ph.D., Organic/Polymer Chemistry, Iowa State University, May 1997,

·B.S., Chemical Physics, University of Science and Technology of China, July 1991,

RESEARCH EXPERIENCE:

5/97-present: Senior Research Chemist
Columns R&D, Chemical Analysis and Life Science Group
Agilent Technologies, 2850 Centerville Road, Wilmington, DE 19808

·Synthesize and evaluate totally porous and nonporous micron particles with different particle size (1.5 um to 10 um) and pore sizes (80, 300, 800 Å) for HPLC columns. The particles include silica, alumina, and zirconia, solid phase extraction (SPE) and related separation materials.
·Develop superficially porous silica particles (Poroshell) for ultra-fast separation of large molecules, polypeptides and proteins and their LC/MS application.
·Develop new phases and bonding chemistry (ion exchange, high aqueous C18, gel filtration) for HPLC columns.
·Modify the surfaces of substrates, such as micron silica particles, capillary silica tubes, quartz/glass plates and polymeric materials, by high temperature sintering and wet chemistry such as hydrothermal treatment, surface leaching, polymer coating and chemical bonding.
·Develop HPLC, capillary HPLC, LC/MS application methods and SPE applications for separation of pharmaceutical

molecules, peptides, DNAs, proteins.
·Develop new chemistries and synthesize organosilanes, polysiloxanes, inorganic/organic hybrid polymers, and other organic polymers for GC, HPLC, CEC, and CE columns.

PUBLICATIONS, PRESENTATIONS AND PATENTS

·More than 20 oral and poster presentations at major conferences such as Pittcon and HPLC meeting and more than 20 seminars for customer training
·7 Patent applications filed.

报告摘要：

High Throughput and High Resolution HPLC: Smaller Particles and Faster Separations

It has been stated often that the column is the heart of the chromatograph. Without the proper choice of column and appropriate operating conditions, method development and optimization of the high performance liquid chromatographic (HPLC) separation can be frustrating and unrewarding experience. Since the beginning of modern liquid chromatography, column technology has outpaced instrumentation developments.

The transition to modern high performance liquid chromatography occurred in late 1960s and early 1970s, when 10 µm silica gel came to the scene and appropriate packing methods were developed. In 1980s, 5 µm and so called Type B silica particles were developed, and became the standard in the earlier 1990s, and now most commercial silica-based analytical packing materials are of this higher level of purity. The 1990s saw a shift towards sub-5-µm particles, narrow-bore columns, and capillary electrochromatography. New particles such as perfusive packings, Poroshell particles, inorganic-organic hybrids, and monoliths also appeared. Post-2000 advances still are being made in column technology, with even smaller porous particles (sub-2 µm), high temperature columns, nanocolumns with diameter under 100 µm, columns on chips, and rapid separation columns enabling high resolution separation in seconds.

This presentation intend to give a review of development of commercial HPLC columns, and more on recent column packing materials, column formats, and some other media development used for high throughput and high resolution of small and large molecules. The presentation especially focuses on development of sub-2 µm and Poroshell, the theory for ultra fast separation and high resolution separation, advantages and limits of these materials.

报告联系人：张丽华

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大连化学物理研究所
科技处 1810
2007-04-04 08:19:33