Analytica Acta-2013

OMICS Group Conferences
Accelerating Scientific Discovery

4th International Conference and Exhibition on
Analytical & Bioanalytical Techniques

October 15-17, 2013 Las Vegas, NV, USA

Hydride-based HPLC stationary phases: A rapidly evolving technology for the development of new bio-analytical methods

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Abstract

The tools for chemical and biological analyses have advanced significantly in the last twenty years. The understanding of the biological and chemical processes of diseases and the treatments (drugs) that provide cures is advancing at an exponential rate. However, there are still limitations of current methods that prevent significantadvancement in some aspects of disease diagnosis and cure, pharmaceutical analysis and the understanding of metabolic pathways. Biological and physiological samples are complex and require a means to separate analytes that are both hydrophobic and hydrophilic. The presentation will focus on a unique LC technology related to analysis of small molecules that are classified as pharmaceuticals, metabolites or biomarkers as well as having the potential to provide peptide information in proteomic studies. Many of these analytes are polar compounds that are often challenging for traditional reversed-phase separation methods. Therefore other approaches are required to in order to be able to obtain a complete analysis of as many components as possible. The key to achieving this goal is the use of stationary phases that possess dual retention mechanisms. Hydride-based separation materials fulfill this requirement and examples of applications will be presented where this capability provides information not available from traditional reversed-phase approaches. The differences and advantages of this approach in contrast to hydrophilic liquid interaction chromatography (HILIC) will be reviewed.

Biography

Joseph Pesek has a B.S. degree in Chemistry (University of Illinois) and Ph.D. in Analytical Chemistry (UCLA). He is Professor of Chemistry at San Jose State University and was named a Camille and Henry Dreyfus Foundation Scholar in 1993 and in 2001. He had sabbatical leaves in Paris (Georges Guiochon), Marseille (Tony Siouffi), and Melbourne (Milton Hearn). He has over 200 publications, 3 books, 4 patents and made over 200 presentations. He is one of the editors for the Journal of Separation Science. His research interests include the development, characterization and applications of separation materials for chromatographic and electrophoretic processes.