

A New HILIC Stationary Phase and Its Uses

Xiaodong Liu, Mark Tracy, and Christopher Pohl, Dionex Corporation, Sunnyvale, CA, USA

INTRODUCTION

While reversed-phase liquid chromatography (RPLC) is the most popular separation technique for a wide range of molecules, a major limitation is the lack of adequate retention of polar molecules. Hydrophilic-interaction liquid chromatography (HILIC) is a type of normal-phase liquid chromatography (NPLC) with several benefits over RPLC. Foremost among these is that HILIC retains polar analytes that cannot be retained on a RP column. For LC/MS applications on very polar compounds, HILIC (using an organic-rich mobile phase) provides 10- to 20-fold sensitivity improvement. In addition, HILIC offers complementary selectivity compared to RPLC. Here, the authors describe a newly developed HILIC stationary phase method and provide examples of applications.

EXPERIMENTAL

The Dionex Acclaim® HILIC-10 column (4.6 × 150 mm, 3 μm) was used for the separation on a modular Dionex UltiMate® 3000 HPLC system equipped with a LPG 3600 gradient pump, WPS-3000 autosampler, TCC-3200 column oven, and a VWD-3400 UV-vis detector. For non-UV absorbing analytes, a Corona® *ultra*™ charged aerosol detector (CAD®, Dionex) or a Sedex 85 ELS detector (Sedere, Alfortville, France) were used for detection.

The Chromeleon® 6.80 Chromatography Data System software was used for system control and data processing. All standards were purchased from Sigma-Aldrich (St. Louis, Missouri).

ACCLAIM HILIC-10 COLUMN

The Acclaim HILIC-10 column is designed for separating highly hydrophilic molecules. It is based on a high-purity, spherical, and porous silica gel whose surface is covalently modified with a proprietary hydrophilic layer.

The Acclaim HILIC-10 column provides the following benefits:

- Retains highly polar molecules that are unretained by reversed-phase chromatography
- Unique selectivity, complimentary to reversed-phase columns
- Hydrolytically stable
- Rugged column packing
- Broad application range

APPLICATIONS

The Acclaim HILIC-10 column is suited for the analysis of polar analytes and has demonstrated its use in a wide variety of applications as shown here.

Melamine and Cyanuric Acid

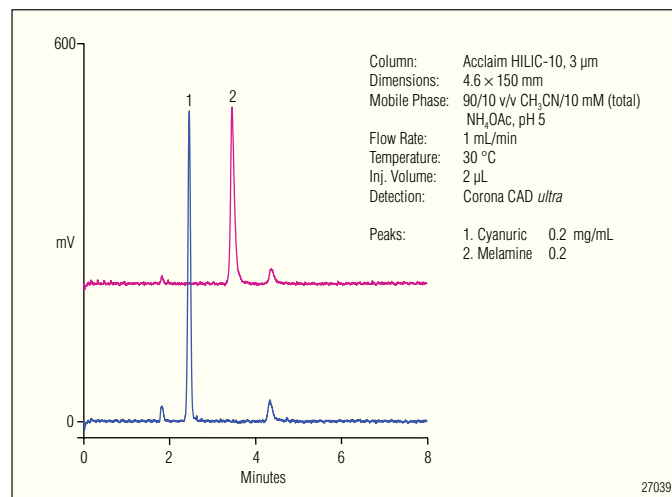


Figure 1. Separation of melamine and cyanuric acid.

Now sold under the
Thermo Scientific brand

Thermo
SCIENTIFIC

Hydrophilic Pharmaceuticals and Metabolites

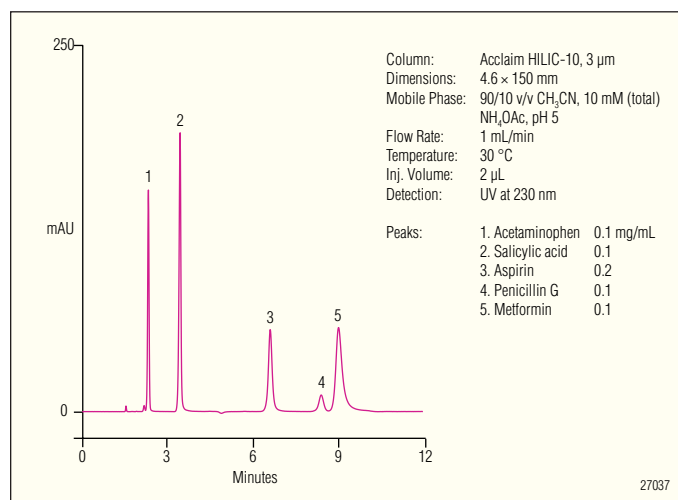


Figure 2. Separation of hydrophilic pharmaceuticals.

Monomers for Industrial Applications

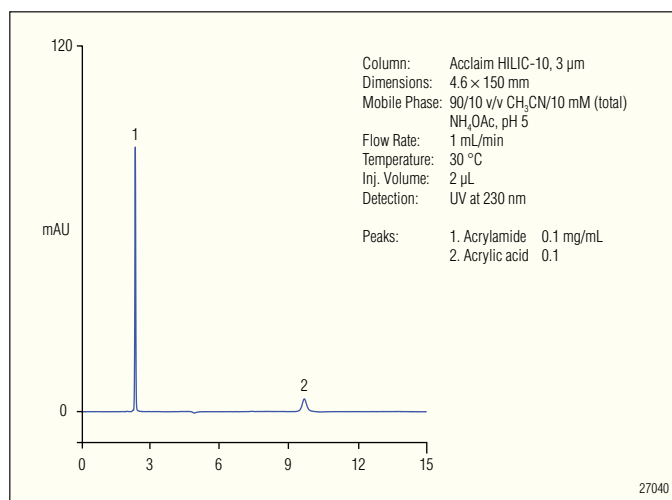


Figure 4. Separation of acrylamide and acrylic acid.

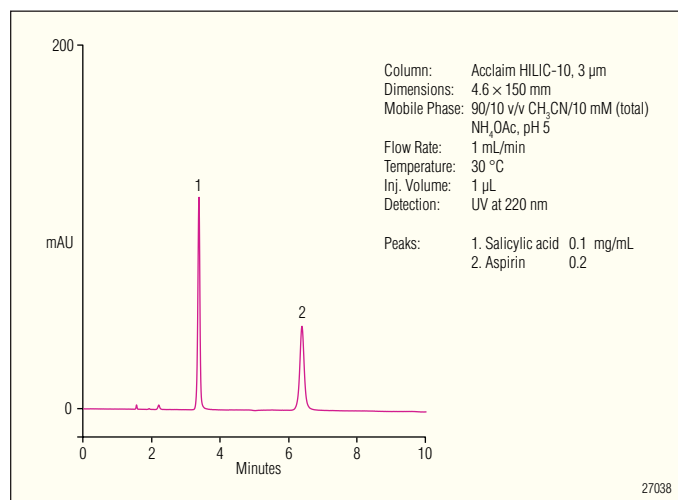


Figure 3. Separation of aspirin and degradation product.

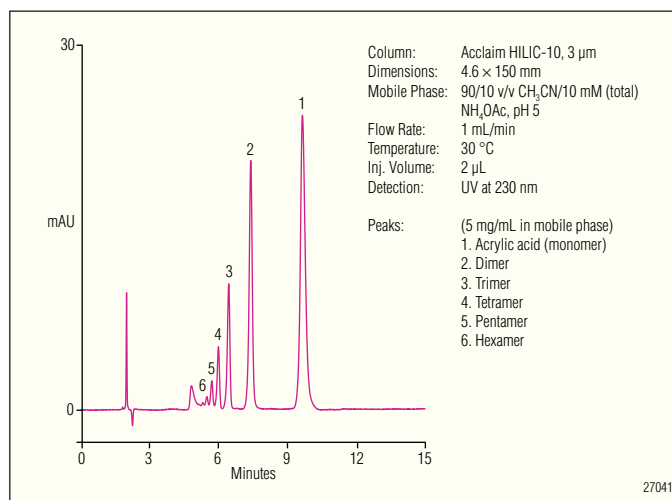


Figure 5. Separation of acrylic acid and oligomers.

Carbohydrates

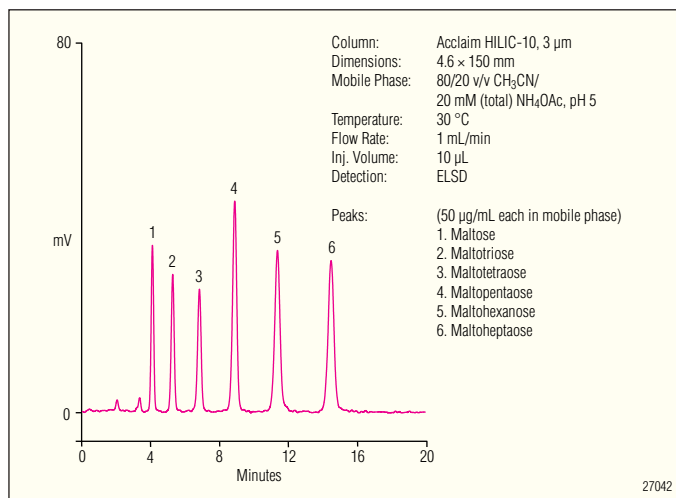


Figure 6. Separation of carbohydrates.

Lipids

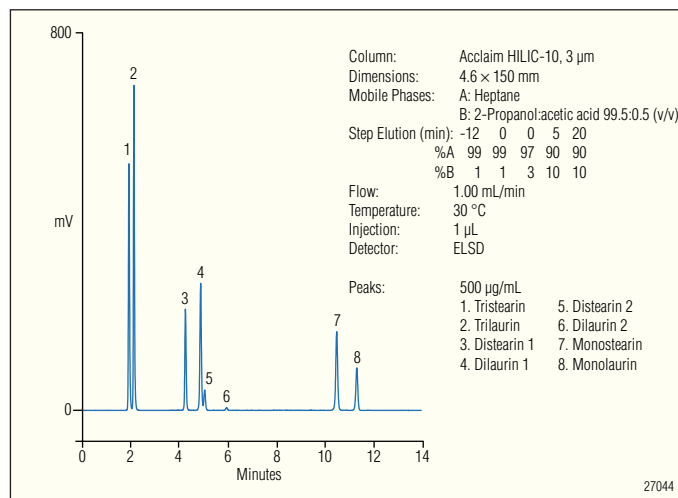


Figure 8. Separation of mono-, di-, and triglycerides.

Good's Buffer Salts

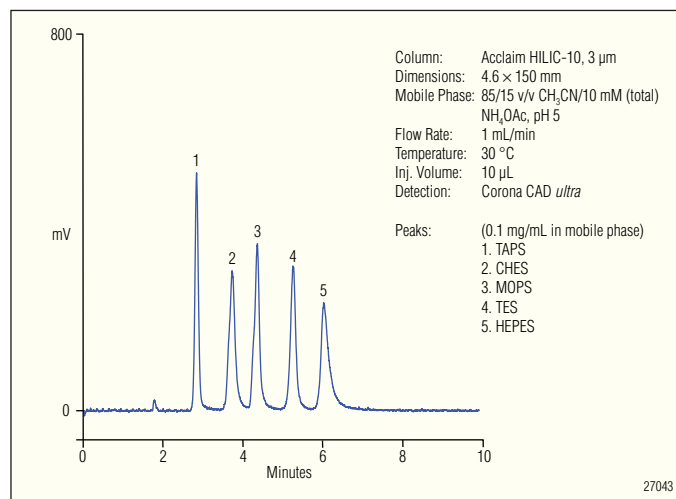


Figure 7. Separation of Good's buffer salts.

CONCLUSIONS

The Acclaim HILIC-10 column features high retention for highly hydrophilic molecules and unique selectivity. It is complementary to reversed-phase HPLC columns and provides solutions to a wide variety of applications including pharmaceutical, food and beverage, and chemicals.

Acclaim, CAD, Corona, Chromeleon, and UltiMate are registered trademarks and *ultra* is a trademark of Dionex Corporation.

Passion. Power. Productivity.



Dionex Corporation
 1228 Titan Way
 P.O. Box 3603
 Sunnyvale, CA
 94088-3603
 (408) 737-0700

North America
 U.S./Canada (847) 295-7500

South America
 Brazil (55) 11 3731 5140

Europe
 Austria (43) 1 616 51 25 Benelux (31) 20 683 9768 (32) 3 353 4294
 Denmark (45) 36 36 90 90 France (33) 1 39 30 01 10 Germany (49) 6126 991 0
 Ireland (353) 1 644 0064 Italy (39) 02 51 62 1267 Sweden (46) 8 473 3380
 Switzerland (41) 62 205 9966 United Kingdom (44) 1276 691722

Asia Pacific
 Australia (61) 2 9420 5233 China (852) 2428 3282 India (91) 22 2764 2735
 Japan (81) 6 6885 1213 Korea (82) 2 2653 2580 Singapore (65) 6289 1190
 Taiwan (886) 2 8751 6655

www.dionex.com



LPN 2435-01 2/10
 ©2010 Dionex Corporation