

Fatty Acids and Esters at Low Nanogram Levels

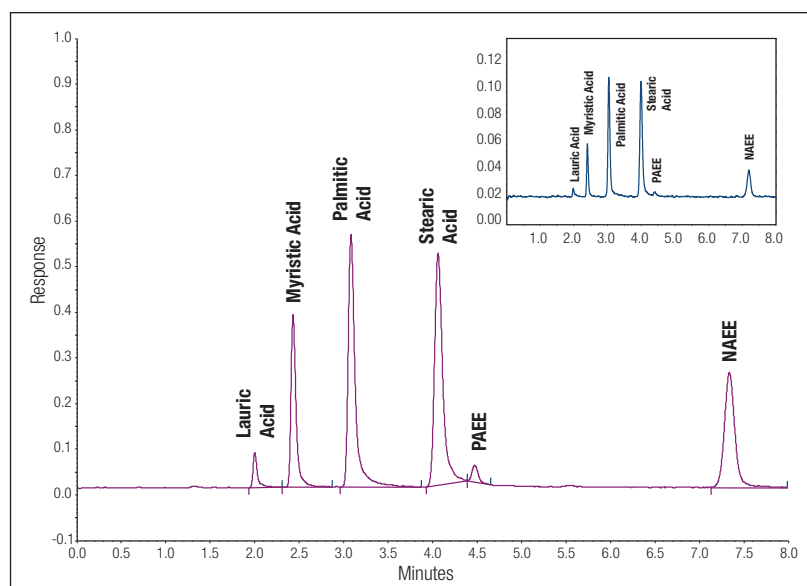


Figure 1. Fatty acid standards (1 μg each on column). Inset: 100 ng each on column.

The need for universal high-performance liquid chromatography (HPLC) detection in analytical laboratories is widespread. While several detection technologies (e.g., low wavelength UV, refractive index, evaporative light scattering, chemiluminescent nitrogen detectors) are currently being used, there is significant room for improvement in performance characteristics such as sensitivity, dynamic range, consistency of response factors, and gradient or solvent compatibility.

To help address the many challenges of universal detection, the Thermo Scientific Dionex Corona Charged Aerosol Detector was developed. This novel technology offers many benefits to analytical scientists including:

- High Sensitivity—Low ng limits of detection.
- Consistent Response Factors—Response magnitude does not significantly depend on analyte properties (e.g., molar absorptivity, proton affinity).
- Broad and Useful Dynamic Range—Four orders of magnitude (ng to μg quantities).
- Excellent Reproducibility—Typically less than 2% relative standard deviation (RSD).

- Broad Applicability—Can be used with a wide variety of HPLC conditions to measure virtually any nonvolatile analyte including proteins, lipids, carbohydrates, and small molecules.
- Ease of Use—Easy setup. Uses minimal bench space and requires only gas input pressure and signal output range to be set.

This application note describes the use of the CADTM Charged Aerosol Detector for the measurement of different fatty acids and esters. The method has a typical limit of detection of <20 ng, on column (Figure 1) for most of the analytes studied. The dynamic range covers ng to μg levels (Figure 2). It illustrates the use of the Corona charged aerosol detector for measurement of lipids and esters, and shows the influence of analyte volatility on detector response.

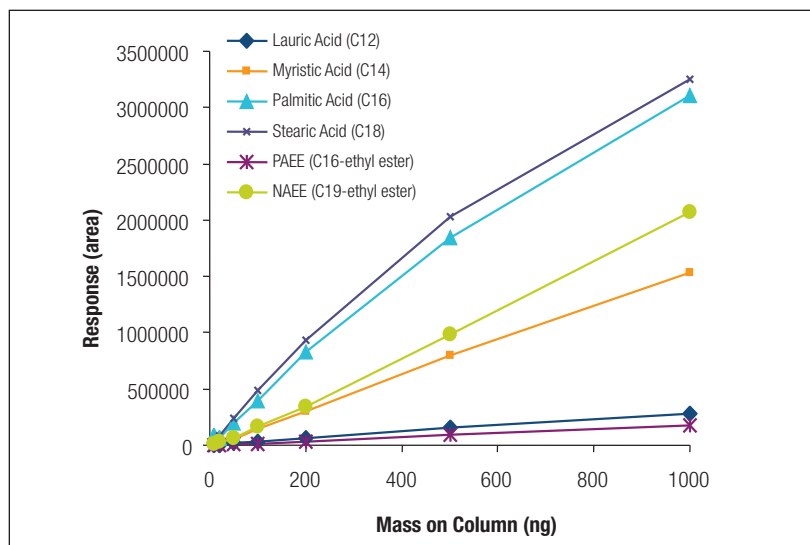


Figure 2. Fatty acid and fatty acid ester response curves.

Corona Parameters

Gas:	35 psi via nitrogen generator
Filter:	None
Range:	100 pA

HPLC Parameters

Mobile Phase:	75:25, acetonitrile:methanol with 50 mM formic acid
Flow Rate:	0.6 mL/min
Column:	150 × 3.2; 3 μm
Column Temperature:	Ambient
Injection Volume:	10 μL

Sample Preparation

Stock:	100 μg/mL of each standard in acetonitrile:methanol 75:25
--------	---

Conclusion

The Corona charged aerosol detector provides universal detection of nonvolatile analytes with response independent of chemical properties, a wide dynamic response range, high sensitivity, and good precision. These characteristics, along with reliability and simple operation, make the Corona charged aerosol detector a superior detector for a wide range of HPLC analyses.

www.thermoscientific.com/dionex

©2012 Thermo Fisher Scientific Inc. All rights reserved. ISO is a trademark of the International Standards Organization. All other trademarks are the property of Thermo Fisher Scientific Inc. and its subsidiaries. This information is presented as an example of the capabilities of Thermo Fisher Scientific Inc. products. It is not intended to encourage use of these products in any manner that might infringe the intellectual property rights of others. Specifications, terms and pricing are subject to change. Not all products are available in all countries. Please consult your local sales representative for details.



Thermo Scientific Dionex products are designed, developed, and manufactured under an ISO 9001 Quality System.

Australia +61 3 9757 4486
Austria +43 1 616 51 25
Benelux +31 20 683 9768
 +32 3 353 42 94
Brazil +55 11 3731 5140

China +852 2428 3282
Denmark +45 36 36 90 90
France +33 1 39 30 01 10
Germany +49 6126 991 0
India +91 22 2764 2735

Ireland +353 1 644 0064
Italy +39 02 51 62 1267
Japan +81 6 6885 1213
Korea +82 2 3420 8600
Singapore +65 6289 1190

Sweden +46 8 473 3380
Switzerland +41 62 205 9966
Taiwan +886 2 8751 6655
UK +44 1276 691722
USA and Canada +847 295 7500

Thermo
 S C I E N T I F I C

Part of Thermo Fisher Scientific