Corona CAD Charged Aerosol Detector
Know what is really in your sample

DIONEX
What is the best way to detect and quantify analytes with HPLC? There is no simple answer. UV detection is the most widely used, but fails to detect analytes without chromophores. Other, so-called “universal detectors” have fallen short of the promise of combining application versatility with reliability. For many, MS is not the answer.

**Now there is a solution – the Corona® Charged Aerosol Detector (CAD®).**

Based on a unique and innovative detection method, the Corona CAD detector offers performance that refractive index (RI), low wavelength UV, evaporative light scattering (ELS), and chemiluminescence nitrogen (CLN) detectors simply cannot match. With charged aerosol detection, you can know what’s really in your sample.

The Corona CAD delivers:

- Response independent of chemical structure
- Sensitivity to low nanograms
- Gradient compatibility
- Wide dynamic range
- Simple operation

**Ideal for a wide range of applications**

The Corona CAD is appropriate for any nonvolatile and many semivolatile compounds, including:

- Pharmaceuticals
- Proteins
- Lipids
- Steroids
- Oligosaccharides
- Surfactants
- Carbohydrates
- Polymers
- Counterions
- Peptides

**Integration with any HPLC system**

The Corona CAD can be used with any standard HPLC system. Software drivers are available for Chromleon®, Chromatography Data System, ChemStation®, EZChrom®, and Empower® 2.
How Charged Aerosol Detection Works

Charged Aerosol Detection
What makes any detector useful is its ability to accurately measure a wide range of analytes with consistent response. However, most detectors exhibit limitations. Often, one analyte responds more strongly than another, or may not respond at all.

The Corona CAD detector measures charge that is imparted to analyte particles, with the charge being in direct proportion to the amount of the analyte in the sample. Measuring this charge is accurate and consistent, regardless of the analyte. The result is that the Corona CAD detector can quantify any nonvolatile analyte—this includes those without chromophores or those that do not ionize—thus providing a consistent response that is independent of chemical structure. With charged aerosol detection, you can even measure many semivolatile analytes.

Simplicity in Operation

**Step One**
Charged aerosol detection begins by converting the eluent into droplets which are subsequently dried, forming particles. The particle size increases with the amount of analyte.

**Step Two**
A stream of positively charged gas collides with the analyte particles. The charge is then transferred to the particles—the larger the particles, the greater the charge.

**Step Three**
The particle charge is then transferred to a collector where the charge is measured by a highly sensitive electrometer. This generates a signal in direct proportion to the quantity of analyte present.
Consistent Response

The response obtained with the Corona CAD for nonvolatile analytes is less dependent on chemical structure than other detectors. As shown in the figure, charged aerosol detection response by flow injection analysis is very similar for equivalent amounts of a wide diversity of structures. Charged aerosol detection response does not depend on analyte optical properties as with UV, or the ability to ionize, as with MS. This characteristic provides significant advantages for a wide range of quantitative methods.

Broad Applicability

The Corona CAD detector provides the ability to measure virtually any nonvolatile and many semivolatile analytes: from proteins, lipids, and oligosaccharides, to amino acids, drugs, and ions.

Positive, negative, or neutral, with or without a chromophore, all can be detected routinely with charged aerosol detection.

Sensitivity

Charged aerosol detection consistently provides high sensitivity with low limits of detection for a wide range of analytes, irrespective of their chemical structure. The Corona CAD can readily detect compounds present in single digit nanogram quantities. Here, 10 nanograms each of four carbohydrates are easily detected, well above the detection limit.
Gradient Compatibility
The Corona CAD detector is fully compatible with gradient operation. Volatile mobile phases such as those used with MS are appropriate for use with the Corona CAD. The figure shows a five minute linear gradient from 10 mM ammonium acetate/2% IPA in H2O to 10 mM ammonium acetate in 75% ACN/25% MeOH. In the example, note the increased nebulization efficiency with increased organic solvent observed during a reversed phase gradient.

Wide Dynamic Range
Corona CAD’s unique method of detection allows quantitation across a range that exceeds four orders of magnitude. The detector’s wide dynamic range provides significant advantages for measurements of an analyte and low level impurities in a single run. This dynamic range (low ng to high μg) closely matches the requirements for typical HPLC methods.

Reproducibility
The Corona CAD offers consistent and reproducible performance. The detector attains excellent precision, making it practical for routine analysis in the QC environment.

At the right are overlaid results of replicate injections of five triglycerides with a RSD of 1.6% to 4.4%. RSD of 2% are typical, with lower results often achieved.
**Superior Performance for your Applications**

**Challenging to Detect**
Detection and quantitation of an API and counterions can be a problem. With the Corona CAD and the Acclaim® Trinity™ P1 column, API and counterions (anions and cations) can be measured simultaneously. This means greater efficiency and more robust methods.

**Challenging to Quantitate**
Trace impurities can be difficult to assess. Often impurities (e.g., degradants, trace residues) have no chromophore and are not detectable with UV. To accurately measure trace impurity levels, high sensitivity and a wide dynamic range are required. With sensitivity to low nanograms and over 4 orders of magnitude dynamic range, the Corona CAD is ideal for trace impurity detection or the trace levels found in cleaning validation. Detection of impurities of 0.005% along with the parent compound are routinely achievable.

**Complementary and Orthogonal Data**
The Corona CAD’s unique method of detection produces data complementary to that of UV and MS. When three detectors are used to analyze the same sample, all respond based on distinctly different physicochemical properties, providing truly orthogonal data. MS only detected two of the three species. With the Corona CAD, three peaks with similar responses were observed – you not only see what you think is in your sample, but what is actually there.
Quick start-up, easy operation

Compatible and versatile
Integrates easily with any HPLC system.

Easy to read display
Brilliant, high contrast readout provides all essential information.

Simple to operate
Set gain and gas flow, and you are up and running.

Soft key operation
Robust, intuitive keypad design.

Gas flow control
Touchpad control with LED status indicator.

Programmable

Flexibility
Run from the keypad or control the Corona CAD from your PC.

Security

The Value of Support and Service
Dionex customer care continues after delivery—you get a partner, not just a detector. Dionex provides access to quality post-installation programs and assistance, including timely and professional service by locally based representatives, expert customer training, comprehensive service agreements, and validation and qualification services, as well as application support. Your success equals our success.
Discover Charged Aerosol Detection

In the world of HPLC, one detection technology stands out. Charged aerosol detection has response independent of analyte structure, provides consistent responses across a range of nonvolatile analytes, has a wide dynamic range, broad applicability, and is as easy to use as UV.

Enjoy Industry-Leading Support

Dionex customer Support Centers are located in the Americas, Europe and Asia and provide accessible locations for advanced training and enhanced application development capabilities. Users can visit these laboratories to learn new skills in addressing challenging applications, receive training and support, and discover new, innovative LC and sample preparations solutions.

Corporate Headquarters

Dionex Corporation
1228 Titan Way
P.O. Box 3603
Sunnyvale, CA 94088-3603
Tel: (408) 737-0700
Fax: (408) 730-9403

Worldwide Sales and Service

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

South America
Brazil  (55) 11 3731 5140

Europe
Austria  (43) 1 616 51 25
Belgium  (32) 3 353 42 94
Benelux  (31) 20 683 9768
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

Specifications subject to change without notice.

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

Chemstation and EZChrom are registered trademarks of Agilent Technologies.

Empower is a registered trademark of Waters Corporation.

© 2010 Dionex Corporation
LPN 2633 5M 10/10  Printed in U.S.A.