

Glycerol at low levels

The need for universal 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, ESA has developed the Corona CAD™ detector. 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 - 4 orders of magnitude (ng - µg quantities).
- Excellent Reproducibility - Typically less than 2% 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.

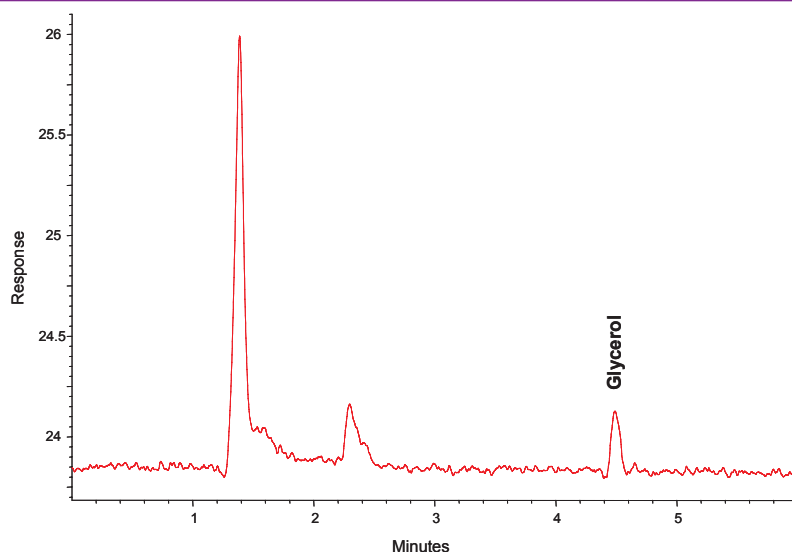


Figure 1. Glycerol ~1.26ng (on column) in mobile phase.

This application note describes the use of the Corona CAD for the measurement of glycerol. The method has excellent sensitivity (Figure 1), precision (Figure 2) and a dynamic range that covers ng to µg levels. This is an example of detection of an analyte that lacks a chromophore.

Corona parameters

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

HPLC Parameters:
Mobile Phase: 75% (v/v) acetonitrile
Flow Rate: 1.0mL/min
Column: Shodex Asahipak NH2-50 4E 4.6 x 250mm
Column Temperature: ambient
Injection Volume: 10µL

Sample preparation

Stock solution (Sigma - G5516) was diluted in water.

The Corona™ Charged Aerosol Detector

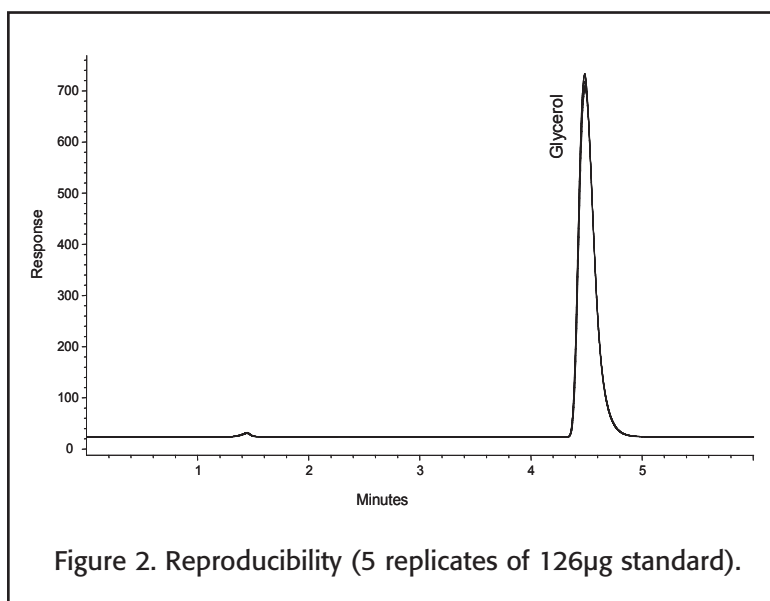


Figure 2. Reproducibility (5 replicates of 126µg standard).

Conclusions

The Corona CAD provides universal detection of non-volatile 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 this a superior detector for a wide range of HPLC analyses.

For more information about this application, the Corona CAD, or charged aerosol detection visit www.coronacad.com. We are interested in your opinions and are available to answer any questions you may have: please contact a technical representative at 978.250.7082, or if e-mail is more convenient, send your questions to coronacad@esainc.com.

Ordering information

Description

Corona

Part Number

70-6350 (100/120V)

70-6351 (230/240V)

Thermal Organizer Module

70-5499TA

Nitrogen generator

70-6003

Pump, model 582

70-4050

Autosampler, model 542

70-4152

Quaternary low pressure gradient
and degasser

70-5260

Elite software including PC

70-5073

Shodex Asahipak NH2-50 4E



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The Corona CAD is covered by multiple patents