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## Dual-wavelength LED-based UV Absorption Detector for Nano-flow Capillary Liquid Chromatography

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### Highlights

A miniaturized light-emitting diode ultraviolet absorption detector was developed.

LED wavelengths of 255 nm and 275 nm were selected as light sources.

The detector housing provided automatic alignment of optical components.

Ray tracing modeling allowed the optimization of optical component positions.

Absorbance ratios of selected analytes were obtained with a dual-detector design.

Accurate flow rate measurements could be made with the dual-detector design.

### Abstract

The design of a miniaturized LED-based UV-absorption detector was significantly improved for on-column nanoflow LC. The detector measures approximately 27 mm x 24 mm x 10 mm and weighs only 30 g. Detection limits down to the nanomolar range and linearity across 3 orders of magnitude were obtained using sodium anthraquinone-2-sulfonate as a test analyte. Using two miniaturized detectors, a dual-detector system was assembled containing 255 nm and 275 nm LEDs with only 216

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