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Sensitive Detection of Malachite Green and Crystal Violet by Nonlinear Laser Wave Mixing and Capillary Electrophoresis

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HIGHLIGHTS

- Sub-nanomolar label-free detection of malachite green and crystal violet.
- Zepto-mole mass detection limit
- Rapid separation and identification of analytes within 2 minutes.
- Uncoated capillaries shown to be superior to coated capillaries.

ABSTRACT

An ultrasensitive label-free antibody-free detection method for malachite green and crystal violet is presented using nonlinear laser wave-mixing spectroscopy and capillary zone electrophoresis. Wave-mixing spectroscopy provides a sensitive absorption-based detection method for trace analytes. This is accomplished by forming dynamic gratings within a sample cell, which diffracts light to create a coherent laser-like signal beam with high optical efficiency and

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