
Passive sampling combined with smartphone camera digital image analysis for ozone monitoring in ambient air.

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Abstract

In the present work, we have developed a portable, low-cost passive sampling-colorimetric detection method for decentralized monitorization of tropospheric ozone in ambient air. The method is based on the chemical reaction of ozone with indigotrisulfonate (ITS) dye deposited on cellulose pads, that reacts with ozone through a diffusive barrier for a given time, typically 24 h. After the sampling stage, the remaining amount of ITS was measured by digital analysis of images the pads, captured by a camera of a smartphone. Therefore, the ozone concentration was derived from the discoloration degree of the ITS dye. Detection limit and linear range are appropriate for ozone levels measurements in ambient air.

Keywords: Ozone passive sampling, colorimetry, RGB channels, digital images, smartphone

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