



Paper-based analytical device for colorimetric determination of oxalate

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Oxalate is an important biomarker for medical diagnosis of kidney stones. Here, we present an oxalate sensor using a paper-based analytical device coupled with colorimetric detection. This oxalate sensor based on the enzymatic reaction between oxalate and oxalate oxidase. Hydrogen peroxide generated from the reaction reacts with 3-methyl-2-benzothiazolinone hydrazone and 3-(dimethylamino) benzoic acid in the presence of peroxidase to yield an indamine dye. The intensity of the color is directly proportional to the concentration of oxalate in the sample. This oxalate sensor can be applied for quantitation of oxalate within 10 min with a linear range covering from 5 to 50 ppm and a detection limit of 5 ppm. The proposed sensor will hold a great promise to be a simple, fast, inexpensive, disposable, low-sample and reagent volume, reliable and portable tool for determination of oxalate, especially on-sited measurements.

Keywords: Oxalate; Paper based analytical device; Sensor; Colorimetric