Development of a Colorimetric Paper Based Sensor for the Determination of 5-Hydroxymethylfurfural

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5-Hydroxymethylfurfural (5-HMF) is a degradation product of sugars formed during the thermal processing and storage of food products, and it is an important indicator of food quality [1]. Some analytical methods for determining 5-HMF require expensive instruments and complex procedures, such as HPLC, GC-MS, or spectrophotometric techniques [2]. A microfluidic paper-based device (µPAD) developed for colorimetric determination of 5-HMF. The sensor is prepared by fixing the N-(1-naphthyl)-ethylenediamine dihydrochloride (NED·2HCl), which is preserved with PVA to increase reagent stability against light and moisture [3]. Upon contact with 5-HMF, the µPAD generates a chromogenic response, red color, which can be visually observed and correlated with the concentration of the analyte. Developed colorimetric sensor using digital colorimetry aims to provide a rapid, low-cost, and portable sensor with application in different sample matrixes, with potential applications in food quality control [4]. These features tell the potential of µPADs to serve as practical and sustainable platforms for chemical analysis of unspecialized personnel [4].

Keywords: 5-Hydroxymethylfurfural (5-HMF), N-(1-naphthyl)-ethylenediamine dihydrochloride (NED·2HCl), Microfluidic device (µPADs), Colorimetric sensor.

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