(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :31/12/2024

(21) Application No.202411105101 A

(43) Publication Date : 10/01/2025

(54) Title of the invention : PAPER-BASED MICROFLUIDIC DEVICES FOR VITAMIN B1 QUANTIFICATION AND RELATED METHODS

(51) International classification :B01L0003000000, G01N0021780000, G01N0031220000, A61K0008670000, G01N0021770000

(86) International Application No :NA
Filing Date :NA

(87) International Publication No : NA

(61) Patent of Addition to Application Number :NA
Filing Date :NA

(62) Divisional to Application Number :NA
Filing Date :NA

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(57) Abstract :
A paper-based microfluidic device (μPAD) has been developed for the quantification of vitamin B1. The device utilizes a paper substrate with hydrophobic and hydrophilic zones, optimized to create channels for reagent interaction. The hydrophobic zones are formed using molten beeswax. A colorimetric assay involving thiamine B1 and phenol red is employed, producing a yellow color with intensity proportional to vitamin B1 concentration. The assay demonstrates high repeatability and sensitivity, with a limit of detection of 8.065 ppm and a limit of quantification of 24.438 ppm. The μPAD is portable, economical, and easy to use, requiring minimal solvents and no specialized training. It is categorized as a Lab-on-Chip instrument suitable for point-of-care chemical analysis. Reference Fig 1

No. of Pages : 15 No. of Claims : 10