



An economical test kit for determination of orthophosphate in wastewater

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The determination of orthophosphate in wastewater by low-cost paper-based test kit coupled with ascorbic acid colorimetric method was developed in this study by simple smartphone application utilisation. A series of standard orthophosphate solutions at various concentrations was quantified by spectrometry at 880 nm. The color intensities of standards were recorded with color capture application on IOS smartphone for red (R), green (G) and blue (B) measurement. The set of orthophosphate standard color charts was produced as benchmarking paper-based test kit for fieldwork analysis. This environment friendly paper-based test kit reduces chemical consumption resultantly. Several parameters that effect the color intensity patterns of orthophosphate determination in wastewater analysis were also identified. The determined linear range concentration was 0.50-3.00 mg L⁻¹ (r²= 0.986). In addition to be an easy and rapid method, this paper-based test kit reduces chemicals uses and decreases cost of analysis. Either standard color photos stored in smartphone or printed standard charts can be conveniently used on fieldwork analysis.

Keywords: Colorimetry; test kit; mobile phone; orthophosphate; ascorbic acid