

**VALIDATION OF UV-VISIBLE SPECTROPHOTOMETRIC  
METHOD FOR ESTIMATION OF PHOSPHOROUS CONTENT IN  
PALMYRAH JAGGERY**

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## ABSTRACT

UV-Visible spectrophotometry is a widely using optical quantification method of concentration of solutes in a wide range of solutions. However, method validation is important in order to achieve accurate, precise and reproducible results. Therefore, the UV-Visible spectrophotometric method was validated according to international committee of harmonization (ICH) standard during the study and Phosphorous content in Palmyrah jaggery in the form of Phosphate was estimated. Absorption maximum ( $\lambda_{max}$ ) of the Phosphate in the Palmyrah jaggery was found to be 400 nm by scanning sample solution into the range of 300-500 nm. The standard curve was constructed for the Potassium dihydrogen phosphate in the range of 1-10 $\mu\text{gml}^{-1}$  at 400 nm wavelength. The method was validated in terms of linearity, accuracy, range, precision, and ruggedness, limit of detection and limit of quantification. The method was shown linear in 1-7  $\mu\text{gml}^{-1}$  concentration range having line equation  $84.824x - 0.0016$  with 0.9998 correlation coefficient ( $r^2$ ). The recovery values were in the range of 100.22% to 100.88% and confirmed the accuracy. The percentage relative standard deviation (RSD %) of precision was in the range of 0.55–1.55% and confirmed the reliability and repeatability. The RSD% of ruggedness was in the range of 0.8964 – 0.9920%. The limit of detection and limit of quantification were 0.05115  $\mu\text{gml}^{-1}$  and 0.1534  $\mu\text{gml}^{-1}$  respectively and the low-value levels showed a better the sensitivity. Hence, the proposed method was precise, accurate and reproducible. This method could be applicable for quantitative determination of the Phosphorous in the form of Phosphate in Palmyrah jaggery.

*Keywords:* Palmyrah jaggery, Method validation, Spectrophotometer