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## HPTLC determination of some water soluble vitamins present in pharmaceuticals

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A high-performance thin-layer chromatographic method (HPTLC) for the simultaneous determination of vitamin B1, B6 and B12 in a ternary mixture has been developed. The method developed was based on HPTLC separation of the three vitamins followed by densitometric measurements of spots at 255, 219 and 361 nm for vitamin B1, B2 and B3, respectively. Separation was carried out on Merck HPTLC silica-gel 60 F<sub>254</sub> plates, using methanol:ammonium acetate (5 M) (10:1; v/v) combination as the mobile phase. Validation of the method was performed based on the ICH ( International Conference on Harmonization) guidelines in terms of linearity, accuracy, precision, limit of detection, limit of quantification, and robustness. Second-order polynomial equations were obtained for the regression line in the ranges of 250–2050 ng/spot for B1 and B6 and 50–1050 ng/spot for B12. Correlation coefficient (r) values were 0.9998, 0.9997 and 0.9999 for vitamin B1, B2 and B6, respectively. The method provides sufficient accuracy as indicated by recovery percentages given for the three vitamins. For system precision study, the low coefficient of variation values (<2%) for both vitamins B1, B2 and B3 ensured reproducible performance of the instrument. In the method precision study, coefficients of variation <2% were obtained, which showed that the proposed method provides acceptable intraday and interday variation. The detection and quantification limits were 7.078 and 21.449 ng/spot for vitamin B1, 4.081 and 12.366 ng/spot for vitamin B6 and 5.1991 and 15.755 ng/spot for vitamin B12. Parameters such as mobile-phase composition, volume of mobile phase, time from spotting to development, and time from development to scanning were used while testing for robustness of the method and the standard deviation of peak areas was calculated for each parameter. The low coefficient of variation values shows the robustness of the method. Statistical treatment did not show any significant effect of one parameter over the others on the robustness of the method.

**Keywords:** Densitometric detection, HPTLC, Vitamin B1, B6 and B12 combinations, Simultaneous determination.

### Biography

Girum Habte completed his Masters of Science degree in Addis Ababa University, School of Pharmacy, Ethiopia. He is a Ph.D. student/Research Associate in Chosun University, Food and Nutrition Department, South Korea. He worked in the Ethiopian Food, Medicine and Health Care Administration and Control Authority as a Senior Quality Control Analyst for about three and half years. He published one paper in a reputed journal.

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