Spectrofluorimetric Determination of Some Water-Soluble Vitamins

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Abstract:

Two simple and sensitive spectrofluorimetric methods were developed for determination of three water-soluble vitamins (B1, B2, and B6) in mixtures in the presence of cyanocobalamin. The first one was for thiamine determination, which depends on the oxidation of thiamine HCl to thiochrome by iodine in an alkaline medium. The method was applied accurately to determine thiamine in binary, ternary, and quaternary mixtures with pyridoxine HCl, riboflavin, and cyanocobalamin without interference. In the second method, riboflavin and pyridoxine HCl were determined fluorimetrically in acetate buffer, pH 6. The three water-soluble vitamins (B1, B2, and B6) were determined spectrofluorimetrically in binary, ternary, and quaternary mixtures in the presence of cyanocobalamin. All variables were studied in order to optimize the reaction conditions. Linear relationship was obeyed for all studied vitamins by the proposed methods at their corresponding λexc or λem. The linear calibration curves were obtained from 10 to 500 ng/mL; the correlation ranged from 0.9991 to 0.9999. The suggested procedures were applied to the analysis of the investigated vitamins in their laboratory-prepared mixtures and pharmaceutical dosage forms from different manufacturers. The RSD range was 0.46-1.02%, which indicates good precision. No interference was observed from common pharmaceutical additives. Good recoveries (97.6 ± 0.7 – 101.2 ± 0.8%) were obtained. Statistical comparison of the results with reported methods shows excellent agreement and indicates no significant difference in accuracy and precision.

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