Implementation of Two Chromatographic Methods for Simultaneous Quantitation of Thiocytic Acid, Benfotiamine and Cyanocobalamin

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Abstract

Two accurate and sensitive chromatographic methods have been introduced and validated for the simultaneous determination of thiocytic acid, benfotiamine and cyanocobalamin in bulk powders and in their pharmaceutical formulation. Method A is reversed-phase ultra performance liquid chromatographic method with an isocratic elution, where a rapid separation was accomplished on a Zorbax C8 column using a mobile phase of acetonitrile:0.05 M phosphate buffer (pH 6 adjusted by o-phosphoric acid) (23:77, v/v). The retention times (tR) were 0.578, 0.852 and 1.376 for cyanocobalamin, benfotiamine and thiocytic acid, respectively. The separated peaks were revealed at 210.0 nm. Method B is a thin-layer densitometric method where the separation of the studied drugs was carried out on silica gel plates using methanol–chloroform–heptane-1-sulphonic acid sodium salt (0.4%) (7:3:0.1, by volume) as a mobile phase, and scanning of the separated bands was done at 240.0 nm. The retardation factor (Rf) values were 0.17, 0.48 and 0.75 for cyanocobalamin, benfotiamine and thiocytic acid, respectively. Validation of the methods was achieved following ICH guidelines and the applied methods succeeded to determine the cited drugs in their pure forms and capsules. Results were statistically compared to the manufacturer’s method where no significant difference was observed.

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