

Spectrophotometric resolution and quantification of ternary co-formulated mixture of thioctic acid, benfotiamine and cyanocobalamin

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Abstract

Four spectrophotometric methods were developed and validated for spectral resolution and determination of thioctic acid (THC), benfotiamine (BEN) and cyanocobalamin (CNCo) in their pure form, laboratory prepared mixtures and capsules. Method A, a first derivative method for determination of CNCo, by recording the peak amplitude at 564.0 nm. Method B, is a Ratio difference spectrophotometric one which is applied for determination of THC and BEN, where CNCo has no interference. Method C applied first derivative of ratio spectra where THC and BEN were determined by recording the peak amplitude at 330.8 and 286.8 nm, in order. Method D a Ratio subtraction method that was successfully determines BEN at its λ_{\max} without interference of the other co-formulated drugs. Validation according to ICH guidelines was performed. The linearity ranges were 200.00–1800.00, 2.00–30.00 and 10.00–200.00 $\mu\text{g/mL}$ for THC, BEN and CNCo, in a respective order. The methods were found to be accurate, precise and specific.

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