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Derivative spectroscopy: Development and validation of new spectroscopic method for the estimation of metadoxine in bulk and solid dosage form

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ABSTRACT

A simple and sensitive spectroscopic method in ultraviolet region was developed and validated for the estimation of Metadoxine in pure and pharmaceutical dosage forms by derivative spectroscopy. The method is based on Metadoxine, showing absorbance at 292, 302, 270 and 314 nm for zero order, first order, second order and third order derivative spectroscopy respectively in distilled water. But regression values with best results were found to be best for third order derivative spectroscopy. The method obeys Beers law in the concentration range of 4 to 40µg/ml. The proposed method is precise, accurate, linear, stable and reproducible and can be extended to the analysis of Metadoxine in bulk and tablet formulations.

Key words: Derivative spectroscopy, Metadoxine, UV spectroscopic, U.V estimation.

INTRODUCTION

Chemically Metadoxine (MDL) is pyridoxol L-2-pyrolidone-5-carboxylate an ion pair that combines pyridoxine and pyrrolidone carboxylate[1]. Metadoxine exerts several actions that are beneficial to patients with alcoholic liver diseases[2]. It increases the clearance of alcohol and acetaldehyde and decreases the damaging effect of free radicals, restores ATP and glutathione levels, reduces steatosis and liver fibrosis[3]. Metadoxine has been estimated by HPLC[4] and HPTLC method[5]. Metadoxine is a drug mainly used in liver disorder and alcoholic liver diseases. Metadoxine addresses the multiple causes and mechanisms involved in the Liver disorder and improves Alcohol metabolism and accelerates the elimination of alcohol from the blood. Metadoxine reduces the toxic effects of alcohol. In hepatic stellate cells, Metadoxine prevents the collagen synthesis & reduces fibrosis and acts as an Antifibrotic agent and is a synthetic antioxidant, provides stronger antioxidant protection[6]. The vast potential of Metadoxine in the treatment of alcoholic liver disorders and even an increasing demand for simple and sensitive method for routine analysis has led to the need for development of simple, accurate, economical and reproducible spectroscopic method for the estimation of Metadoxine in bulk and in Pharmaceutical formulation.

MATERIAL AND METHODS

Instrument

Shimadzu UV 1601 double beam spectrophotometer connected to a computer loaded with Shimadzu UVPC software was used for all the