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METHOD DEVELPOMENT OF NIACIN IN BULK AND DOSAGE FORM BY UV-VISIBLE SPECTROPHOTOMETER

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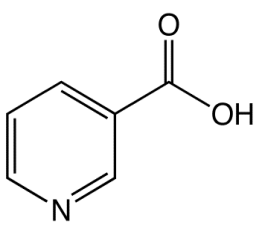
ABSTRACT

A simple and specific UV spectroscopic method has been developed using methanol and double distilled water as solvent to estimate niacin content in pharmaceutical dosage formulation. The λ_{max} of niacin 260 nm.The linearity in the concentration range of 2µg/ml-10µg/ml was exhibiting good correlation coefficient(R^2=0.9976). the results of the study proved the applicability of the present method in routine analysis of niacin in pharmaceutical dosage form. Niacin inhibits directly and noncompetitively inhibits hepatocytediacylglycerol acyltransferase-2. The inhibition of TG synthesis by niacin results in accelerated intracellular hepatic apo B degradation and the decreased secretion of VLDL and LDL particles

KEYWORDS: UV spectroscopy, Niacin, Methanol.

INTRODUCTION

Niacin is also known as vitamin B_3 or vitamin PP, and it is water soluble vitamin which is essential nutrient to our body and which converts to food to energy. Niacin exists in two forms they are nicotinic acid and nicotinamide which are the derivatives of tryptophan. deficiency of niacin in low quantity can slow metabolism and causes headache but severdeficiency causes the disease pellagra, Characterized by diarrhea. Niacinis highly stable. For the determination of niacin in pharmaceutical dosage the present study efforts were made in developing a simple, specific, economic UV spectroscopic method using methanol as solvent. Niacin inhibits a hormone sensitive lipase in adipose tissue which reduces the breakdown of triglycerides to free fatty acids and to transport the free fatty acids to liver.Niacin helps in lower cholesterol, ease arthritis, and boost brain function. The amide derivatives nicotinamide is component of the coenzymes nicotinamide adenine dinucleotide(NAD) and nicotinamide adenine dinucleotide phosphate (NADP+). Although niacin and nicotinamide are identical in their vitamin activity, nicotinamide does not have the same pharmacological, lipid-modifying effects or side effects as niacin, i.e., when niacin takes on the amide group, it does not reduce cholesterol nor cause flushing.



Structure of Niacin

Fig 1: chemical structure of Niacin hydro -2H-pyran-2yl)ethyl}-3,7-dimethyl-1,2,3,7,8,8a-hexa hydro naphthalene-1-yl2,2-dimethyl butanoate
Molecular formula: $C_6H_5NO_2$
Molecular weight: 123.1094g/mol

MATERIALS AND METHODS

Chemicals**:** Standard niacin, methanol, distilled water, Niacin tablet (10mg). PLUSE PHARMA[Johnson-Johnson]

Instruments: ELICO SL 210 double beam UV-Visible spectrometer, quart cuvettes, ultrasonic water bath, analytical weighing balance were used.

Method Development

Solubility: water, methanol, ethanol, acetonitrile.

Preparation of standard stock solution

Weigh accurately 10mg of Niacin (API) and dissolve in 10 ml of diluent that is 5ml of methanol and 5 ml of double distilled water which is referred as solution [A] with the concentration of 1000 ppm.

Working standard solution preparation

From standard stock solution or from solution A pipette out 1ml in 10 ml volumetric flask and make up 5ml of methanol and 5ml of double distilled water which is referred as solution [B] with the concentration of 100ppm.

Determination of wavelength of maximum absorption**:**

10µg/ml standard solution was prepared by using the diluent and scanned under the UV spectroscopy within the range 200-400 using the diluent as blank. The absorption maxima were found at 260nm (figure:1).

Preparation of calibration curve
The stock solution of niacin was diluted to obtain concentration in range of 2-10µg/ml. The absorbances wereobserved against diluent as blank and the calibration curve was plotted between concentration (x-axis) and absorbance (y-axis).

Assay of tablet dosage form:
Weigh 10 tablets and calculate the average weight of 1 tabletpowder the tablets and calculate the equivalent weight from label claim weight and transfer it into 10 ml volumetric flask make up with diluent (methanol and water)Measure the absorbance at 260nm.From the calibration of standard find out the concentration of niacin in sample.

RESULTS AND DISCUSSIONS

The λ_{max} of niacin in methanol was found to be 262 nm. Niacin was found to be linear within the concentration range2-10µg/ml and exhibited correlation coefficient of 0.9976(fig. 2).

Table 1: Absorbance values of niacin in serial dilutions.

Concentration	Absorbance
2	0.0383
4	0.0637
6	0.1001
8	0.1323
10	0.1654

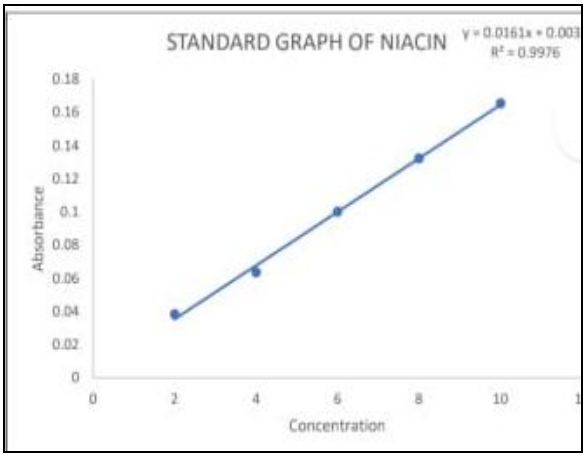


Fig. 2: Calibration of niacin.

In table1 indicates the serial dilutions of 2ppm, 4ppm, 6ppm, 8ppm and 10ppm with respective absorbance values which are in linear. There is more difference in sample absorbance value compare to that of standard value.

CONCLUSION

The method which is proposed in the above study was found to be simple and economic. Determination of niacin in formulations were good agreement with their respective label claims without any interferences of excipients or additives. the percentage recovery of assayed concentrations showed an average 98.7 %. The assay of niacin is of continued importance of for industrial, quality control and clinical environments.

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