

Development and Validation of Dimenhydrinate Analysis Method in Tablet with Absorbance Method and Method of Area under Curve with Ultraviolet Spectrophotometry

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Abstract: Methods of ultraviolet spectrophotometry have been developed and validated for the analysis of dimenhydrinate in tablets with absorbance methods and methods of areas under the curve. This method uses 0.1 M HCl as a solvent and wavelength of 276.20 nm. The area under the curve is measured at a wavelength of 245.60-304.60 nm. The calibration curve was obtained in the concentration range of 10-30 µg / mL. Method of absorbance shows linear regression equation $y = 0,105 + 0,019x$ and value $r = 0.99983$; wide-area-under-curve method shows linear regression equation $y = 2.248 + 0.472x$ and $r = 0.9985$. Dimenhydrinate content in trademark tablets with absorbance method was 105.09% and with the method of area under the curve was 104.56%. Dimenhydrinate content in generic tablet with absorbance method is 93.86% and with method of area under the curve is 94.34%. Dimenhydrinate levels in both samples were eligible according to Pharmacopoeia edition V of 90-110%. The recovery and the relative standard deviation (RSD) obtained from both samples by absorbance method and the area-under-curve method met the requirements of the validation parameters, i.e. 80-120% and 0-2%, respectively. Statistical analysis showed that there was no significant difference between the two methods.

Keywords: Dimenhydrinate, absorbance method, area under curve method, ultraviolet spectrophotometry.

INTRODUCTION

Dimenhydrinate is used as anti-motion sickness drugs [1]. Dimenhydrinate has molecular formula $C_{17}H_{21}NO.C_7H_7ClN_4O_2$ and molecular weight 469.96 g/mol. Chemically, dimenhydrinate is 8-chloroteophylline, compound with 2-

(diphenylmethoxy)-N,N-dimethyl ethylamine (1:1) [523-87-5] as presented in Figure 1. The chemical properties for dimenhydrinate are white crystal powder, no smell, difficult to dissolve in water, easily soluble in ethanol and in chloroform, rather difficult to dissolve in ether [2].

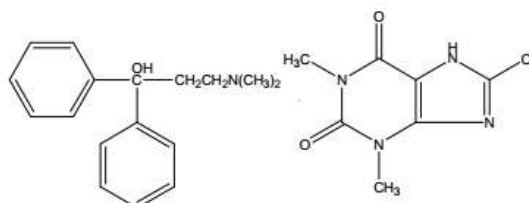


Fig-1: Chemical structure of dimenhydrinate

Determination of dimenhydrinate content as raw material can be done by water-free titration method using potentiometer as indicator. Dimenhydrinate in tablets can be determined with high performance liquid chromatography [2]. A convenient spectrophotometric method was developed for the determination of dimenhydrinate in bulk drug and dosage forms and in

1:1 combinations with aspirin, acetaminophen, meprobamate, phenylephrine, and tolbutamide. The method consisted of reacting dimenhydrinate with Reinecke salt in an acidic medium at $27 \pm 2^\circ$. The purple precipitate was filtered and dissolved in acetone, and the maximum colour absorption attained in 15 min was measured at 540 nm [3].

Two chromatographic methods have been established and validated for simultaneous determination of mixture of Dimenhydrinate (DMH) and Cinnarizine (CIN) in their pharmaceutical formulation and in presence of Cinnarizine impurity (1-(Diphenylmethyl) piperazine); CIN impurity. The first method was TLC-densitometry one, depends on separation and quantitation of DMH, CIN and CIN impurity on TLC silica gel 60 F₂₅₄ plates, using chloroform:methanol:glacial acetic acid: ammonia solution (9.5:0.5:0.1:0.1, by volume) as a developing system followed by densitometry measurement at 235 nm. The second method was RP-HPLC, separation on C8 column using 0.05 M KH₂PO₄ (pH = 3): methanol (35:65, v/v) as the mobile phase at a flow rate of 1 mL/min and DAD detection at 240 nm [4].

Among the various methods used in the determination of drug levels, UV-Vis spectrophotometry is still very popular. In our previous research we have developed several analytical methods using the absorption method and the area measurement method under the curve with ultraviolet-visible spectrophotometry [5-11]. In this research, the best solvent search for dimenhydrinate analysis was done, and then developed method for determination of dimenhydrinate concentration by UV-Vis spectrophotometry. The method developed is the method of absorbance and method of area under the curve.

MATERIALS AND METHODS

Tools and materials

The tools used in this research are: UV-Vis Spectrophotometer (Shimadzu UV-1800), Analytical Scales (Precisa), Sonicator (Branson), Micro Pipettes (Iwaki), Funnel, Measuring Glass (Iwaki), Measuring Pipettes (Iwaki), dropper, spatula, pumpkin measure (Iwaki), filter paper (Whatman No. 41), mortar, pestle.

Materials used in this research are dimenhydrinate raw materials (PT Phapros Tbk), Antimo (PT Phapros Tbk), Dramamine (PT Taisho Pharmaceutical Indonesia Tbk), citric acid (Merck), sodium hydroxide (Merck), hydrochloric acid (Merck).

Procedure

Preparation of Solvents

Preparation of 0.1 M HCl

The preparation of 0.1 M HCl solvent was performed by diluting 8.5 ml of concentrated hydrochloric acid with distilled water up to 1000 mL. A total of 100 mL of this solution, fed into a 1000 mL quantity flask, added sufficient carbon dioxide-free distilled water to the limit and homogenized

Preparation of 0.1 M NaOH

Preparation of NaOH 1 M was done by carefully weighing 4.0 grams of sodium hydroxide, then put into a 100 mL measuring flask, then adding distilled

water to 100 mL. Then diluted to 0.1 M NaOH solution by plucking 50 ml of 1 M NaOH solution, then put into a 500 mL measuring flask, then added and treated with distilled water up to 500 mL.

Preparation of 0.1 M citric acid solution

The preparation of 0.1 M citric acid solvent was carried out by dissolving 19.21 grams of citric acid in carbon dioxide-free water, put in a 1000 mL quantity flask. Shake until dissolved, then sufficient until the mark boundary with distilled water.

Preparation of standard solution of dimenhydrinate 1000 ppm

Standard solution of dimenhydrinate 1000 ppm in 0.1 M NaOH

The standard solution of pure dimenhydrinate with a concentration of 1000 ppm was prepared by carefully weighing 100 mg of pure dimenhydrinate using an analytical scale, inserted into a 100 mL measuring flask, then partially added 0.1 M NaOH, then sonication, after which it was supplied with 0.1 M NaOH until the boundary mark

Standard solution of dimenhydrinate 1000 ppm in 0.1 M HCl

The standard solution of pure dimenhydrinate with a concentration of 1000 ppm was prepared by carefully weighing 100 mg of pure dimenhydrinate using an analytical scale, inserted into a 100 mL measuring flask, then partially added 0.1 M HCl, then sonication and subsequently added 0.1 M HCl until boundary mark.

Standard solution of dimenhydrinate 1000 ppm in 0.1 M citric acid

The standard solution of pure dimenhydrinate with a concentration of 1000 ppm was prepared by carefully weighing 100 mg of pure dimenhydrinate using an analytical scale, inserted into a 100 mL measuring flask, then partially added 0.1 M citric acid, then sonication after it was supplied with citric acid 0.1 M to the limit.

Determination of maximum absorption wavelength dimenhydrinate

Each standard solution of dimenhydrinate 1000 ppm with three kinds of solvent (0.1 M NaOH, 0.1 M HCl and 0.1 M citrate acid) was diluted to 100 ppm by taking with as much as 10 mL of the solution, feeding it into the flask measure 100 mL, and then dilute it with each solvent until the boundary marks, then homogenize. Each 100 ppm dimenhydrinate standard solution was pipetted with 1 mL micropipette, inserted into a 10 mL measuring flask and then treated with each solvent until the boundary mark, after which it was homogenized to obtain a concentration of 10 ppm. The spectra were measured at a wavelength range of 200-400 nm (UV) and 400-800 (Visible) with UV-Vis spectrophotometry. The measurement results will show

the maximum absorption wavelength of each dimenhydrinate solution.

Preparation of the dimenhydrinate calibration curve

The standard solution of dimenhydrinate 1000 ppm in 0.1 M HCl was diluted to 100 ppm with 0.1 M HCl, and then pipetted as much as 1.0 mL, 1.5 mL, 2.0 mL and 2.5 mL and 3.0 mL. Each solution was put into a 10 mL measuring flask, 0.1 M HCl added to the limit mark, obtained concentrations of 10 ppm, 15 ppm, 20 ppm, 25 ppm and 30 ppm. The absorbent and area under the curve of each solution are measured at maximum absorption wavelength of dimenhydrinate.

Determination of dimenhydrinate content in tablets

Determination of dimenhydrinate content in tablets was performed using 20 tablets of Antimo 50 mg and 20 tablets of Dramamine 50 mg. The samples were crushed until smooth and weighed. The sample was weighed equivalent to 100 mg of pure dimenhydrinate, dissolved with some of the best solvent in 100 mL measuring flask. The solution was vibrated by sonication for several minutes until dissolved and filtered using filter paper. Then the solution is added with the best solvent to the boundary mark, so that the concentration of 1000 ppm will be obtained.

The sample solution with a concentration of 1000 ppm was taken with a 10 mL pipette, put into a 100 mL measuring flask, diluted with 0.1 M HCl until the boundary marks, to obtain a solution of the sample with a concentration of 100 ppm. The solution was taken again with a pipette of 1 mL, and then put into a 10 mL measuring flask, added with 0.1 M HCl until the boundary marker, homogenized to obtain a concentration of 10 ppm. The absorbent and area under the curve were measured with a UV-Vis spectrophotometer at maximum dimenhydrinate wavelength. Dimenhydrinate levels were determined based on the calibration curve of the standard solution of dimenhydrinate

Method of area under the curve

This method involves calculating the integrated value of absorbance against the wavelength between the two selected wavelengths. The calculation of the area is determined by calculating the area boundary with curve and horizontal axis. The horizontal axis is chosen by entering the wavelength range where the area must be calculated. The selected wavelength range on the basis of repeated observation is to obtain the linearity between the area under the curve and the concentration.

Validation of analytical methods

Linearity Test

This study used a series of dimenhydrinate raw solutions of different concentrations between 50% - 150% of the analyte content in the sample. As a parameter showing the linear relationship used

correlation coefficient r in linear regression analysis $y = a + bx$. The ideal linear relationship is achieved if the values $a = 0$ and $r = +1$ or -1 depend on the direction of the line. The value of b shows the sensitivity of the analysis, especially the instruments used. Other parameters that must be calculated are residual standard deviation [12].

Detection Limits and Quantification Limits

The detection limit (LOD) and the quantification limit (LOQ) determined the regression of the standard curve obtained. The value of $LOD = 3.3 (S_{yx}/S)$ and $LOQ = 10 (S_{yx}/S)$. S_{yx} is the standard deviation of response determined based on residual deviation standard (residual standard deviation). S is the value of the slope of the line or linear regression $y = a + bx$ [12].

Test accuracy

The preparation of the sample solution for accuracy was made by weighing a sample equivalent to 100 mg of pure powder, put into a 100 mL measuring flask, then weighing 80%, 100% and 120% pure dimenhydrinate of the sample mean weight, inserted into a measuring flask and dissolved with 0.1 N HCl to the limit marker, sonication for approximately 15 minutes, and the solution was filtered using Whatmann no 41 paper. From this solution, 5.5 mL, 5 mL and 4.5 mL of solution taken, then put into a 10 mL measuring flask, diluted with 0.1 N HCl to the limit mark, shake until homogeneous. Thereafter, pipetted as much as 1 mL into a 10 mL measuring flask and added 0.1 N HCl solvent to a limit marker and a homogeneous shake. Thereafter, the solution was pierced 1 mL, put into a 10 mL measuring flask, 0.1 N HCl solvent added to the limit mark and shake until homogeneous. Measure the absorbance and area under the curve at maximum wavelength with UV-Vis spectrophotometry [12].

Precision test

The precision test is performed at the repeatability level by measuring the standard dimenhydrinate solution with repeatability 3 times each. Precision testing was performed by measuring standard dimenhydrinate solution concentrations at 14 $\mu\text{g} / \text{mL}$, 16 $\mu\text{g} / \text{mL}$ and 18 $\mu\text{g} / \text{mL}$. Measurements of dimenhydrinate levels were performed at 3 different times of the day (intraday) with repetitions of each 3 times as well as measurement of standard dimenhydrinate solutions of the same concentration. The dimenhydrinate concentration was performed on 3 consecutive days (interday) with repetition of each 3 times [12].

Data analysis

Determination of dimenhydrinate levels

Dimenhydrinate levels in tablets are determined by linear regression equation $y = a + bx$.

$$a = \frac{\sum y - b \sum x}{n}$$

$$b = \frac{n \sum xy - \sum x \cdot \sum y}{n \sum x^2 - (\sum x)^2}$$

Information:

- y = absorbance / area under the curve
- x = concentration (µg / mL)
- a = intercept / intersection on the Y axis
- b = slope

a) Linearity

Linearity is determined by the value of the correlation coefficient (r) of the regression equation $y = a + bx$.

$$r = \frac{\sum x_i y_i - \sum x_i \sum y_i / n}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}}$$

This regression equation can be used if the correlation coefficient ranges from $0.99 \leq r \leq 1$ [13].

Limit of detection (LOD) and limit of quantitation (LOQ)

The detection of limit (LOD) and the limit of quantitation (LOQ) can be determined by the following formula [13]:

$$LOD = \frac{3 S_y/x}{b}$$

$$LOQ = \frac{10 S_y/x}{b}$$

Accuracy

Accuracy is measured as the number of recovered analyte (R).

$$R = \frac{C1 - C2}{C3} \times 100 \%$$

Information:

- C1 = concentration of sample + standard
- C2 = actual sample concentration
- C3 = standard concentration added

Validation method is eligible if recovery is in the range 80-120% [13].

Precision

Precision is expressed by percentage of relative raw deviation (% RSD) or per cent coefficient of variation. Per cent of RSD is stated to meet the validation method if the RSD value ranges from 1-2% [13].

Statistical analysis of research data

The statistical test was performed with SPSS 20.00. Normality test is done to find out the statistical test that will be used. If the data is normally distributed and homogeneous then the parametric test used is paired t-test, if the data obtained are not normally distributed and not homogeneous, then the statistical test is followed by nonparametric test.

RESULTS AND DISCUSSION

The best solvent

Figure-1 shows a dimenhydrinate absorption spectrum (at a concentration of 10 µg / mL) in 0.1 M HCl as a solvent with a maximum absorption wavelength of 276.20 nm and an absorbance of 0.299.

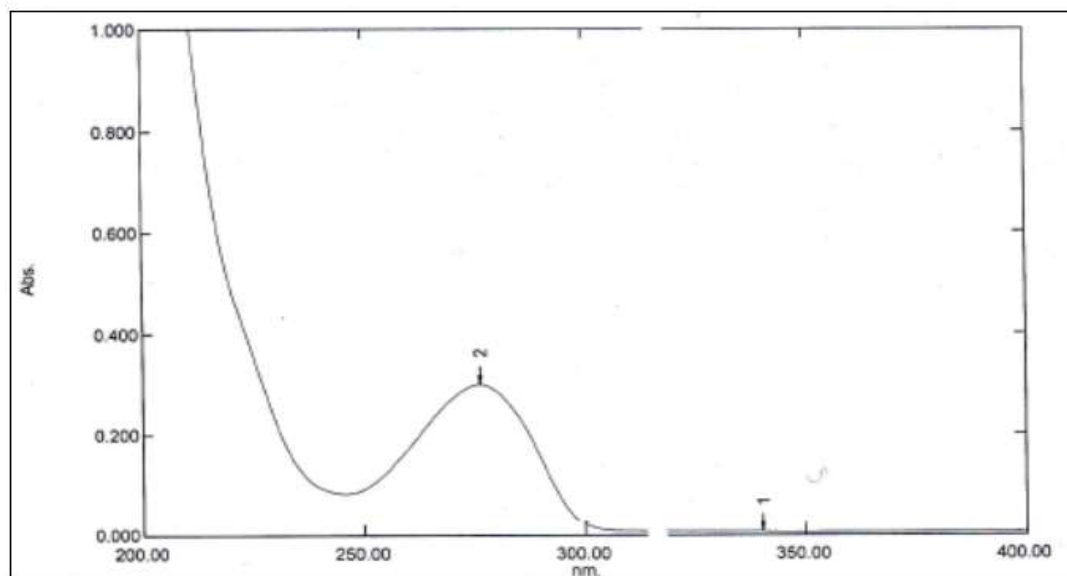


Fig-1: The absorption spectrum of the dimenhydrinate solution at a concentration of 10 µg / mL in 0.1 M HCl as a solvent

Figure 2 shows a dimenhydrinate absorption spectrum (concentration of 10 $\mu\text{g} / \text{mL}$) in 0.1 M NaOH

as a solvent with a maximum absorption wavelength of 278.40 nm and an absorbance of 0.243.

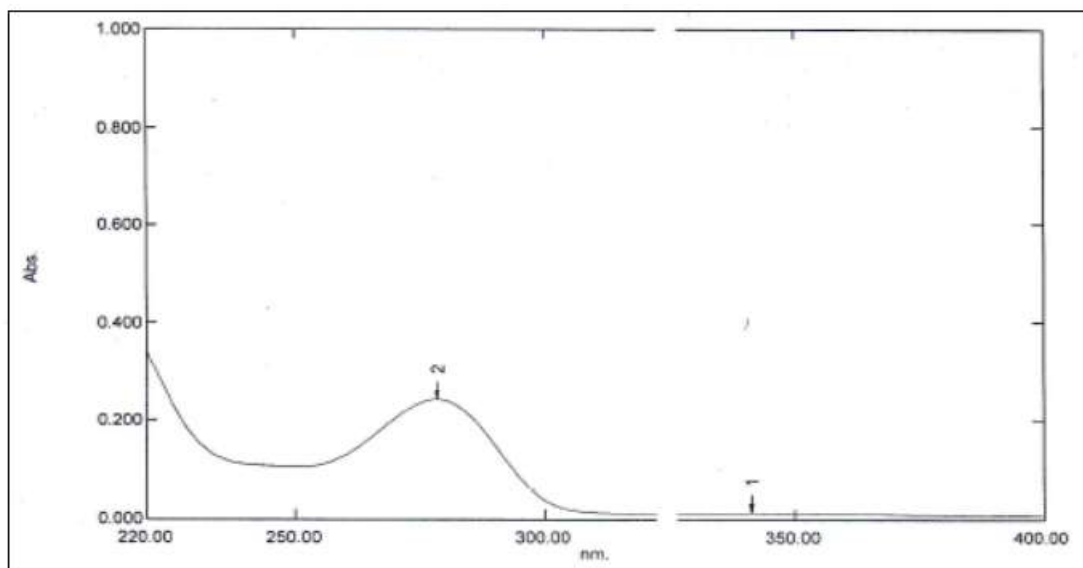


Fig-2: The absorption spectrum of a dimenhydrinate solution at a concentration of 10 $\mu\text{g} / \text{mL}$ in 0.1 M NaOH as a solvent

Figure-3 shows a dimenhydrinate absorption spectrum (10 $\mu\text{g} / \text{mL}$ concentration) in 0.1 M citric acid

acid as a solvent with a maximum absorption wavelength of 276.40 nm and an absorbance of 0.293.

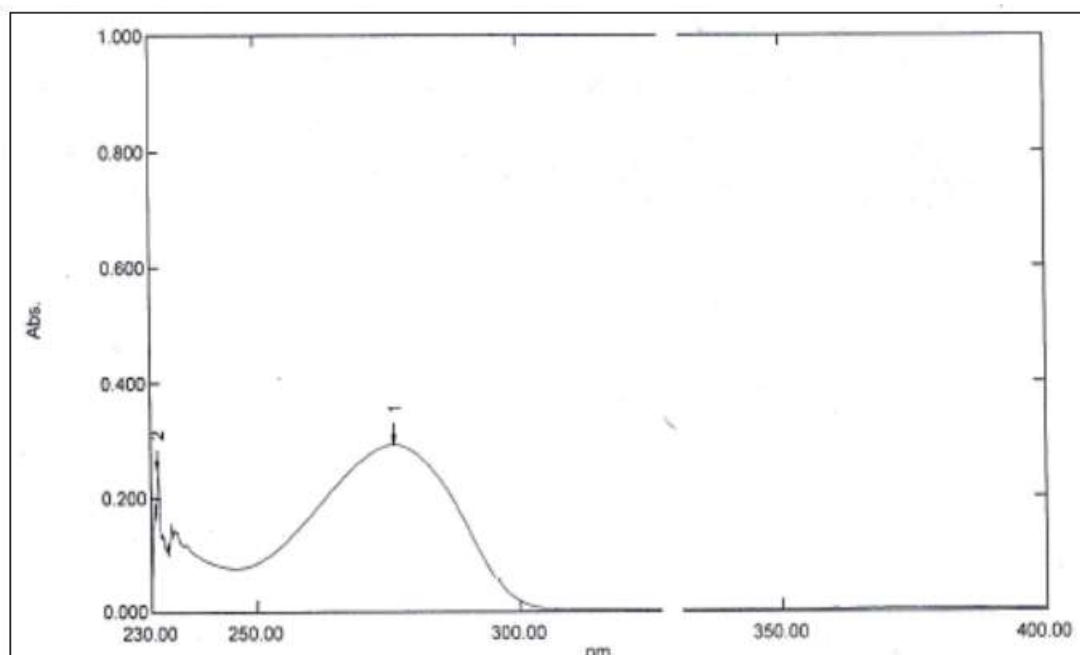


Fig-3: The absorption spectrum of a dimenhydrinate solution at a concentration of 10 $\mu\text{g} / \text{mL}$ in 0.1 M citric acid as a solvent

Determination of solvent used in this research is done by testing some solvent. The solvent tested was 0.1 M HCl, 0.1 M NaOH, and 0.1 M citrate acid. The best solvent determination of some of the solvents was seen from the maximum wavelength results according to the Pharmacopoeia Indonesia edition V of 276 nm, absorbance, the shape of the spectrum and not toxic.

Determination of maximum absorption wavelength (λ_{max}) with 0.1 M HCl as solvent shows λ_{max} at 276.20 nm with absorbance 0.299. Determination of λ_{max} with 0.1 M NaOH as solvent shows λ_{max} 278.40 nm with absorbance 0.243. Determination of λ_{max} with 0.1 M citric acid as solvent shows λ_{max} 276.40 nm with absorbance 0.293. Based on the wavelength and

absorbance obtained, the 0.1 M HCl is chosen as the best solvent because the maximum wavelength corresponds to the Pharmacopeia Indonesia Edition V of 276.20 nm. In addition, the absorbance obtained with 0.1 M HCl has a range of 0.2-0.8, i.e. 0.299 and has a good form of spectrum that is like a bell.

The calibration curve

Preparation of the calibration curve of standard solution of dimenhydrinate was done by making series of standard solution with concentration 10, 15, 20, 25, 30 µg / mL using 0.1 M HCl as solvent. The solution

was measured absorbance and area under the curve at λ_{max} dimenhydrinate i.e. 276.20 nm with ultraviolet spectrophotometer. The absorbance measurement of the solution shows the absorbance of 0.299, 0.392, 0.493, 0.582 and 0.685, respectively, so that the linear regression equation is $y = 0.019x + 0.105$.

Figure-4 shows the dimenhydrinate calibration curve in 0.1 M HCl as solvent by absorbance method. This calibration curve was made with concentrations of 10, 15, 20, 25 and 30 µg / mL and obtained linear regression equation $y = 0.019x + 0.105$.

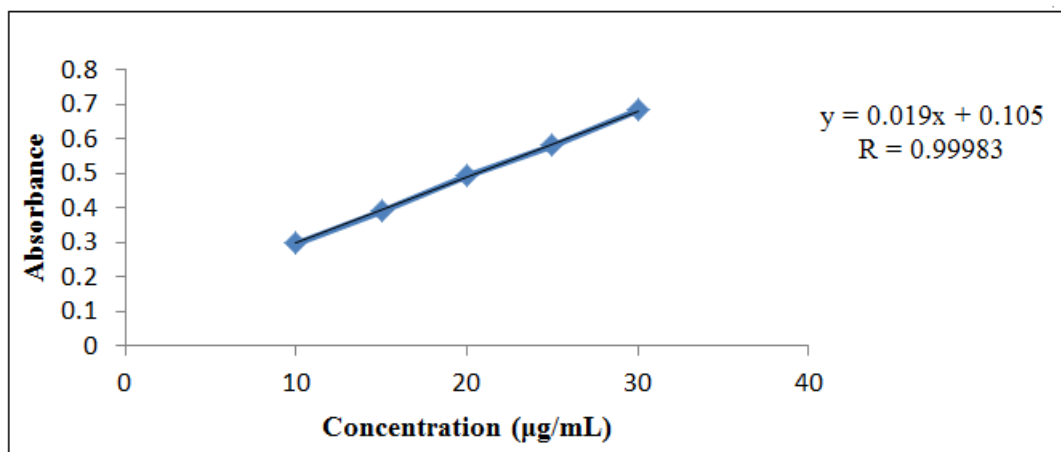


Fig-4: Dimenhydrinate calibration curve in 0.1 M HCl as solvent by absorbance method

Measurement of area under the curve of the solution shows the area of 7.177, 9.267, 11.424, 14.020 and 16.616, respectively. Figure 5 shows a dimenhydrinate calibration curve in 0.1 M HCl as a

solvent with a method of area under the curve. This calibration curve was made with concentrations of 10, 15, 20, 25 and 30 µg / mL and obtained linear regression equation $y = 0.472x + 2.248$.

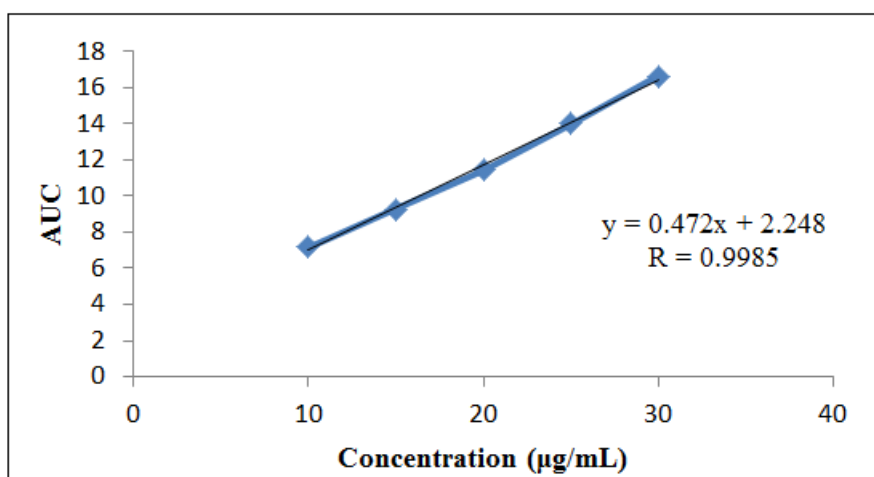


Fig-5: The dimenhydrinate calibration curve in 0.1 M HCl as the solvent by the method of the area under the curve

Dimenhydrinate content in tablets

The determination of the sample content of dimenhydrinate tablets under the trade name Antimo® (PT Phapros Tbk, No. Batch 06002015, Exp. January 2020) by absorbance method showed levels of

105.09%, whereas with the method of area under the curve showed levels of 104, 56%. Determination of the dimenhydrinate content in Dramamine® (PT Taisho Pharmaceutical Indonesia Tbk, Batch No. 7B2491, and Exp. February 2019) showed levels with absorbance

method of 93.86%, whereas with the method of area under the curve showed levels of 94.34%.

Table-1 show the result of determination of dimenhydrinate content in Antimo® tablet with absorbance method and obtained an average of 105.09% with an SD value of 0.003%.

Table-1: Determination of dimenhydrinate content in Antimo® tablets with absorbance method

No	Abs	Levels obtained (µg/mL)	Weight (mg)	% Content
1	0.304	10.474	104.74	104.74
2	0.305	10.526	105.26	105.26
3	0.305	10.526	105.26	105.26
Average			105.09	105.09
SD				0.003

Table-2 shows the results of the determination of dimenhydrinate content in Antimo® tablets with the

area under the curve method and obtained an average of 104.56% with an SD value of 0.001%.

Table-2: Determination of dimenhydrinate content in Antimo® tablets with area under the curve method

No	AUC	Levels obtained (µg/mL)	Weight (mg)	% Content
1	7.180	10.449	104.492	104.492
2	7.186	10.462	104.619	104.619
3	7.184	10.458	104.576	104.576
Average			104.562	104.56
SD				0.001

Table 3 shows the results of the determination of dimenhydrinate content in Dramamine tablets by

absorbance method and obtained an average of 94.34% with an SD value of 0.037%.

Table-3: Determination of dimenhydrinate content in Dramamine tablets by absorbance method

No	Abs	Levels obtained (µg/mL)	Weight (mg)	% Content
1	0.276	9.000	90.00	90.00
2	0.284	9.421	94.21	94.21
3	0.290	9.737	97.37	97.37
Average			93.86	93.86
SD				0.037

Table-4 shows the result of determination of dimenhydrinate content in Dramamine tablet with the

method of area under the curve and obtained an average of 94.34% with SD value equal to 0.008%.

Table-4: Determination of dimenhydrinate content in Dramamine tablets by method of area under the curve

No	AUC	Levels obtained (µg/mL)	Weight (mg)	% Content
1	6.606	9.233	92.33	92.33
2	6.722	9.479	94.79	94.79
3	6.774	9.589	95.89	95.89
Average			94.34	94.34
SD				0.008

Validation of analytical methods

Linearity is determined by processing the relationship data between concentration (x) with absorbance (y) and concentration (x) with the area under the curve (y) obtained from the calibration curve using linear regression equation. The result of calibration curve between concentration and absorbance gives linear result with $r = 0.99983$ and the result of calibration curve between concentration and area under the curve gives a linear result with $r = 0.9985$.

The limits of detection and quantification limits of dimenhydrinate by absorbance method showed results of 11.8386 µg / mL and 35.8745 µg / mL, respectively. The limits of detection and quantification limits of the dimenhydrinate by the area under the curve method showed results of 7.5042 µg / mL and 22.7401 µg / mL, respectively.

Accuracy is measured as the number of recovered analytes. The recovery is determined by the addition of standardized dimenhydrinate solution of

80%, 100% and 120%. In the sample Antimo® per cent recovery was obtained by absorbance method, 96.96%, 100.50%, 105.10% with the average recovery percentage was 100.85%. The percentage of acquisition obtained by the method of area under the curve was 94.56%, 103.65%, 107.10% with the average recovery percentage was 101.77%. In the Dramamine® sample per cent recovery was also performed with the addition of 80%, 100% and 120% dimenhydrinate standard solution, so that the percentage recovery was obtained by absorbance method 98.02%, 100.75%, 105.31% and the average recovery percentage was 101.36%. Per cent of acquisition obtained by method of area under the curve is 94.54%; 97.31%; 107.36% and the median recovery percentage was 99.74%.

The determination of intraday precision for dimenhydrinate in Antimo® is performed in the morning, afternoon and evening with three different concentrations. The results of intraday precision determination of Antimo® using absorbance method at 20 µg / mL concentration showed RSD of 1.87%, 0.46% and 0.46%, respectively; at a concentration of 25 µg / mL showed RSD of 0.32%, 0.72% and 0.90%, respectively; and at a concentration of 30 µg / mL showed RSD of 0.63%, 0.40% and 1.20%, respectively. The results of intraday precision determination of Antimo® using the area under the curve method at a concentration of 20 µg / mL showed RSD of 1.74%, 0.13% and 0.06%, respectively; at a concentration of 25 µg / mL showed RSD of 0.52%, 1.09% and 0.51%, respectively; and at concentrations of 30 µg / mL showed RSD of 0.36%, 0.01% and 0.93%, respectively. The result of determination of Dramamine® intraday precision by using absorbance method at 20 µg / mL concentration showed RSD of 0.41%, 0.70% and 0.40%, respectively; at a concentration of 25 µg / mL showed RSD of 0.21%, 0.41% and 1.21%, respectively; at concentrations of 30 µg / mL showed RSD of 0.30%, 0.34% and 0.55%, respectively. The results of determining the intraday precision of Dramamine® using the area under the curve method at a concentration of 20 µg / mL showed RSD of 0.17%, 0.13% and 0.07%, respectively; at a concentration of 25 µg / mL showed RSD of 0.14%, 0.22% and 1.02%, respectively; at a concentration of 30 µg / mL showed RSD of 0.27%, 1.50% and 0.53%, respectively.

The determination of interday precision for dimenhydrinate in Antimo® was performed for 3 consecutive days at three different concentrations. The result of determination of interday precision by using absorbance method at the concentration of 20 µg / mL on the first, second and third day showed that RSD was 0.46%, 0.55% and 0.81% respectively; at concentrations of 25 µg / mL on the first, second and third day showed RSD at 1.42%, 1.89% and 1.45%, respectively; at concentrations of 30 µg / mL on the first, second and third day showed RSD at 0.52%, 1.30% and 0.20%, respectively. The result of

determination of interday precision by using area under curve method at concentration 20 µg / mL on the first, second and third day showed RSD respectively 0.55%, 0.60% and 0.46%; at concentrations of 25 µg / mL on the first, second, and third day showed RSD respectively of 1.28%, 1.90% and 1.86%; and at a concentration of 30 µg / mL on the first day of the second and third shows RSD respectively of 0.59%, 0.09% and 0.12%.

The results of determining the interday precision of dimenhydrinate in Dramamine® using the absorbance method at 20 µg / mL concentrations on the first, second and third day showed RSD at 1.73%, 0.39% and 0.26%, respectively; at concentrations of 25 µg / mL on the first, second, and third day showed RSD 0.24%, 0.43% and 0.21%, respectively; at concentrations of 30 µg / mL on the first, second, and third day showed RSD 0.40%, 0.43% and 0.17%, respectively. The results of interday precision determination of dimenhydrinate using the area under the curve method at a concentration of 20 µg / mL on the first, second and third day showed RSD at 1.54%, 1.40% and 1.17%, respectively; at a concentration of 25 µg / mL on the first, second and third day showed RSD at 0.12%, 0.46% and 0.05%, respectively; at a concentration of 30 µg / mL on the first day of the second and third shows RSD respectively of 0.34%; 0.40% and 0.10%.

CONCLUSION

Based on the research, it can be concluded that the best solvent used for the analysis of dimenhydrinate in tablets with absorbance method and the area under the curve method with ultraviolet spectrophotometry was 0.1 M hydrochloric acid. The absorbance method and the area under the curve method by ultraviolet spectrophotometry was a method which was valid for dimenhydrinate analysis in tablets. There was no significant difference between the absorbance method and the area under the curve method in the dimenhydrinate analysis in tablets.

Conflict of Interests

The authors declare that no conflict of interest is associated with this work.

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