BAZI LOKAL ANESTEZİKLERİN SPEKTROFOTOMETRİK MIKTAR TAYINLERİ

SPECTROPHOTOMETRIC DETERMINATION OF SOME LOCAL ANESTHETICS

Ünal YARS*

SUMMARY

In this work the determination of benzocaine, procaine hydrochloride, butacaine sulfate or tetracaine hydrochloride in the injections solutions containing thiamine hydrochloride or pyridoxine hydrochloride was performed at UV by absorbancy ratio method without prior separation of the drugs. Best accuracy was obtained for solutions containing 5-10 mcg/ml of each substances.

ÖZET

Bu çalışmada benzokain, prokain hidroklörür, butakain sulfat ve tetra-
kain hidroklörür'un tiamin hidroklörür veya piridoksin hidroklörür ihtiva
eden injeksiyonluk solüsyonlarındaki miktar tayinleri UV de absorbsans
ortan metodu ile yapılmıştır. Sonuçlar çok iyi olup, karışımlarda ml de 5 mcg
kadar maddenin tayin edilebileceği anlaşılmıştır.

INTRODUCTION

Existing spectrophotometric methods used for the analysis of some local anesthetics were based either on the color intensity
determination of Schiff bases (1-6), azo-compounds (7-12), sodium
1,2-naphtoquinone-4-sulfonate derivatives (13-15) and others (16-

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(21), or on the measurement of the UV absorbance at a wavelength by comparing with a reference substance (22-25).

In this work the spectrophotometric determination of benzo- cane, procaine hydrochloride, butacaine sulfate, orthocaine and tetracaine hydrochloride is described. The procedure used for analysis based on the UV estimation of local anesthetics in their mixtures with thiamine hydrochloride or pyridoxine hydrochloride by the absorbancy ratio method.

EXPERIMENTAL

Chemicals Benzocaine (B), procaine hydrochloride (PH), butacaine sulfate (BS), tetracaine hydrochloride (TH), pyridoxin hydrochloride (PyH) and thiamine hydrochloride (ThH), purified by crystallisation and dried.

Solutions 1) Standart solutions were prepared by dissolving 1.0 mg of each local anesthetic or pyridoxine hydrochloride and 2.0 mg of thiamine hydrochloride in 100 ml water. Extinction coefficients were determined with these solutions at max. and isosbestic points.

2) Binary mixtures were: 1a) B-PyH, 1b) B-ThH, 2a) PH- PyH, 2b) PH-ThH, 3a) BS-PyH, 3b) BS-ThH, 4a) TH-PyH, 4b) TH-ThH.

Spectral characteristics of substances

Absorption maxima: B-285 nm, PH-290 nm, BS-292 nm, TH-310 nm.

Location of the isosbestic points: The isosbestic points were located first approximately by superimposing the spectra of each pair and then by fixing the exact wavelength by comparing the solutions with the interval of 0.01 nm.

The chosen first wavelengths for the mixture 1a, 1b are 285 nm, 2a, 2b are 290 nm, 3a, 3b are 292 nm and 4a, are 310 nm and the located isosbestic points are 317.0 nm, for 1a, 250.85 nm, for 1b, 253.70 nm, for 2a, 257.20 nm, for 2b, 312.0 nm, for 3a, 262.30 nm, for 3b, 337.25 nm, for 4a, and 274.60 nm, for 4b.
sorbance at a wavelength (22-25).

determination of benzoate sulfate, orthocaine and the procedure used for analgesic anesthetics in their pyridoxine hydrochloride

e prepared by dissolving oxine hydrochloride and 30 ml water. Extinction solutions at max. and 'H, 1b) B-ThH, 2a) PH-

90 nm, BS-292 nm, TH-

e iodosbestic points were sing the spectra of each length by comparing the

e mixture 1a, 1b are 285 1 and 4a, are 310 nm and 1, for 1a, 250.85 nm, for 312.0 nm, for 3a. 262.30 0 nm, for 4b.

Fig. 1 - Absorption curves a) B, b) ThH, c) PyH

Fig. 2 - Absorption curves a) PH, b) ThH, c) PyH
The absorbances were and the isosbestic points concentrations of the drugs yields into the following equation:

\[ C_x = \frac{Q_0 - Q_v}{Q_0 - Q_v} \]

\( C_x \) and \( C_y \) are the coefficients of the mixture. \( Q_0 \) and \( Q_v \) are the absorbancies at \( \lambda \) max. to the isosbestic point. \( A_x \) is the absorbance ratio of the isosbestic point, \( A_v \) is the extinction coefficient.

The rest of the text is not visible in the image.
The absorbances were measured at the absorption maxima and the isosbestic points against a water blank. The relative concentrations of the drugs were calculated by substituting the values into the following equations (26):

$$C_x = \frac{Q_o - Q_y}{Q_x - Q_y} \cdot \frac{A_3}{a_4}, \quad \text{or} \quad C_y = \frac{Q_o - Q_y}{Q_x - Q_x} \cdot \frac{A_3}{a_4}$$

$C_x$ and $C_y$ are the concentration of the substances x and y in the mixture. $Q_x$ and $Q_y$ are the ratio of the extinction coefficients at $\lambda$ max. to the isosbestic point for x and y respectively. $Q_o$ is the absorbancy ratio of the mixtures at $\lambda$ max. and to the isosbestic point. $A_3$ is the absorbancy of the mixture at the isosbestic point, $a_4$ is the extinction coefficient at the isosbestic point.

The results are given in table 1-4.

<table>
<thead>
<tr>
<th>Compound</th>
<th>Added (mg)</th>
<th>Found (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzocaine</td>
<td>1.0</td>
<td>0.998</td>
</tr>
<tr>
<td></td>
<td>0.75</td>
<td>0.988</td>
</tr>
<tr>
<td></td>
<td>0.50</td>
<td>0.495</td>
</tr>
<tr>
<td>ThH</td>
<td>2.0</td>
<td>2.002</td>
</tr>
<tr>
<td></td>
<td>1.50</td>
<td>1.508</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>1.005</td>
</tr>
<tr>
<td>Benzocaine</td>
<td>1.0</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>0.75</td>
<td>0.765</td>
</tr>
<tr>
<td></td>
<td>0.50</td>
<td>0.50</td>
</tr>
<tr>
<td>PyH</td>
<td>1.0</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>0.75</td>
<td>0.765</td>
</tr>
<tr>
<td></td>
<td>0.50</td>
<td>0.50</td>
</tr>
</tbody>
</table>

The absorbancy ratio method for analysis was used for the mixtures of B-PyH, B-ThH, PH-PyH, PH-ThH, BS-ByH, BS-ThH and TH-PyH, TH-ThH; the results obtained for orthocaine in the mixtures with PyH or ThH are not favorable for the analysis of this substance.
The spectral character fig 1-4. This characteris benzocaine, procaine hyd
caine hydrochloride with
hydrochloride can be an
market samples of parant
taken for each assay is th
measurable amounts of t
meg/ml.

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The spectral characteristics of compounds are illustrated in fig 1-4. This characteristics indicated that binary mixtures of benzo-caine, procaine hydrochloride, butacaine sulfate and tetra-caine hydrochloride with pyridoxine hydrochloride or thiamine hydrochloride can be analyzed by applying this procedure to the market samples of paranteral solution of this drug. The quantities taken for each assay is the same as market samples. The minimum measurable amounts of the local anesthetic with this method is 5 mcg/ml.

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ANTİDIYABETİ

THE NATURAL SOURCE

Hülya TI

Diyabet tedavisinde kullanılan plantlerin kullanımaması önemli bir sorun. Antidiyabetik maddelerin araştırılması gerekmektedir.

Antidiyabetik plantler uzun kognozinin temelini teşkil eder ve incelemesi, çalışmalarımızın ana konudur.

Ayrıca, antidiyabetik olan plantların listesi halinde tutulmaktadır.

Even though insulin is the mellitus, has an important role in the investigations on somatic diabetes.

The structure-activity relationship of folk medicine and which are the target of the study.

In addition to the literature, a list of the published articles are given.

GİRİŞ

Bir zamanlar erken tahlik olarak kabul edilen bir soğuk me ile denetim altında bulundu.

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