DEVELOPMENT OF AN EXTRACTION-PHOTOMETRIC METHOD FOR DETERMINATION OF GLICLAZIDE

Kucher T. V., Merzlikin S. I.
National University of Pharmacy, Kharkiv, Ukraine
Smiletety@gmail.com

Introduction. Gliclazide is an oral hypoglycemic agent which is widely used for the treatment of non-insulin-dependent diabetes mellitus. It belongs to the sulfonylurea class of insulin secretagogues, which act by stimulating β-cells of the pancreas to release insulin. Due to mechanism of action, gliclazide may cause hypoglycemia, cardiovascular events and other pathological complications. Herewith, observed tendency of patients with this complications to suicide attempts. These factors cause the development of the side effects, which lead to the acute or lethal poisoning. In accordance with legislation of International judicial practice of poisoning of chemical substance for determination of toxicant in the biological objects a forensic toxicology investigation should been conducted. The extraction-photometric method is sensitive and rapid photometric method which is used for determination of mentioned drug. The method is quite selective as the drug contains basic moiety which preferentially interacts with acidic dye and the drug-dye ion-pair can be extracted into the organic solvent before measurement.

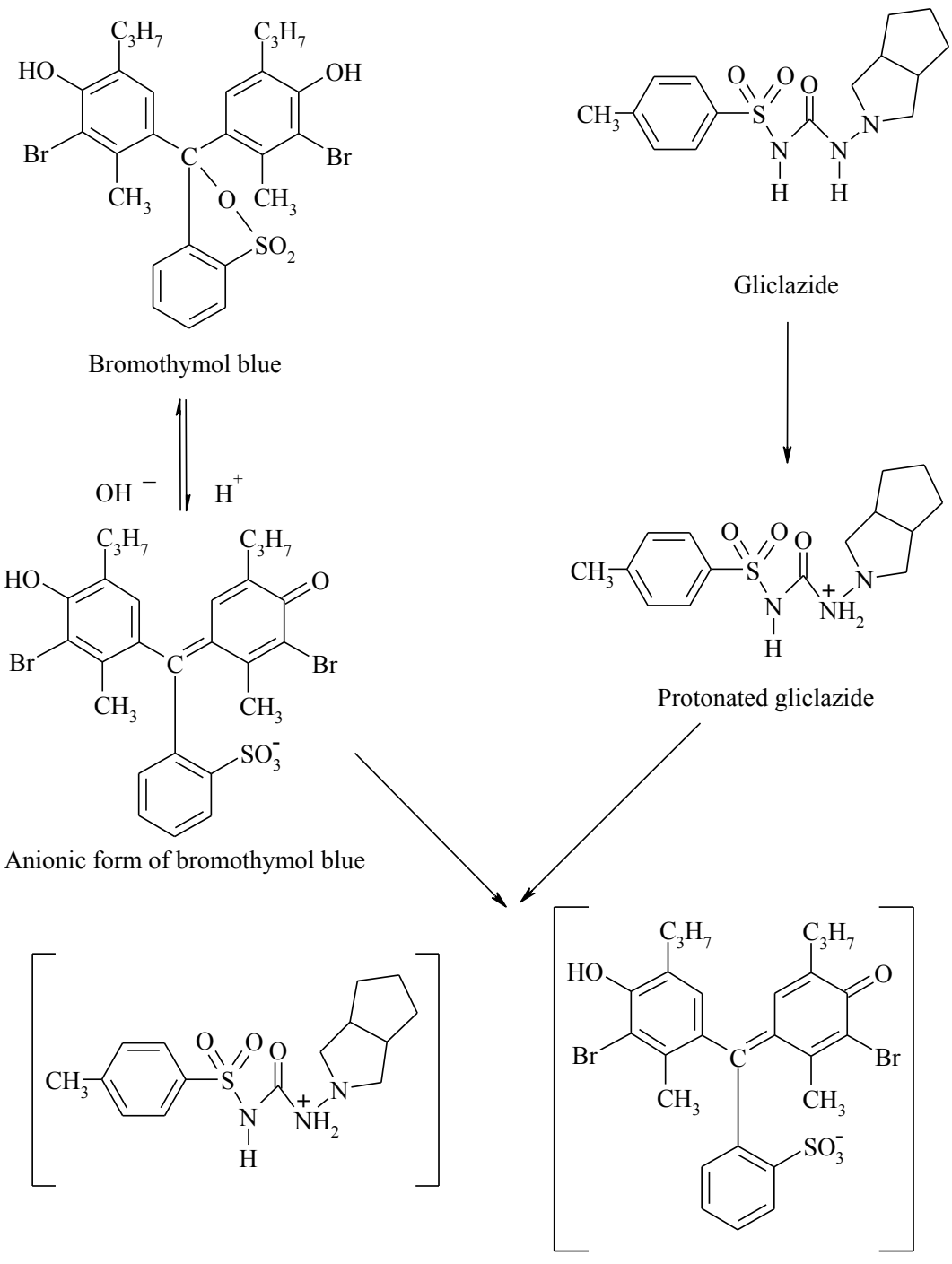
The aim of present paper was to develop highly sensitive, rapid, simple visible photometric method for the determination of gliclazide.

Materials and methods. A spectrophotometer (KPhK-2) with matched 1.0 cm quartz cuvettes for all absorbance measurements was used. A laboratory ion meter I-160 M was used for pH measurements. For the researches of gliclazide methanol solution (50 μg/ml) and 0.1% aqueous bromothymol blue were used.

Results and discussion. Development of extraction-photometric method was composed by exploiting gliclazide analytically useful functional groups and its ability to form ion-pair complex with acidic dye bromothymol blue. Experiments were carried out to assess various wavelengths and buffer solutions at different pH values. The studying of the absorption spectrum of the chloroform solution of the gliclazide ion-pair complex with bromothymol blue in the range of 364-490 nm was conducted. It has been found that absorption maximum was observed at 400 nm.

For foundation of pH at which maximum absorption of extraction of ion-pair complex can formed, series of phosphate buffer solutions with different pH (2.5 to 4.0) were used. The value of pH 3.0 was determined as the most suitable for the formation of ion-pair complex.

Reaction of ion-pair complex can be represented by scheme:



Consequently, the proposed method which is based on the formation of ion-pair complex between gliclazide and bromothymol blue at pH 3.0 followed by extraction of the complex by chloroform, and measuring the absorbance of yellow drug-dye complexes at 400 nm.

Conclusion. Extraction-photometric method for the quantitative determination of gliclazide which is based on the reaction of ion-pair complex with bromothymol blue has been developed. Hence, the proposed method can be used for the determination of gliclazide in the extracts obtained from biological objects.