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Pharmaceutical Analytical Chemistry: Open Access

Commentary

Spectrophotometric Analysis of Caroverine in Pharmaceutical Industries

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DESCRIPTION

Spectrophotometric techniques are being developed and used to measure caroverine quantitatively in pharmaceutically pure and tablet forms. The assaying and stability testing in pharmaceutical analysis play a significant part in meeting the industry's statutory certification requirements for medications and their formulations [1]. In determining if a chemical is suitable for usage in patients, it is crucial to analyses both the pure drug material and any pharmaceutical dose forms. The most popular techniques are based on Gas Chromatography (GC), High-Performance Liquid Chromatography (HPLC), and Ultra-Performance Liquid Chromatography (UPLC). In recent years, capillary electrophoresis and super critical fluid chromatography have quietly gained popularity [2]. The visible spectrophotometric method's selectivity and sensitivity are solely influenced by the type of chemical processes involved in color creation and not by how sophisticated the apparatus is used. Under particular experimental circumstances, the colorimetric method must produce repeatable results.

The determination of caroverine, a spasmolytic medication, in pharmaceutical formulations can be done utilizing two straightforward and innovative analytical procedures that use spectrophotometric technology [3]. The first (A) is a direct procedure that involved analyzing the pure drug at its maximum absorption wavelength of 304 nm in an ethanol solution. With a correlation coefficient of 0.999 and a molar absorptivity of 5.55104 L, the method was linear from 0.5 to 18 g/ml. The limits of detection and quantification were 0.44 and 1.47 g/ml, respectively. The second technique (B) relies on a charge transfer process between caroverine, an n-electron donor, and 7,7,8,8-Tetracyanoquinodimethane (TCNQ), a pi-acceptor, to produce a highly colorful stable complex that exhibits its greatest absorption band at 525 nm in wavelength.

The Gibbs free energy, G°, was calculated to be 6.72 kJ/mol, and the association constant, to be 7.53104 mol. The impact of many factors on the charge transfer reaction was thoroughly investigated and optimized [4]. Beer's law held true in the concentration range of 1-35 g/ml at the most favorable reaction conditions, with a molar absorptivity of 1.17104 L and a correlation coefficient of 0.9999. The suggested approaches were approved in accordance with International Council for Harmonization of Technical Requirements for Pharmaceuticals for Human Use (ICH) recommendations [5]. There are two different methods used.

The caroverine standard solution (0.5-18 g/ml) was produced in various aliquots. These solutions 304 nm absorbance was measured in comparison to a blank for the reagent. Pipetting the drug solution, which included 1-35 g/ml caroverine, into a series of 10 ml volumetric flasks was done in the proper quantity. Then each flask received 1 cc of TCNQ solution. For five minutes, the solution was maintained in a thermostated water bath at 40°C. The volume was adjusted with DMSO after cooling at room temperature, and the colored complex's absorbance was measured at 525 nm in comparison to a blank for the reagent.

Reaction mechanism

TCNQ (tetracyanoquinodimethane) has been utilized to quantitatively assess medicines in dosage forms by the production of charge-transfer complexes [6]. A deep hue with a distinctive longer wavelength absorption band was reported to result from the interaction with TCNQ in acetonitrile solution. The main chromogenic associated with TCNQ is a blue-colored radical anion, which most likely came about as a result of the medication dissociating an initial donor-acceptor complex. A partial ionic bond (D^+ A^+) is thought to form in this complex, which is made up of a lone pair of electrons provided by the caroverine base as an electron donor and the charge transfer agent as an electron acceptor

REFERENCES

1. Davison M. Pharmaceutical anti-counterfeiting: Combating the real danger from fake drugs. John Wiley & Sons; 2011.
2. Muruganathan G, Thengungal Kr. Use of Folin-Ciocalteu phenol reagent and 3-methyl-2-benzothiazolinone hydrazine hydrochloride in the determination of oxcarbazepine in pharmaceuticals. Acta Pharm. 2008;58(1):111-117.
3. Nohl H, Bieberschulte W, Dietrich B, Udilova N, Kozlov AV. Caroverine, a multifunctional drug with antioxidant functions. BioFactors. 2003;19(1-2):79-85.

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Received: 31-Oct-2022, Manuscript No. PACO-22-21284; **Editor assigned:** 03-Nov-2022, PreQC No. PACO-22-21284 (PQ); **Reviewed:** 17-Nov-2022, QC No. PACO-22-21284; **Revised:** 24-Nov-2022, Manuscript No. PACO-22-21284 (R); **Published:** 01-Dec-2022, DOI: 10.35248/2471-2698.22.7.170

Citation: Aslam S (2022) Spectrophotometric Analysis of Caroverine in Pharmaceutical Industries. Pharm Anal Chem. 7:170.

4. Peterson GL. Review of the Folin phenol protein quantitation method of Lowry, Rosebrough, Farr and Randall. Anal Biochem. 1979;100(2):201-220.

5. Sivakumar R, Nallasivan PK, Saranya KC, Solomon WS, Akelesh T, et al. Visible spectrophotometric estimation of diacerein in bulk and pharmaceutical dosage forms. J Young Pharm. 2010;2(4):414-416.

6. Udilova N, Kozlov AV, Bieberschulte W, Frei K, Ehrenberger K, et al. The antioxidant activity of caroverine. Biochem Pharmacol. 2003;65(1):59-65.