Spectral and electro analytical studies for microdetermination of soma drugs

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Contains the introduction which includes two parts. The first part is conserned with a detailed discussion about the definitions, action and indications, pharmaco kinetics, chemical strucutures, chemical names, and characters of the drugs under investigation Dextromethrphane Hydrobr- omid, (DXM) Salbutamol (SIS) sulphate, and Hydroxyzine hydrochloride (HXZ). The second part gives a literature survey of the previous studies for the analysis of the studied drugs including spectrofluormetric, ultra-violet, spectrophotometric, titrimetric, physico chemical electro analytical and chromatographic methods.Chapter IIContains the experimental part which includes apparatus used for measurement and procedures for the preparation of the solution of drugs and reagents solutions. It contains the proposed sepctrophotometric methods for determination of the studied drugs in pure and in dosage forms .it contains pharmacopoeia and official methods for analysis of the studied drugs .as well as ion-selective electrode measurements.Chapter IIIContains the results and discussion which include three parts: The first part includes specrophotometric procedures for determination of the studied drugs using KMno4. The proposed methods are based on oxidation of the studied drugs by KMno4 determination of the unreacted KMno4 by measuring the decrease in absorbance of amaranth dye and Methlene blue dye. The following experimental variables are investigated .1- Effect of acid concentration .2- Effect of time and temperature .3- Effect of sequence of additions .4- Effect of dye concentration .Beer’s law is obeyed in the concentration ranges (0.4-9.0, 0.5-8.0 and 0.5-8.5 µg ml-1) and (0.4-8.0, 0.5-7.0 and 1.0-7.5 µg ml-1) for Dxm, SIS and HXZ using MB and AM dyes, respectively. For more accurate results, ringbom optimum concentration ranges are determined. The apparent molar absorptivity. Sandell sensitivity, detection limits and quantitation limits are calculated. The stoichiometric ratios of the studied drugs with KMnO4 are established using the molar ratio method and found to be (1.0 :2.99, 1.0 : 2.66 and 1.0 : 2.22 and 1.0 : 4.16, 1.0 : 2.17 and 1.0: 2.0) for DXM, SIS and HXZ To KMnO4 using MB and AM, respectively. In order to determine the accuracy and precision of the proposed methods, solutions containing three different concentrations of the studied drugs are prepared and analysed in six replicates. The recovery relative standard deviation, the relative error and the confidence limits are calculated. The proposed methods are successfully applied to determine the studied drugs in the pure and in -their dosage forms The results obtained are compared statistically by student’s t

test (for accuracry) and variance ratio F –test (for precision) with the official methods at 95% confidence level. The results showed that the t- and f-values are less than the critical values indicating that there is no significant difference between the proposed and official methods. Thus, the proposed spectrophotometric methods can applied in determination of the studied drugs in pure form, in dosage forms and in the presence of their oxidative degradates.The second part includes, -spectrophotometric procedures for determination of the studied drugs using N bromosuccinimde (NBS). The proposed methods are based on oxidation of the studied drugs by NBS and determination of the unreacted NBS by measuring the decrease in absorbance of amaranth dye. The following experimental variables are investigated .1- Effect of acid concentration .2- Effect of time and temperature .3- Effect of KBr concentration .4- Effect of sequence of additions .5- Effect of dye concentration .Beer's law is obeyed in the concentration ranges 0.5-6.0 and 1.0-6.5 µg ml-1 for DXM, SIS and HXZ to NBS respectively. For more, accurated results, ringbom optimum concentration ranges are determined. The apparent molar absoptivity, sandell sensitivity, detection and quantitation limits are calculated. The stoichiometric ratios of the studied drugs with NBS are established using the molar ratios method and found to be 1.0:2.0, 1.0:1.66, and 1.0:1.36 for DXM, SIS and HXZ to NBS respectively. In order to determine the accuracy and precision of the proposed methods, solutions containing three different concentrations of the studied drugs are prepared and analysed in six replicates. The recovery relative standard deviation, the relative error and the confidence limits are calculated. The proposed methods are successfully applied to determine the studied drugs in the pure and in their dosage forms. The results obtained are compared statistically by student's t –test (for accuracy) and variance ratio F– test (for precision) with the official methods at 95% confidence level. The results showed that the t – and F-values are less than the critical values indicating that there is no significant difference between the proposed and official methods. Thus the proposed spectophotometric methods can applied in determination of the studied drugs in pure form, in dosage forms and in the presence of their oxidative degradates .The Third part includes of ion-selective electrode for preparation and study of four kinds of poly (vinyl chloride) matrix membrane sensors respective to drug (DXM, SIS and -HXZ) are described and characterized . The sensors are based on the use of ion association complexes of drugs citrons with tungestophosphate anion, dioctylphythalate as mediator and poly (vinyl chloride) with percentage (2:63:35 w/w/w) respectively. The sensors were evaluated according to (IUPAC) recommendations, the calibration of drugs from 10-2 up to 10-6 M are studied. The effect of pH on the responses and sensor selectivity of drugs interference also are studied. The results show that:1- Fast, stable and near Nernstine responses for 10-2-10-7 M of the different drugs.2- The optimum pH for the study and determination of drugs is found to be from pH range of (5-8, 3-10, and 3-6) for DXM ,SIS, and HXZ, respectively.3- Many inorganic, organic cations as well as drug excipiants do not interfere.4- The sensors are used for direct potentiometry of drugs in pure and pharmaceutical preparations with high efficiency (99.5%) and the data obtained by ion-selective electrode technique confirmed to data obtained using Birth pharmacopoeia method .5- The measurements by this method are simple,

rapid, non destructive, inexpensive, not time-consuming .