Development of a UV-VIS Spectrophotometric Azithromycin Assay

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The goal of project was the elaboration of an alternative Azithromycin assay given the fact that the Pharmacopoeial method is the biological one. This method is hardly realizable, and requires special determination conditions, which also creates some difficulties in the substance and pharmaceutical forms analysis. Materials and methods: For spectral analysis Agilent - 8453 UV-VIS spectrophotometers in wavelengths range from 350 up to 550 nm were used. Phosphate buffer solutions with different pH values were used as solvent. The colored product, resulting from reaction with concentrated sulphuric acid, was investigated. Results: Azithromycin, which is a compound with complex structure and is part of macrolide antibiotics group, forms a colored compound in reaction with concentrated sulphuric acid. In order to determine the possibility of using this compound in the UV-VIS spectrophotometric assay, we have studied the properties of mixture complex being composed from Azithromycin and Sulphuric acid; such as parameters also were assayed: the stability over the derivatization time, its dependency on reagents co-ratio and solvent's influence, and the value of pH environment. There were been developed the optimal technique of life time colouring reaction: the amount of reagents - 10 ml; reaction time – 30 min; pH – 7.0. The spectrum of absorption was recorded in the range from 350 up to 550 nm; the maximum of absorption was established at 483 nm. The basic parameters of the method were determined: solution concentration, specific absorption, absorbance law enforcement. The linearity and accuracy of the method were evaluated that range within the limits of about 3%. Conclusions: 1. There were been established the optimum conditions of Azithromycin assay, using the UV-VIS spectrophotomety on the base of coloring reaction of Azithromycin with concentrated Sulphuric acid. 2. There were been developed valuable technique and have evaluated the main criteria of validation: linearity, accuracy and the repeatability of the method. 3. UV-VIS spectrophotometry of quantitative Azithromycin determination may be also employed in the determination of this active principle in the pharmaceutical forms.

Elaboration of Principle Extractive Method From Skin Ointment Containing Izohidrafural and Methyluracil

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The objective was to create a new pharmaceutical form for external use – the combined ointment with Izohidrafural and Methyluracil, which combines the antibacterial action of Izohidrafural and the regenerating action of Methyluracil and also to elaborate the method of extraction of active principles from the ointment. Materials and methods: Izohidrafuralum, Methyluracilum, the excipients: Vaselinum album, Alcoholum cetylstearylicum, Propylenglycolum, Glycerinum, Tween 80, PEG 400, Natrii laurylsulfas; the extragents: Dimethylformamidum, Natrii hydroxidum 0.1mol/l and the mixture of these two substances; spectrophotometer Agilent 8453 UV-VIS. Results: The combined ointment with Izohidrafural and Methyluracil can be used in treating skin diseases, in surgery, obstetrics and gynecology, ophthalmology, proctology due to high efficiency and good way of application. It was studied the concentrations of 0.1% for Izohidrafural and 5% for Methyluracil which ensure a good availability and the maximum pharmacological effect. To create

the optimal formulation of ointment, the active substances have been incorporated into various excipients, of different nature. So it was investigated four compositions containing emulsion-type ointment bases O/W and W/O. It was established the manufacturing technology flow of the ointment. To select the optimal composition that would allow an effective therapeutic action and minimal side effects, first of all it was elaborated the optimal extraction method and after that it was used the dosage of active substances from the extract by UV-VIS spectrometry methods. So, it was analyzed the extraction with solution of 0.1% sodium hydroxide, dimethylformamide and the mixture: solution of 0.1% sodium hydroxide and dimethylformamide (1:3). It was recorded the absorption spectra in the region 250nm-450nm in the case of extraction with solution of 0.1% sodium hydroxide, 250-400nm in the case of extraction with dimethylformamide and 250-450nm in case of extraction with the mixture. Conclusions: 1.Izohidrafural and Methyluracil have been incorporated into different excipients. As a result, it was investigated four compositions containing emulsion-type ointment bases O/W and W/O; 2.It was selected the optimal manufacturing technology for the compositions; 3.It was elaborated the extraction with solution of 0.1% sodium hydroxide, dimethylformamide and the mixture of these two substances; 4.It was concluded that the optimal extraction method is with dimethylformamide.

Robustness Testing of a Modified-Release Tablet Formulation Comprising Metformin and Glibenclamide

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It was recently ascertained that sulphonylureas and biguanides synergistically act for the control of blood glucose levels in patients with type II diabetes, by different pharmacological mechanisms. The aim of this study is to design a modified release formulation comprising metformin hydrochloride and glibenclamide, where one drug does not affect the release of the other drug. Due to a relatively high unit dose of metformin, the tablets should be size fitted for oral administration and should ensure the controlled release of the two active ingredients. Taking into consideration the poor flowability of metformin hydrochloride, in order to attain dose uniformity, a wet granulation manufacturing process was used. Glibenclamide was geometrically dispersed into the granules of metformin. The mixture was blended with soluble filler, a hydrophilic polymer, a desintegrant and a lubricant. The hydrophilic polymer used was: hydroxypropylcellulose (Klucel® HF, HXF) and hydroxymethylpropylcellulose (Methocel® K100 LV CR, K4M and E4M). The matrix tablets were evaluated for their robustness: hardness, friability, thickness, and weight variation and disintegration time. It was concluded that satisfactory robustness profiles can be achieved using all types of hydrophilic polymers, by wet granulation of the major active ingredient, followed by a direct compression into a modified release matrix. Keywords: metformin hydrochloride, glibenclamide, diabetes, formulation, matrix tablets.