PIROCTONE OLAMINE DETERMINATION IN BULK BY UV SPECTROPHOTOMETRIC METHOD

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Introduction: The piroctone olamine is 1-hydroxy-4-methyl-6-(2,4,4-trimethyl)-pentyl-2(1*H*)-pyridone 2-aminoethanol salt. Under the brand name Octopirox, it was used for the first time in the Seborin produced by Schwarzkopf & Henkel Düsseldorf (subsidiary of Hoechst). Nowadays, the compound is contained in many cosmetic products for the treatment of dandruff (*Pityriasis simplex capillitii*). It has fungicidal activity against all medically relevant dermatophytes, yeasts and mold fungi, due to penetration into the cell wall of fungi such as *Malassezia furfur* and complexation with iron(III) ions, which results inhibition of the energy metabolism in the mitochondria of the fungi. Still, analyzing the literature data, there was found no simple, fast, low-cost and exact method for determination of Octopirox in bulk just by UV absorbance measurement for usage in common laboratory.

The aim of study: To develop and validate UV spectrophotometric method of determination for piroctolone olamine in bulk.

Materials and methods: The substance was weighed using analytical balances Shimadzu AUX220 (10 mg – 220 g), Shimadzu Corporation, ShimUkraine Ltd., Kyiv. UV spectra were recorded on UV-*vis* spectrophotometer UV-2600 (190-1100 nm), Shimadzu Corporation, ShimUkraine Ltd., Kyiv. Validation of the method was prepared in accordance to the analytical methods validation parameters: linearity, accuracy, precision, range, ruggedness and robustness.

Results: According to the Beer's law, regression coefficient, calculated specific absorbance, the calibration curve of Octopirox with good linearity was found in the concentration range 10.0-50.0 μg/ml in solution of ethanol-water (1:3, v:v) at the 307±1 nm wavelength with $r^2 = 0.99$. Standard deviations of each measured absorbancies were within 0.0030-0.0060 and RSD was 0.0048-0.0138%. The mean percentage of recoveries was found to be 100.04±0.01%. The results were highly reproducible during the day – RSD was 0.0032%, and during the week increased to 0.076%, still with high precision. The limit of detection was calulated to be 1.18 μg/ml, while the limit of quantification - 3.58 μg/ml. Such criteria like robustness and ruggedness also showed high validity and reproducibility, noticing the high importance of substance first step of substance dilution in 96% ethanol.

Conslusions: A precise, accurate, reproducible, simple, fast and low-cost UV-spectrophotometric method has been developed and validated for the quantification of Octopirox in bulk.