INFRARED SPECTROSCOPY FOR IDENTIFICATION OF VERAPAMIL HYDROCHLORIDE IN TABLETS

El Kouid El Mostafa, Georgiyants V. A., Bevz N. Yu.
National University of Pharmacy, Kharkiv, Ukraine
nata.bevz.60@gmail.com

Introduction. IR-spectroscopy is the section of spectroscopy that studies the interaction of IR radiation with substances. The method is widely used in scientific research and in manufacturing for the quality control of pharmaceutical products since it allows to determine the structure of the substance, identify and quantify organic compounds. Nowadays one of the great advantages of infrared spectroscopy is that virtually any sample in virtually any state can be studied. In pharmaceutical analysis IR spectroscopy is used for qualitative analysis of the known substances, identification by the reference spectrum or determination of the structure of the unknown substances.

Aim. Only USP propose use IR-spectroscopy method for identification of active pharmaceutical ingredients in tablets.

Materials and methods. The infrared spectroscopy method has been studied on verapamil tablets ("Verapamil", tablets, 0.04 g, "Pharmaceutical firm "Darnitsa" CJSC) with the aim of following using it in correspondent monograph of state Pharmacopoeia of Ukraine. The sample was previously ground and mixed thoroughly with potassium bromide to obtain an infrared transparent matrix in the ratio of 1:5 (Sample: KBr). The KBr discs were prepared by compressing the powder for 5 min in a hydraulic press. Scanning was carried out at the resolution of 4 cm^{-1} in the range from 4000 to 400 cm^{-1}.

Results and discussion. From the peaks obtained the following functional groups were found. In the range from 3030 and 2860 cm^{-1} a broad complex absorption was observed due to superimposing of C-H stretching vibrations of the methyl and methylene groups. At 2840 cm^{-1} there was a band due to C-H stretching vibration of the methoxy groups. In the range of 2800 – 2300 cm^{-1} a broad complex absorption was observed due to N-H stretching vibrations of the protonated amine. At 2236 cm^{-1} there was a sharp weak band due to C=N stretching vibration of the saturated alkyl nitrile. In the range of 1607, 1591 and 1518 cm^{-1} due to skeletal stretching vibrations of the benzene ring the bands were found. At 1262 cm^{-1} there was a strong band due to C-O stretching vibrations of the aromatic ethers.

The disadvantage of the method is that in addition to the characteristic bands of verapamil there are bands that are typical for organic excipients of the tablets.

Conclusions. The work on developing the method has been conducted. It will allow identifying only the active substance – verapamil hydrochloride in tablets by the method of IR-spectroscopy.