29. THE IR SPECTROPHOTOMETRY APPLICATIONS IN THE STUDY OF PHYSICAL AND CHEMICAL COMPATIBILITY OF SOME ACTIVE SUBSTANCES

Donici Elena, Gorodeţchi Ecaterina

Scientific adviser: **Uncu Livia,** Ph.D., associate professor, Department of Pharmaceutical and Toxicological chemistry, State Medical and Pharmaceutical University „Nicolae Testemiţanu", Chişinău, Republic of Moldova

Introduction: The qualitative aspects of infrared spectroscopy are one of the most powerful attributes of this diverse analytical technique. IR spectrophotometric method is a modern method, which is used to identify the molecular structure of the drug substances based on the spectrum, resulting from the interaction of light with certain functional groups, bonds and structural units. IR spectrophotometric method was used in this study to determine the physical and chemical compatibility of izohydrafural, methyluracil and benzocaine by interpretation of the spectrum of pure and mixed substances.

Purpose and objective: To apply the IR spectrophotometric method in the research of physical and chemical compatibility of izohydrafural, methyluracil and benzocaine. This study will prove the possibility of a combination of izohydrafural, methyluracil and benzocaine in the same dosage form.

Materials and methods: In this research it was used the active substances: izohydrafural, methyluracil and benzocaine, and FT-IR Bruker Equinox 55 spectrometer.

Results: The infrared spectrum of a molecule is considered to be a unique physical property and it is a characteristic of the molecule. It is based on the fact that the structural features of the molecule, whether they are the backbone of the molecule or the functional groups attached to the molecule, produce characteristic and reproducible absorptions in the spectrum. This information can indicate whether there is backbone to the structure and, if so, whether the backbone consists of linear or branched chains. Next it is possible to determine if there is unsaturation and/or aromatic rings in the structure. Finally, it is possible to deduce whether specific functional groups are present. If detected, one is also able to determine local orientation in the group and its location in the structure. IR spectrophotometry is rich in information and it can be used in the chemical and physical compatibility studies of the drugs. An infrared absorption spectrum often contains a bewildering array of sharp peaks and minima. Peaks useful for the identification of functional groups are located in the shorter-wavelength region of the infrared, from about 2.5 to 8.5 mm, where the positions of the maxima are only slightly affected by the carbon skeleton of the molecule. Identifying functional groups in a molecule is seldom sufficient to positively identify the compound. For the study of physical and chemical compatibility of the drugs, there were interpreted the spectrum of each drug substances. Then it was analyzed the spectrum of the mixture of the chemical substances. After that, it was overlapped the infrared spectrum of each chemical substance with the infrared spectrum of the mixture. If the substances are physically and chemically compatible, then it must be present the same characteristic absorption bands of chemical functional groups both in the spectrum of each substance and in the spectrum of the mixture. The infrared spectrum of the mixture of izohydrafural, methyluracil and benzocaine has the most characteristic absorption bands of each substance, which indicates the physical and chemical compatibility of the molecules of the substances.

Conclusions: It was used the IR spectrophotometry to research the physical and chemical compatibility of some active, chemical substances.

Keywords: Physical and chemical compatibility, infrared spectroscopy

30. ISOFLAVONES-STRUCTURE, PROPERTIES, APPLICATIONS

Roman Zinaida, Staver Olga

Scientific adviser: **Uncu Livia**, Ph.D., associate professor, Department of Pharmaceutical and Toxicological chemistry, State Medical and Pharmaceutical University "Nicolae Testemiţanu", Chişinău, Republic of Moldova

Introduction: Isoflavones are a class of organic compounds and biomolecules related to the flavonoids. Isoflavones are produced almost exclusively by the members of the *Fabaceae* (i.e., *Leguminosae*, or bean) family. Some are termed antioxidants because of their ability to trap singlet