THE STUDY OF THE OPTICAL PROPERTIES OF THESUBSTANCE ON THE EXAMPLE OF THE SEVERAL POPULAR GEORGIAN WHITE WINES USING PCAAND TES ANALYSIS

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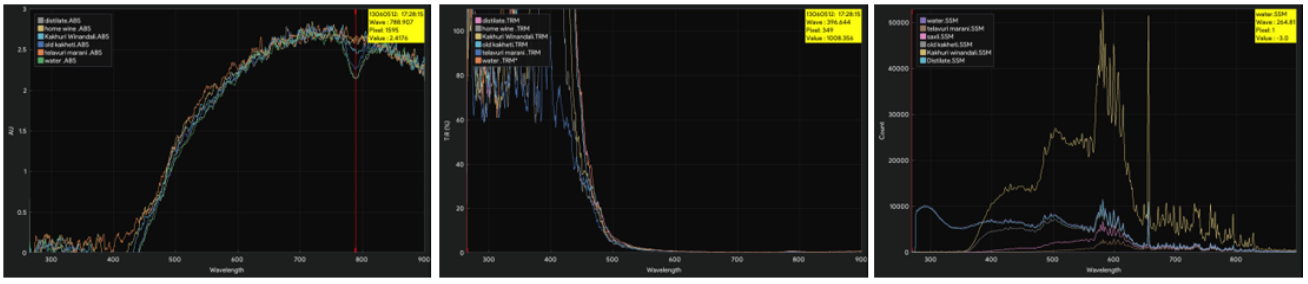
Quality control of food products and beverages is obviously one of the topical issues of today and therefore of research centers and laboratories. Of all the samples already investigated, wine is one of the most studied products. One of the analytical methods that has a high application potential in the identification of wine products is three-dimensional fluorescence spectroscopy, which is a fast, sensitive and accessible method and which is based on the sequential acquisition and evaluation of excitation or emission spectra at several wavelengths of excitation and/or emission.

The research provides for the analysis of different types of Georgian wine based on 3D fluorescence spectroscopy (3DF) using the Black Comet (200-950 nm) spectrometer manufactured by StellarNet. In this method, the 3D fluorescence signal is divided into a fixed number of statistical components. For each type of wine, a 3D database is strictly defined, which we conventionally call references. The standard describe the excitation/emission spectra in detail. The advantage of the 3DF method compared to other statistical methods, such as peak component analysis (PCA), lies in the uniqueness of the unfolding of the spectra. The fluorescence spectra of the wine will be further analyzed by peak component analysis (PCA). After performing the PCA analysis, in order to reduce the number of tolerant standard, we used the tolerant standard sample (TES) comparison analysis, thus determining how tolerant the researched wine sample is to this or that specific standard.



a) b) c)

Fig. 1. a) Ultraviolet (UV) LED signal transmission spectra of wine samples with a lamp (excitation wavelength 396 nm), b) Absorption spectra of wine samples with an ultraviolet (UV) LED lamp (excitation wavelength 396 nm), c) Signal spectra of wine samples as a result of joint excitation with a halogen and deuterium lamp

The possibility of increasing its efficiency in the situation we have. Equally clamped spectra show very similar mean signal levels within a few numbers, averaged over the entire spectral range. The spectra show a larger change in the average signal level for a given time iteration, possibly due to thermal fluctuations between measurements. Therefore, the optimal level of thermal stabilization was selected for the spectrometer. As the measurements showed, to achieve thermal stabilization, the average signal level should be calculated for about 100 iterations in 180 milliseconds.

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