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DEFINITION OF ALCOHOL CONTENT AND EXTRACT IN THE WINES BY THE METHOD OF TWO PARAMETERS

The definition of the index of light refraction and wine density allow to calculate the volume fraction of alcohol and mass fraction of general extract. At first, using the index of light refraction and density the concentrations of water solution of saccharose are defined. The scale of dependence of saccharose concentration on the index of light refraction and wine density is called a scale of dry soluble substances as to saccharose content. Next, the values of concentration of dry soluble substances are included into formulae and calculations are made.

The fact, that alcohol increases the index of light refraction and decreases the wine density forms the foundation of the method, that's why the increase of the volume fraction of alcohol is accompanied by the increase of the difference between the indications of aerometer and refractometer. Sugars and other soluble substances also increase both the index of light refraction and wine density, so the increase of their mass fraction is accompanied by the increase of the sum of indications of aerometer and refractometer. It means that the volume fraction of alcohol may be defined by the difference of the afore mentioned indications, while the mass fraction of the extract may be calculated by their sum.

The results of the experimental research have shown that the mass fraction of general extract is approximately equal to average arithmetic indications of the scale of dry soluble substances of refractometer (C_n) and aerometer (C_p):

$$C = \frac{C_n + C_p}{2}.$$

A more precise value of the mass fraction of general extract may be received by adding insufficient table corrections.

The volume fraction of alcohol is calculated by the formula:

$$C_s = K(C_n - C_p),$$

where K is coefficient of proportionality, the value of which is in linear dependence on the mass fraction of general extract, expressed as a percentage:

$$K = 1,40 + 0,0105C.$$

Accuracy of the method is defined the precision of areometrical and refractometrical measurements. The average error of the volume fraction of alcohol equals 0,2% vol., while the error of mass fraction of the extract is 0,1%.

The possibility of making express analyses, simple devices and non-sophisticated methods of calculating allow to use the method of two parameters on enterprises and in private households.

Key words: areometer, refractometer, concentration, ethyl alcohol, dry soluble substances, extract.