Annotation

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Electrical conductivity of apple and grape juices

Measurements of specific electrical conductivity were done at constant current by using a two-electrode method. Apple juices of Red Delicious and Rennet Simirenko varieties, cherry juice of Podbelska variety and grape juice of Riesling variety were studied.

Components of juices may be divided into three groups: electrically neutral substances whose molecules do not dissociate into ions, strong electrolytes and weak electrolytes.

Electrically neutral substances of juices are sugars which form the main mass of dry soluble substances. Electrically neutral substances decrease specific electrical conductivity. They are characterized by a coefficient of conductivity reduction which equals the ratio of conductivity of the solution with electrically neutral substances to conductivity of the solution without electrically neutral substances.

The solution conductivity of strong electrolytes is proportional to solution concentration, while the solution conductivity of weak electrolytes is proportional to square root of the solution concentration. Thus, if there are strong and weak electrolytes in the solution, specific electrical conductivity has linear and non-linear components.

The juices simultaneously contain electrically neutral substances, strong and weak electrolytes, so the equation of electrical conductivity is as follows:

$$\sigma = k(\alpha c + \beta\sqrt{c}),$$

In which k is a coefficient of conductivity reduction, α and β are constants, c is a concentration of dry soluble substances.

The non-linear component of conductivity in juices is determined by organic acids, while the linear component of conductivity is determined by salts of organic acids, pectin substances and amino acids.

Key words: *specific conductivity, concentration, dry soluble substances, amino acids, organic acids.*