

Table 1. Characteristics of carbohydrates.

No	Name of carbohydrate	Content of the main substance, %, additional characteristics	The ratio of the number of bonds $\alpha(1\rightarrow4)$ to the number of pyranose rings in a sugar molecule (conditional value R)	Manufacturing firm, serial number
1	Glucose	$\geq 99.5\%$ D-(+)-glucose BIOXTRA	0	Sigma No G8270
2	Maltose	$\geq 98.0\%$ D-(+)- maltose monohydrate	0.50	Sigma-Aldrich No M5885
3	Maltotriose	98.0%	0.67	Sigma-Aldrich No M8378, lot 017K0679
4	Maltotetraose	96.0%	0.75	Sigma-Aldrich No M8253, lot 109K1271
5	Maltopentaose	96.0%	0.80	Sigma-Aldrich No M8128, lot 040M1774
6	Maltohexaose	$\geq 90.0\%$	0.83	Sigma-Aldrich No M9153,
7	Maltoheptaose	94.0%	0.86	Sigma-Aldrich No M7753, lot 079K0987
8	Amylose	98.0%	1.00	City Chemical LLC, lot 01M54
9	Amylopectin	$\geq 95.0\%$	1.00	Sigma-Aldrich, 10118, lot 1422493

form of a very small thermal effect. The discrepancy between the thermal and gravitational manifestations can be explained by the superposition of several reactions, including the secondary ones. This refers to the reaction between the primary product glucose thermolysis occurring, for example, in the gas phase. As a result, with a significant decrease in the weight of the substance, the thermal effect of the process may be small.

The condensed phase remaining after removal of the main part of the volatile products from glucose consists mainly of carbon. However, judging by the fact that the TG curve does not reach the horizontal section even at the end of heat treatment (500°C), the resulting residue is not an individual substance, but rather a substance in which organic components are preserved in addition to carbon.

The second representative of the homologous series of linear carbohydrates, the disaccharide maltose, when heated should behave like glucose [1]. Indeed, this saccharide resembles glucose in its behavior, but at the same time it differs from it. As in the case of glucose, there are three endo-peaks on the DSC curve of maltose, but not two,

like glucose, but three stages of weight loss (Fig. 1(b)).

The lowest temperature endo-effect on the DSC curve of maltose with a minimum of about 128°C is most intense. During it, water is released from the substance in an amount of about 4 %, which corresponds to the monohydrate composition of the starting saccharide. Since the anhydrous disaccharide melts at 107°C, at the temperature of the endothermic effect the substance passes into a liquid state.

The second endo-peak in the DSC maltose curve is shifted to higher temperatures compared to the same effect of glucose. On the TG line, it corresponds to a reduction in weight in the form of a distinct step, which indicates the beginning of destruction. It is likely that at this stage the same transformations occur in maltose as in glucose.

The third stage of transformations in the disaccharide is expressed on the DSC curve much stronger than that of glucose, although the weight loss on it is almost the same.

If a small heat absorption with significant decom-