Table 1. Characteristics of carbohydrates used for the research.

| No | Trivial (common) name of carbohydrate | Content of the main sustance, %, additional characteristics | The ratio of the number of bonds α (1-4) to the number of pyranose rings in the sugar molecule | Supplier company, serial number |
|---|---|---|---|---|
| 1 | Glucose | ≥ 99.5 % D- (+) - glucose BIOXTRA | 0.0 | Sigma No G8270 |
| 2 | Maltose | ≥ 98 % D - (+) - maltose monohydrate | 0.50 | Sigma-Aldrich No M5885 |
| 3 | Maltotriose | 98 % | 0.67 | Sigma-Aldrich No M8378, Lot 017K0679 |
| 4 | Maltotetraose | 96 % | 0.75 | Sigma-Aldrich No M8253, Lot 109K1271 |
| 5 | Maltopentaose | 96 % | 0.80 | Sigma-Aldrich No M8128, Lot 040M1774 |
| 6 | Maltohexaose | ≥ 90 % | 0.83 | Sigma-Aldrich No M9153 |
| 7 | Maltoheptaose | 94 % | 0.86 | Sigma-Aldrich No M7753, Lot 079K0987 |
| 8 | Amylose | 98 % | 1.00 | City Chemical LLC, Lot 01M54 |
| 9 | Amylopectin | ≥ 95 % | 1.00 | Sigma-Aldrich, 10118, Lot 1422493 |

Table 2. Samples of starches studied.

| No | Manufacturer | Producing country |
|---|---|---|
| 1 | Birkamidon | Poland |
| 2 | Windmile | Holland |
| 3 | KMC Brander | Denmark |
| 4 | Birkamidon GmbH | Germany |
| 5 | Merille | France |

these substances were recorded on FT-IR Nicolet 6700 spectrometer of Thermo Electron Corporation in the mode of disturbed total internal reflection. A horizontal prefix ZnSe 45° with a 12-fold reflection of the infrared laser beam at a depth of penetration into the sample of ~ 2 μm was used. The spectra were recorded at a room temperature with a resolution of 4 $cm^{-1}$, and a measurement accuracy of ± 0.5 $cm^{-1}$. The number of scans referred to 32. The structure of the individual spectral bands was analyzed using Origin Pro 8 program resources.

## RESULTS AND DISCUSSION

The infrared spectrum of glucose monosaccharide (Fig. 1), as an ancestor of the studied series of compounds, is identical to those described in the literature [1 - 5], and also presented in the NIST database. According to the authors' interpretations the valence vibrations of the C-O (νCO), C-C (νCC) and C-C-H (νCOH) chemical bonds are the most pronounced in the spectrum of the substance. A similar type of vibrations of O-H and C-H bonds is found in the form of relatively weak bands. The deformation vibrations of C-C-O and C-H bonds are somewhat more intense when compared to those of O-C-H (δOCH), C-O-H (δCOOH) and C-C-H (δCCH) bonds. The second representative of the disaccharide series, maltose, can be considered as a condensation