ABSTRACT

The aim of this doctoral dissertation was to obtain new, original building blocks containing a carbohydrate fragment. The first group of synthesized compounds are *C*-glycosyl-aminoethyl sulfide derivatives with potentially interesting biological properties. The second is sugar derivatives of Lacosamide - the latest generation anti-epileptic drug. In the synthesis of both classes of compounds, in addition to carbohydrates, optically pure aziridines were used, which, subjected to a nucleophilic ring opening reaction, led to the desired connections.

The work has been divided into three main chapters - Literature part, Discussion of own research results and Experimental part.

In the literature part, two main subsections have been distinguished. The first one presents the literature methods of (*R*)-Lacosamide synthesis and agrees on the biological activity of its previously synthesized derivatives. In the second, the aziridine ring opening reactions with carbon, oxygen, sulfur and nitrogen nucleophiles are discussed.

Another part of the work consists of own research, which describes a simple and stereoselective method for the synthesis of *C*-glycosyl-aminoethyl sulfide derivatives in a sequence of transformations involving the reactions of tributyltin glycyl derivatives with aziridinecarboaldehyde, followed by regioselective ring opening of chiral aziridine with thiophenol. The absolute configurations of the resulting diastereoisomeric products were also determined by ^{1}H NMR spectroscopy. In the second part, a new, previously unknown modification of Lacosamide was proposed, consisting in replacing the benzyl substituent in its structure with a sugar fragment. Lacosamide derivatives were obtained in the condensation reaction of 2-aminoglucopyranose with aziridinecarboxylic acids, followed by the opening of the aziridine ring in the obtained amides with selected sulfur and oxygen nucleophiles.

The experimental part contains descriptions of all performed syntheses along with the characteristics of the obtained compounds based on the analysis of ^{1}H and ^{13}C NMR spectra, DEPT, ^{1}H-^{1}H COSY, ^{1}H-^{13}C HMQC and mass spectrometry.