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SYNTHESIS OF A NEW CLASS OF FLUORO-THIO-NUCLEOSIDES WITH POTENTIAL ANTIVIRAL AND ANTICANCER ACTIVITY

ABSTRACT

In recent years, a large number of investigations has been directed towards the development of drugs for the treatment of viral infections and cancer. The vast majority of approved drugs are analogues of natural nucleosides. Modified nucleosides play an important role in chemotherapy of viral diseases and cancer. The fact that many nucleosides have remarkable antiviral and anticancer activities, makes it important to conduct research on these bioactive agents and their biological properties. Therefore, considering the urgent need for the development of new chemotherapeutic agents and based on the significant pharmacological properties of modified nucleoside analogues, the synthesis of new series of fluorinated thionucleosides, with modified five-and six-membered carbohydrate rings, took place.

Based on the specific chemical properties and the great biological activity of furano- and pyranonucleosides, as a result of both the introduction of fluorine into the sugar moiety and containing sulfur in the sugar ring or as a substituent, while considering the interesting biological properties of fluorinated keto unsaturated pyranonucleoside analogues, in the present work, the synthesis of new series of fluorinated thionucleosides was described.

Initially, the synthesis of a new class of nucleoside analogues, fluoro-5′-thiofuranonucleosides, which combine the presence of fluorine and sulfur, as substituents of the sugar moiety, was studied. Then, the synthesis of new fluorinated 6′-thiopyranonucleosides, in which the presence of a six-membered sugar moiety is combined with the activity of fluorine and sulfur, was described, while the synthesis of unsaturated fluoro-6′-thio-ketonucleosides, possessing fluorine, sulfur and six-membered ring accompanied by the simultaneous presence of a double bond and a keto group, was studied. Finally, the synthesis of

two new classes of fluorinated thionucleosides, followed. Fluorinated 5′-thiopyranonucleosides, which combine the introduction of sulfur in the six-membered sugar ring with the simultaneous presence of fluorine, as a substituent, and the corresponding 5′-thio-ketopyranonucleosides, which possess fluorine and sulfur in the six-membered ring together with a keto group, were synthesized.

In the present thesis, the results of the biological studies of the newly synthesized compounds were also accomplished, concerning their antiviral and anticancer activity.