SYNTHESIS AND BIOLOGICAL ACTIVITY OF NOVEL SN(IV) COMPLEXES WITH SCHIFF BASE BEARING ANTIOXIDANT MOIETY

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Organotin compounds possess antitumor properties [1]. The mechanisms of antiproliferative activity of tin compounds are based on the ability of the Sn atom to bind to SH-groups of proteins and to promote oxidative stress. A decrease in undesirable nonspecific toxicity towards healthy cells is possible due to the introduction of a fragment of 2,6-di-*tert*-butylphenol – a mimetic of the natural antioxidant vitamin E – into the structure of the molecule.

Novel complexes of 2-(N-3',5'-di-*tert*-butyl-4'-hydroxyphenyl) – iminomethylphenol (**L**) with Me₂SnBr₂ (**1**), Ph₃SnBr (**2**) and Bu₂SnCl₂ (**3**) have been synthesized. Single crystals of compounds **3** and **L** were obtained, the structures of which were studied by X-ray diffraction. It was found that the coordination polyhedron around the metal center in compound **3** is an octahedron, and the ligand forms a bond with the Sn atom due to the presence of the O atom (Fig. 1).

Fig. 1. Molecular structure of complex **3**.

The antioxidant activity of compounds **1-3** was investigated using the CUPRAC and DPPH tests. It was found that the Sn(IV) complexes are more active than the initial ligand **L** and the standard Trolox.

Cytotoxicity of **1-3** was investigated on the cell lines of human colon cancer HCT-116 and human breast adenocarcinoma MCF-7 in the MTT test (Table 1).

Tab. 1

IC₅₀ values (μM), MTT-test

Compound	HCT-116	MCF-7
1	58 ±14	81±10
3	0.2±0.1	0.3±0.1

It was discovered that the cytotoxicity of complex **2** lies in the nanomolar range, which indicates the critical role of the organotin fragment in mechanism of action of polyfunctional compounds.

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References

- [1] T. Antonenko, D. Shpakovsky, M. Vorobyov, et.al., Applied Organometallic Chemistry, 2018, 32, e4381.