Organotin complexes of pyruvic acid thiosemicarbazone: synthesis, crystal structures and antiproliferactive activity of neutral and cationic diorganotin complexes.

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Streszczenie

The synthesis and spectral characterization of novel neutral and cationic organotin complexes with pyruvic acid thiosemicarbazone, H_2pt (**1**), [S*n*Ph_2(pt)] (**2**), [$SnMe_2$(Hpt)(H_2O)]Cl (**3**) and [$SnPh_2$(Hpt)(H_2O)]Cl (**4**) are reported. The crystal structure of the complexes [S*n*Ph_2(pt)] (**2**) and [$SnMe_2$(Hpt)(H_2O)]Cl (**3**) have been solved by single-crystal X-ray diffraction. The crystal structure of complex **2** showed that the ligand is doubly deprotonated at the oxygen and amide nitrogen atoms and is coordinated to the $SnPh_2$ fragment *via* two five-membered chelate rings. The monomers of **2** are linked through intermolecular hydrogen bonds of C−H–O type and through π−π intermolecular interactions. The crystal structure of [$SnMe_2$(Hpt)(H_2O)]Cl (**3**) showed that the ligand is mono-deprotonated at the oxygen atom and is coordinated to the $SnMe_2$ fragment *via* two five-membered chelate rings. The counter ion chloride is participated in intermolecular hydrogen bonds. An extended network of intermolecular hydrogen bonds leads to aggregation and a supramolecular assembly. The IR and NMR spectroscopic data of the complexes are reported. The *in vitro* cytotoxic activity has been evaluated against the cells of three human cancer cell lines: MCF-7 (human breast cancer cell line), T-24 (bladder cancer cell line), A-549(non-small cell lung carcinoma) and a mouse L-929 (a fibroblast-like cell line cloned from strain L). The most active of all was found the diorganotin complex **2**. The cytotoxic activity shown by these compounds against all these cancer cell lines indicates that coupling of **1** with R_2Sn(IV) metal center result in metallic complexes with important biological properties and remarkable cytotoxic activity, since they are display IC_{50} values in a μM range the same or better to that of the antitumor drug *cisplatin*. Compound **2** is considered as agent with potential antitumor activity, and can therefore be candidate for further stages of screening *in vitro* and/or *in vivo*.