Novel complexes of tris(aminomethyl)phosphanes with platinum(II) : structural, spectroscopic, DFT and biological activity studies.

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Streszczenie

Two new platinum(II) complexes with tris(aminomethyl)phosphanes: [*trans*-$PtCl_2\{P(CH_2N(CH_2CH_2)_2NCH_3)_3\}_2$] (**1Pt**) and [*trans*-$PtCl_2\{P(CH_2N(CH_2CH_2)_2O)_3\}_2$] (**2Pt**) were prepared and characterized with NMR and UV–Vis spectroscopies. Their structures were investigated by X-ray crystallography and DFT methods. TDDFT calculations were employed to interpret the electronic spectra of the complexes. Obtained results are not unequivocal, however population analysis indicate, that the character of HOMO and HOMO−1 orbitals depend strongly on the electron donoring properties of the phosphane ligand. Biological activity of **2Pt** complex, which is more stable and more soluble in polar solvents than **1Pt**, was examined *in vitro* on the Vero cell line (IC_{50} = 12.5 μM). At higher concentrations it induces apoptosis, probably due to changes of the cell cytoskeleton. Luminescence quenching studies and CD spectroscopy of interactions of **2Pt** with HSA and BSA indicate that these albumins bind the complex slightly – without altering their tertiary structures, however HSA interacts with **2Pt** noticeably stronger than BSA. It was also found that **2Pt** does not cleave supercoiled pUC18 plasmid.

Słowa kluczowe

Platinum (II) complexes, Tris(aminomethyl)phosphanes, Cytotoxicity, DFT studies, Structural studies

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