Copper(I) complexes with phosphine derived from sparfloxacin. Part I – structures, spectroscopic properties and cytotoxicity.

Autorzy

Urszula K. Komarnicka

Radosław Starosta

Agnieszka Kyzioł

Małgorzata Jeżowska-Bojczuk

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Streszczenie

In this paper we present new copper(I) iodide or copper(I) thiocyanate complexes with hydroxymethyldiphenylphosphine ($PPh_2(CH_2OH)$) or phosphine derivatives of sparfloxacin, a 3rd generation fluoroquinolone antibiotic agent ($PPh_2(CH_2–Sf)$) and 2,9-dimethyl-1,10-phenanthroline (**dmp**) or 2,2′-biquinoline (**bq**) auxiliary ligands. The synthesised complexes were fully characterised by NMR and UV-Vis spectroscopy as well as by mass spectrometry. Selected structures were additionally analysed using X-ray and DFT methods. All complexes proved to be stable in solution in the presence of water and atmospheric oxygen for several days. The cytotoxic activity of the complexes was tested against two cancer cell lines (CT26 – mouse colon carcinoma and A549 – human lung adenocarcinoma). Applying two different incubation times, the studies enabled a preliminary estimation of the dependence of the selectivity and the mechanism of action on the type of diimine and phosphine ligands. The results obtained showed that complexes with $PPh_2(CH_2–Sf)$ are significantly more active than those with $PPh_2(CH_2OH)$. On the other hand, the relative impact of diimine on cytotoxicity is less pronounced. However, the **dmp** complexes are characterised by strong inhibitory properties, while the **bq** ones are rather not. This confirms the interesting and promising biological properties of the investigated group of copper(I) complexes, which undoubtedly are worthy of further biological studies.

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