

Vanadium Bisphenolato Complexes of Different Oxidation States as Anticancer Agents

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Since the discovery of the anticancer activity of cis-platin there is a growing interest in studying transition metal complexes as potential anticancer agents. One transition metal that was studied in this context is titanium(IV). Families of Ti(IV) complexes such as budotitane and titanocene dichloride reached clinical trials, but failed, mainly due to their high hydrolysis rate and the formation of unidentified aggregates in water. In our laboratory we study a different family of complexes of highly promising features regarding their cytotoxicity and hydrolytic stability. These complexes contain tetradentate bis(phenolato), ligands with oxygen and nitrogen as the donor atoms to the metal centre. Applying different changes to these complexes allows us to characterise the effect of different parameters on the anticancer activity and the hydrolytic stability of these complexes. One such line of changes includes studying this family of ligands with a different transition metal such as vanadium. Vanadium is located next to titanium in the periodic table, and unlike titanium, has three stable oxidation states. Some vanadium compounds are used as a nutritional supplement, and other compounds have been found to possess anticancer activity. In this work we synthesise and characterise vanadium complexes with the oxidation states +3, +4, and +5, and examine their anticancer activity and hydrolytic behaviour. The connection between these activities, and the comparison to the parallel Ti(IV) complexes will be discussed.

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