Antimony(V) and Bismuth(V) Complexes of Lapachol: Synthesis and Cytotoxic Activity

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Antimony(V) and bismuth(V) complexes of lapachol have been synthesized by the reaction of Ph3SbCl2 or Ph3BiCl2 with lapachol (Lp) and characterized by several physicochemical techniques such as IR, and NMR spectroscopy and X-ray crystallography. The compounds contain six-coordinated antimony and bismuth atoms. The antimony(V) complex is a monomeric derivative, (Lp)(Ph3Sb)OH, and the bismuth(V) complex is a dinuclear compound bridged by an oxygen atom, (Lp)2(Ph3Bi)2O. Both compounds inhibited the growth of a chronic myelogenous leukemia cell line and the complex of Bi(V) was about five times more active than free lapachol. This work provides a rare example of an organo-Bi(V) complex showing significant cytotoxic activity.