Mixed-ligand complexes of technetium and rhenium with tridentate benzamidines and bidentate benzoylthioureas

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Abstract: Mixed-ligand complexes of technetium(V) or rhenium(V) containing tridentate N-[(dialkylamino)(thiocarbonyl)]benzamidine (H_2L^1) and bidentate N,N-dialkyl-N'-benzoylthiourea (HL^2) ligands were formed in high yields when $(NBu_4)[MOCl_4]$ (M = Tc or Re) or $[ReOCl_3(PPh_3)_2]$ was treated with mixtures of the proligands. Other approaches for the synthesis of the products are reactions of $[MOCl(L^1)]$ complexes with HL^2 or compounds of the composition $[ReOCl_2(PPh_3)(L^2)]$ with H_2L^1. The resulting air-stable $[MO(L^1)(L^2)]$ complexes possess potential for the development of metal-based radiopharmaceuticals. $[TcO(L^1)(L^2)]$ complexes are readily reduced by PPh_3 with formation of $[Tc(L^1)(L^2)(PPh_3)]$. The resulting Tc^{III} complexes undergo two almost-reversible oxidation steps corresponding to one-electron transfer processes. ?? 2009 Wiley-VCH Verlag GmbH & Co, KGaA.

Author Keywords: Rhenium; S,N,O ligands; S,O ligands; Structure elucidation; Synthetic methods; Technetium

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