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New complexes containing 2-mercaptobenzothiazole and different dinitrogen or phosphorous aromatic donors: Synthesis, characterization and DNA interaction

Sahar I Mostafa
Mansoura University, Egypt

The synthesis of new complexes of 2-mercaptobenzothiazole (Hmbt), $[Zn(L)(mbt)(H_2O)_2]Cl$, [M(mbt)(L)]Cl (M(II)=Pd, Pt; L=bpy, phen), $[M(mbt)(PPh_3)Cl]$ (M(II)=Pd, Pt), $[Zn(PPh_3)_2(Hmbt)_2Cl_2]$, $[Ru(mbt)_2(H_2O)_2]$, $[Ru(PPh_3)_2(mbt)2]$, $[Ir(mbt)_3]Cl$, $[O_sO_2(mbt)_2]$, $[Rh(mbt)_3(H_2O)_3]$, [Ag(Hmbt)(mbt)] and $[Au(mbt)_2Cl]$, are reported. Their structures are discussed on the bases of spectroscopic [(IR, Raman, UV-vis, NMR (^1H, ^{13}C and ^{31}P) and mass]), elemental analysis, molar conductivity and thermal degradation measurements. The *in vitro* anticancer activity of Hmbt and its complexes, $[Zn(L)(mbt)(H_2O)_2]Cl$, [M(L)(Hmbt)]Cl (M(II)=Pd, Pt; L=bpy, phen) and [Ag(Hmbt)(mbt)], were evaluated against human breast cancer (MDA-MB231) and human ovarian cancer (OVCAR-8) cell lines. The CT-DNA-binding properties of $[Zn(mbt)(phen)(H_2O)_2]Cl$, [Pd(Hmbt)(phen)]Cl, [Pt(L)(Hmbt)]Cl (L=bpy, phen) and $[Au(mbt)_2Cl]$, were studied using circular dichroism (CD) spectroscopy. The CD spectral data are further supported by UV-visible titrations of [Pt(phen)(mbt)]Cl, [Pd(phen)(mbt)]Cl and $[Zn(mbt)(phen)(H_2O)_2]Cl$ with CT-DNA. The results indicate that the complexes may have intercalative CT-DNA binding capabilities.

Biography

Sahar I Mostafa is a Professor of Inorganic Chemistry at Chemistry Department, Faculty of Science, Mansoura University, Egypt since 2008, Visiting Professor at Chemistry Department, McGill University, Montreal, Canada since 2009. She has developed several aspects of O,O; N,O; N,S and N,O,S low cytotoxic-organic transition metal complexes. Her current research interest is on the synthesis, characterization, reactivity and applications of O,O; N,O; N,S and N,O,S low or non-cytotoxic organic transition metal complexes in particular for biology, particularly, anticancer, for catalytic oxidation of organic substrates using transition metal complexes at higher oxidation states and catalytic epoxidation of olefins using transition metal complexes immobilized on Modified Solid Supports (MSS) such as zeolite, silica, cellulose and chitosan in heterogeneous catalytic systems. She has written several chapters in books including MSS transition metal complexes. She is the principal author of about 50 publications and co-author of 20 publications. She is a Member in the Editorial Boards and Reviewer in many Inorganic, Bioinorganic and Catalysis journals. Her academic efforts have been recognized nationally by Al-Azhar University Award (2007, 2009, 2011), Who's is Who's in the world (2008) and Lecturer Award from Mansoura University for Excellence in Graduate Teaching (1992).

sihmostafa@yahoo.com

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