Synthesis, characterization and cytotoxicity of Mn(II) and Cu(II) complexes with *N*-substituted glycine hydrazone

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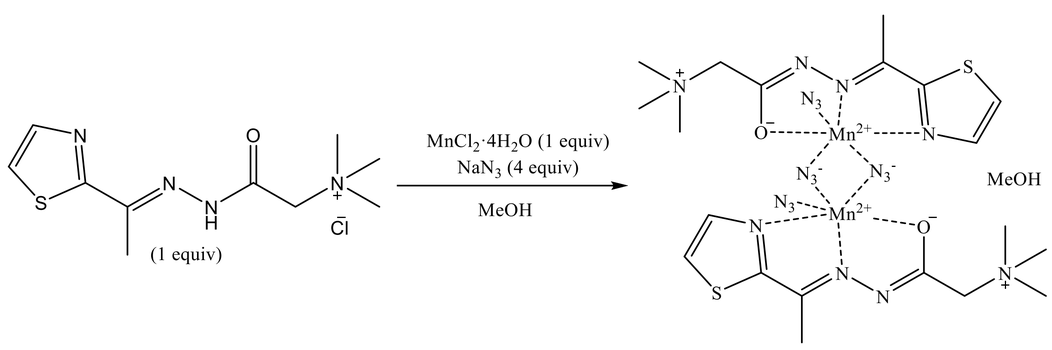
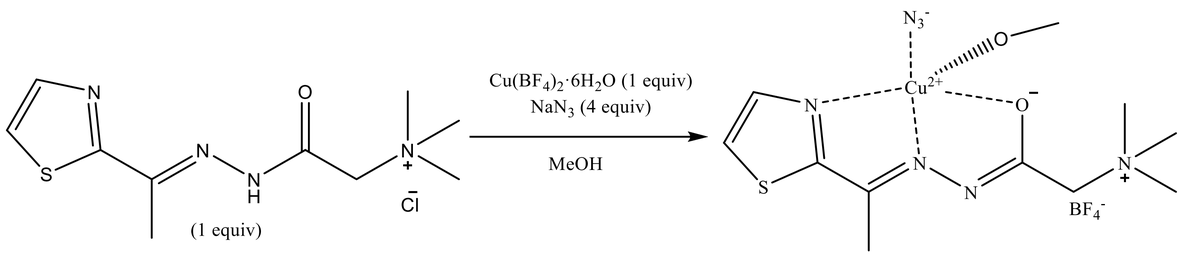
Synthesis:

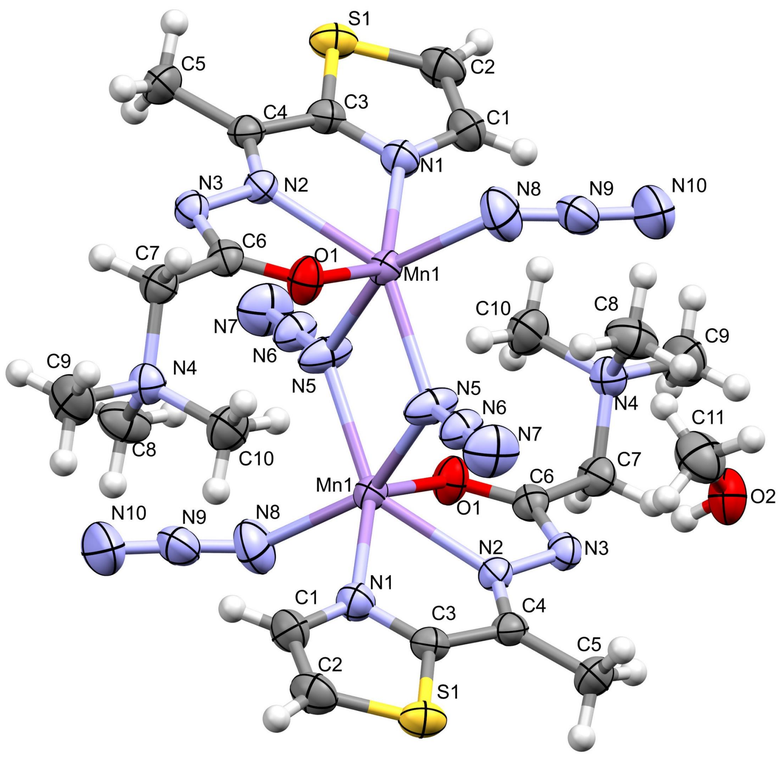


Scheme 1: Synthesis of complex $[Mn_2\mathbf{L}_2(\mu\text{-}1,1\text{-}N_3)_2(N_3)_2]MeOH$



Scheme 2: Synthesis of complex $[Cu\mathbf{L}(N_3)(MeOH)]BF_4$

Structure:

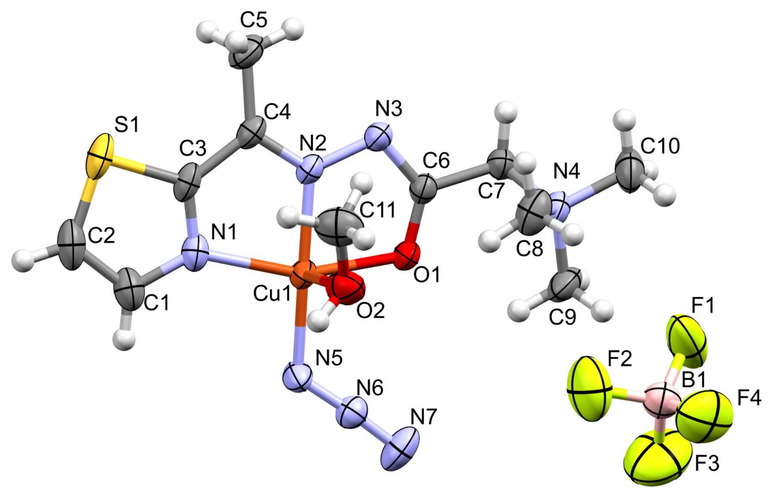


Picture 1: Graphical presentation of the molecular structure of $[Mn_2\mathbf{L}_2(\mu\text{-}1,1\text{-}N_3)_2(N_3)_2]MeOH$. Thermal ellipsoids are drawn at the 40% probability level

Table 1: Selected bond lengths (Å) and angles (°) for complex $[Mn_2\mathbf{L}_2(\mu\text{-}1,1\text{-}N_3)_2(N_3)_2]MeOH$, with esd's in parentheses

Mn(1)–N(8)	2.112(2)
Mn(1)–O(1)	2.1879(16)
Mn(1)–N(5)	2.229(2)
Mn(1)–N(5)	2.2425(19)
Mn(1)–N(2)	2.2500(18)
Mn(1)–N(1)	2.3668(19)
N(8)–Mn(1)–O(1)	98.88(9)
N(8)–Mn(1)–N(5)	147.86(10)
O(1)–Mn(1)–N(5)	107.66(8)
N(8)–Mn(1)–N(2)	121.21(9)
O(1)–Mn(1)–N(2)	69.51(6)
N(5)–Mn(1)–N(2)	85.67(7)
N(8)–Mn(1)–N(1)	86.84(9)
O(1)–Mn(1)–N(1)	134.91(7)
N(5)–Mn(1)–N(1)	87.04(7)
N(2)–Mn(1)–N(1)	69.46(7)

Structure:

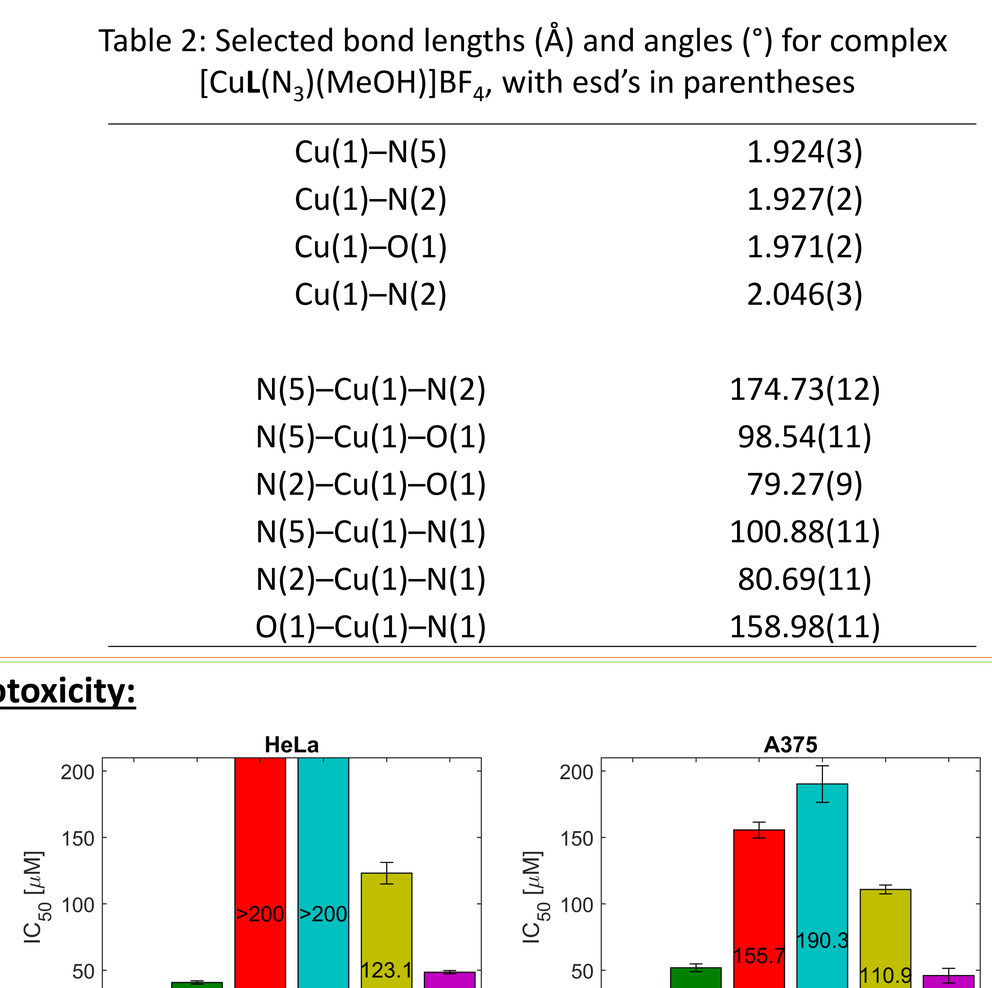


Picture 2: Graphical presentation of the molecular structure of $[Cu\mathbf{L}(N_3)(MeOH)]BF_4$. Thermal ellipsoids are drawn at the 40% probability level.

Table 2: Selected bond lengths (Å) and angles (°) for complex $[Cu\mathbf{L}(N_3)(MeOH)]BF_4$, with esd's in parentheses

Cu(1)–N(5)	1.924(3)
Cu(1)–N(2)	1.927(2)
Cu(1)–O(1)	1.971(2)
Cu(1)–N(2)	2.046(3)
N(5)–Cu(1)–N(2)	174.73(12)
N(5)–Cu(1)–O(1)	98.54(11)
N(2)–Cu(1)–O(1)	79.27(9)
N(5)–Cu(1)–N(1)	100.88(11)
N(2)–Cu(1)–N(1)	80.69(11)
O(1)–Cu(1)–N(1)	158.98(11)

Cytotoxicity:



$C_1 = [Cu\mathbf{L}(N_3)(MeOH)]BF_4$; $C_2 = [Mn_2\mathbf{L}_2(\mu\text{-}1,1\text{-}N_3)_2(N_3)_2]MeOH$; L* = NaN_3;
$M_1 = Cu(BF_4)_2\cdot 6H_2O$; $M_2 = MnCl_2\cdot 4H_2O$

Conclusion: Mn(II) and Cu(II) complexes with *N*-substituted glycine hydrazone ligand were synthesized and characterized. Complexes exerted strong to moderate cytotoxic activities against tested malignant cell lines. Cu(II) complex showed higher cytotoxic effects on malignant cells when compared to Mn(II) complex, except against MCF7 cells. The both complexes exhibited higher cytotoxicity in comparison with its ligand.

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