

Chelation Behavior of bis(1-(pyridin-2-yl)ethylidene)-Malonohydrazide towards Some Transition Metal Ions

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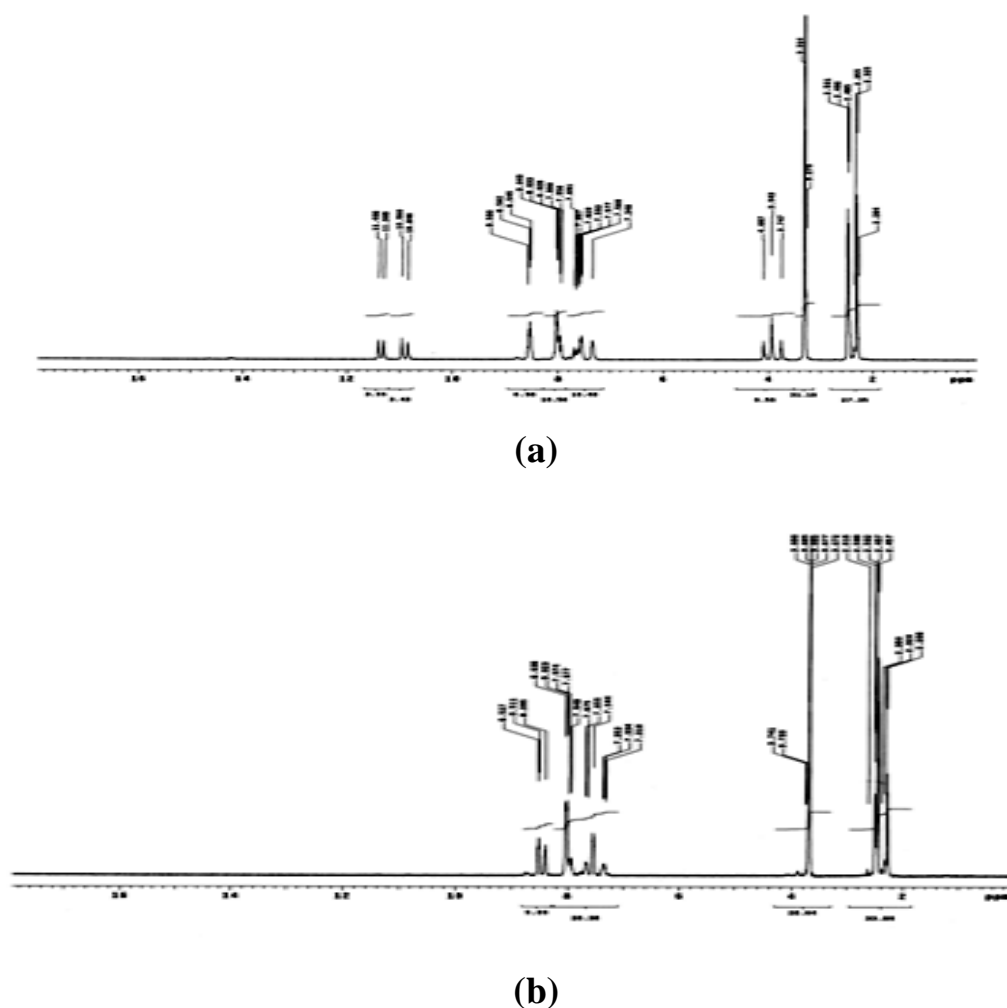


Figure 1S. ¹H NMR spectra of [Ag(H₂L)NO₃].H₂O (a) in DMSO (b) in D₂O

Table 1S. Magnetic moments, electronic spectral bands, molar absorptivity and ligand field parameters of H₂L and its complexes

Compound	μ_{eff} (B.M.)	Solvent DMF(Nujol)	Intraligand and d-d transitions cm^{-1}	Molar absorptivity, ($\epsilon = \text{L mol}^{-1} \text{cm}^{-1}$)	Ligand field parameters		
					Dq (cm^{-1})	B (cm^{-1})	β
H ₂ L	-	DMF	33557,31446,27027	-			
		Nujol	38168,32467,26596	-			
[Cu(H ₂ L)(OAc) ₂].H ₂ O	1.43	DMF	33333,28571,23923, 14164	(2643,2596,2407, 1602)*			
		Nujol	26738,25510,20325, 17668,14577				
[Co ₂ (L)(OAc) ₂ (H ₂ O) ₂].H ₂ O	3.41	DMF	41667,36232,28249, 26316, 17065	(2524,1656,1243, 479)*	976.66	745.68	0.77
		Nujol	26596,25000,21929, 21008, 18050,16129				
[Ni(H ₂ L)(OAc) ₂ H ₂ O].H ₂ O	3.64	DMF	33557,31645,28248, 27472,24876,24154		739.01	869.42	0.83
		Nujol	26738,24876,22831, 19380,12315				
[Fe(HL)Cl ₂ (H ₂ O)]	4.70	DMF	36232,31446,27778, 25773, 19084	(2565,384,249)*			
		Nujol	30303,25773, 19685,17921,16287				
[Cr(H ₂ L)Cl ₃].2H ₂ O	4.82	DMF	35971,31447,28289, 25510, 18657	(2609,2565,2083)*	1865.70	668.04	0.73
		Nujol	29412,25773,21097, 17921,15773				
[Mn(H ₂ L)Cl ₂ (H ₂ O)].2H ₂ O	7.47	DMF	33557,31446,28249, 27472,24752,22936	(2586,2485,618)*			
		Nujol	26596,24272, 17606				
[(VO) ₂ (L)(OH) ₂].2H ₂ O	1.59	DMF	33333,31645,28248, 27472,23809, 12788	(2586,1524,1178)*			
		Nujol	25252,23923,22421, 21277, 18248,14164				
[Cd(H ₂ L)(OAc) ₂].2H ₂ O	-	DMF	34014,27933,24272	(2141,1392)*			
		Nujol	29762,26178,24154	-			
[Ag(H ₂ L)NO ₃].EtOH	-	DMF	36496,33557,31465, 23255				
		Nujol	29412,25773,21097	-			

* ϵ ($\text{L mol}^{-1} \text{cm}^{-1}$) values determined in DMSO.

Table 2S. The stages of decomposition, temperature range, decomposition product and the weight loss percentages of metal complexes

Complex	Temp. Range, °C	Removed species	Wt. Loss	
			Found %	Calcd %
[Cu(H ₂ L)(OAc) ₂].H ₂ O	37-138	-(H ₂ O)	3.84	3.35
	139-399	-(2OAc) + C ₅ H ₄ N	36.58	36.46
	400-602	-(C ₅ H ₄ N+CONH+CNH+CH ₂ +2CNCH ₃)	45.00	45.42
	602-800	-(CuO) (Residue)	14.58	14.77
[Co ₂ (L)(OAc) ₂ (H ₂ O) ₂].H ₂ O	39-88	-(H ₂ O)	2.68	2.87
	88-201	-(2H ₂ O +OAc)	15.02	15.17
	297-479	-(C ₅ H ₄ N+OAc+CNCH ₃)	28.21	28.44
	479-602	-(C ₅ H ₄ N+CNCH ₃)	19.33	19.02
	602-748	-(CN+ CH ₂)	10.55	10.75
	748-800	-2(CoO) (Residue)	24.01	23.93
[Ni(H ₂ L)(OAc) ₂ H ₂ O].H ₂ O	39-209	-(H ₂ O)	3.70	3.27
	311-425	-(C ₅ H ₄ N+H ₂ O+2OAc)	38.49	38.86
	425-650	-(2CNCH ₃ +CONH+CNH+CH ₂ +C ₅ H ₄ N)	44.83	44.32
	650-800	-NiO (Residue)	12.98	13.55
[Fe(HL)Cl ₂ (H ₂ O)]	42-122	-(H ₂ O)	3.09	3.74
	123-369	-(C ₅ H ₄ N+ CNCH ₃ +2Cl)	39.82	39.41
	500-647	-(CH ₂ +CONH+CON)	19.50	19.11
	647-794	-(CNCH ₃ + C ₅ H ₄ N)	23.45	23.24
	794-800	-FeN (Residue)	14.14	14.49
[Cr(H ₂ L)Cl ₃].2H ₂ O	39-115	-(2H ₂ O)	7.34	6.76
	173-270	-(2Cl)	13.34	13.31
	271-338	-(Cl)	6.11	6.66
	338-431	-(C ₅ H ₄ N)	14.55	14.66
	431-520	-(CNCH ₃ +CONH)	15.74	15.78

	520-658	-(C ₅ H ₄ N+CCH ₃ +CONH+CH ₂)	30.48	30.44
	658-800	-CrN (Residue)	13.44	12.39
[Mn(H ₂ L)Cl ₂ (H ₂ O)].2H ₂ O	39-109	-(2H ₂ O)	7.51	6.95
	206-408	-(C ₅ H ₄ N+H ₂ O+Cl)	25.04	25.38
	408-543	-(CNCH ₃ +Cl)	14.28	14.76
	543-758	-(C ₅ H ₄ N+CNCH ₃ +CONH+CNH+CH ₂)	39.57	39.21
	758-800	-MnO (Residue)	13.60	13.69
	38-150	-2(H ₂ O)	6.34	6.67
[(VO) ₂ (L)(OH) ₂].2H ₂ O	257-371	-(C ₅ H ₄ N+2OH)	20.88	20.75
	372-458	-(CNCH ₃ +C ₅ H ₄ N)	22.56	22.05
	458-568	-(CNCH ₃ +2CN+CH ₂)	19.30	19.82
	568-800	-2VO ₂ (Residue)	30.92	30.70
[Cd(H ₂ L)(OAc) ₂].2H ₂ O	39-117	-(2H ₂ O)	6.09	5.95
	117-273	-(2OAc)	19.51	19.52
	273-491	-(C ₅ H ₄ N+CNCH ₃ +CONH)	26.26	26.81
	492-599	-(CNH+CH ₂)	6.72	6.79
	600-783	-(C ₅ H ₄ N+CNCH ₃)	19.67	19.70
	783-800	-(CdO) (Residue)	21.75	21.23