

TABLE 1S: Characteristic IR spectral bands (cm⁻¹) for Ag(I)- pyrazolone (HL¹⁻⁴) complexes

Compounds	$\nu_{asNH_2}, \nu_{sNH_2}, \nu_{OH}$	ν_{NH_2}	$\nu_{C=O}$	$\nu_{(C=N)s}$	δ_{NH_2}	δ_{NH_2}	$\nu(NO_3)(ion)$	ν_{M-N}
1) HL ¹	3410,3333	3184, 3160	1671	1586, 1565	1625	1493, 1442	-----	----
2) [Ag (HL ¹) ₂](NO ₃)	3319, 3247	3191	1671	1570, 1566	1595	1494,1420	1380	530
3) HL ²	3420, 3330	3195, 3180	1663	1599	1644	1522, 1488	-----	----
4) [Ag (HL ²) ₂](NO ₃)	3400, 3327	3205, 3192	1683	1591, 1583	1630	1487,	1381	560
5) HL ³	3380, 3335	3190, 3177	1667	1559,1530	1633	1505, 1464	-----	----
6) [Ag (HL ³) ₂](NO ₃)2H ₂ O	3410 (B.C),	3181 (B.C)	1668	1559, 1504	1629	1505, 1440	1384	511
7) HL ⁴	3456, 3356	3219, 3190	1672	1589, 1512	1637	1480, 1470	-----	----
8) [Ag (HL ⁴) ₂](NO ₃)	3445, 3338	3197(B)	1685	1573, 1512	1612	1470	1384	509

B.C, Broad band centered

TABLE 2S: Plausible TGA data for Ag(I)- pyrazolone (HL¹⁻⁴) complexes

Compound	Steps	Temp. range(°C)	Decomposed	Weight loss; Calcd (Found %)
1) HL ¹	1 st	150.2 - 250.5	- NH ₃ +CO	22.17(22.16)
	2 nd	251.1 - 560.2	- 2NH ₃ +2CN	42.37(42.37)
	Residue		6C	35.46(35.47)
2) [Ag (HL ¹) ₂](NO ₃)	1 st	155.3 - 280.4	-NO ₂ +H ₂ CO ₃ +0.5H ₂	18.92(19.01)
	2 nd	282.3- 571.8	-C ₆ H ₆ +3NH ₃	22.42(22.38)
	3 rd	572.0 - 770.2	-4CN	18.06(18.06)
	Residue		7C + AgN ₃	40.60(40.55)

3) HL^2	1 st	140.1 - 310.3	- $\text{NH}_3 + \text{CO} + \text{HCl}$	34.29(34.41)
	2 nd	311.2 - 620.4	- $\text{N}_2\text{H}_4 + 2\text{CN}$	35.38(35.30)
	Residue		6C	30.33(30.29)
4) $[\text{Ag}(\text{HL}^2)_2](\text{NO}_3)$	1 st	162.1 - 350.1	- $\text{NO}_2 + \text{C}_2\text{O}_3 + \text{Cl}_2$	29.28(29.28)
	2 nd	350.2 - 610.1	- $\text{C}_{12}\text{H}_{10} + \text{NH}_2 + \text{N}_2$	30.73(30.76)
	3 rd	610.3 - 810.8	- 4HCN	16.76(16.76)
	Residue		AgN_3	23.23(23.20)
5) HL^3	1 st	157.6 - 301.2	- $\text{NH}_3 + \text{CO} + \text{N}_2$	33.63(33.62)
	2 nd	301.2 - 631.7	- $\text{N}_2\text{H}_4 + \text{CH}_4$	22.14(22.21)
	Residue		8C	44.23(44.17)
6) $[\text{Ag}(\text{HL}^3)_2](\text{NO}_3)2\text{H}_2\text{O}$	1 st	67.8- 158.9	- $2\text{H}_2\text{O}$	5.63(5.62)
	2 nd	160.1 - 320.9	- $\text{NO}_2 + 2\text{CH}_4 + \text{CO}_2 + \text{CO}$	23.44(23.45)
	3 rd	322.1- 584.5	- $\text{C}_{12}\text{H}_{10}$	24.08(24.21)
	4 th	584.7 - 805.4	- $4\text{HCN} + 3\text{N}_2$	30.01(29.89)
	Residue		Ag	16.84(16.83)
7) HL^4	1 st	147.6 - 301.2	- $\text{NH}_3 + \text{CO} + \text{N}_2$	32.26(32.24)
	2 nd	301.2 - 631.7	- $\text{N}_2\text{H}_4 + \text{CH}_4$	33.87(33.90)
	Residue		8C	33.87(33.86)
8) $[\text{Ag}(\text{HL}^4)_2](\text{NO}_3)$	1 st	166.1 - 350.5	- $2\text{NO}_2 + 4\text{HCN} + \text{N}_2$	34.24(34.23)
	2 nd	350.5- 590.2	- N_2O_5	16.21(16.18)
	3 rd	590.3 - 793.8	- $2\text{C}_6\text{H}_6$	23.45(23.45)
	Residue		2C + AgN_3	26.10(26.14)

Table 3S. Energy parameters (eV) applying DFT method

Compound	E _H (eV)	E _L (eV)	(E _H - E _L) (eV)	E _I -E _H	x(eV)	μ(eV)	η(eV)	S(eV-1)	ω(eV)	σ(eV)
H ₂ L ¹	-0.18521	-0.06966	-0.1156	0.11555	0.127435	-0.12744	0.057775	0.028888	0.140542	17.30852445
Ag(I)-HL ¹	-0.21018	-0.19055	-0.0196	0.01963	0.200365	-0.20037	0.009815	0.004908	2.045142	101.8848701
H ₂ L ²	-0.19022	-0.07564	-0.1146	0.11458	0.13293	-0.13293	0.05729	0.028645	0.154219	17.45505324
Ag(I)-HL ²	-0.21571	-0.19595	-0.0198	0.01976	0.20583	-0.20583	0.00988	0.00494	2.144028	101.2145749
H ₂ L ³	-0.18337	-0.06722	-0.1162	0.11615	0.125295	-0.1253	0.058075	0.029038	0.13516	17.21911322
Ag(I)-HL ³	-0.19798	-0.18199	-0.016	0.01599	0.189985	-0.18999	0.007995	0.003997	2.257305	125.0781739
H ₂ L ⁴	-0.18143	-0.06156	-0.1199	0.11987	0.121495	-0.1215	0.059935	0.029968	0.123142	16.6847418
Ag(I)-HL ⁴	-0.21877	-0.20101	-0.0178	0.01776	0.20989	-0.20989	0.00888	0.00444	2.480507	112.6126126

TABLE 4S: Significant log file data for pyrazolone ligands and their Ag(I) complexes

Compounds	N ⁸	N ¹⁵	N ³⁶	N ⁴³	M	C ¹¹ -N ¹⁵	C ¹² -N ⁸	D(Debye)	f	E(nm)
HL ¹	-0.372663	-0.810500	----	----	----	1.370778	1.290060	2.4597	0.0305	481.54
Ag(I)- HL ¹	-0.379435	-0.111566	-0.358308	-0.074319	-0.170741	----	----	4.5428	0.0259	2576.38
HL ²	-0.372993	-0.170822	----	----	----	1.370611	1.290075	1.7522	0.0307	491.48
Ag(I)- HL ²	-0.382616	-0.111681	-0.361115	-0.072323	-0.164420	----	----	4.5286	0.0241	2646.8
HL ³	-0.373119	-0.174258	----	----	----	1.370975	1.289734	2.8477	0.0322	477.42
Ag(I)- HL ³	-0.361510	-0.131663	-0.355586	-0.092131	-0.259004	----	----	2.1739	0.0025	9548.13
HL ⁴	-0.060119	-0.064912	----	----	----	1.417723	1.334193	5.5760	0.0001	5479.51
Ag(I)- HL ⁴	-0.362551	-0.143065	-0.207957	0.214036	-0.189765	----	----	1.7655	0.0048	7279.67

TABLE 5S: Energy values (k cal/mol) for pyrazolone - protein docked complexes

ligands	pKa, pKb	Receptor	Est. free energy of binding	Est. inhibition constant (K _i)(uM)	vdW+ bond+ desolve energy	Electrostatic Energy	Total intercooled Energy	Frequency	Interact surface
HL ¹		3s7s	-6.76	11.06	-7.91	-0.04	-7.96	80%	423.372
	1.58	3e1r	-4.75	330.07	-5.21	-0.05	-5.26	40%	416.009
	-0.81	4dk7	-3.88	1.42	-4.52	-0.05	-4.57	20%	479.222
HL ²		1bpb	-5.39	112.83	-5.88	-0.02	-5.91	50%	466.75
		3s7s	-7.89	1.64	-8.74	-0.11	-8.85	50%	455.857
	2.10	3e1r	-5.29	132.93	-5.75	-0.05	-5.81	30%	435.984
	-0.84	4dk7	-4.01	1.14	-4.53	-0.07	-4.59	10%	506.796
HL ³		1bpb	-5.89	47.95	-6.75	-0.15	-6.89	20%	515.286
		3s7s	-7.04	6.89	-7.86	-0.10	-7.96	90%	456.741
	1.05	3e1r	-4.97	225.74	-5.46	-0.02	-5.48	50%	440.961
	-0.80	4dk7	-4.14	917.05	-4.89	-0.10	-4.99	10%	517.815
HL ⁴		1bpb	-5.42	107.22	-6.23	-0.17	-6.40	50%	501.982
		3s7s	-8.27	863.48	-9.44	-0.11	-9.55	80%	461.009
	2.54	3e1r	-5.18	159.40	-5.92	-0.04	-5.95	30%	449.648
	-0.85	4dk7	-4.58	437.03	-5.51	+0.02	-5.49	20%	511.913
		1bpb	-6.21	28.20	-7.37	-0.17	-7.54	40%	507.894

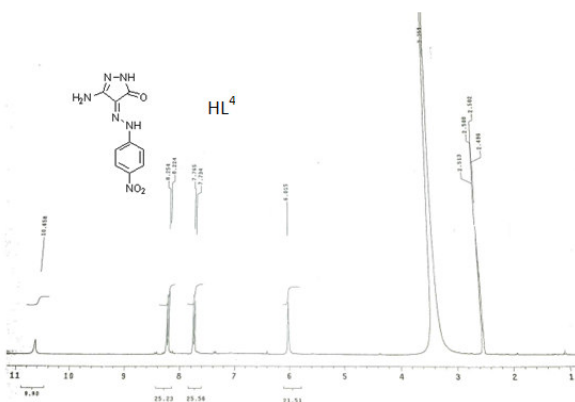
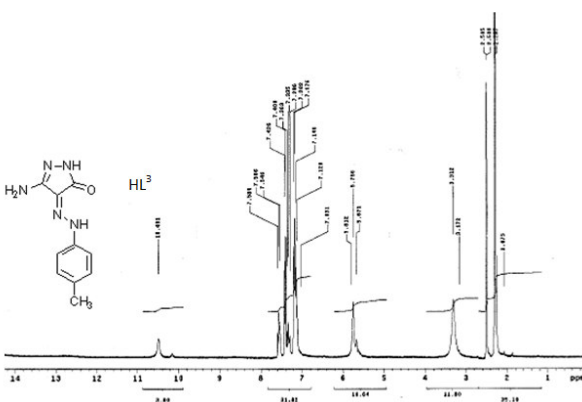
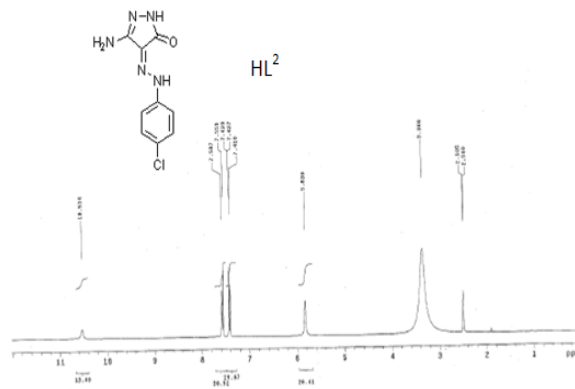
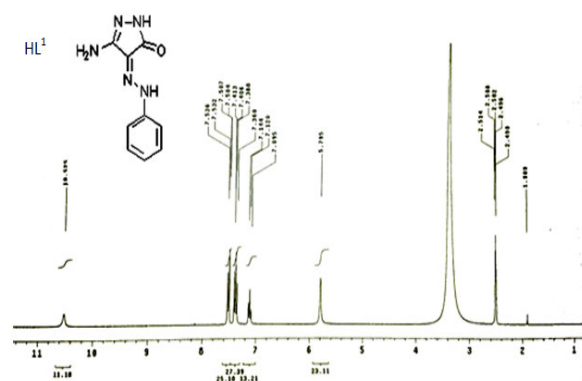
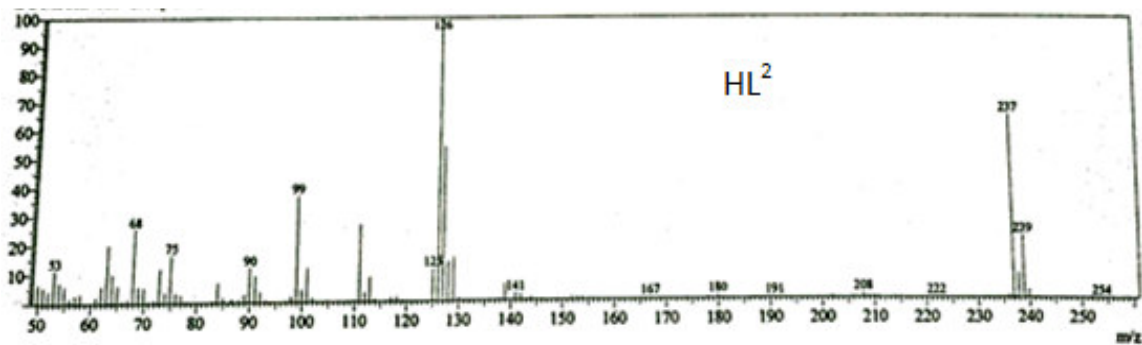


Figure 1S. ¹H NMR spectra of pyrazolone derivatives, HL⁽¹⁻⁴⁾



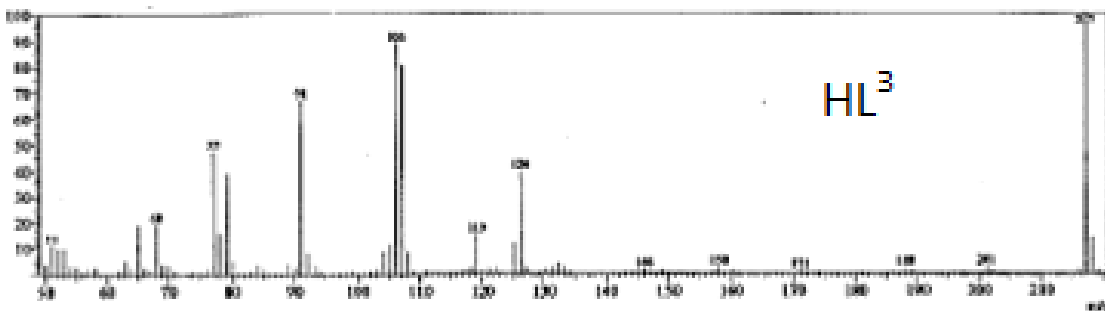


Figure 2S . Mass spectra of two elected ligands

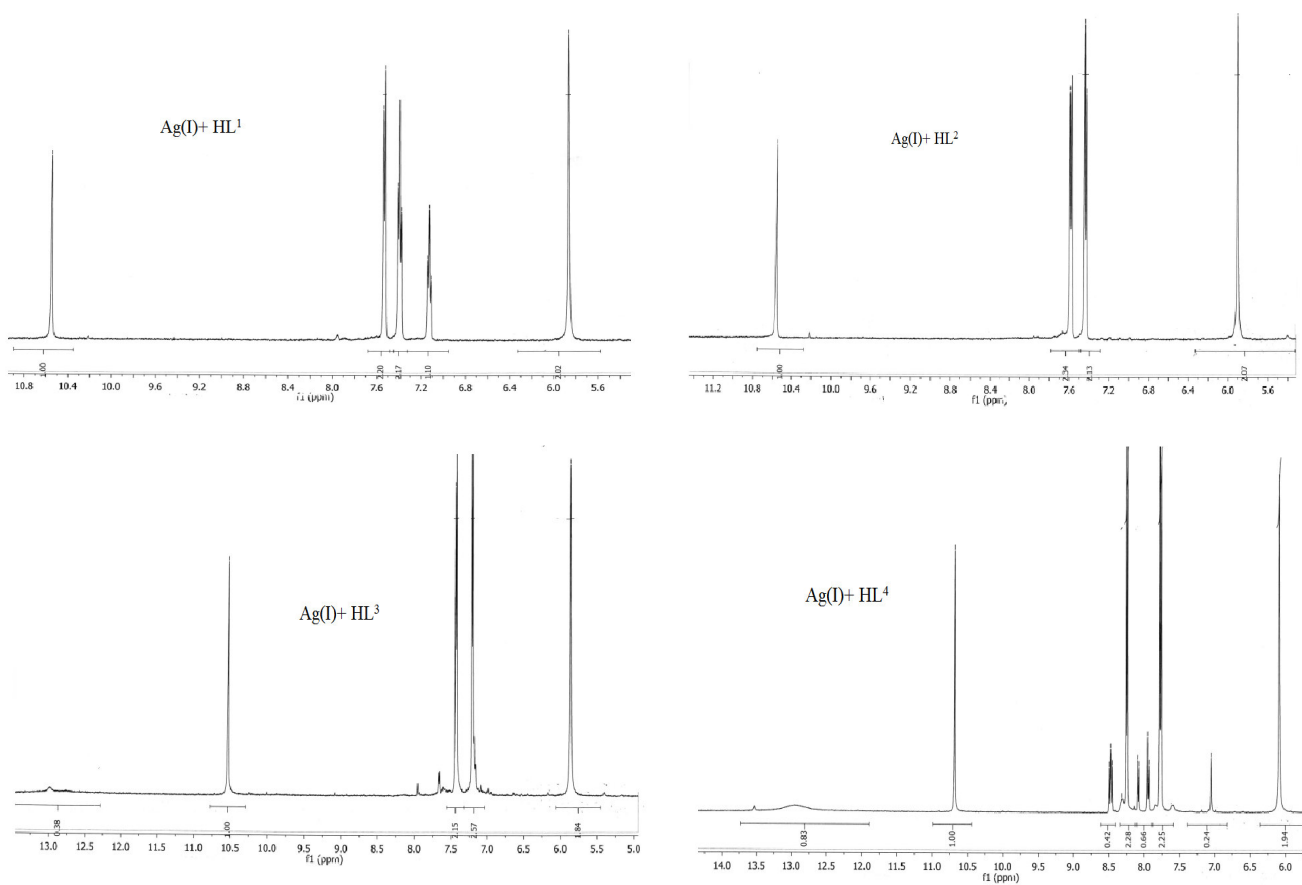


Figure 3S . ¹H NMR spectra of three Ag(I)- pyrazolone derivatives

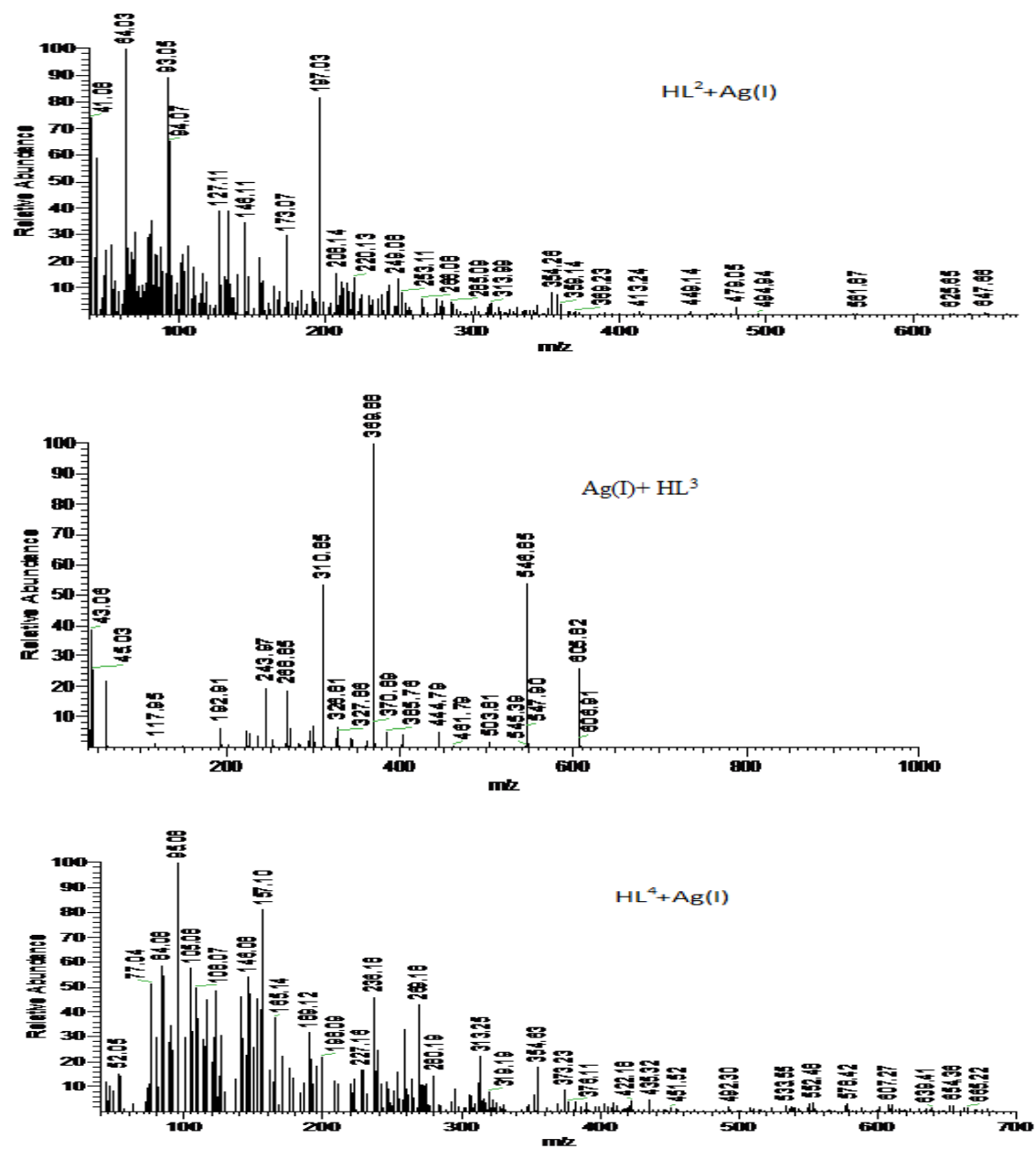


Figure 4S . Mass spectra of selected ligands and three Ag(I) complexes

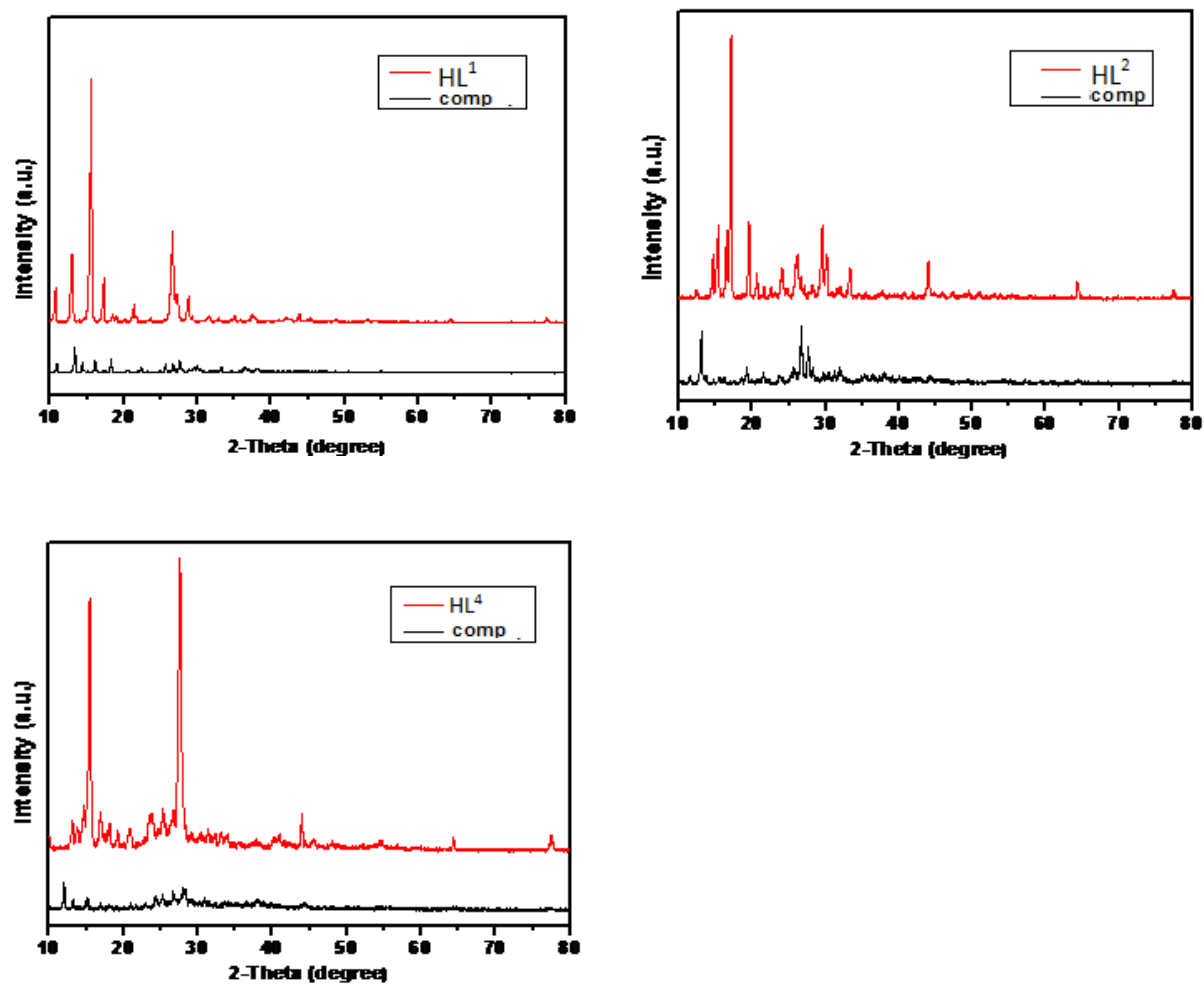
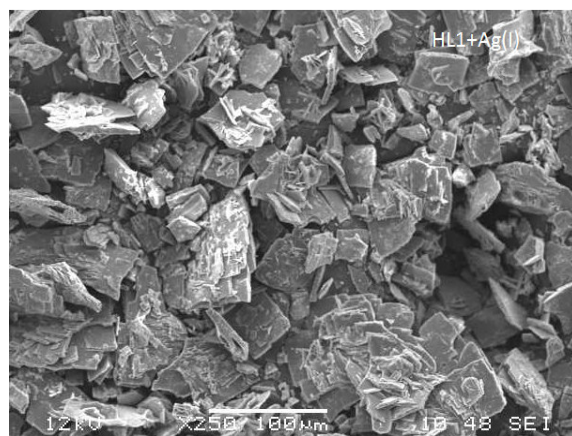
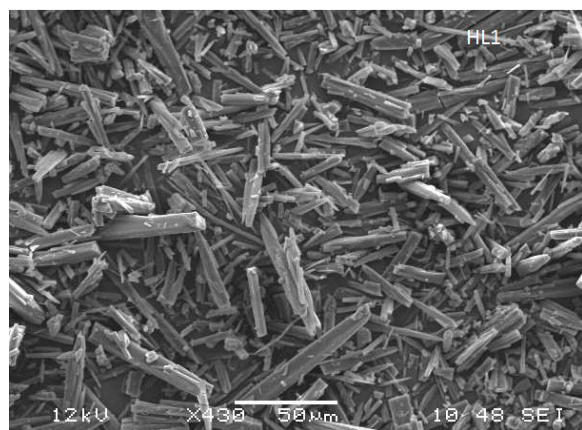


Figure 5 S. X-Ray patterns of three pyrazolone derivatives and their Ag(I) complexes



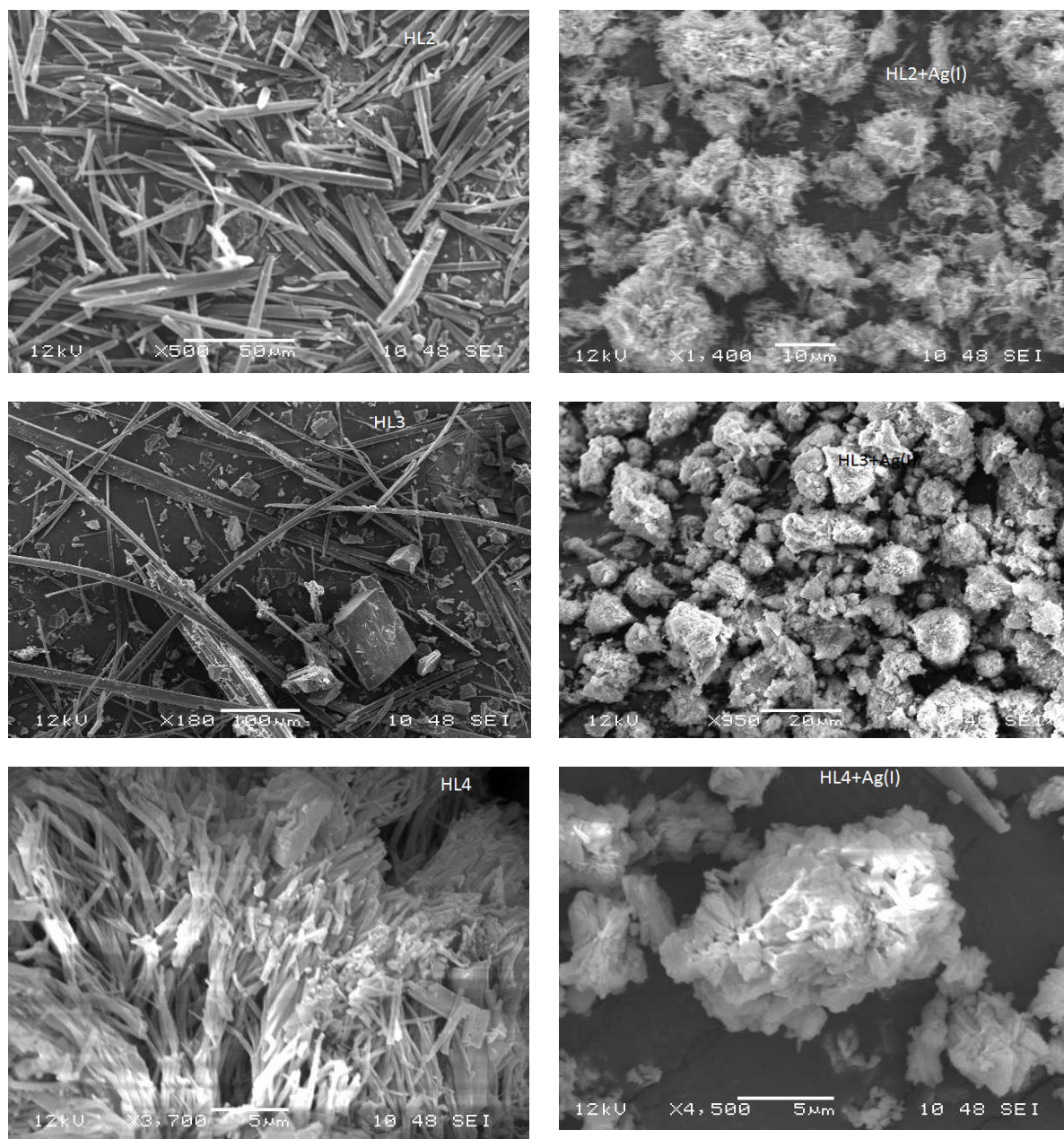


Figure 6S. SEM images of pyrazolone derivatives ,HL⁽¹⁻⁴⁾ and their Ag(I) complexes

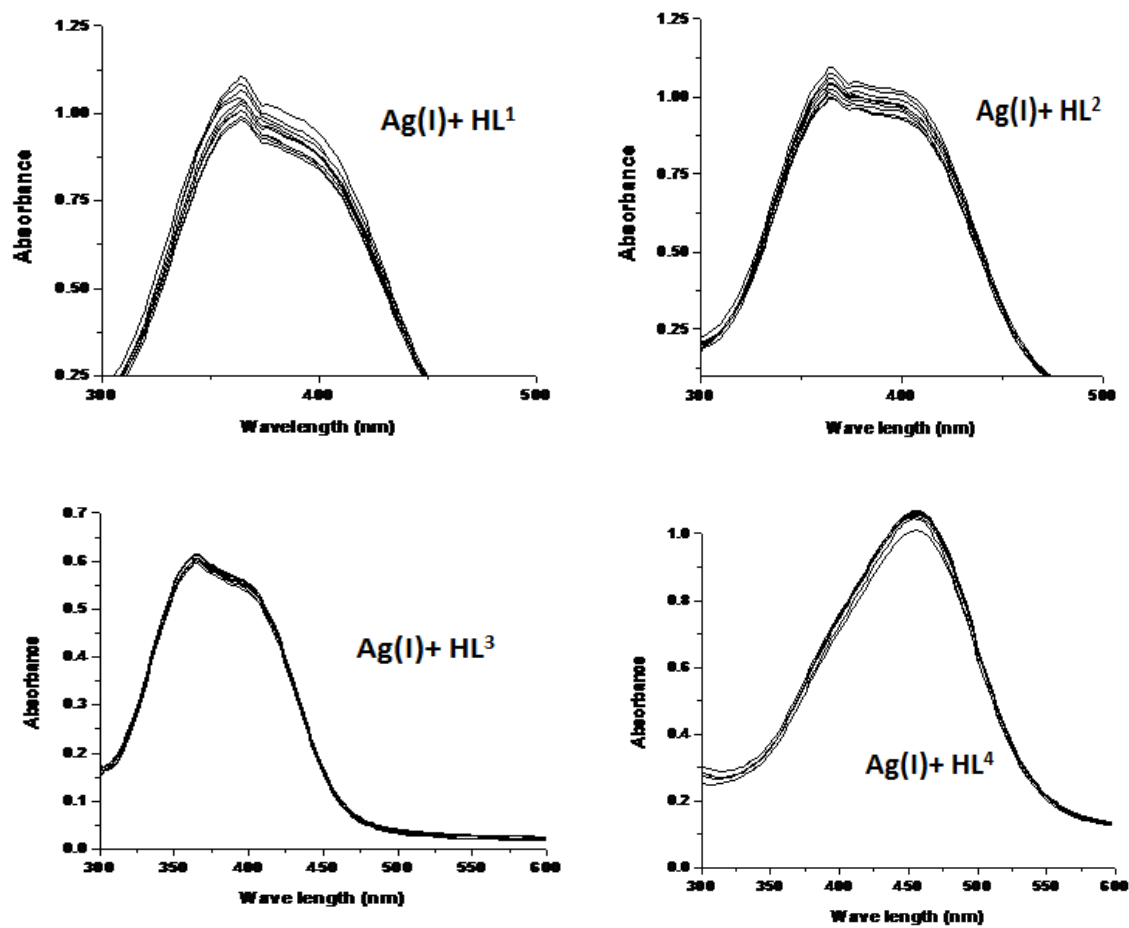
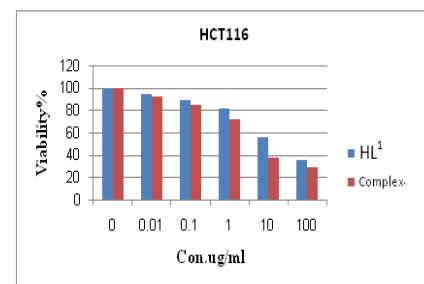
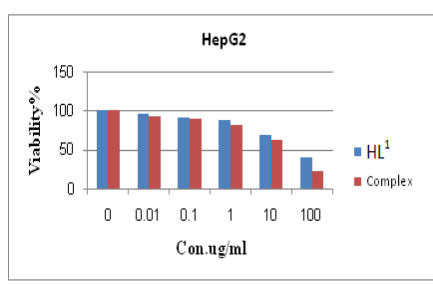
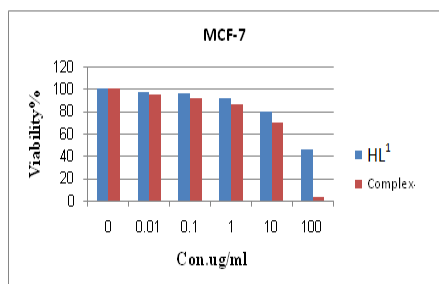


Figure 7S. Spectrophotometric plots for DNA binding towards Ag(I) complexes(1-4)



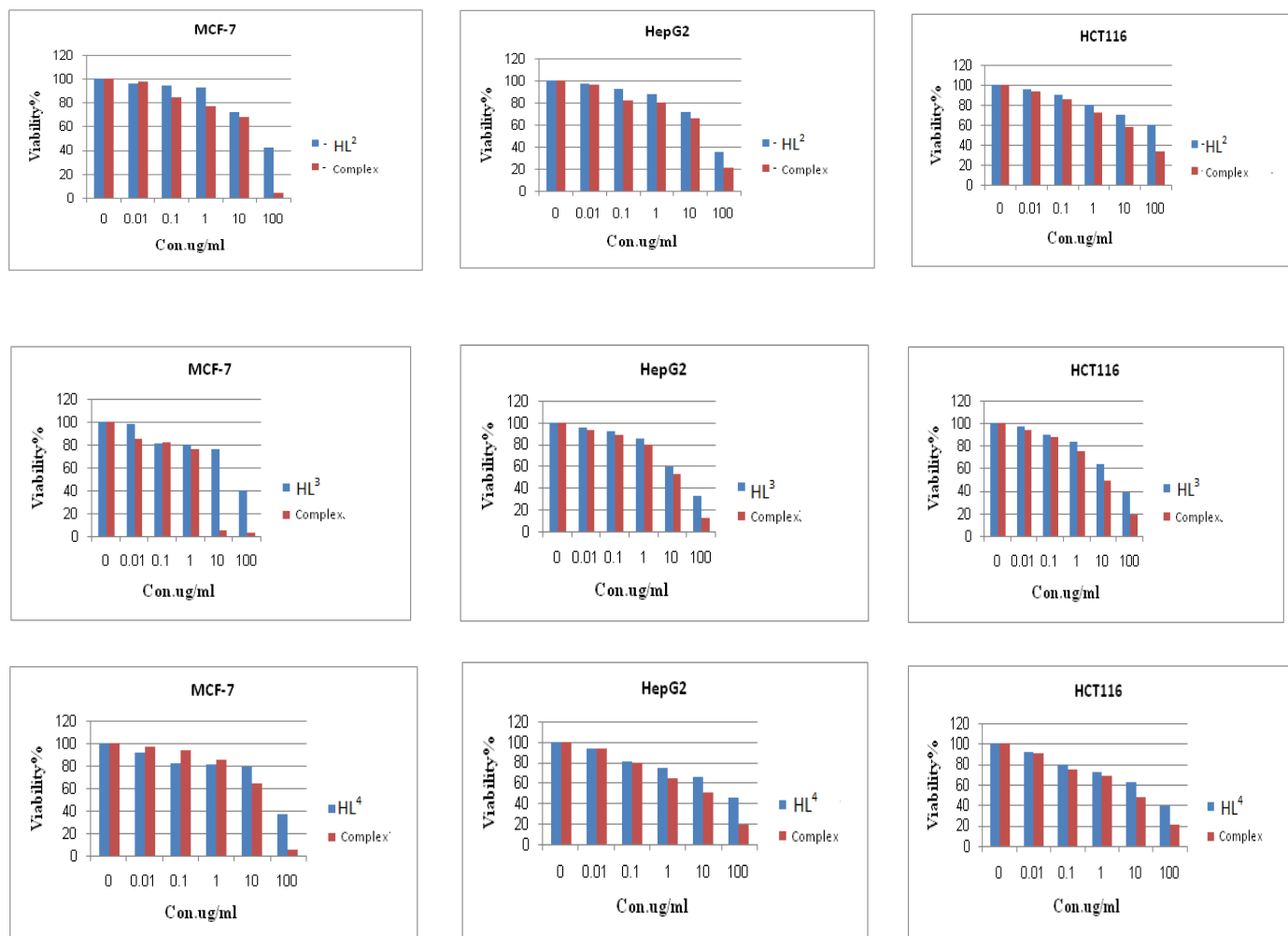
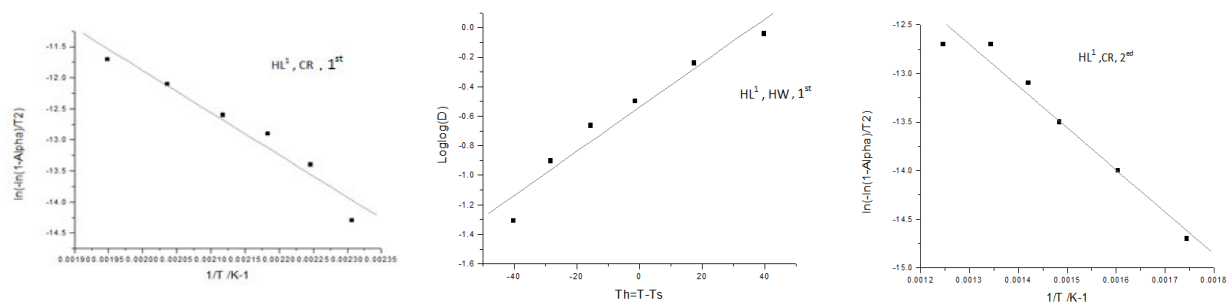
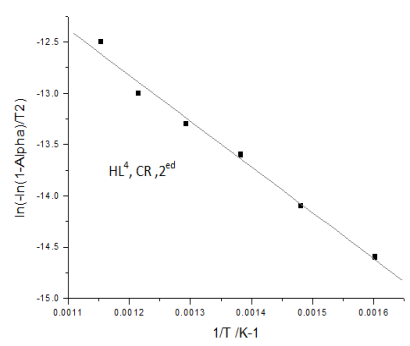
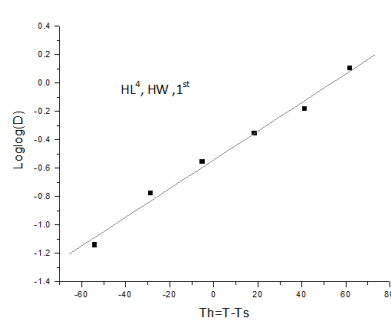
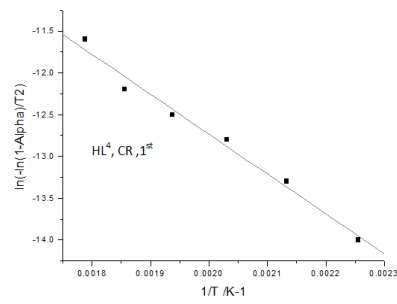
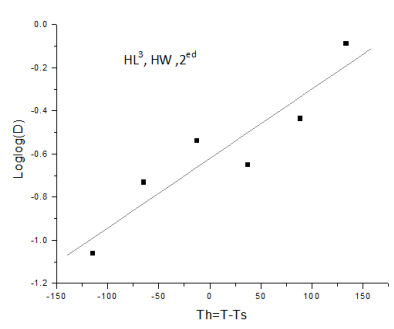
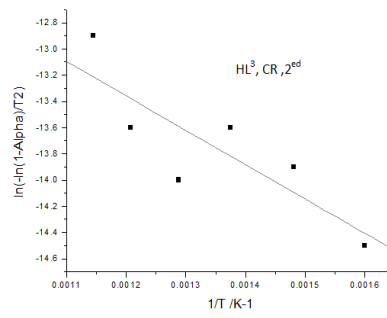
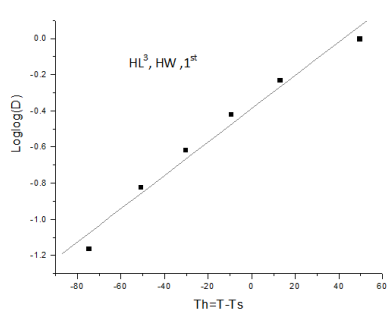
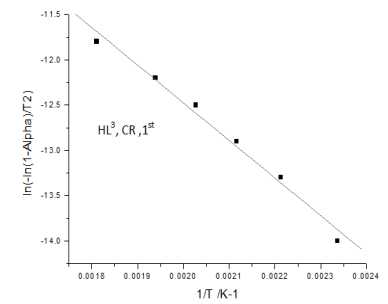
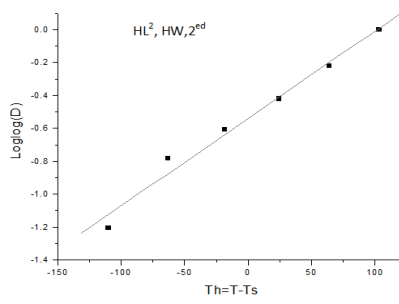
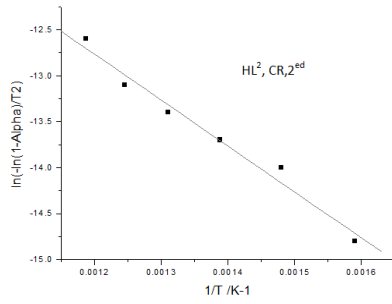
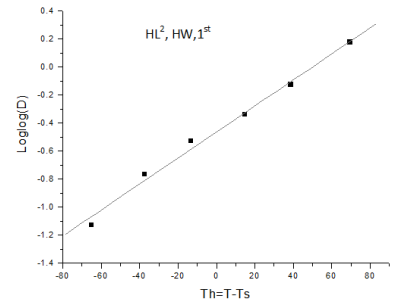
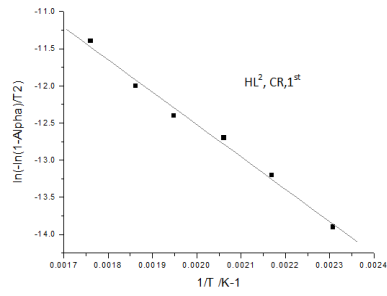
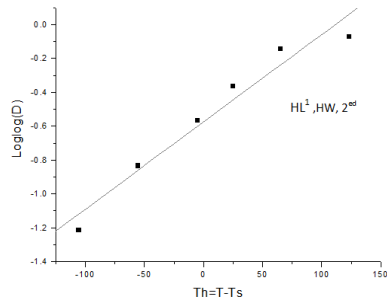


Figure 8S . Dose response curves of HL(1-4) ligands and their Ag(I) complexes against MCF-7, HEPG-2 and HCT-116 cancer cells, cells were treated with various concentrations of ligands and complexes incubated for 72 hrs. %5 CO₂.





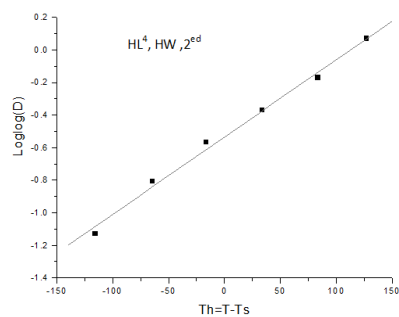
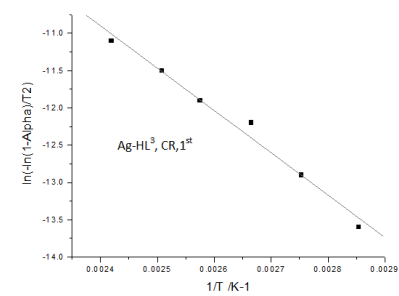
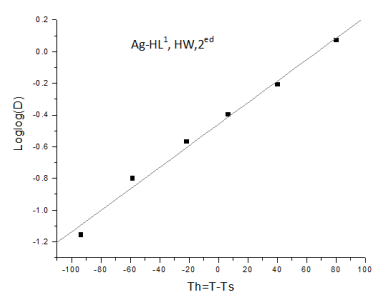
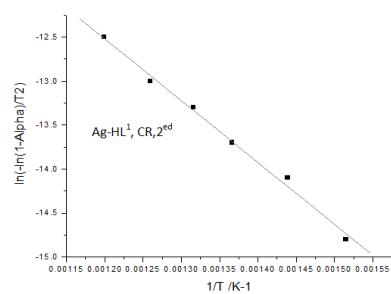
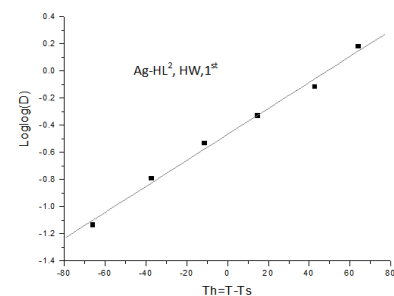
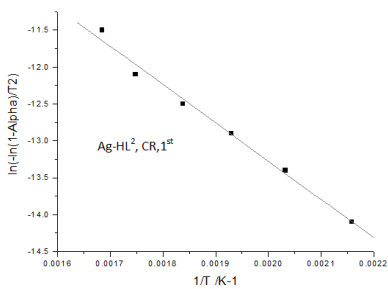
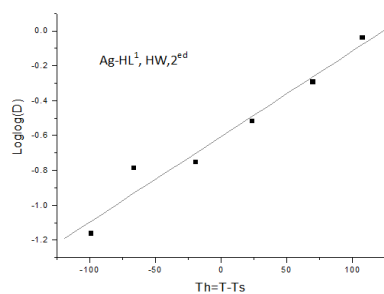
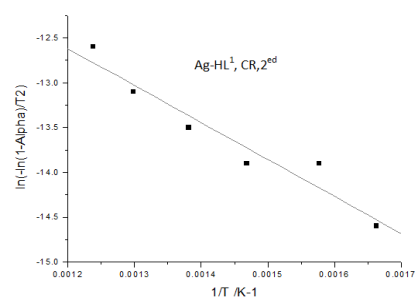
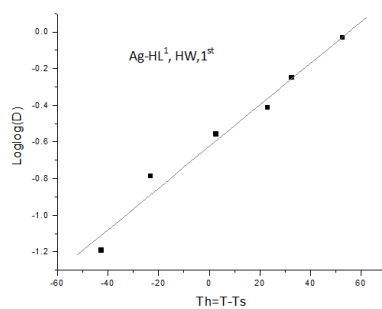
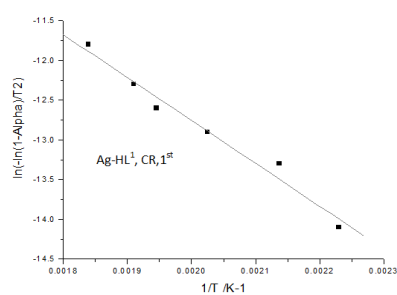


Figure 9A,S. kinetic plots using Coats Redfern and Horowitz-Metzger for pyrazolone liugands, HL(1-4)



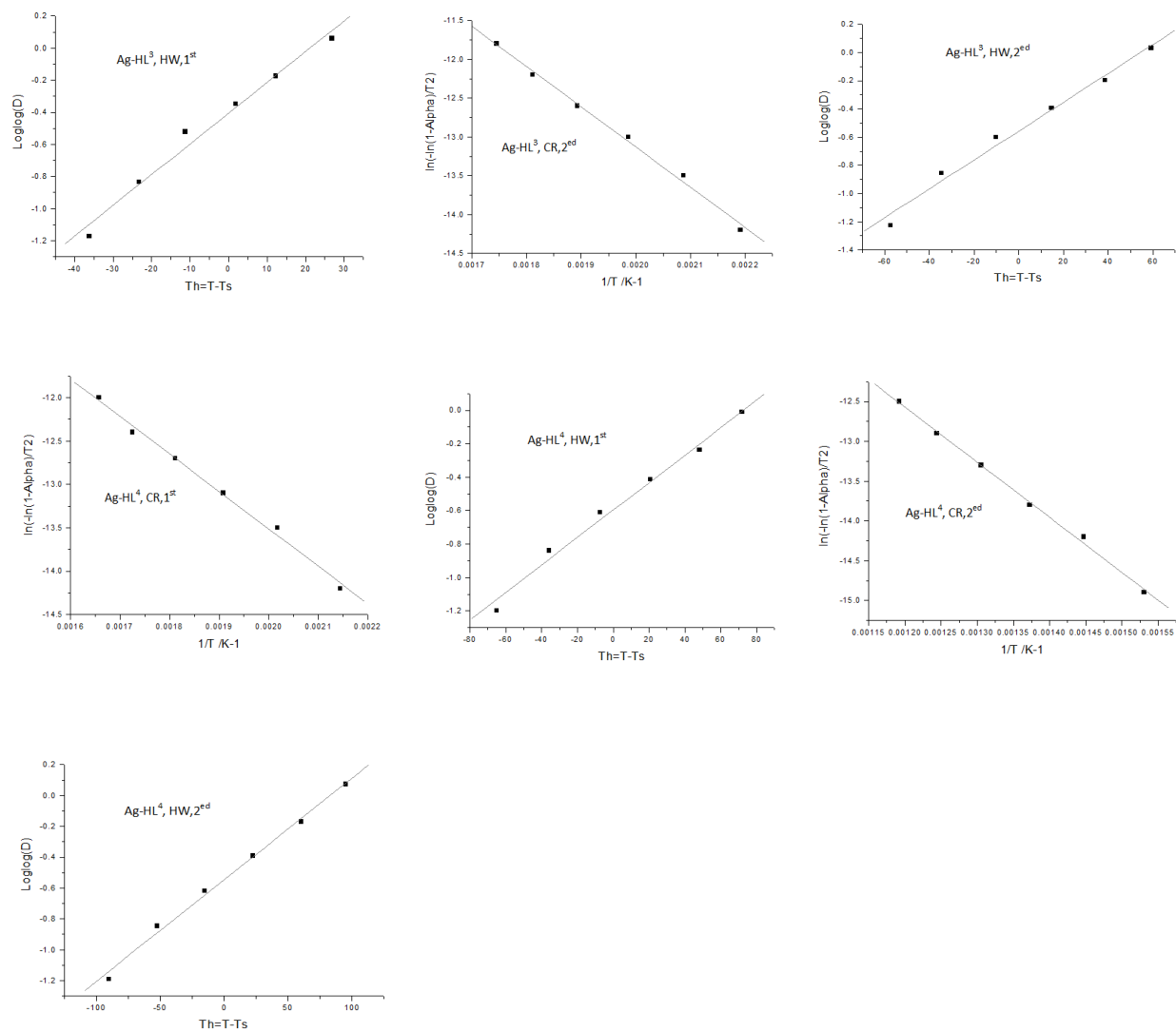
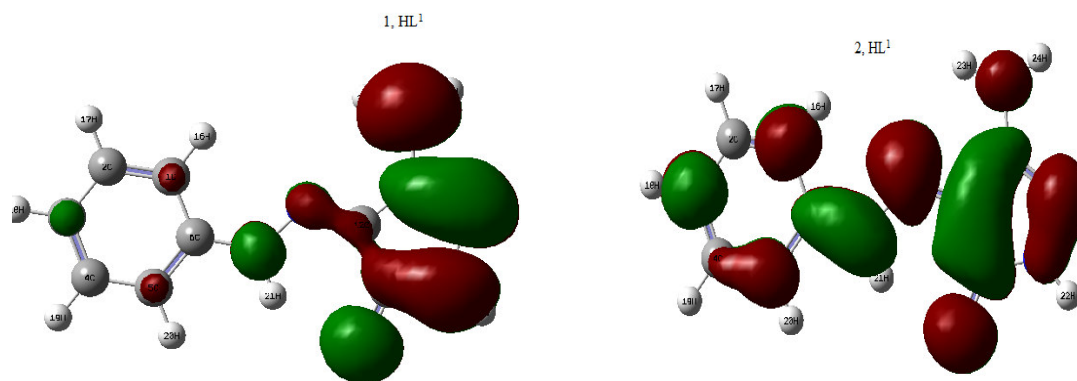


Figure 9B, S. kinetic plots using Coats Redfern and Horowitz-Metzger for pyrazolone- Ag(I) complexes



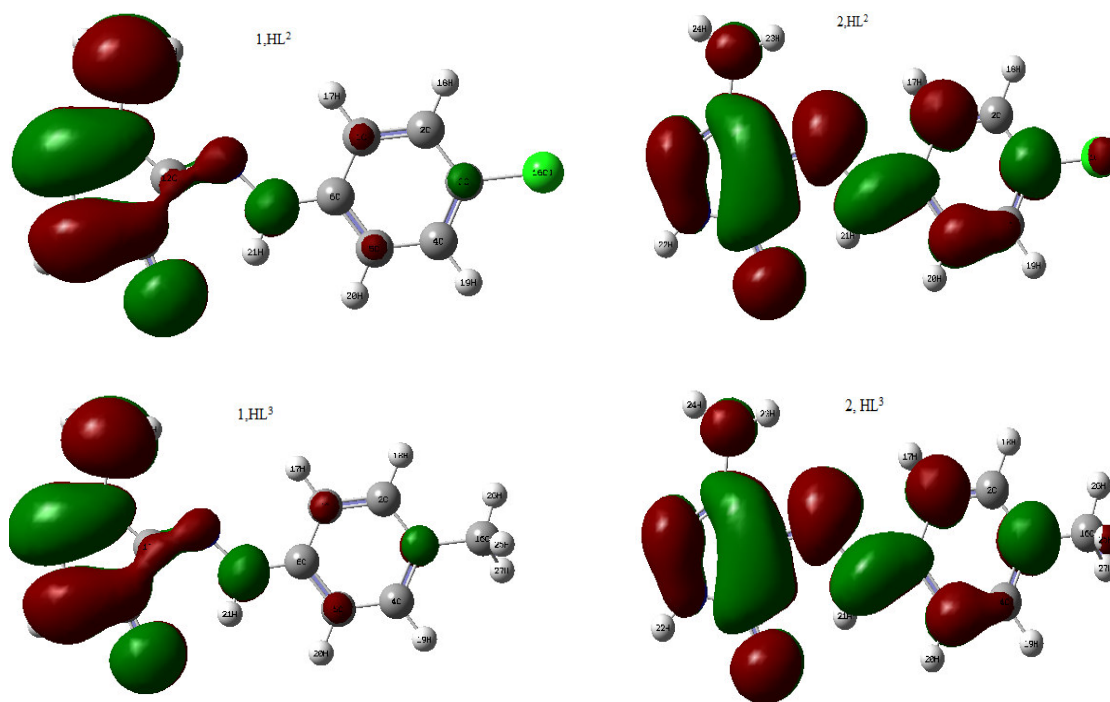
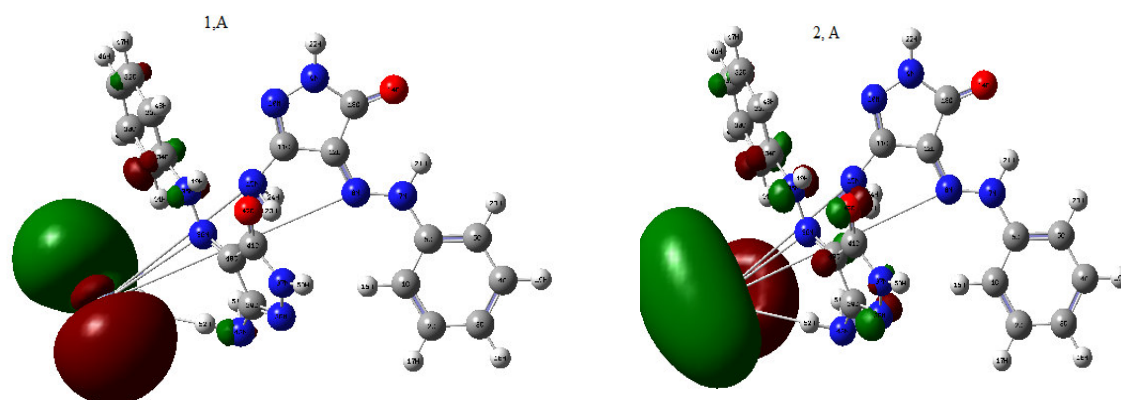


Figure 10A, S. Images of frontier molecular orbital's (HOMO,1 & LUMO,2) for pyrazolone ligands (HL¹⁻³)



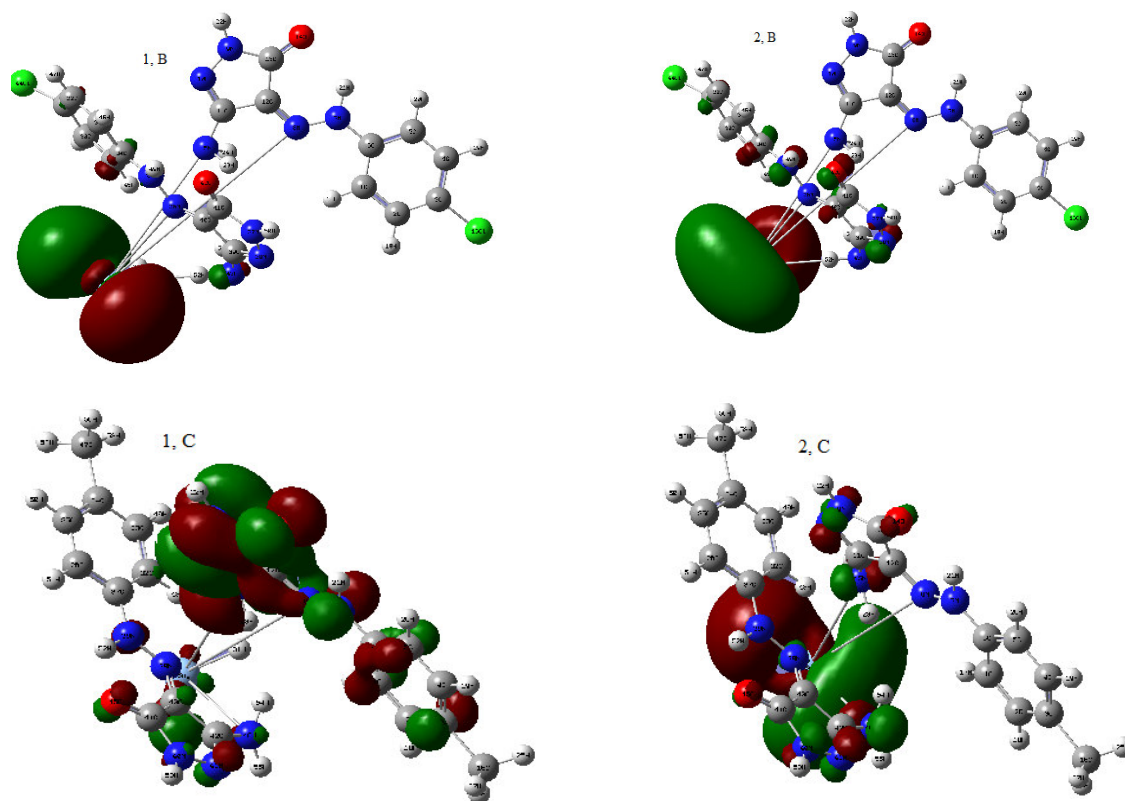
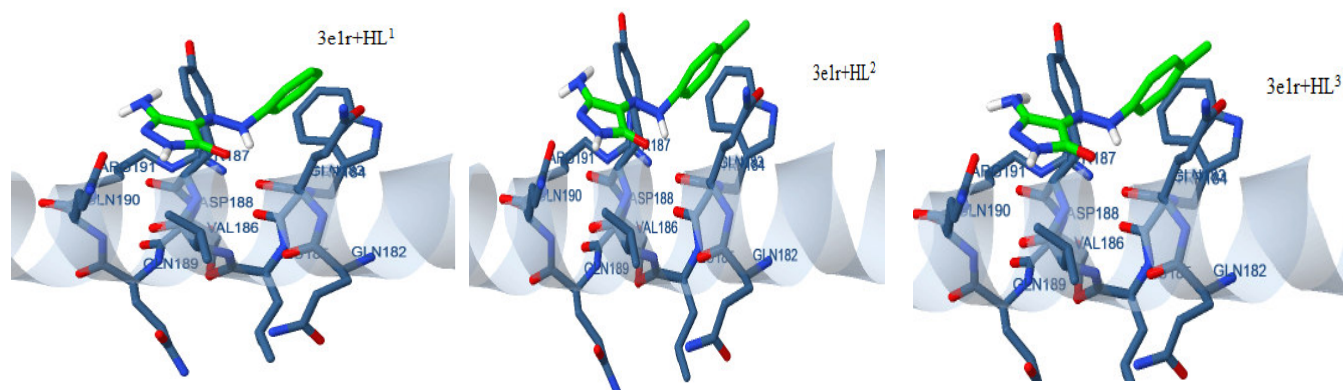
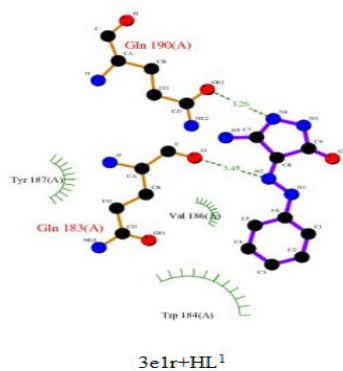


Figure 10B, S. Images of frontier molecular orbital's(HOMO,1 & LUMO,2) for Ag(I)-HL ¹⁻³ complexes (A-c, respectively)

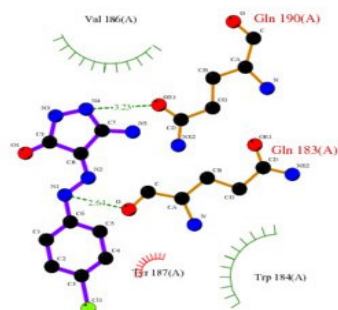




Key

- Ligand bond
- Non-ligand bond
- Hydrogen bond and its length

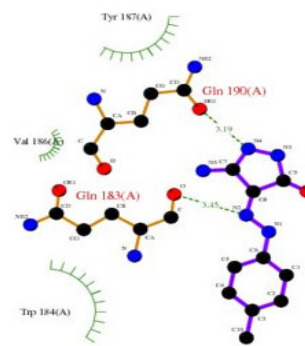
His 53 Non-ligand residues involved in other contact(s)



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- Ligand bond
- Non-ligand bond
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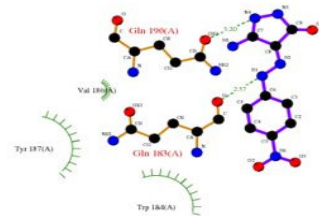
His 53 Non-ligand residues involved in other contact(s)



Key

- Ligand bond
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- Hydrogen bond and its length

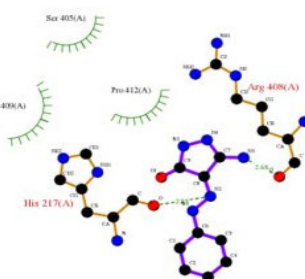
His 53 Non-ligand residues involved in other contact(s)



Key

- Ligand bond
- Non-ligand bond
- Hydrogen bond and its length

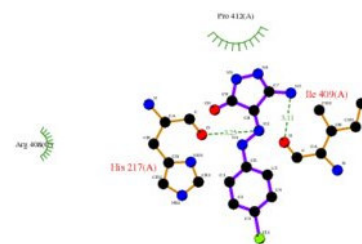
His 53 Non-ligand residues involved in other contact(s)



Key

- Ligand bond
- Non-ligand bond
- Hydrogen bond and its length

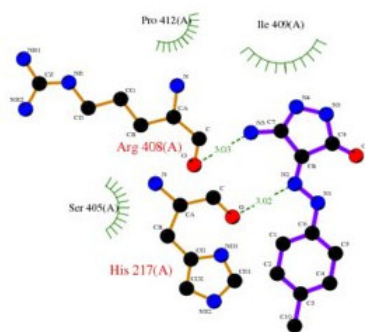
His 53 Non-ligand residues involved in other contact(s)



Key

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- Hydrogen bond and its length

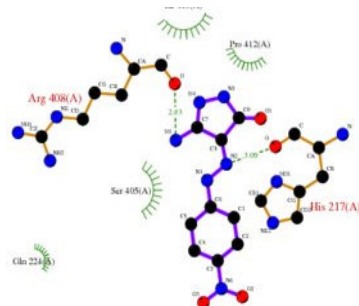
His 53 Non-ligand residues involved in other contact(s)



Key

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- Hydrogen bond and its length

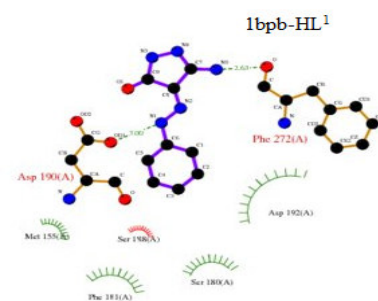
His 53 Non-ligand residues involved in other contact(s)



Key

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- Hydrogen bond and its length

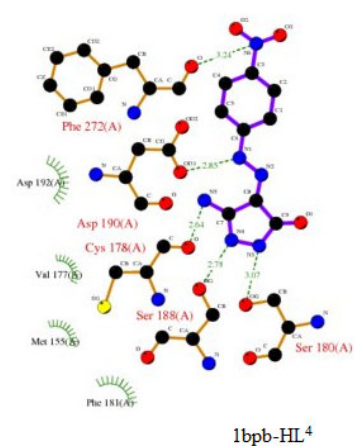
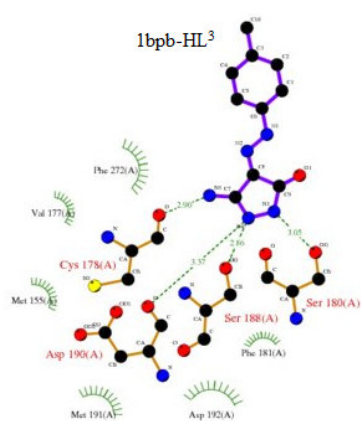
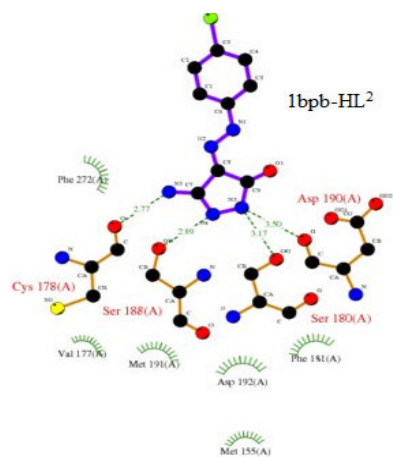
His 53 Non-ligand residues involved in other contact(s)



Key

- Ligand bond
- Non-ligand bond
- Hydrogen bond and its length

His 53 Non-ligand residues involved in other contact(s)



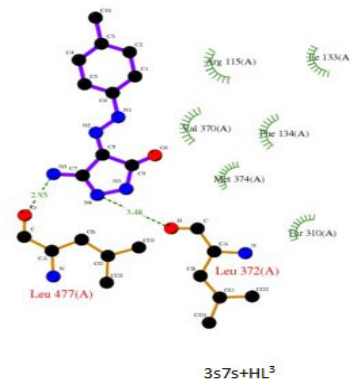
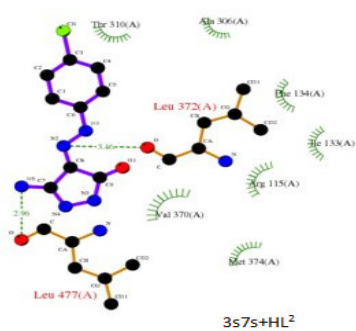
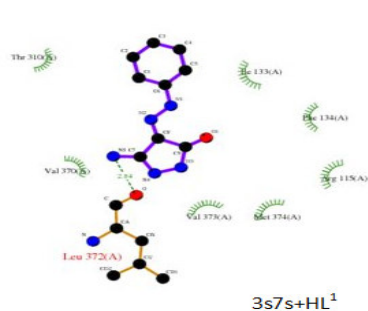
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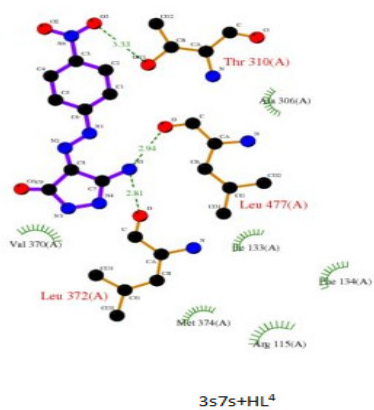
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Figure 12S . 2D plots for interacting complexes appeared with 3e1r , 4dk7, 1bpb and 3s7s proteins and HL¹⁻⁴ ligands