

## REFERENCES

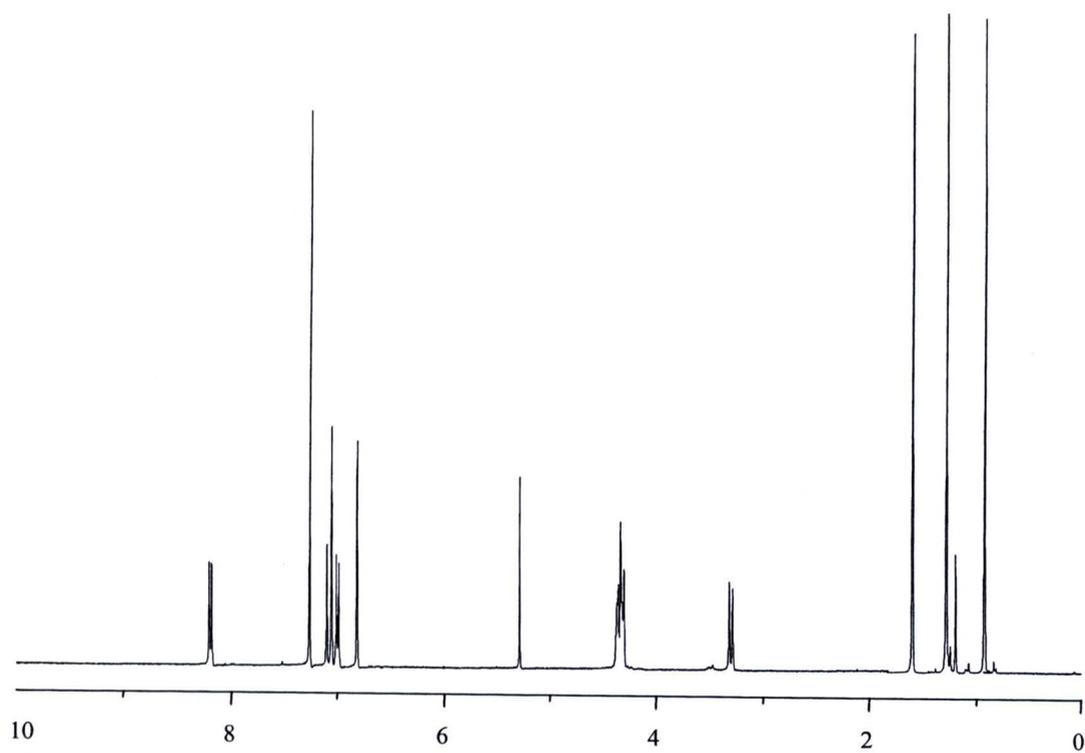
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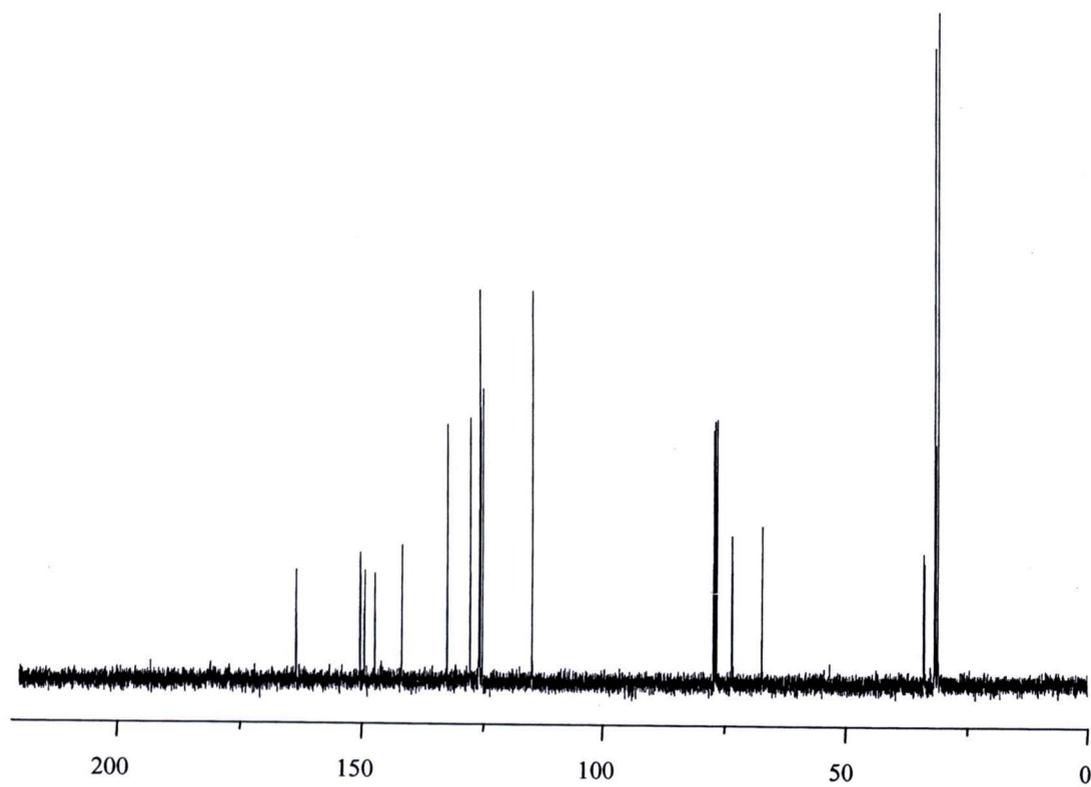
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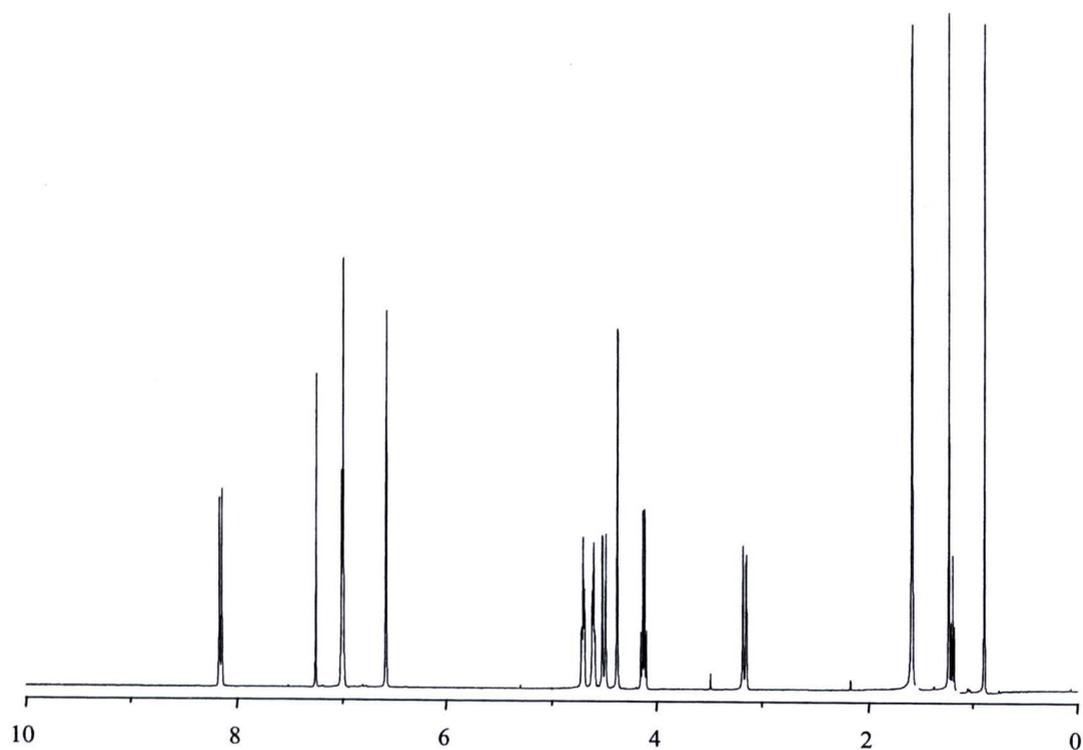
## **APPENDIX**



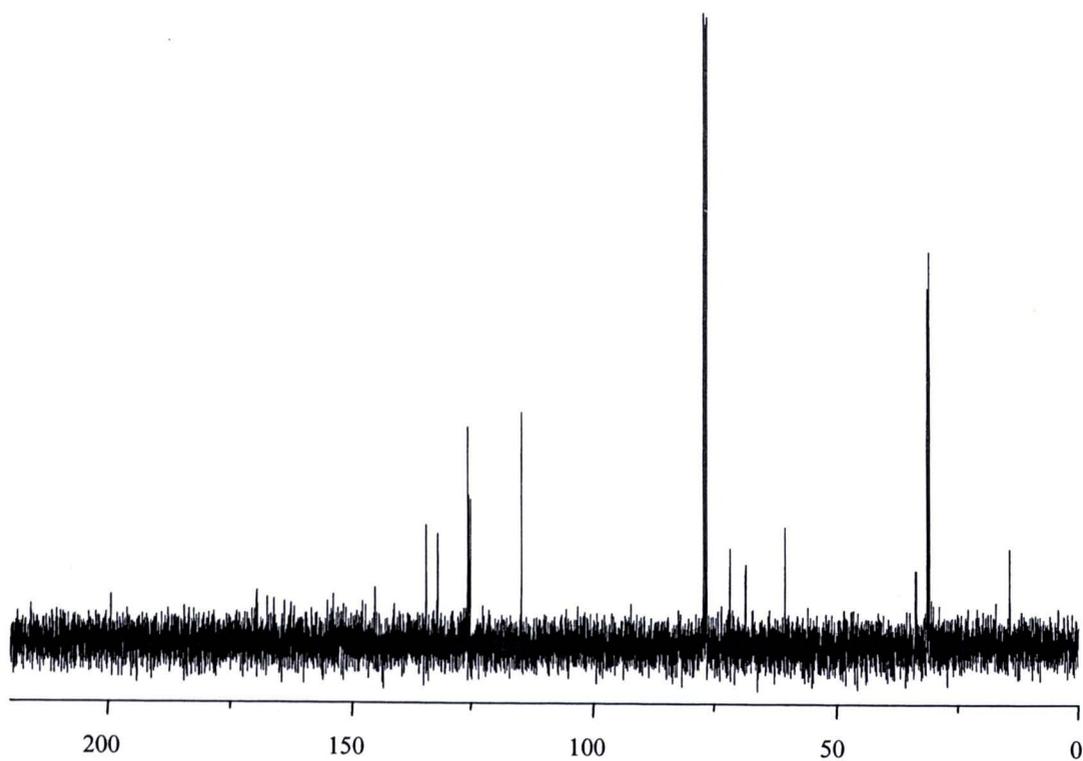
**Figure A.1**  $^1\text{H-NMR}$  spectrum of compound **1a** in  $\text{CDCl}_3$



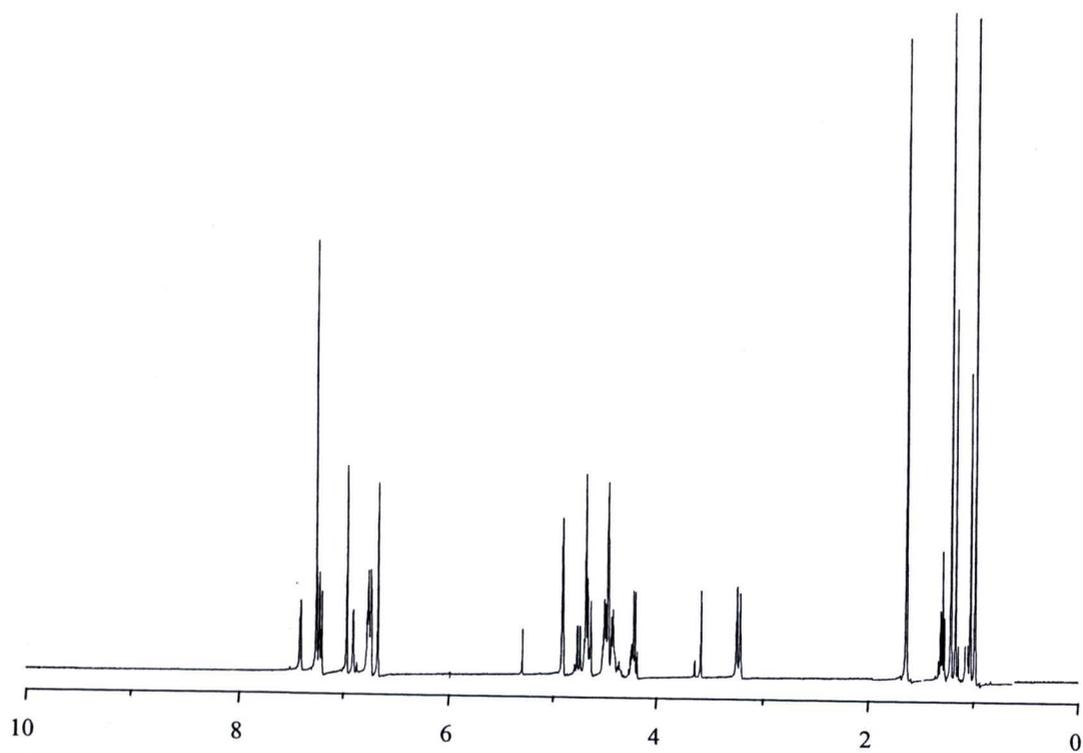
**Figure A.2**  $^{13}\text{C-NMR}$  spectrum of compound **1a** in  $\text{CDCl}_3$



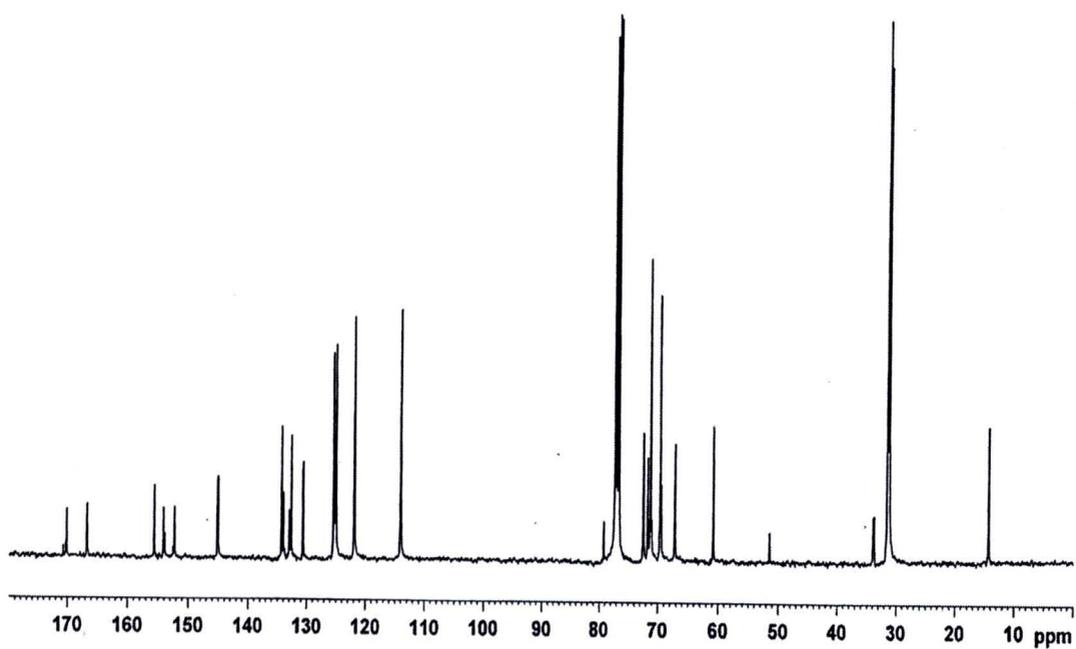
**Figure A.3**  $^1\text{H-NMR}$  spectrum of compound **1b** in  $\text{CDCl}_3$



**Figure A.4**  $^{13}\text{C-NMR}$  spectrum of compound **1b** in  $\text{CDCl}_3$



**Figure A.5**  $^1\text{H-NMR}$  spectrum of compound **1** in  $\text{CDCl}_3$



**Figure A.6**  $^{13}\text{C-NMR}$  spectrum of compound **1** in  $\text{CDCl}_3$

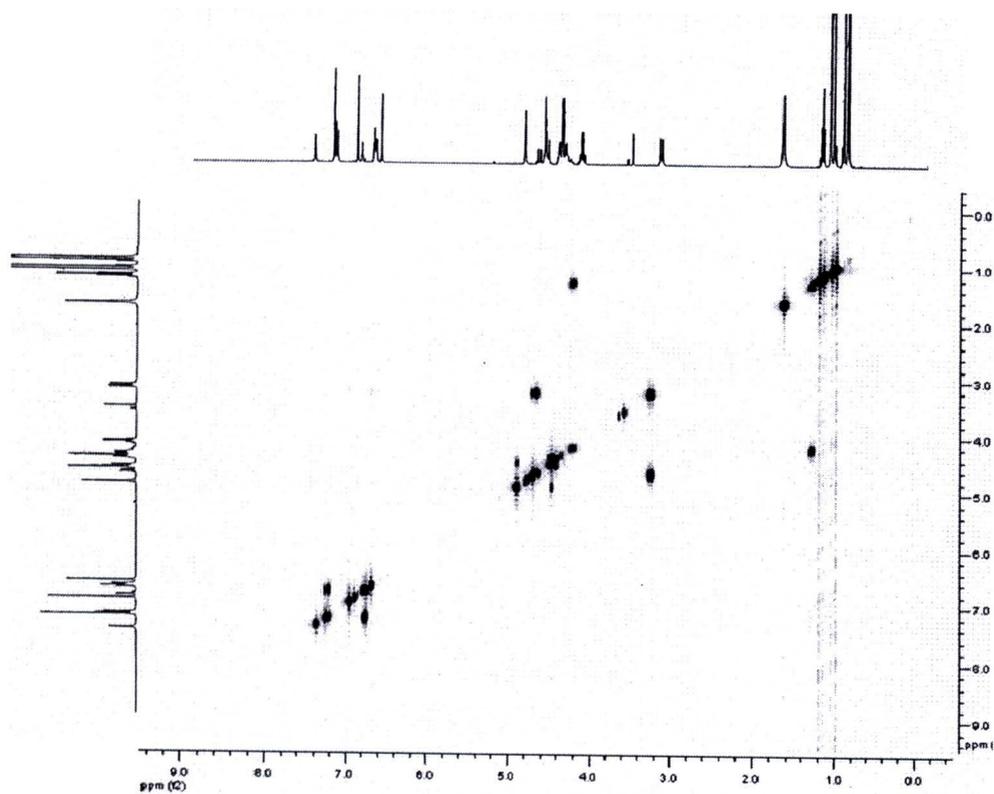


Figure A.7  $^1\text{H}$ - $^1\text{H}$  COSY spectrum of compound 1 in  $\text{CDCl}_3$

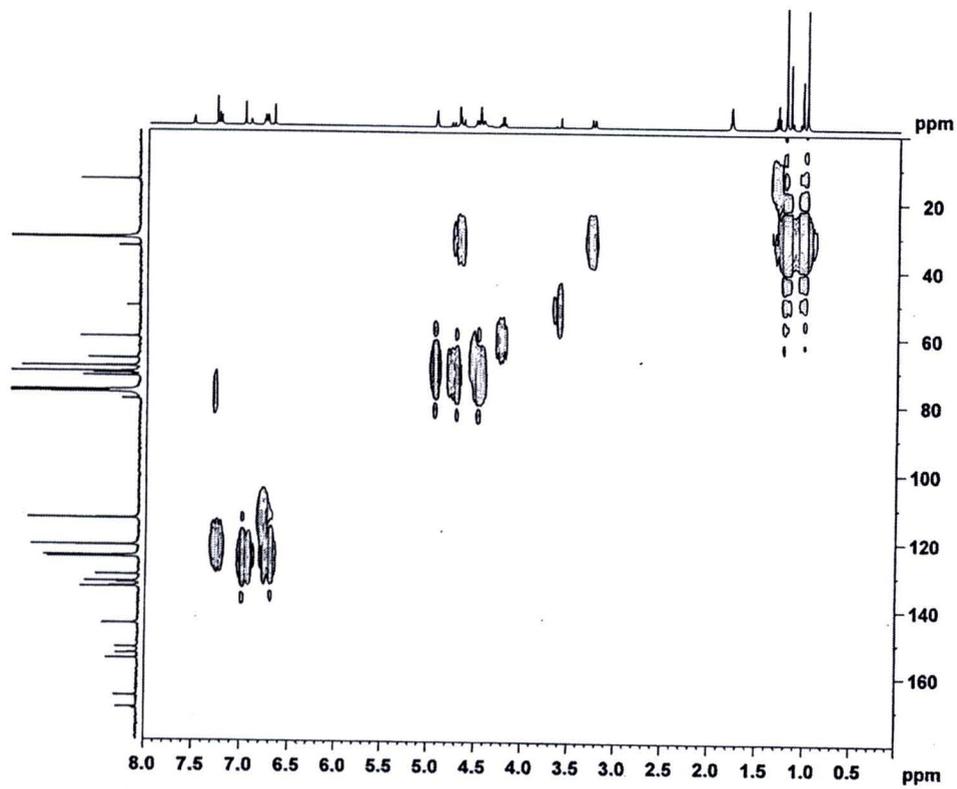
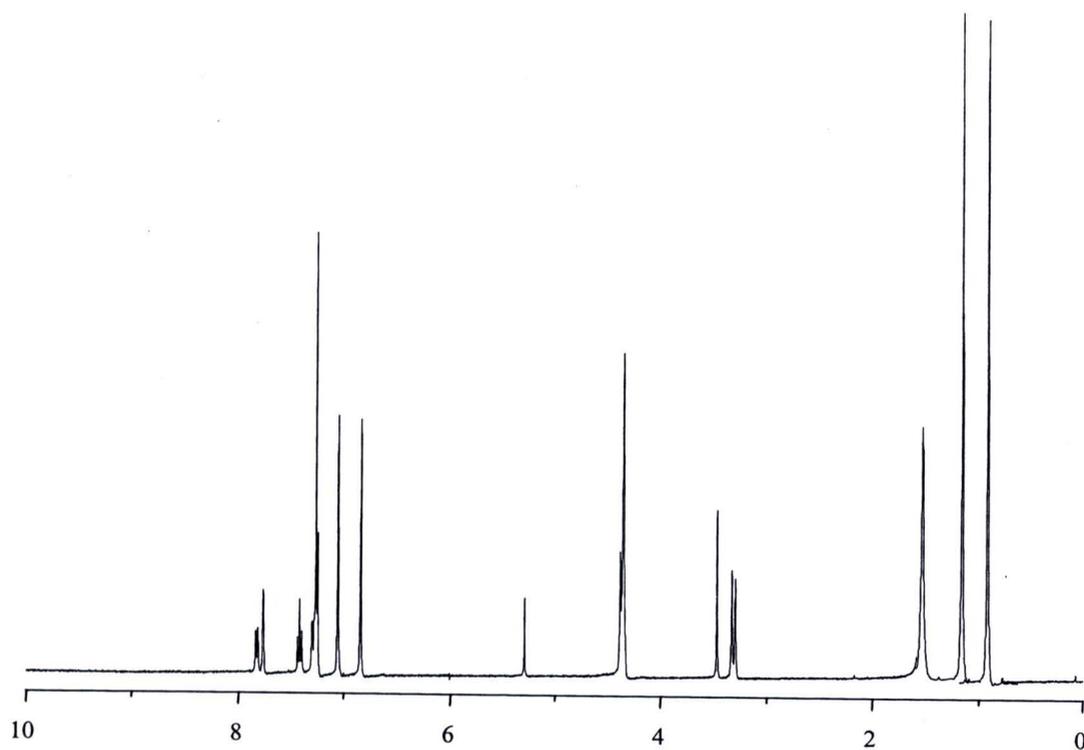
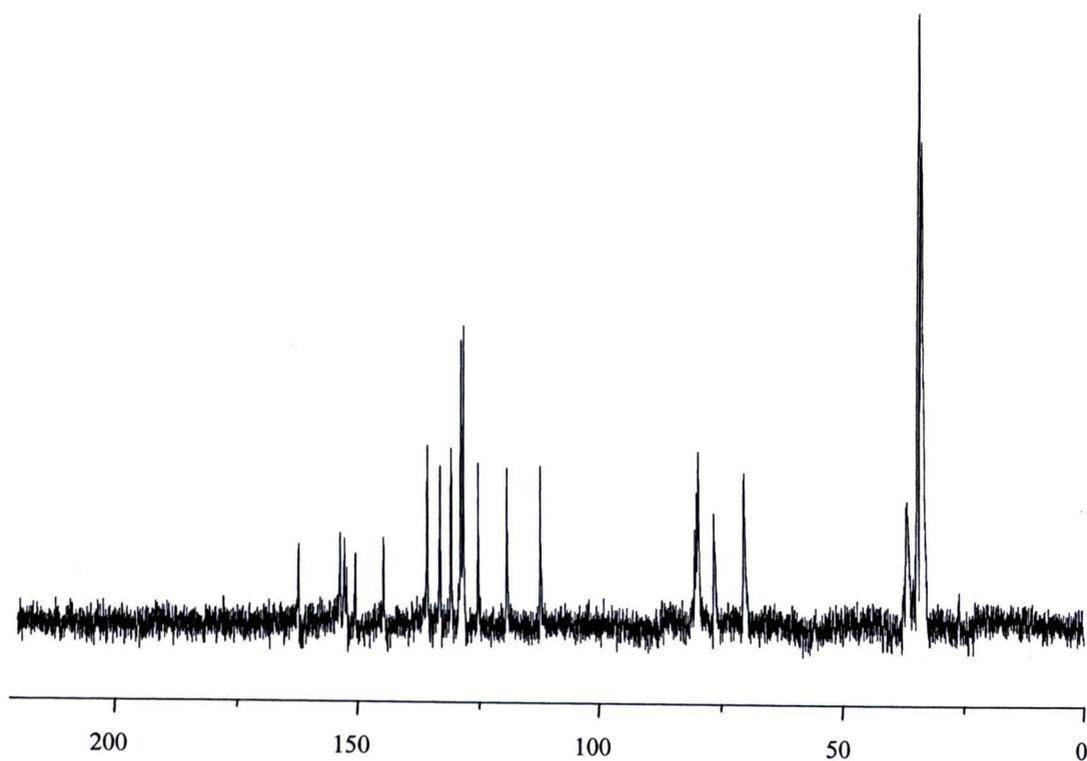


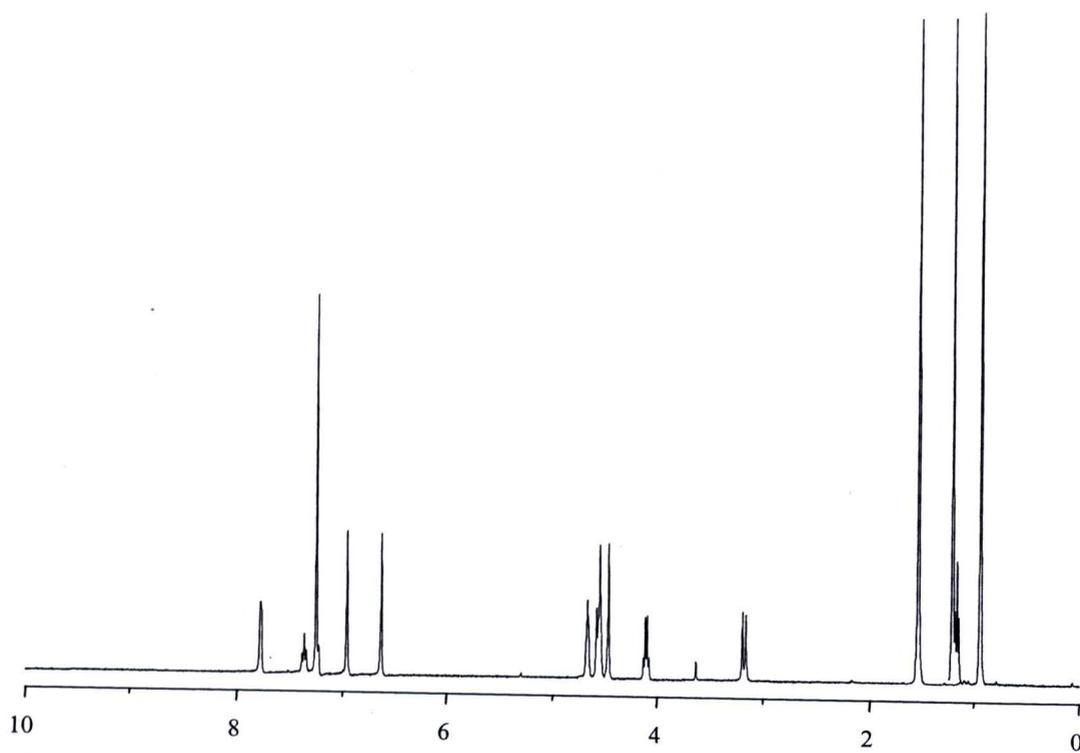
Figure A.8  $^1\text{H}$ - $^{13}\text{C}$  HMQC spectrum of compound 1 in  $\text{CDCl}_3$



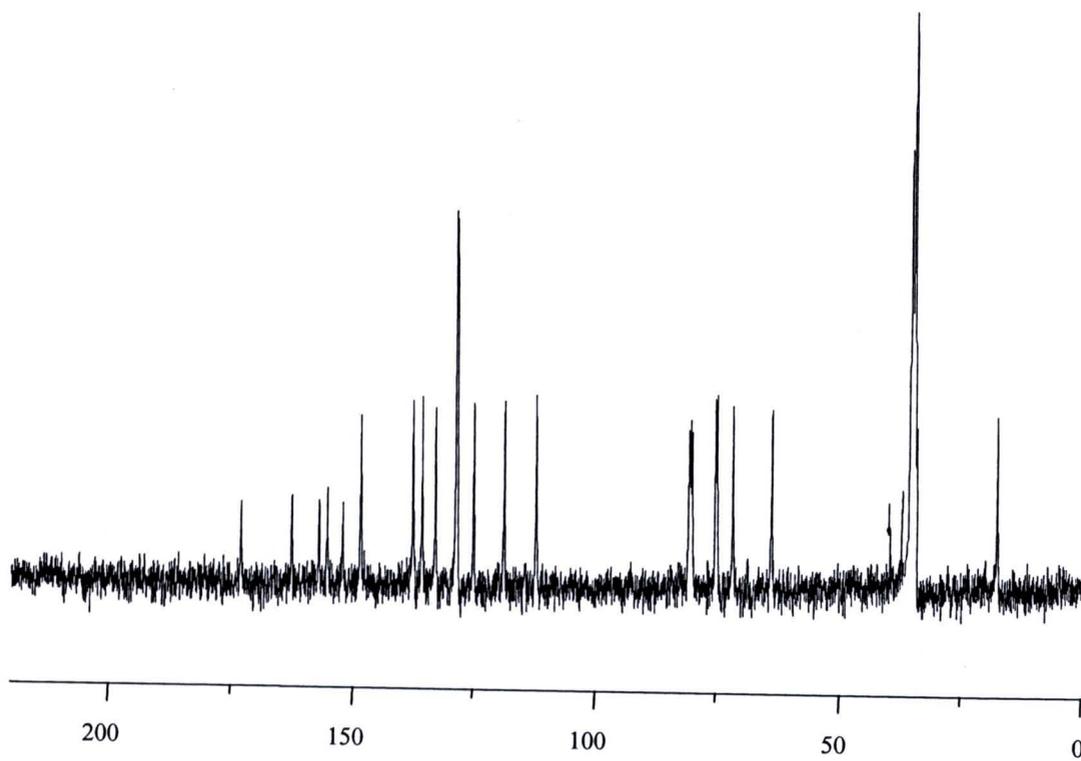
**Figure A.9**  $^1\text{H-NMR}$  spectrum of compound **2a** in  $\text{CDCl}_3$



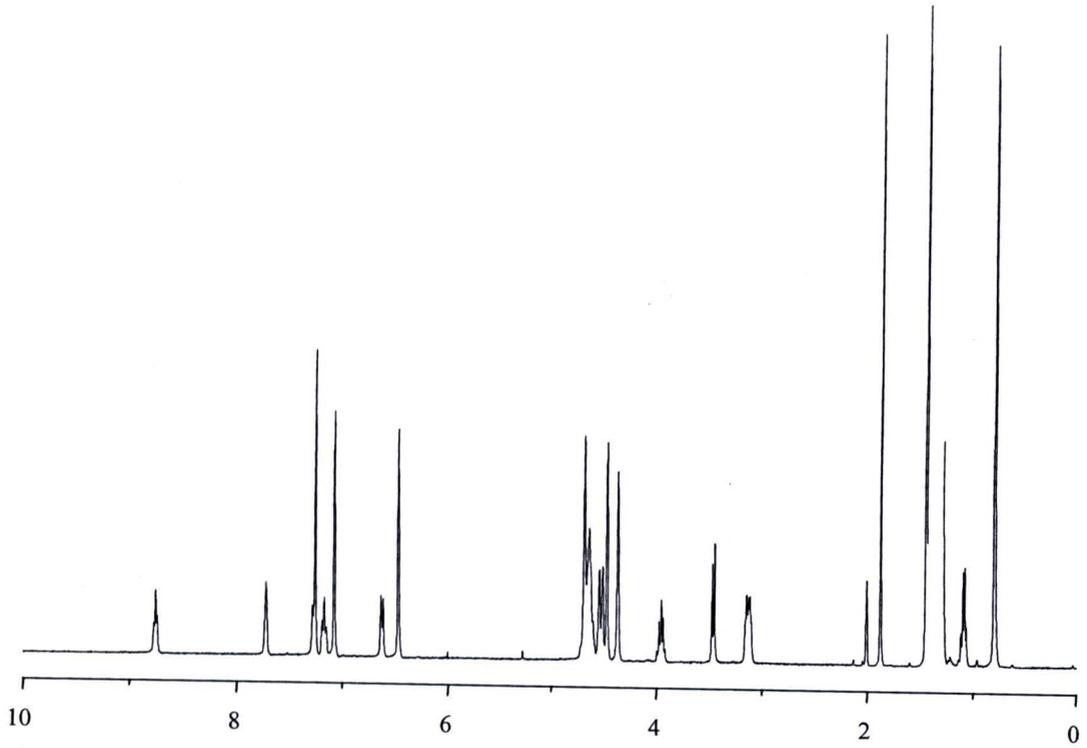
**Figure A.10**  $^{13}\text{C-NMR}$  spectrum of compound **2a** in  $\text{CDCl}_3$



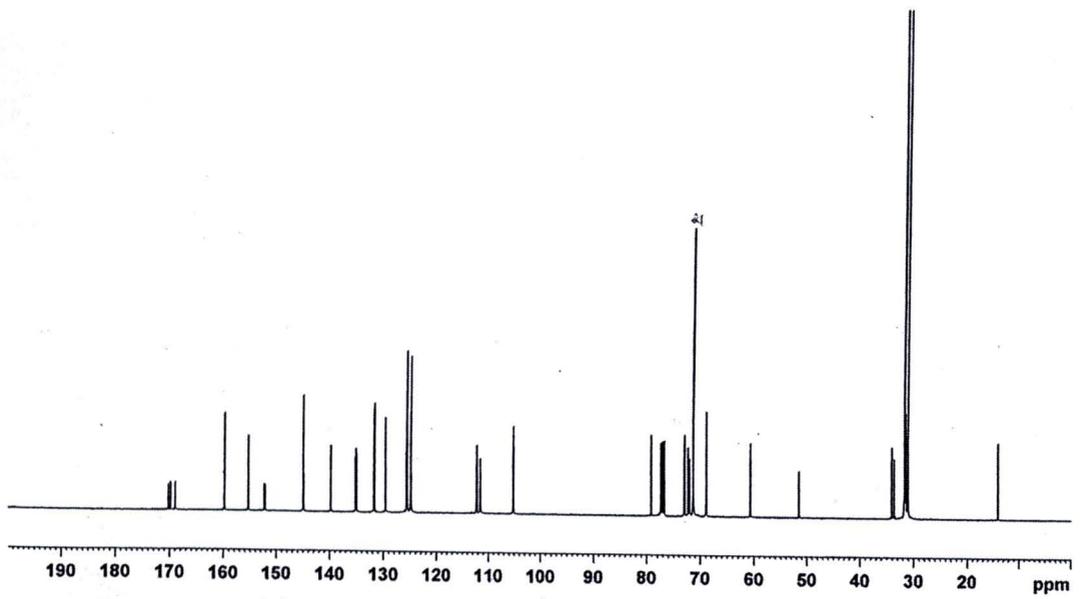
**Figure A.11**  $^1\text{H-NMR}$  spectrum of compound **2b** in  $\text{CDCl}_3$



**Figure A.12**  $^{13}\text{C-NMR}$  spectrum of compound **2b** in  $\text{CDCl}_3$



**Figure A.13**  $^1\text{H-NMR}$  spectrum of compound **2** in  $\text{CDCl}_3$



**Figure A.14**  $^{13}\text{C-NMR}$  spectrum of compound **2** in  $\text{CDCl}_3$

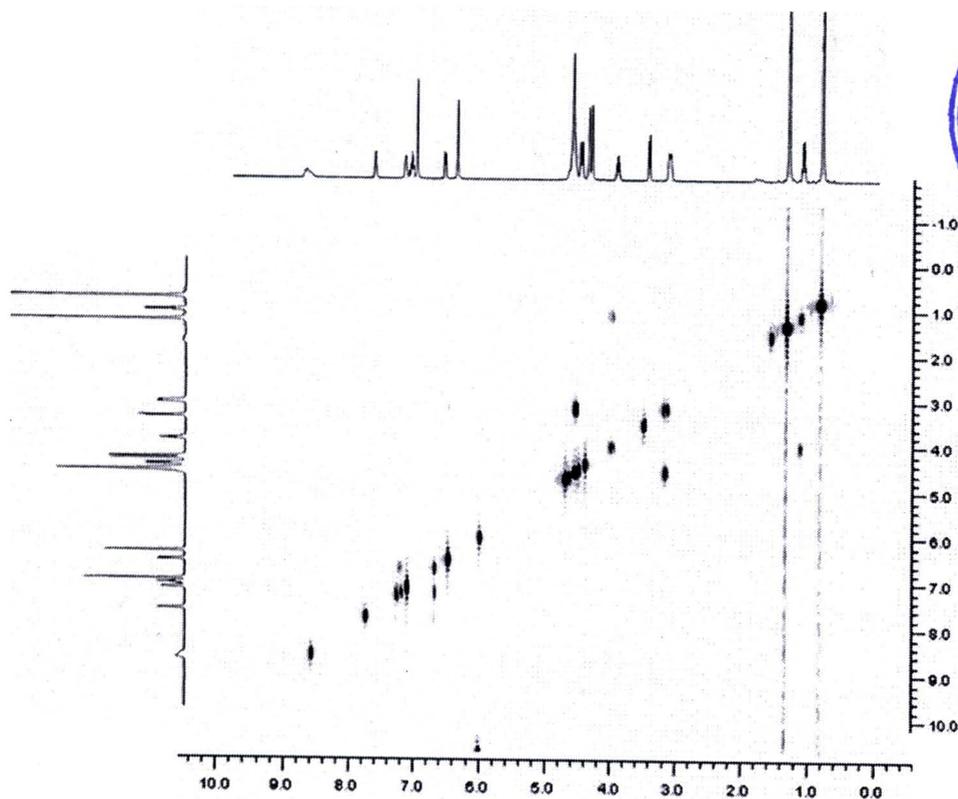


Figure A.15  $^1\text{H}$ - $^1\text{H}$  COSY spectrum of compound 2 in  $\text{CDCl}_3$

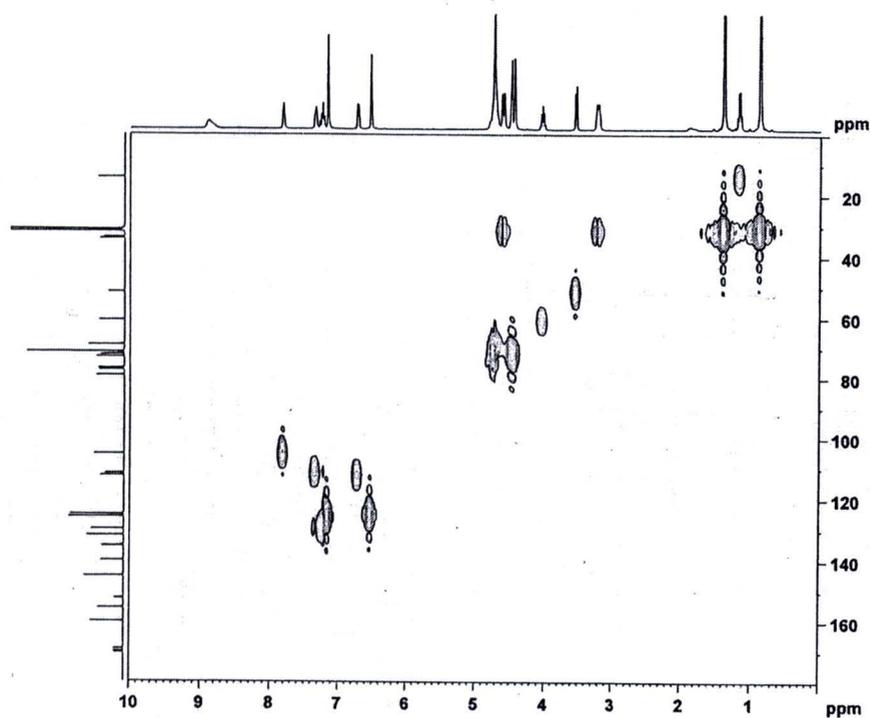
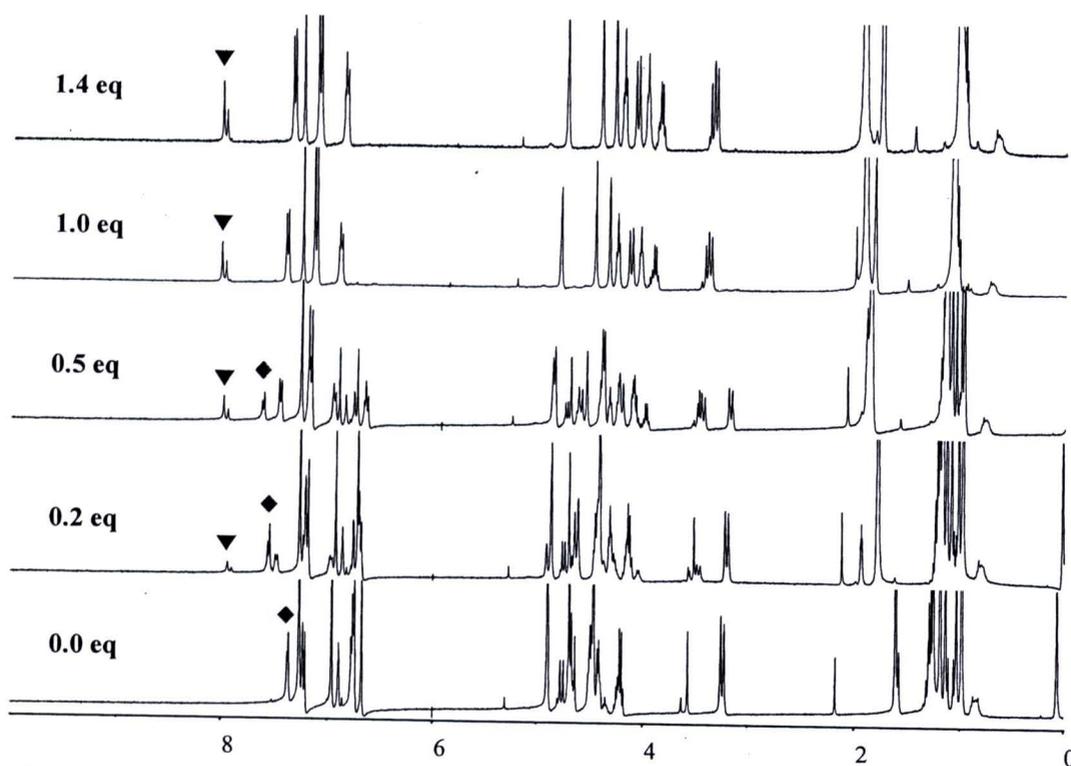
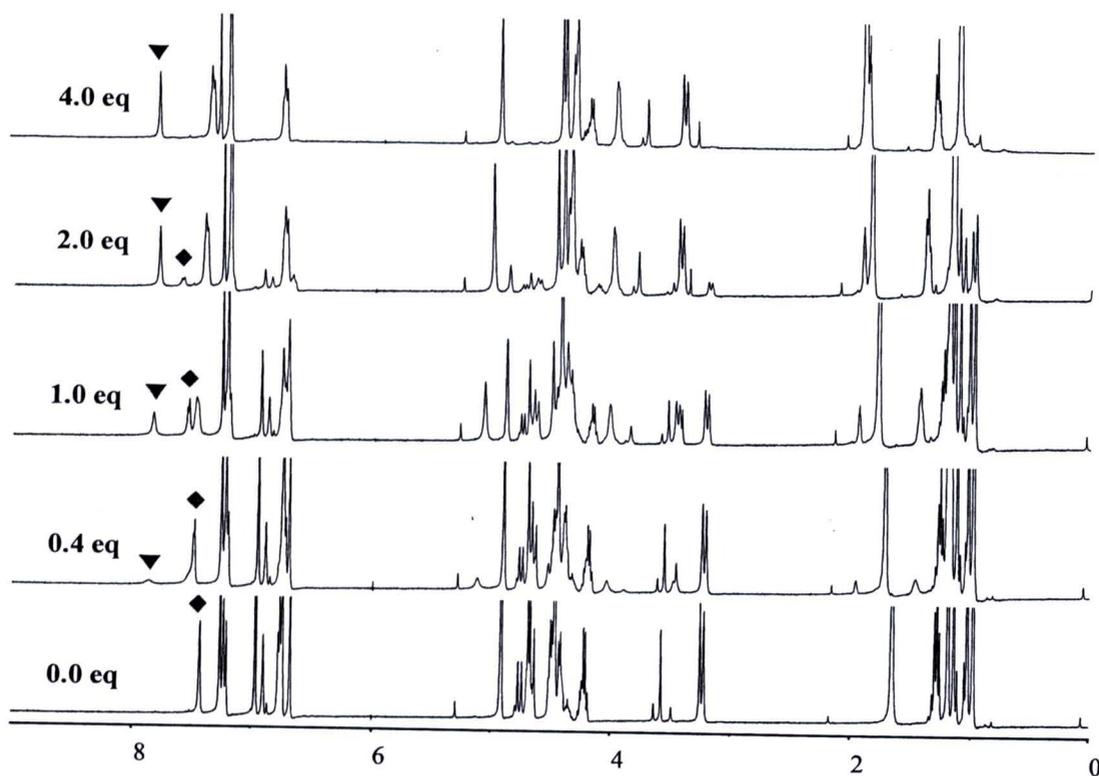


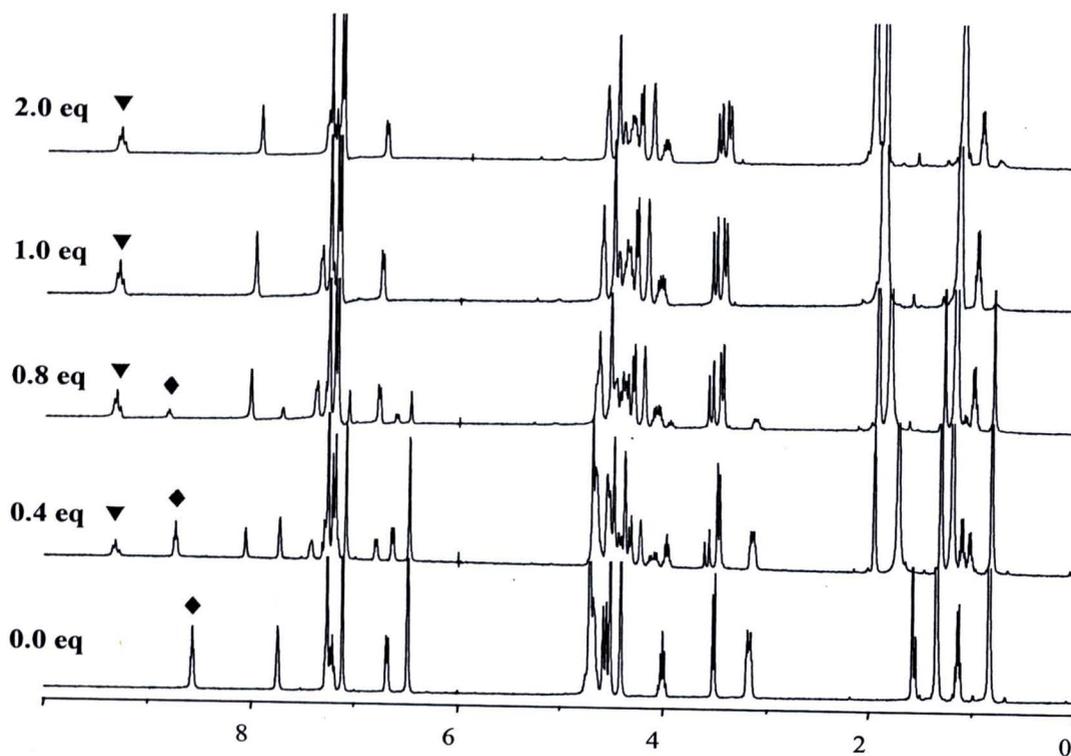
Figure A.16  $^1\text{H}$ - $^{13}\text{C}$  HMQC spectrum of compound 2 in  $\text{CDCl}_3$



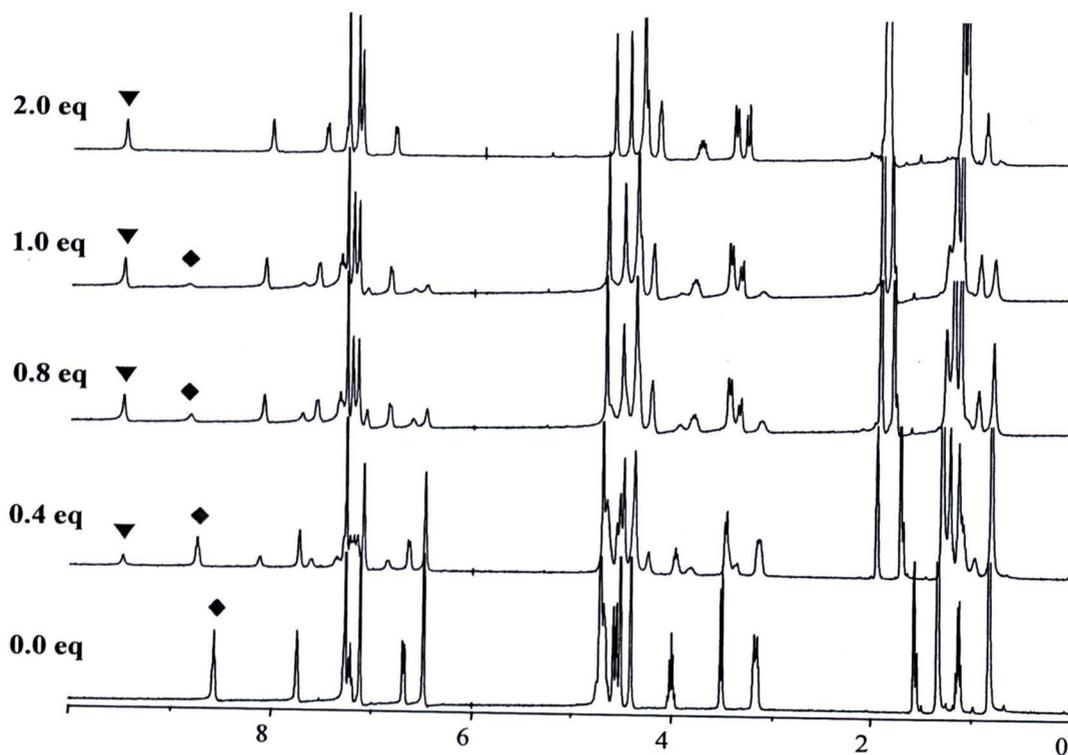
**Figure A.17**  $^1\text{H-NMR}$  titration of receptor **1** with  $\text{NaPF}_6$  in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where ▼ is NH protons of the complex  $[\mathbf{1}.\text{Na}^+]$  and ◆ is NH proton of the free receptor **1**



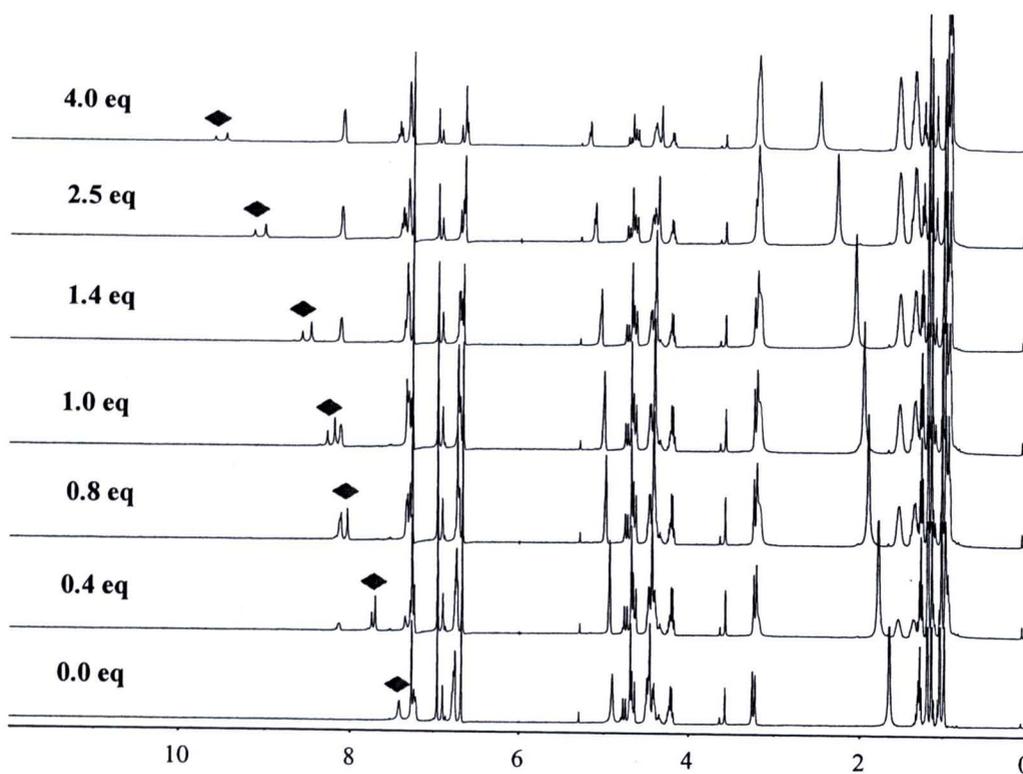
**Figure A.18**  $^1\text{H-NMR}$  titration of receptor **1** with  $\text{KPF}_6$  in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where ▼ is NH protons of the complex  $[\mathbf{1}.\text{K}^+]$  and ◆ is NH proton of the free receptor **1**



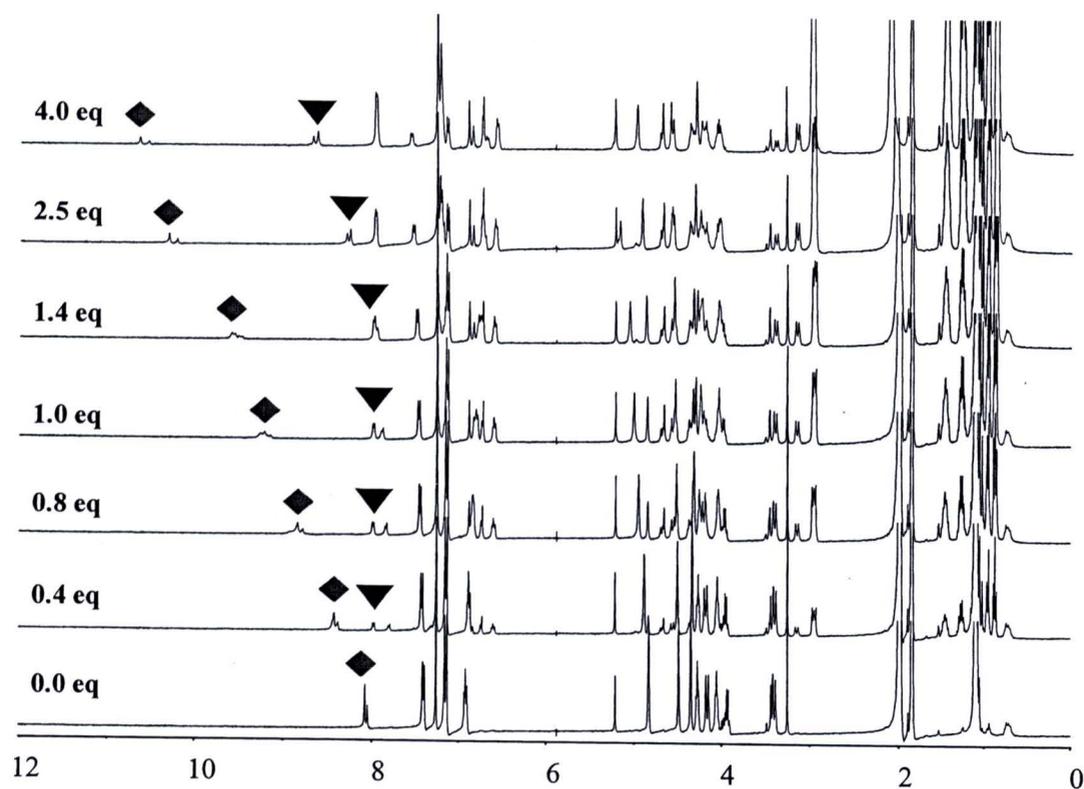
**Figure A.19**  $^1\text{H-NMR}$  titration of receptor **2** with  $\text{NaPF}_6$  in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where ▼ is NH protons of the complex  $[\mathbf{2}.\text{Na}^+]$  and ◆ is NH proton of the free receptor **1**



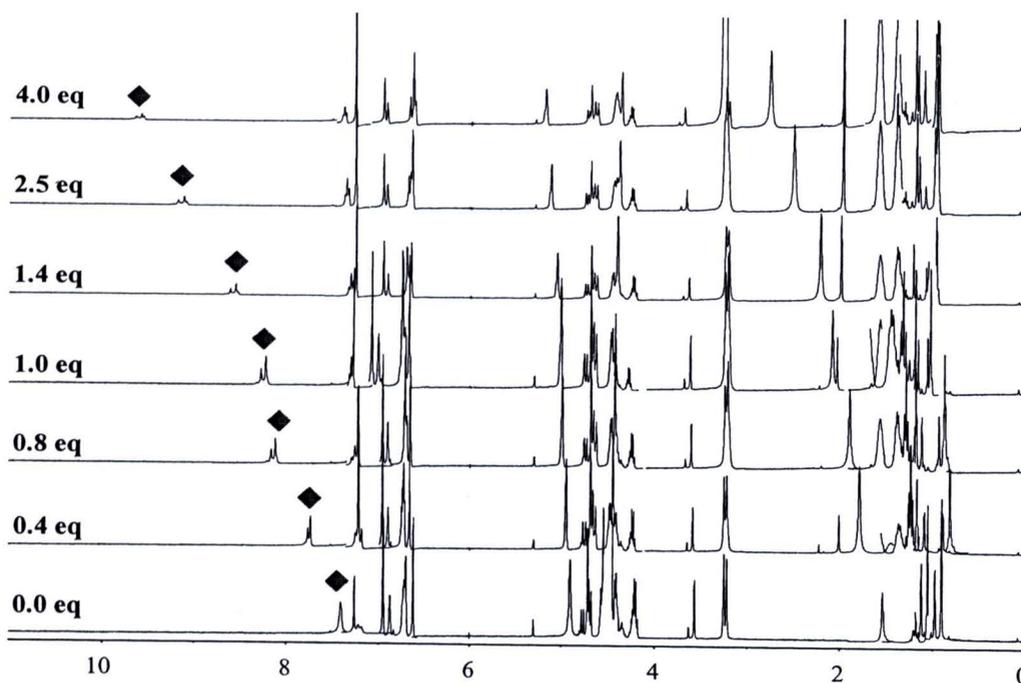
**Figure A.20**  $^1\text{H-NMR}$  titration of receptor **2** with  $\text{KPF}_6$  in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where ▼ is NH protons of the complex  $[\mathbf{2}.\text{K}^+]$  and ◆ is NH proton of the free receptor **1**



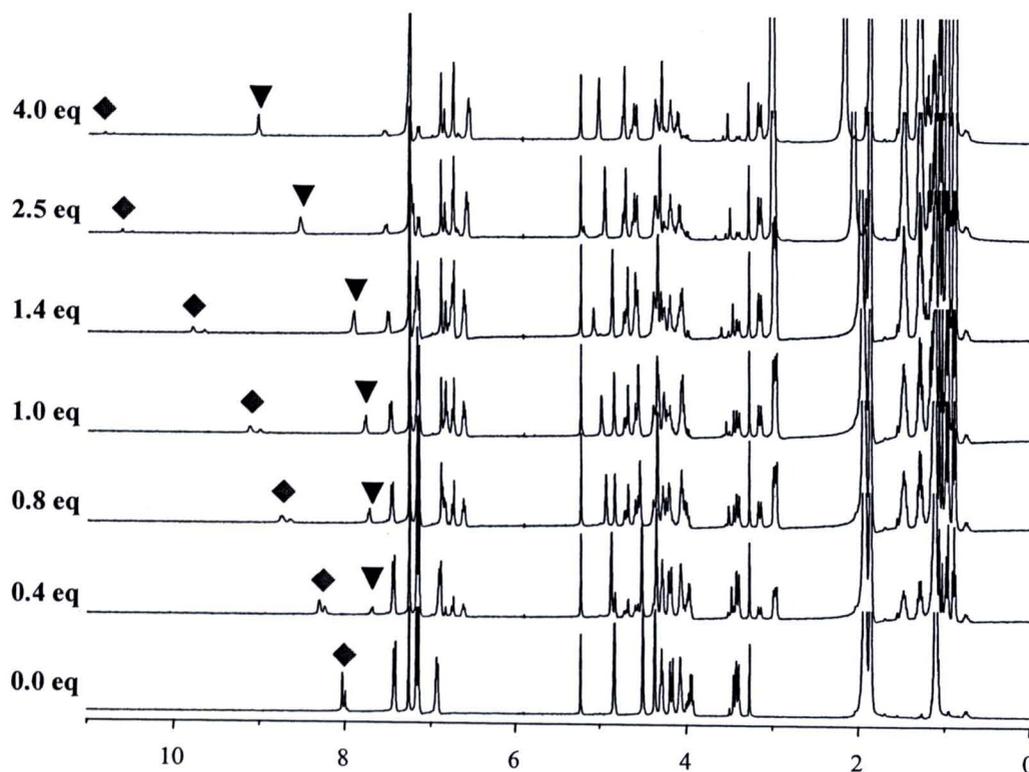
**Figure A.21**  $^1\text{H-NMR}$  titration of receptor **1** with benzoate in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the receptor **1**.



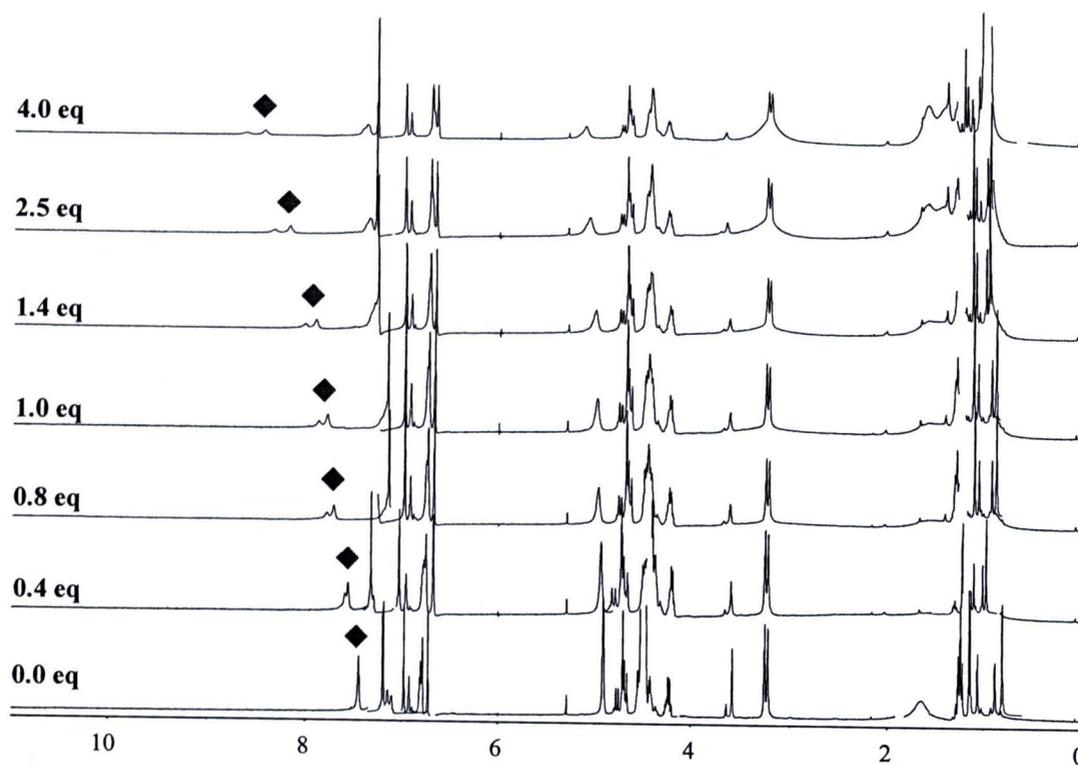
**Figure A.22**  $^1\text{H-NMR}$  titration of complex  $[1.\text{Na}^+]$  with benzoate in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the complex  $[1.\text{Na}^+]$  and  $\blacktriangledown$  is NH protons of the free receptor **1**.



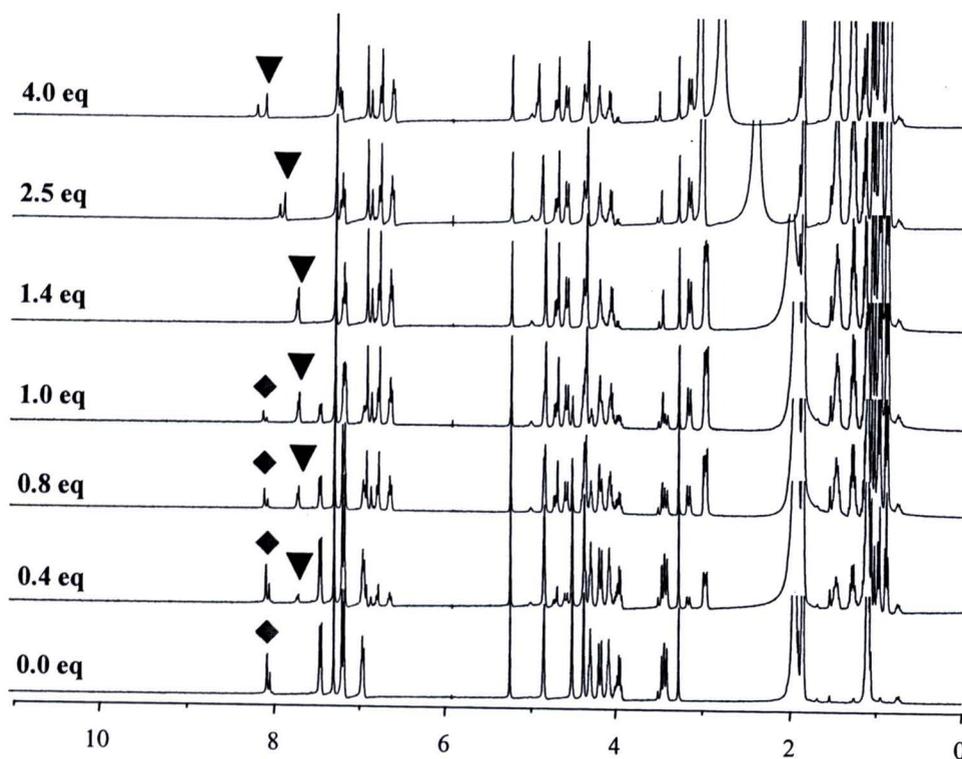
**Figure A.23**  $^1\text{H}$ -NMR titration of receptor **1** with acetate in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the receptor **1**.



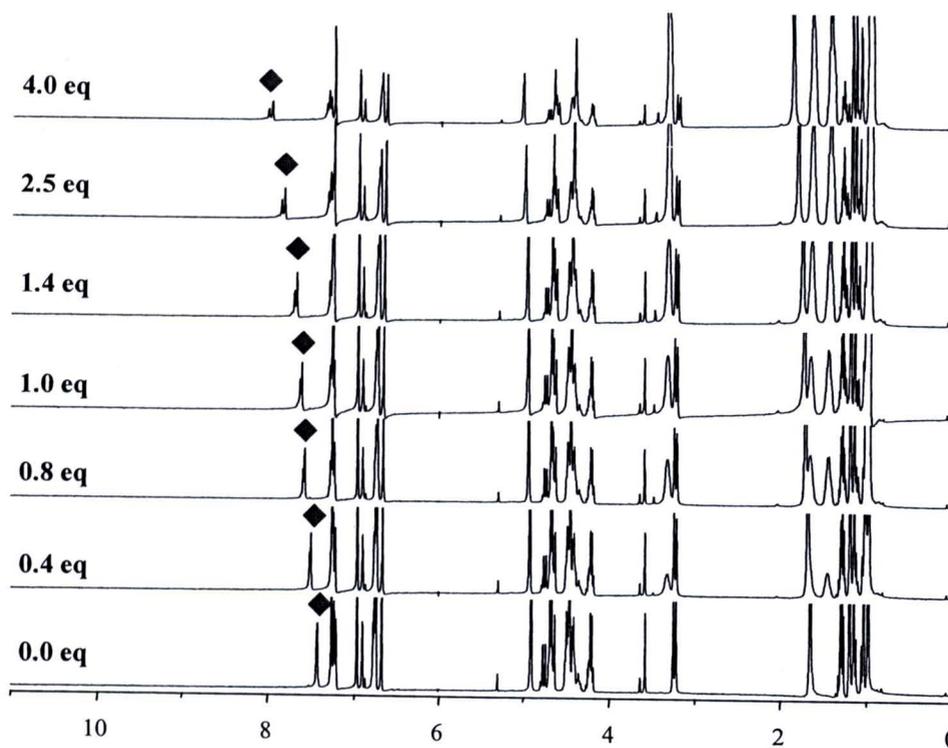
**Figure A.24**  $^1\text{H}$ -NMR titration of complex  $[\mathbf{1}.\text{Na}^+]$  with acetate in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the complex  $[\mathbf{1}.\text{Na}^+]$  and  $\blacktriangledown$  is NH protons of the free receptor **1**.



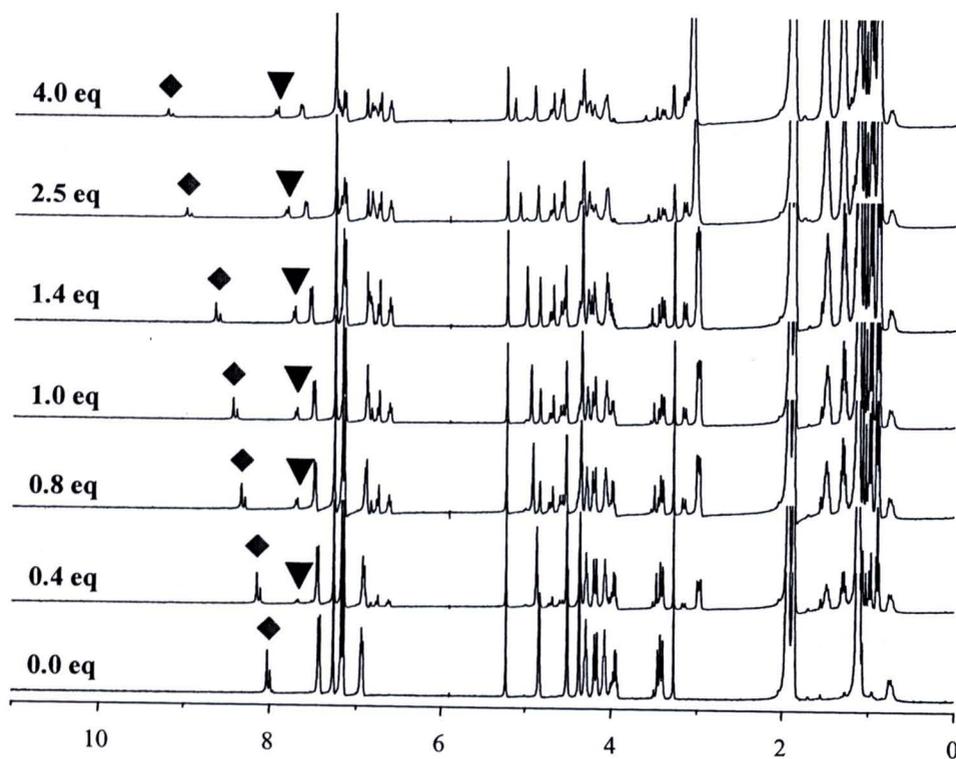
**Figure A.25**  $^1\text{H}$ -NMR titration of receptor **1** with dihydrogenphosphate in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the receptor **1**.



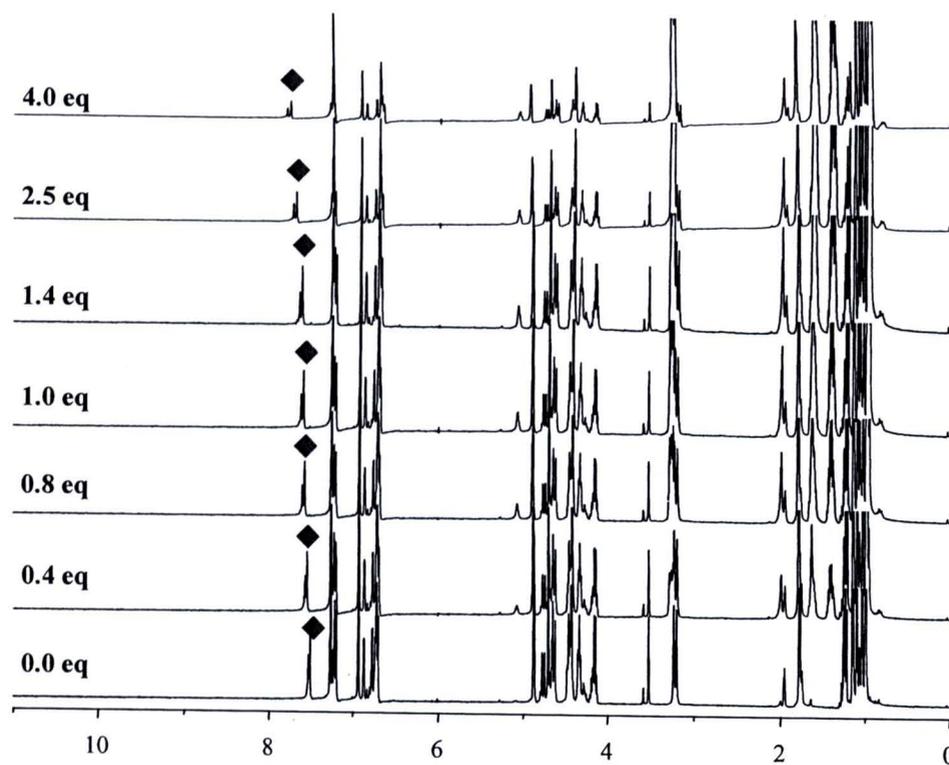
**Figure A.26**  $^1\text{H}$ -NMR titration of complex  $[\mathbf{1}.\text{Na}^+]$  with dihydrogenphosphate in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the complex  $[\mathbf{1}.\text{Na}^+]$  and  $\blacktriangledown$  is NH protons of the free receptor **1**.



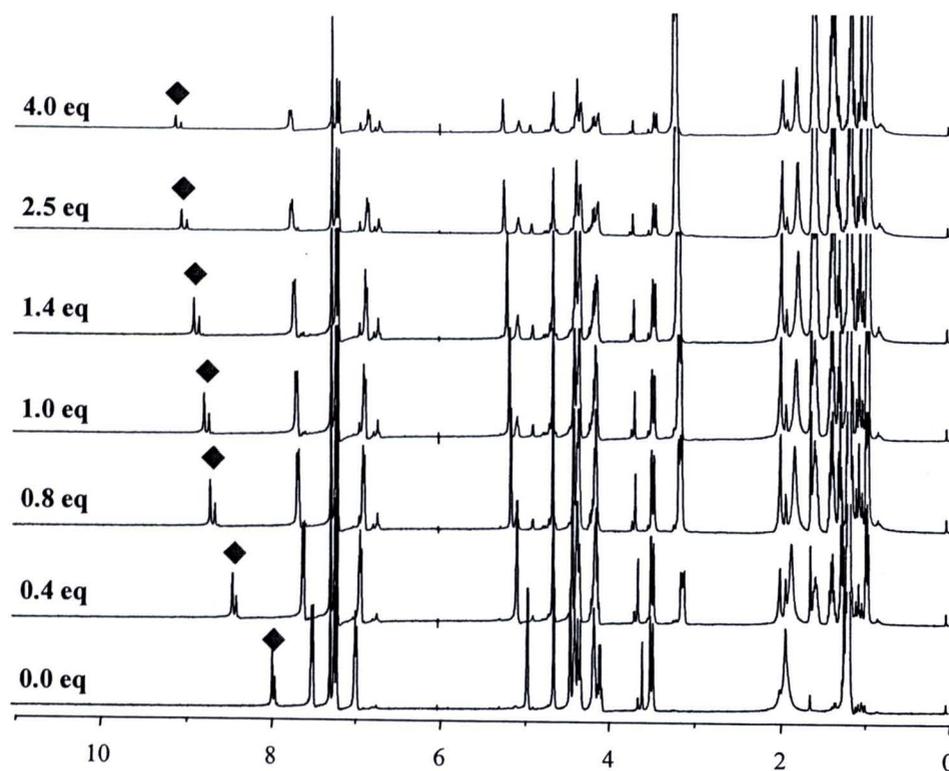
**Figure A.27**  $^1\text{H-NMR}$  titration of receptor **1** with chloride in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the receptor **1**.



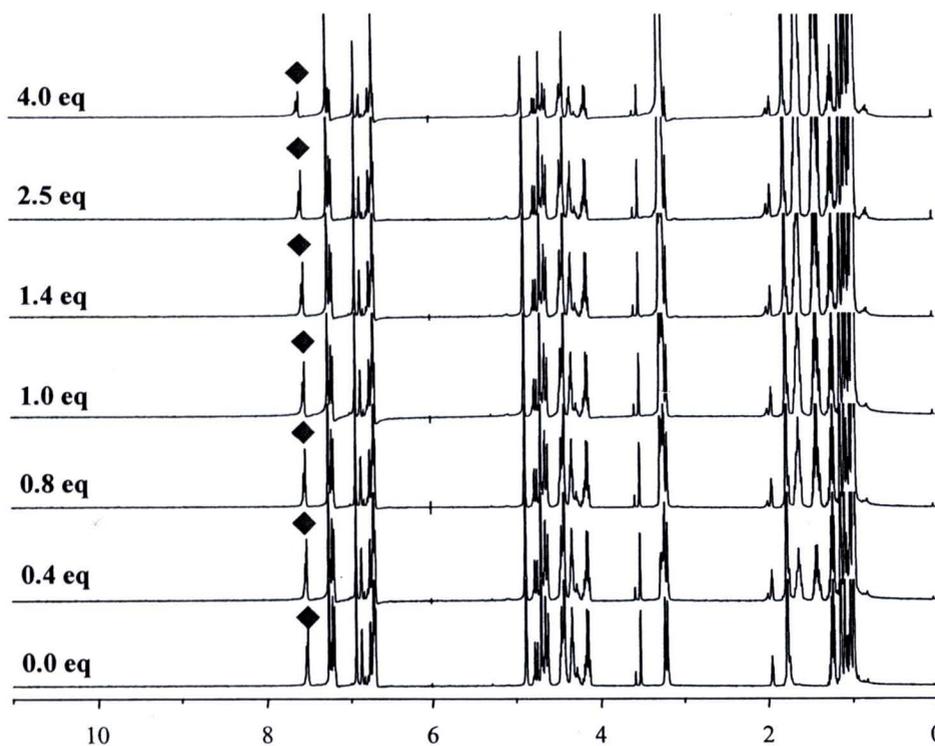
**Figure A.28**  $^1\text{H-NMR}$  titration of complex  $[\mathbf{1}.\text{Na}^+]$  with chloride in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the complex  $[\mathbf{1}.\text{Na}^+]$  and  $\blacktriangledown$  is NH protons of the free receptor **1**.



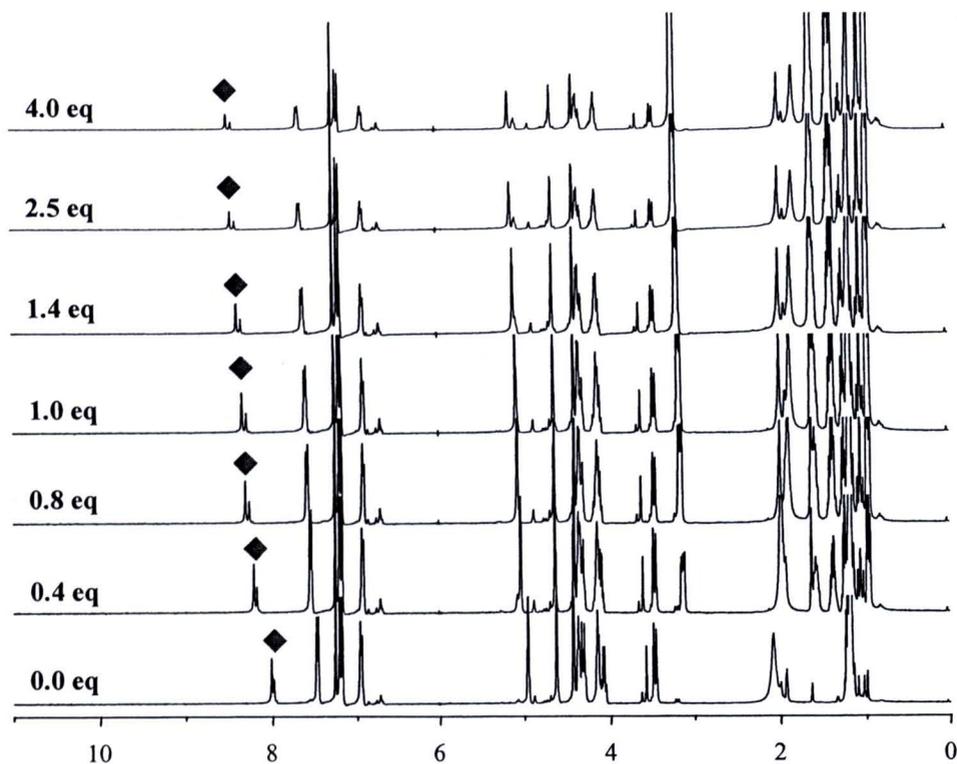
**Figure A.29**  $^1\text{H-NMR}$  titration of receptor **1** with bromide in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the receptor **1**.



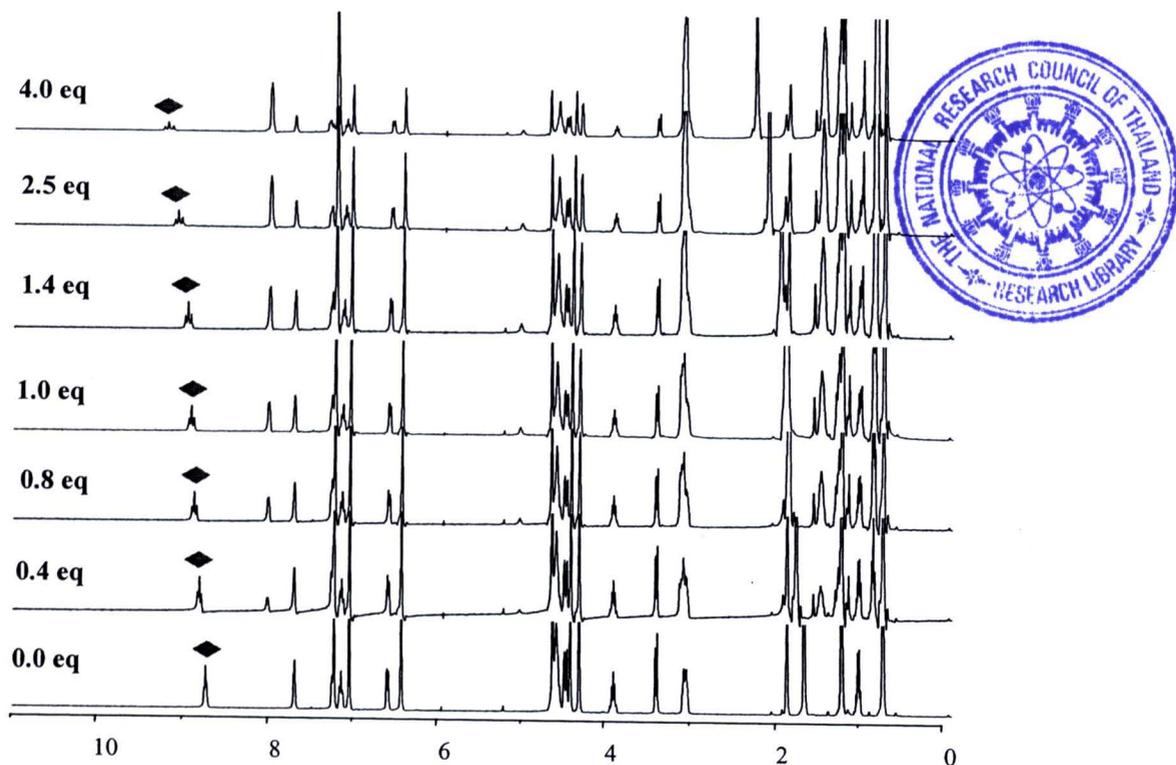
**Figure A.30**  $^1\text{H-NMR}$  titration of complex  $[\mathbf{1}.\text{Na}^+]$  with bromide in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the complex  $[\mathbf{1}.\text{Na}^+]$ .



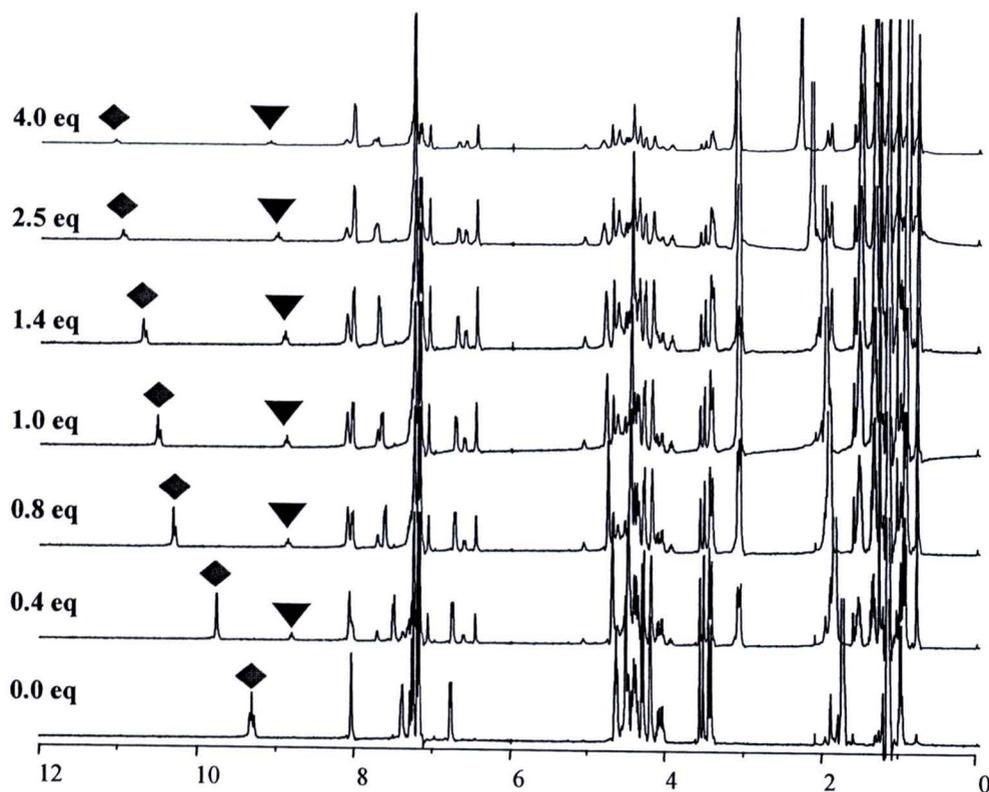
**Figure A.31**  $^1\text{H-NMR}$  titration of receptor **1** with iodide in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where ◆ is NH protons of the receptor **1**.



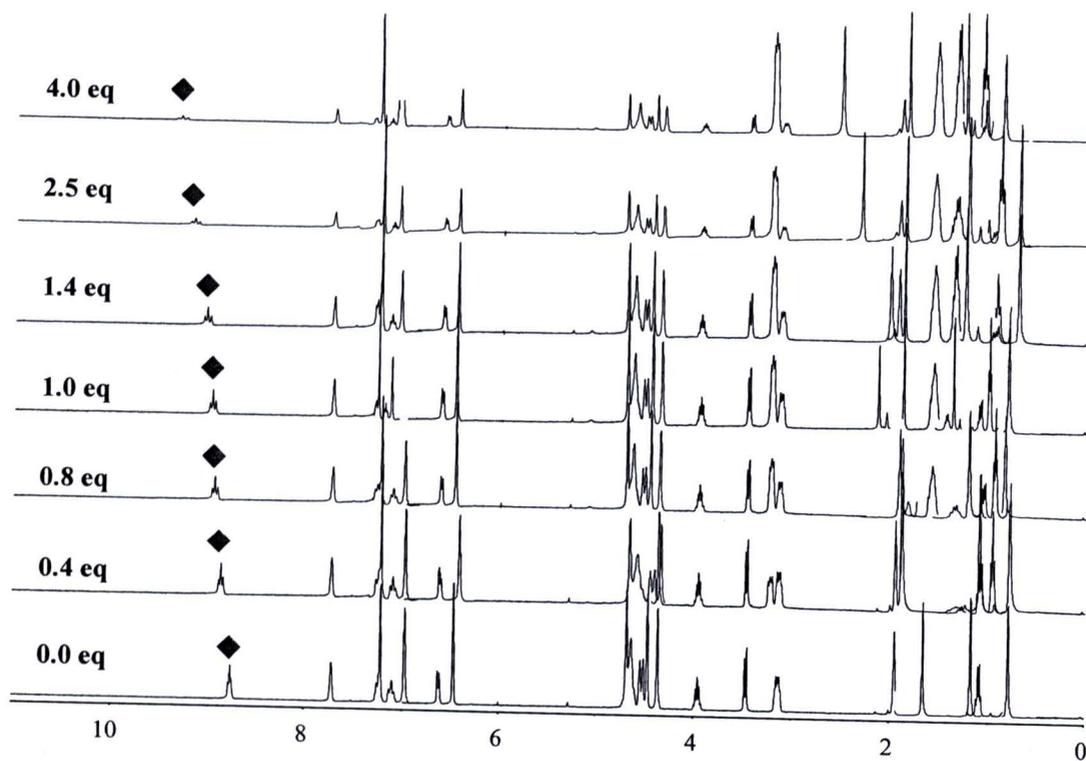
**Figure A.32**  $^1\text{H-NMR}$  titration of complex  $[\mathbf{1}.\text{Na}^+]$  with iodide in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where ◆ is NH protons of the complex  $[\mathbf{1}.\text{Na}^+]$ .



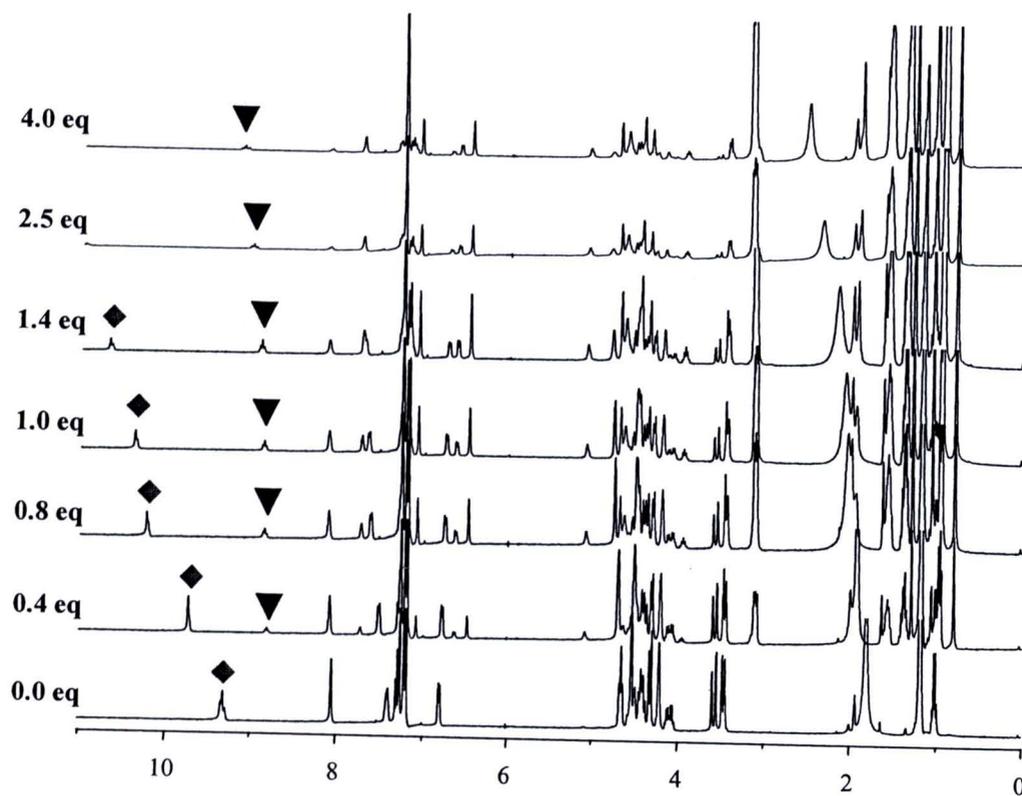
**Figure A.33**  $^1\text{H-NMR}$  titration of receptor **2** with benzoate in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the receptor **2**.



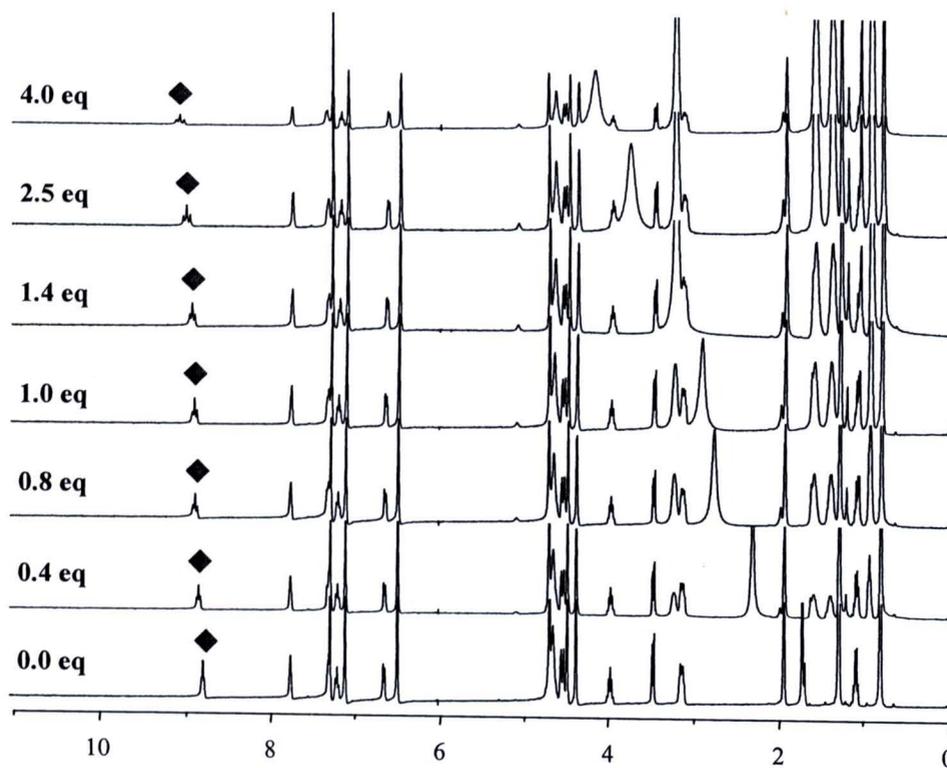
**Figure A.34**  $^1\text{H-NMR}$  titration of complex  $[2.\text{Na}^+]$  with benzoate in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the complex  $[2.\text{Na}^+]$  and  $\blacktriangledown$  is NH protons of the free receptor **2**.



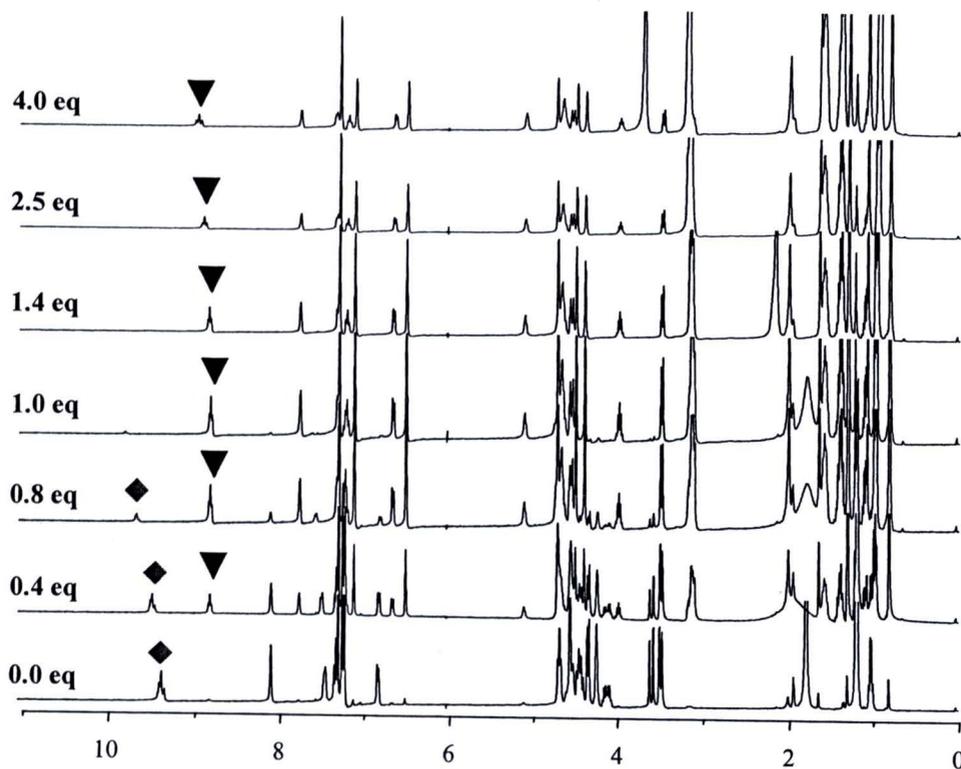
**Figure A.35**  $^1\text{H-NMR}$  titration of receptor **2** with acetate in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the receptor **2**.



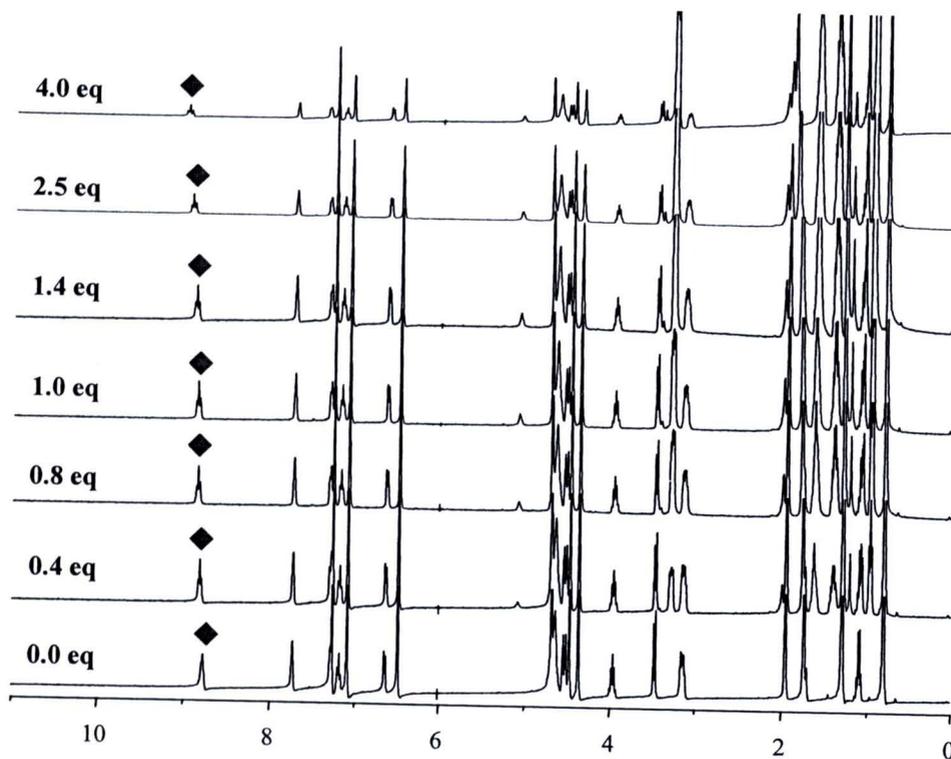
**Figure A.36**  $^1\text{H-NMR}$  titration of complex  $[2.\text{Na}^+]$  with acetate in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the complex  $[2.\text{Na}^+]$  and  $\blacktriangledown$  is NH protons of the free receptor **2**.



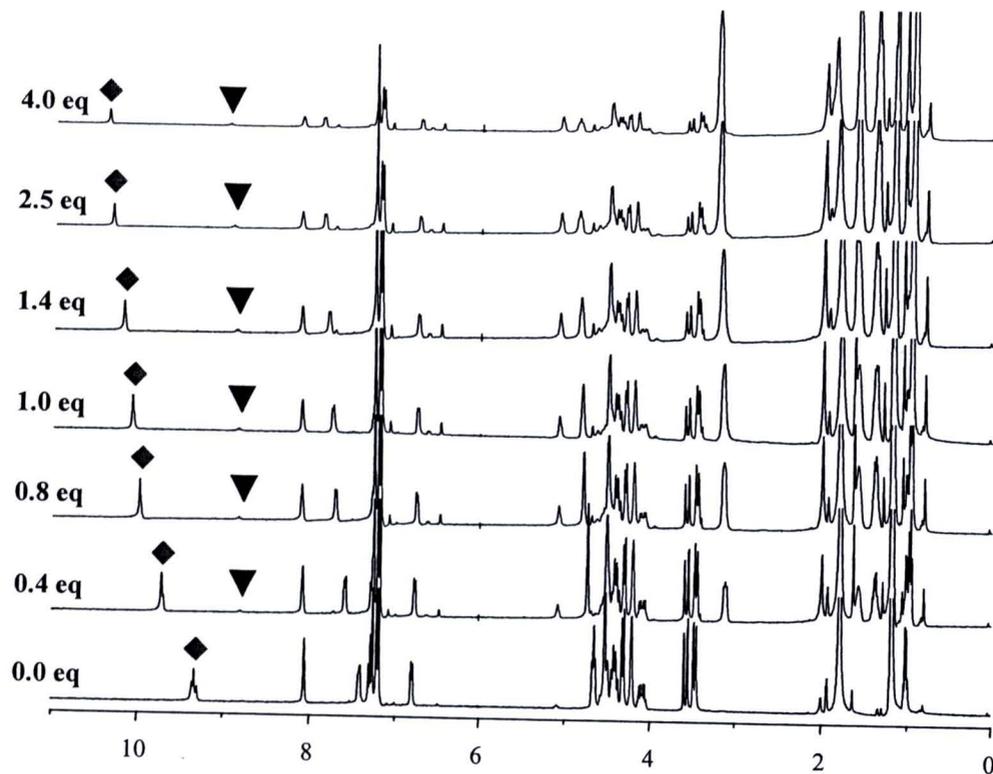
**Figure A.37**  $^1\text{H-NMR}$  titration of receptor **2** with dihydrogenphosphate in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the receptor **2**.



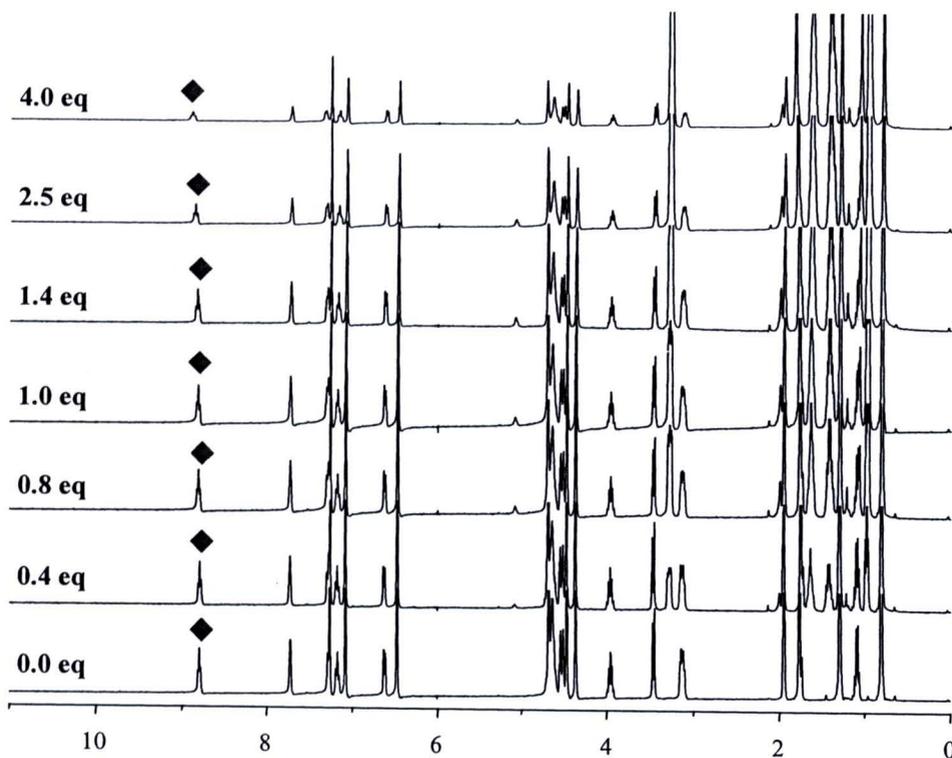
**Figure A.38**  $^1\text{H-NMR}$  titration of complex  $[2.\text{Na}^+]$  with dihydrogenphosphate in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the complex  $[2.\text{Na}^+]$  and  $\blacktriangledown$  is NH protons of the free receptor **2**.



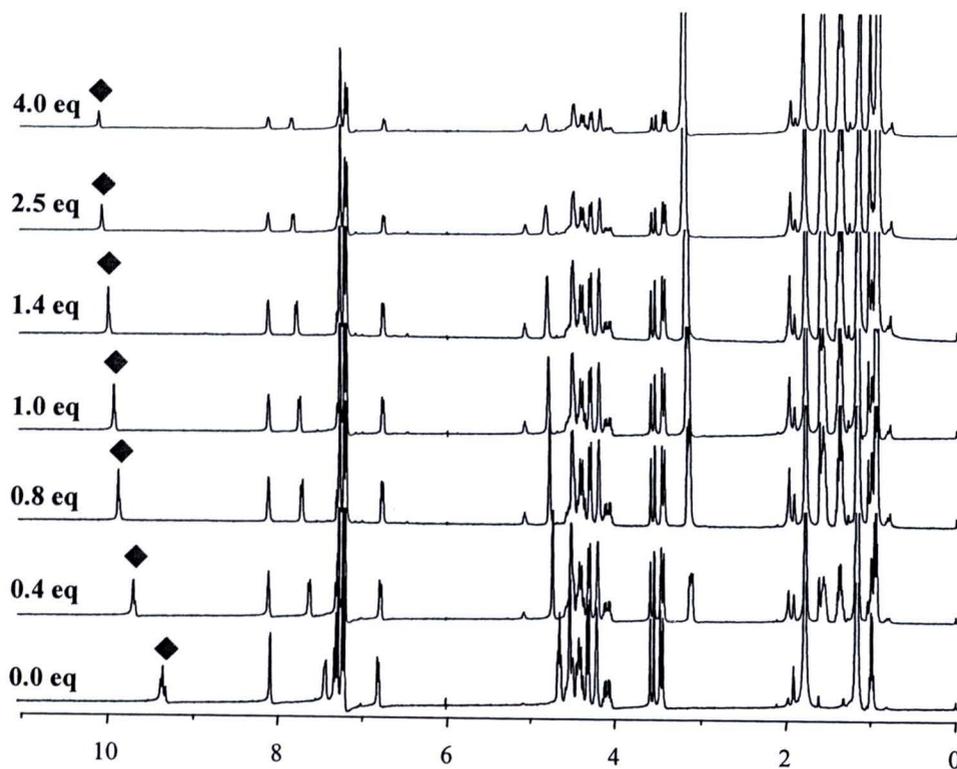
**Figure A.39**  $^1\text{H-NMR}$  titration of receptor **2** with chloride in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the receptor **2**.



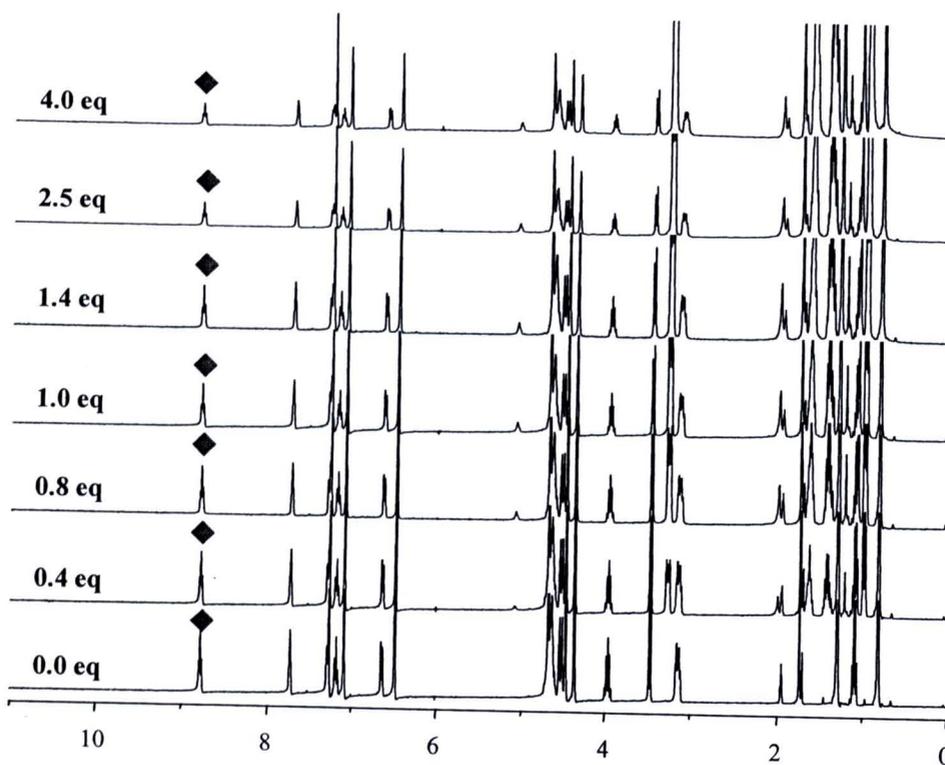
**Figure A.40**  $^1\text{H-NMR}$  titration of complex  $[\mathbf{2}.\text{Na}^+]$  with chloride in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the complex  $[\mathbf{2}.\text{Na}^+]$  and  $\blacktriangledown$  is NH protons of the free receptor **2**.



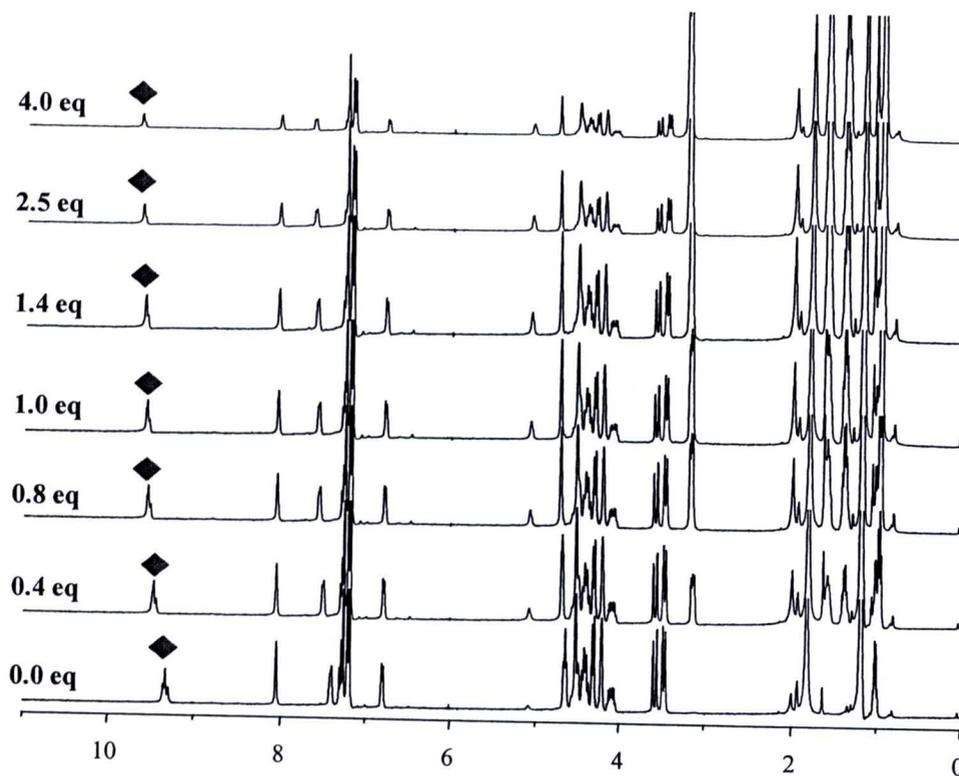
**Figure A.41**  $^1\text{H-NMR}$  titration of receptor **2** with bromide in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the receptor **2**.



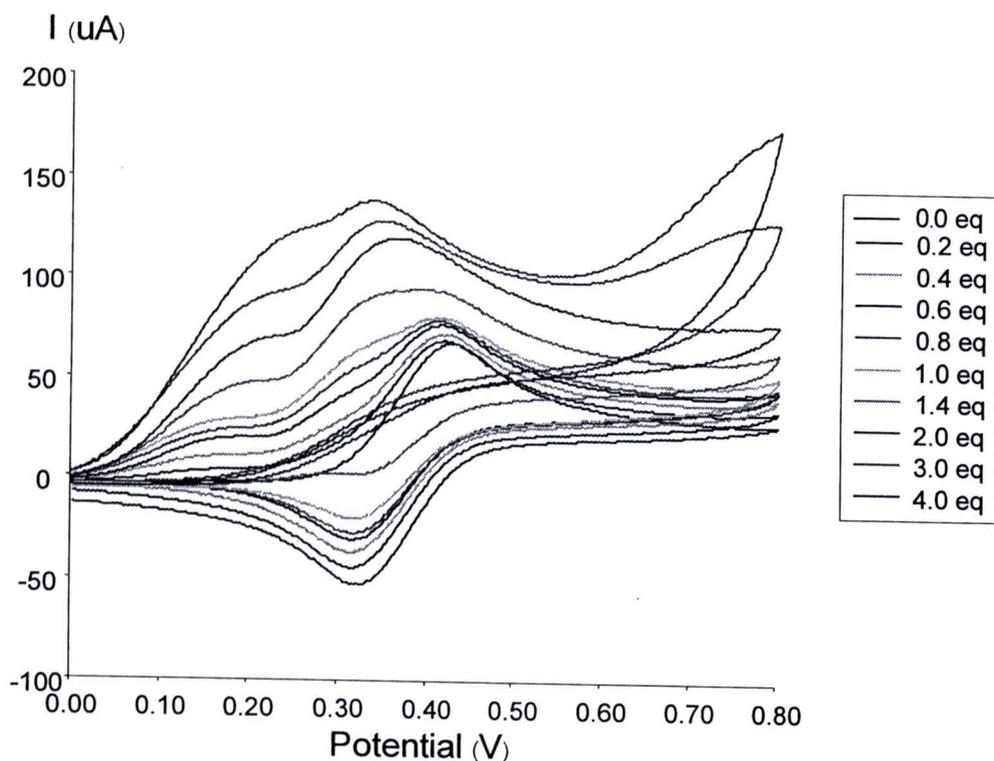
**Figure A.42**  $^1\text{H-NMR}$  titration of complex  $[\mathbf{2}.\text{Na}^+]$  with bromide in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the complex  $[\mathbf{2}.\text{Na}^+]$ .



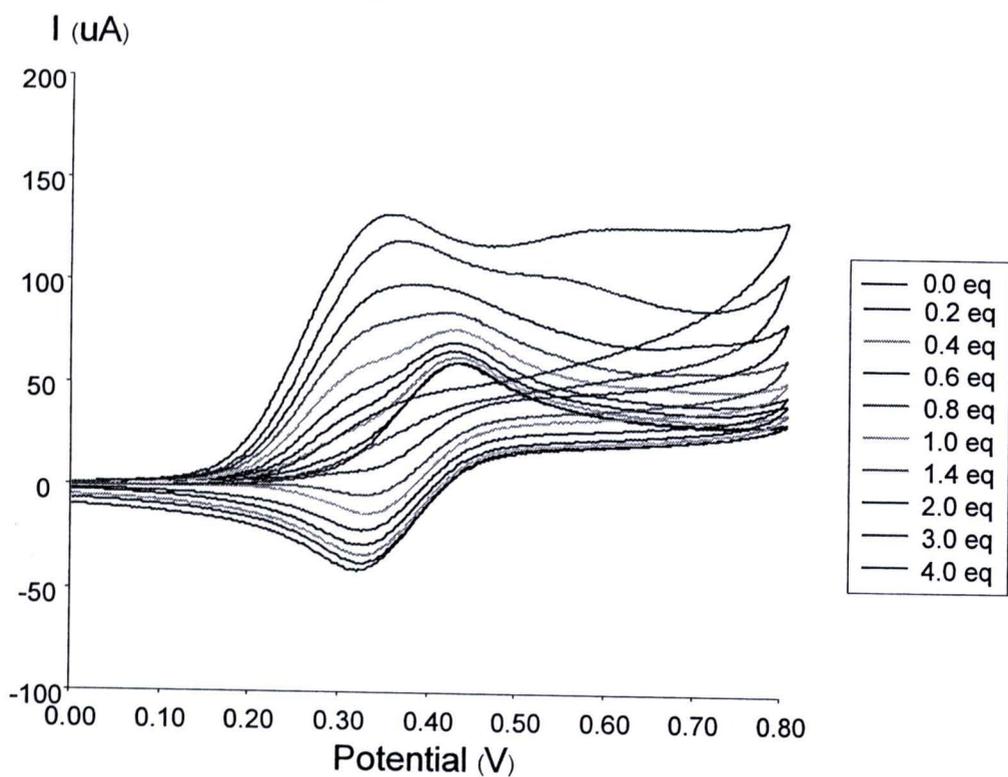
**Figure A.43**  $^1\text{H}$ -NMR titration of receptor **2** with iodide in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the receptor **2**.



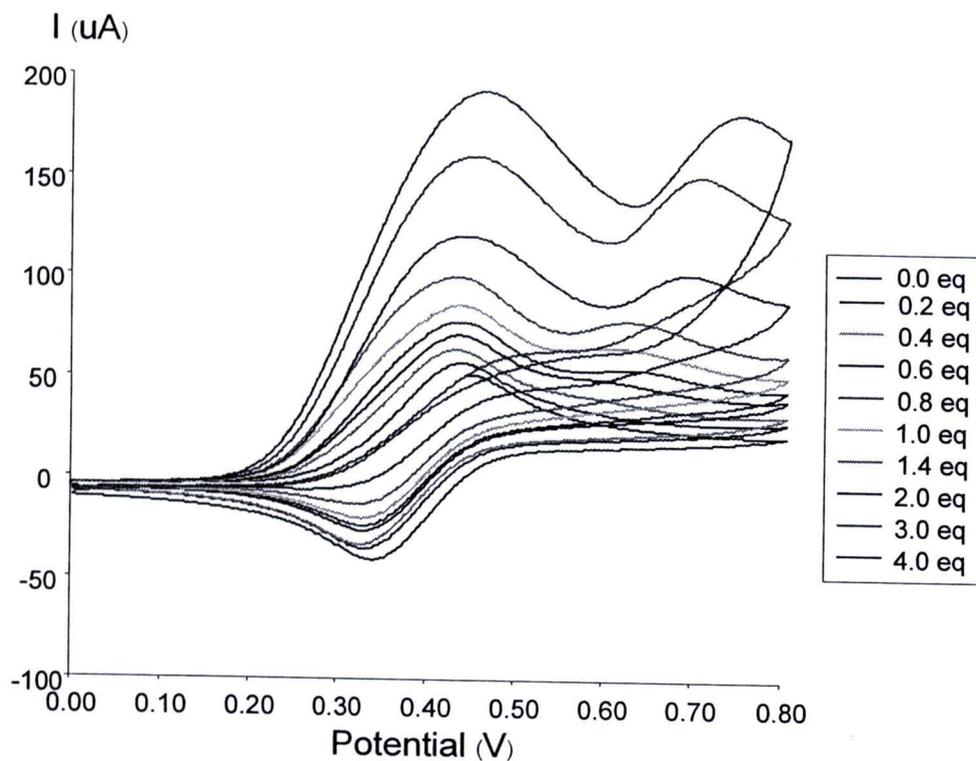
**Figure A.44**  $^1\text{H}$ -NMR titration of complex  $[2.\text{Na}^+]$  with iodide in 5%  $\text{CD}_3\text{CN}:\text{CDCl}_3$  where  $\blacklozenge$  is NH protons of the complex  $[2.\text{Na}^+]$ .



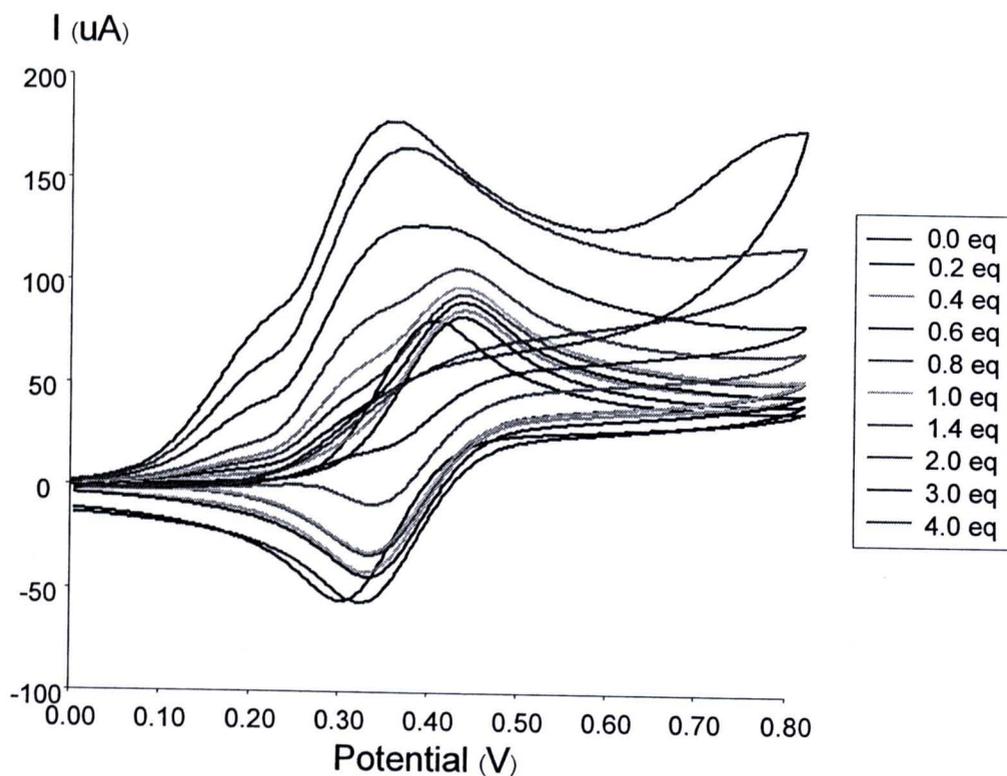
**Figure A.45** CV titration of receptor **1** with acetate in 40%  $\text{CH}_3\text{CN}:\text{CH}_2\text{Cl}_2$  with 0.1M  $\text{TBAPF}_6$  at scan rate 100 mV/s.



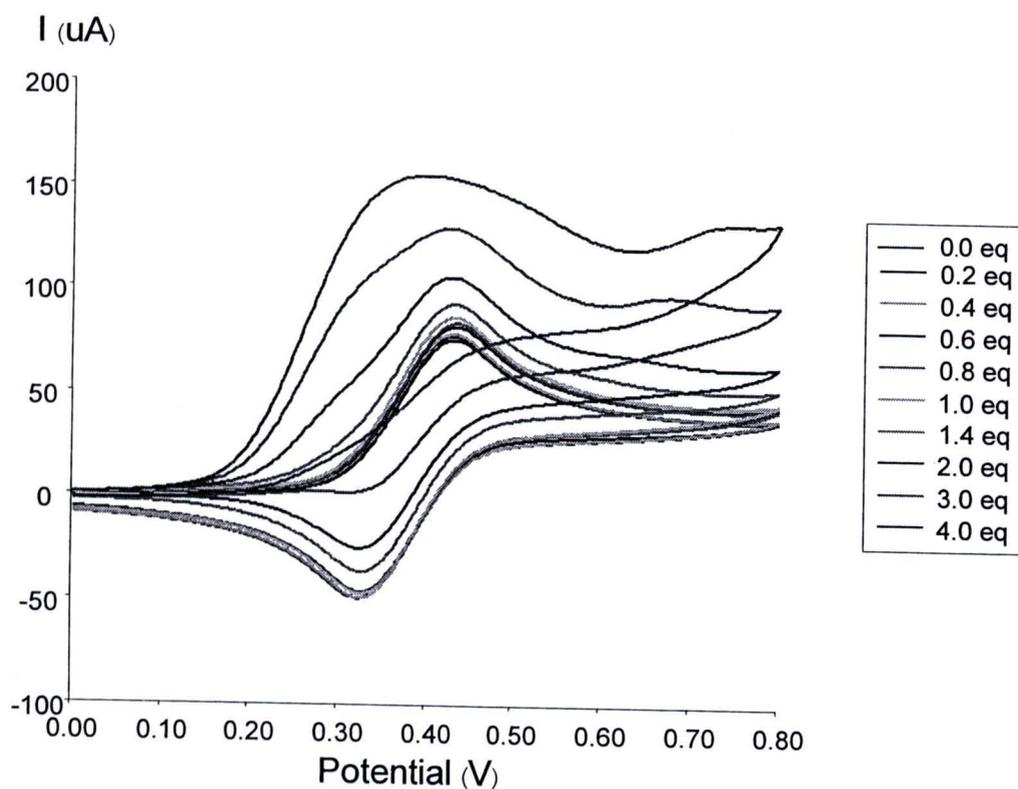
**Figure A.46** CV titration of receptor **1** with chloride in 40%  $\text{CH}_3\text{CN}:\text{CH}_2\text{Cl}_2$  with 0.1M  $\text{TBAPF}_6$  at scan rate 100 mV/s.



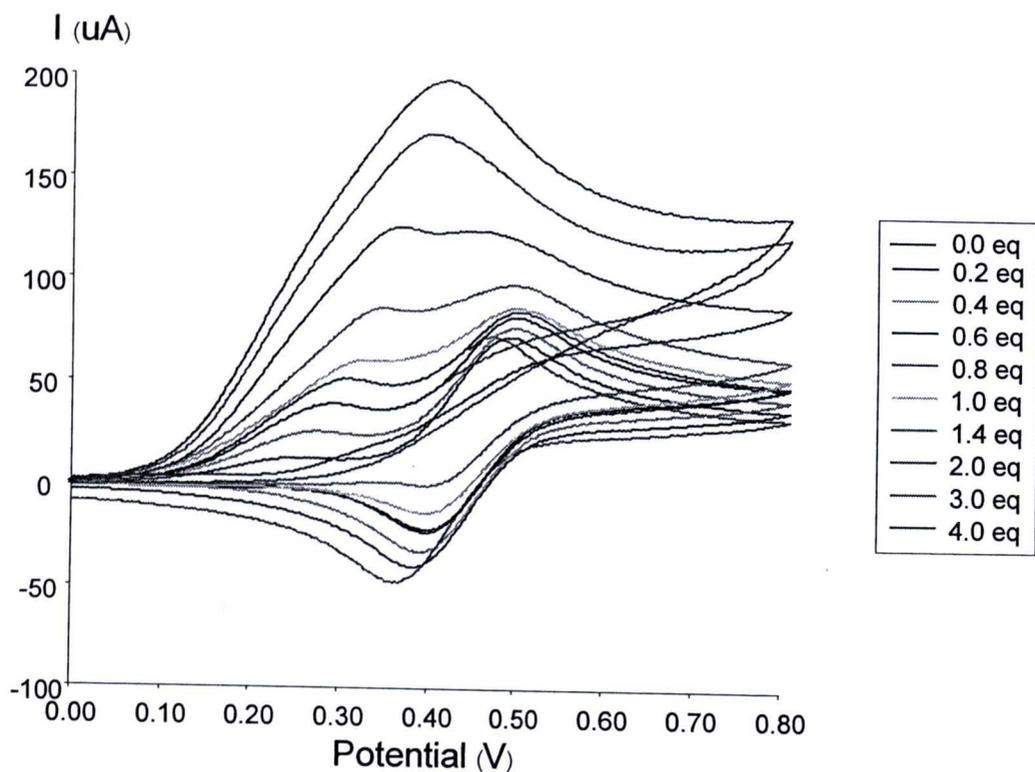
**Figure A.47** CV titration of receptor **1** with bromide in 40%  $\text{CH}_3\text{CN}:\text{CH}_2\text{Cl}_2$  with 0.1M  $\text{TBAPF}_6$  at scan rate 100 mV/s.



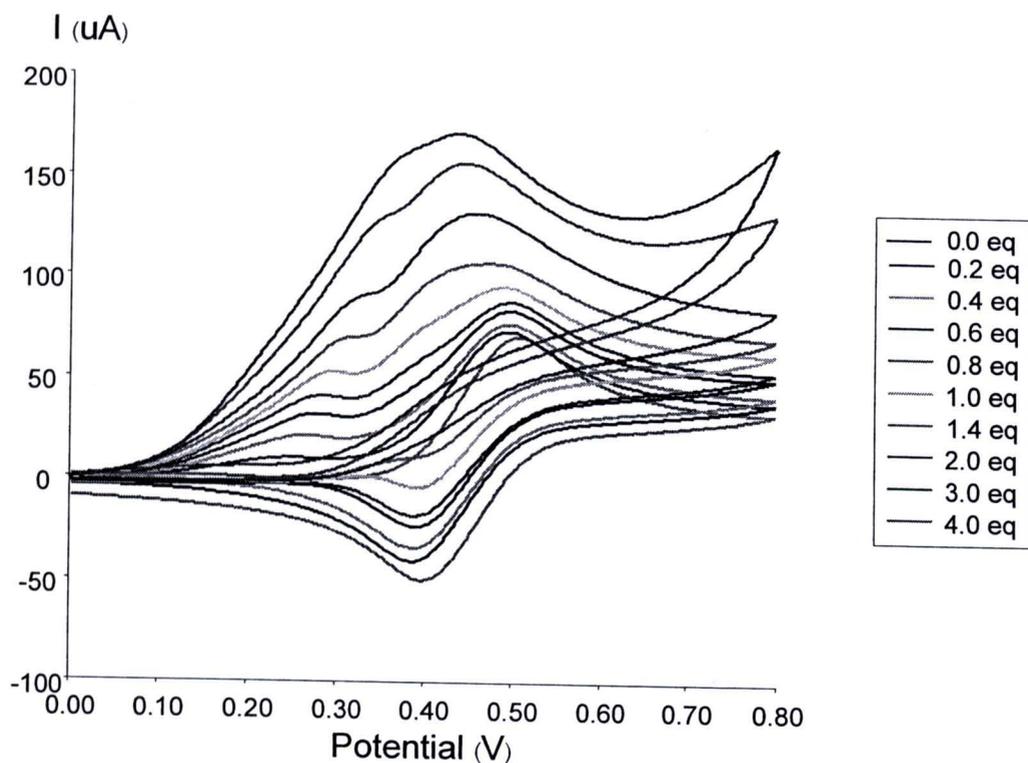
**Figure A.48** CV titration of complex  $[\mathbf{1}.\text{Na}^+]$  with acetate in 40%  $\text{CH}_3\text{CN}:\text{CH}_2\text{Cl}_2$  with 0.1M  $\text{TBAPF}_6$  at scan rate 100 mV/s.



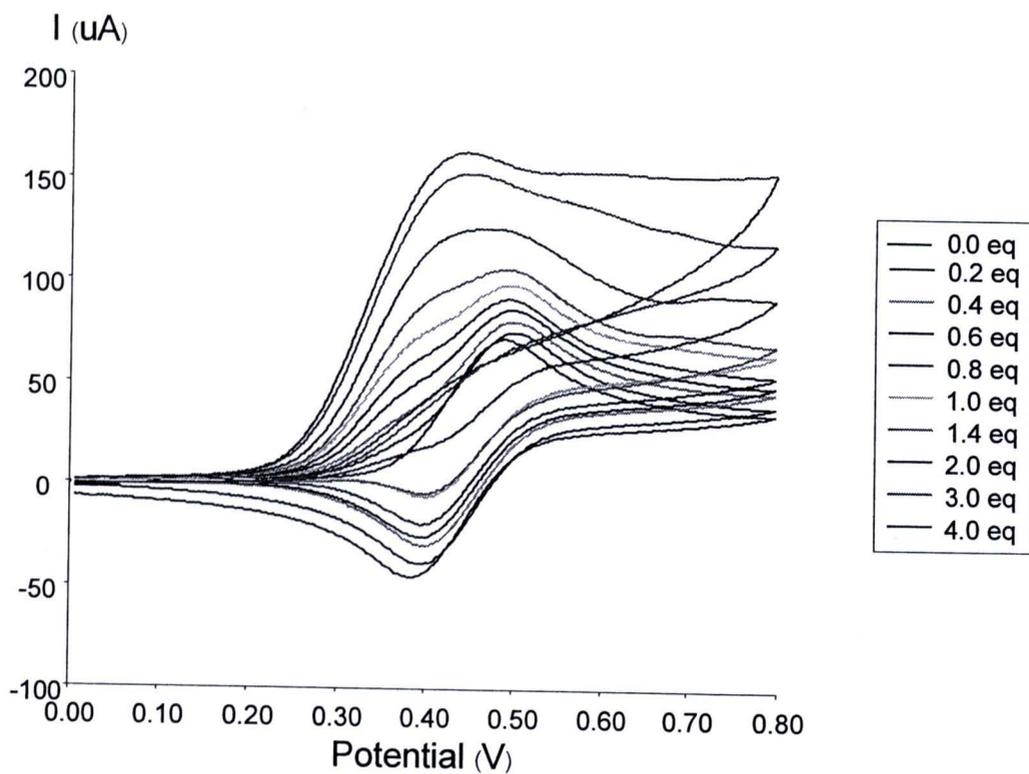
**Figure A.49** CV titration of complex  $[1.Na^+]$  with chloride in 40%  $CH_3CN:CH_2Cl_2$  with 0.1M  $TBAPF_6$  at scan rate 100 mV/s.



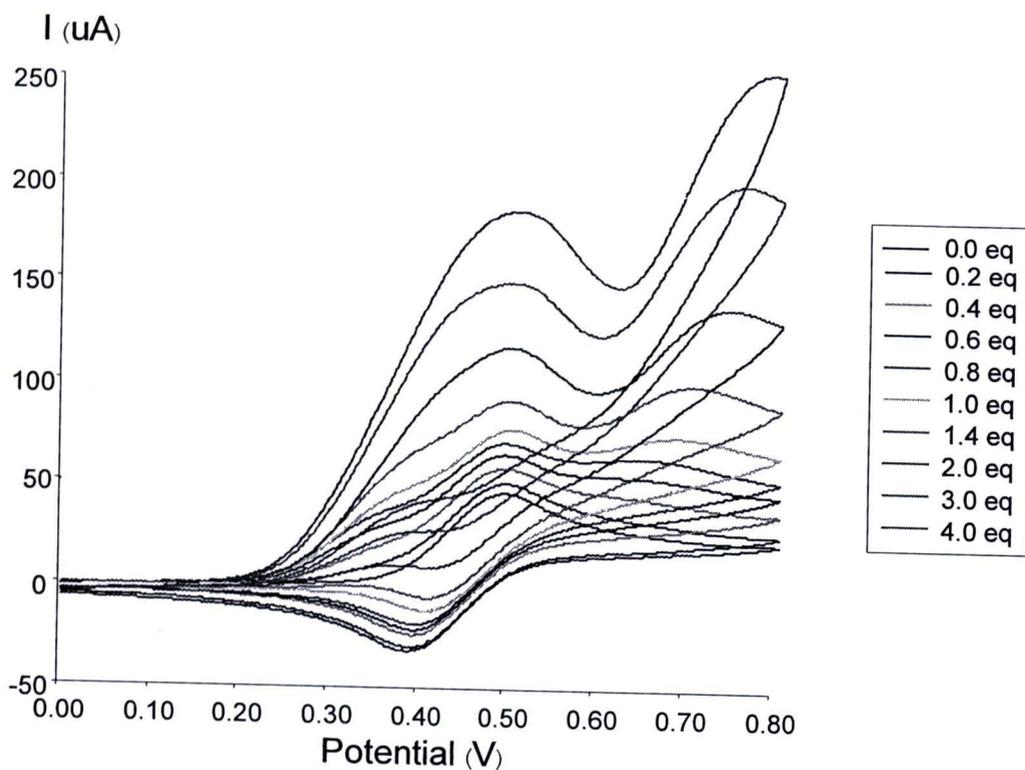
**Figure A.50** CV titration of receptor **2** with benzoate in 40%  $CH_3CN:CH_2Cl_2$  with 0.1M  $TBAPF_6$  at scan rate 100 mV/s.



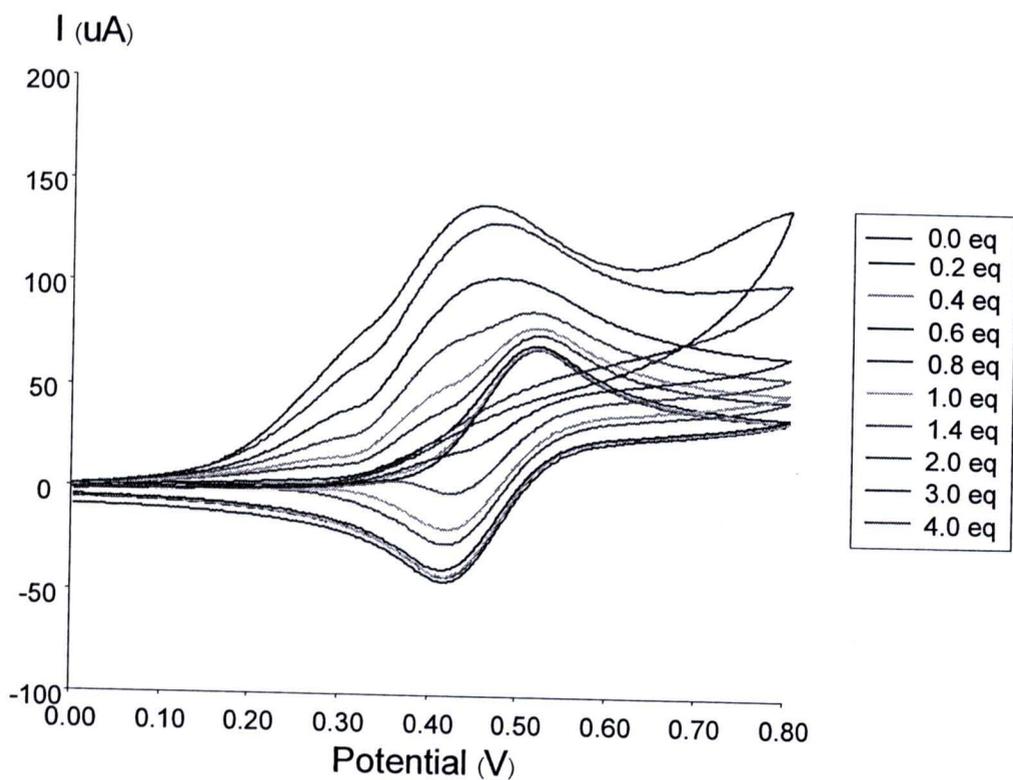
**Figure A.51** CV titration of receptor 2 with acetate in 40%  $\text{CH}_3\text{CN}:\text{CH}_2\text{Cl}_2$  with 0.1M  $\text{TBAPF}_6$  at scan rate 100 mV/s.



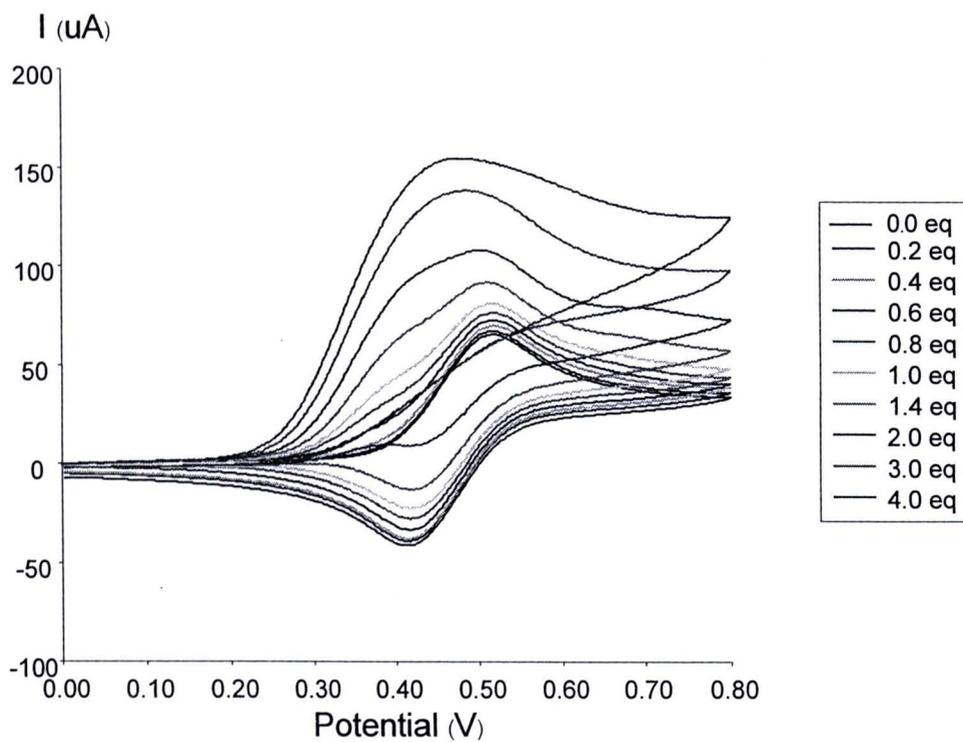
**Figure A.52** CV titration of receptor 2 with chloride in 40%  $\text{CH}_3\text{CN}:\text{CH}_2\text{Cl}_2$  with 0.1M  $\text{TBAPF}_6$  at scan rate 100 mV/s.



**Figure A.53** CV titration of receptor **2** with bromide in 40%  $\text{CH}_3\text{CN}:\text{CH}_2\text{Cl}_2$  with 0.1M  $\text{TBAPF}_6$  at scan rate 100 mV/s.



**Figure A.54** CV titration of complex  $[2.\text{Na}^+]$  with acetate in 40%  $\text{CH}_3\text{CN}:\text{CH}_2\text{Cl}_2$  with 0.1M  $\text{TBAPF}_6$  at scan rate 100 mV/s.



**Figure A.55** CV titration of complex  $[2.Na^+]$  with chloride in 40%  $CH_3CN:CH_2Cl_2$  with 0.1M  $TBAPF_6$  at scan rate 100 mV/s.

## VITAE



**Name:** Miss Nisachol Nerngchamnong

**Born:** May 22<sup>nd</sup>, 1984

**Education:** 2005 B. Sc. (Chemistry), Chulalongkorn University, Bangkok, Thailand.

2008 M. Sc. (Inorganic Chemistry), Chulalongkorn University, Bangkok, Thailand

