

Fig. 4.1 IR (KBr) spectrum of ethyl-1,4-dihydro-1-phenylthiochromeno[4,3-c]pyrazole-3-carboxylate (3)

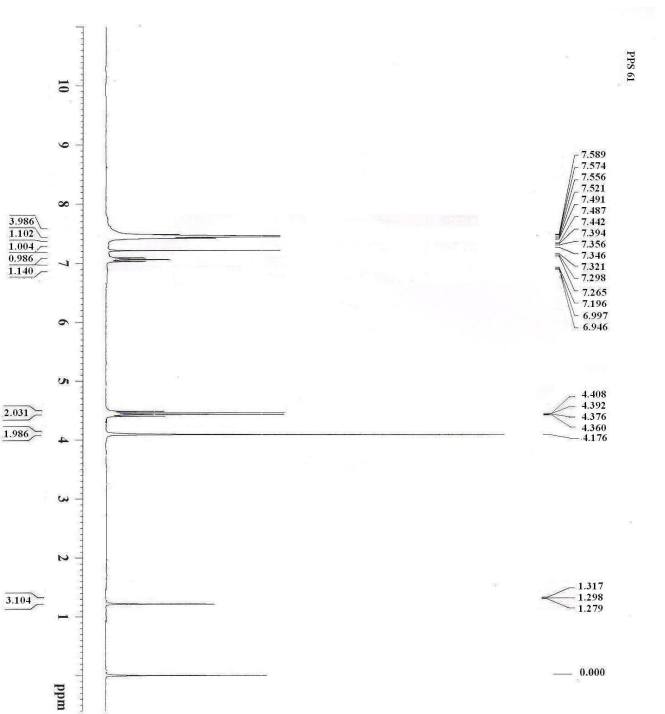


Fig. 4.2 ¹H-NMR (CDCl₃) spectrum of ethyl-1,4-dihydro-1-phenylthiochromeno[4,3-c]pyrazole-3-carboxylate (3)

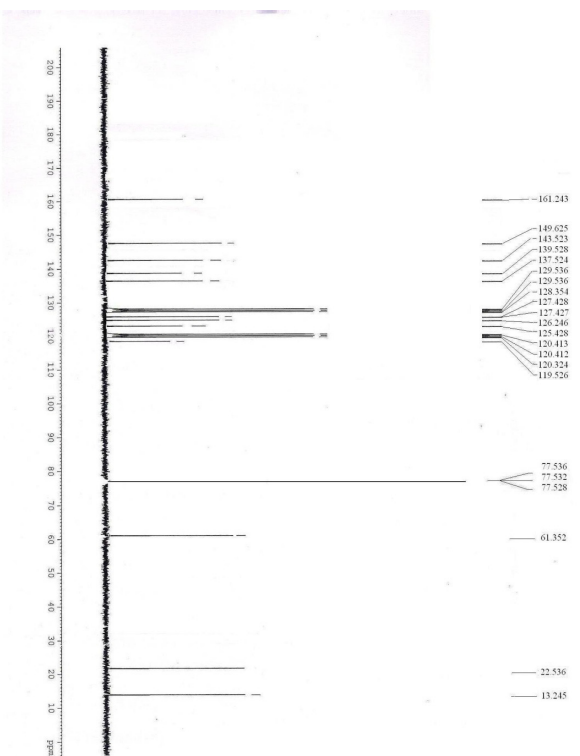


Fig. 4.3 ¹³C-NMR (CDCl₃) spectrum of ethyl-1,4-dihydro-1-phenylthiochromeno[4,3-c]pyrazole-3-carboxylate (3)

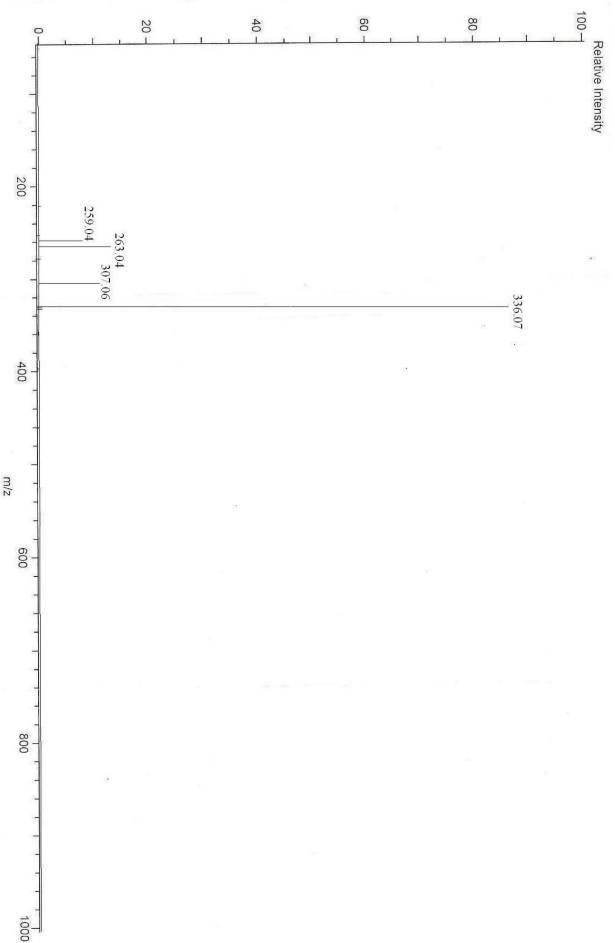


Fig. 4.4 Mass (ESI) spectrum of ethyl-1,4-dihydro-1-phenylthiochromeno[4,3-c]pyrazole-3-carboxylate (3)

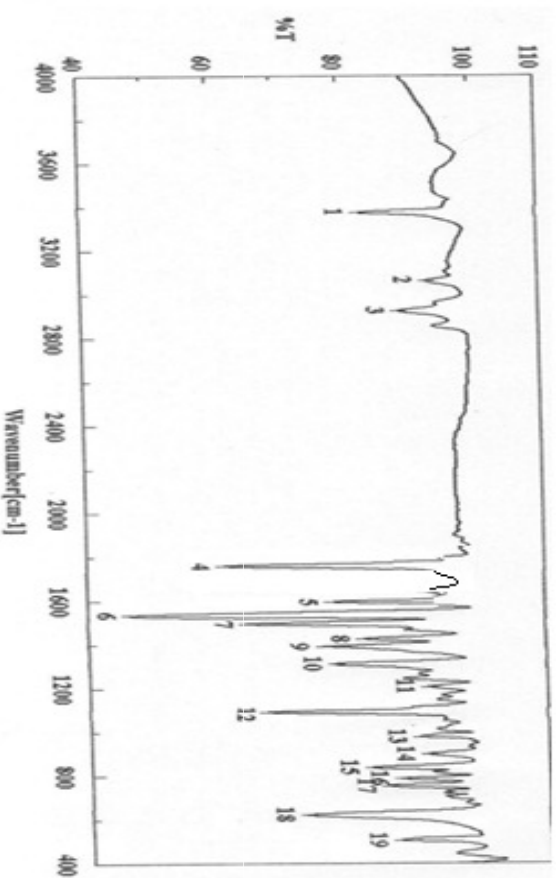


Fig. 4.5 IR spectrum (KBr) of ethyl 1,4-dihydrothiochromeno[4,3-c]pyrazole-3-carboxylate (4)

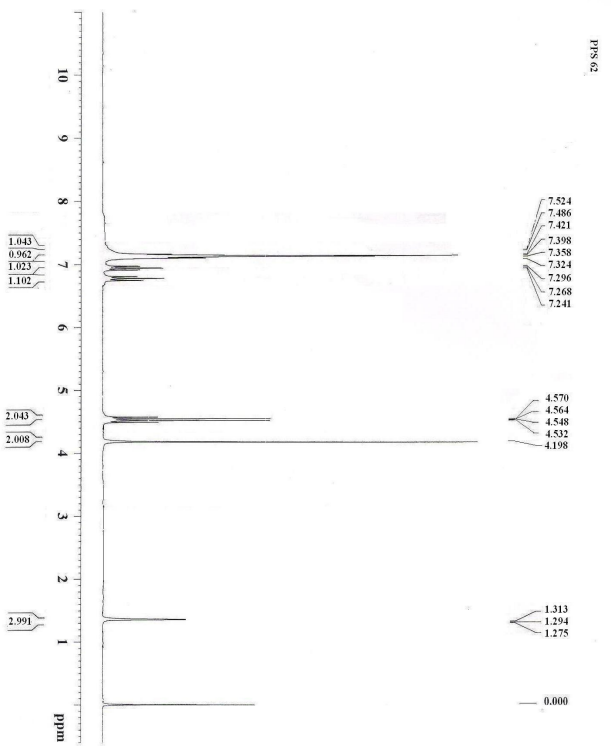


Fig. 4.6 ¹H-NMR (CDCl₃) spectrum of ethyl 1,4-dihydrothiochromeno[4,3-c]pyrazole-3-carboxylate (4)

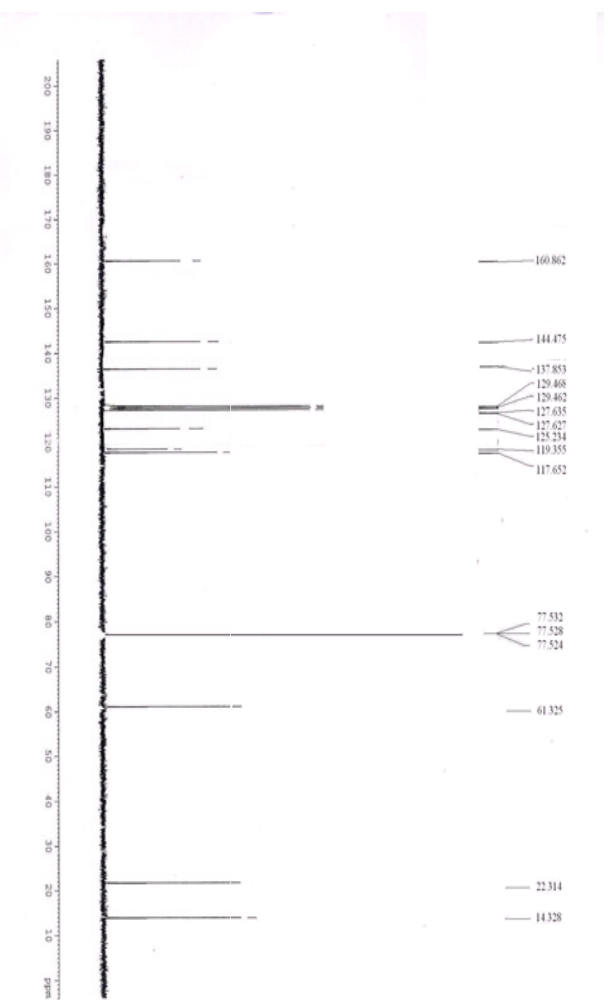


Fig. 4.7 ¹³C-NMR (CDCl₃) spectrum of ethyl 1,4-dihydrothiochromeno[4,3-c]pyrazole-3-carboxylate (4)

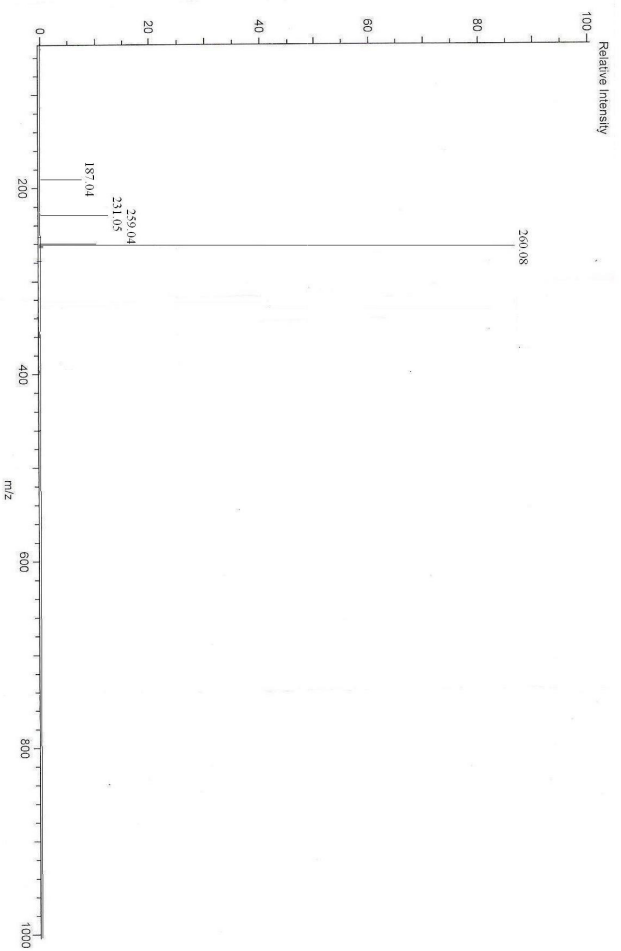


Fig. 4.8 Mass (ESI) spectrum of ethyl 1,4-dihydrothiochromeno[4,3-c]pyrazole-3-carboxylate (4)

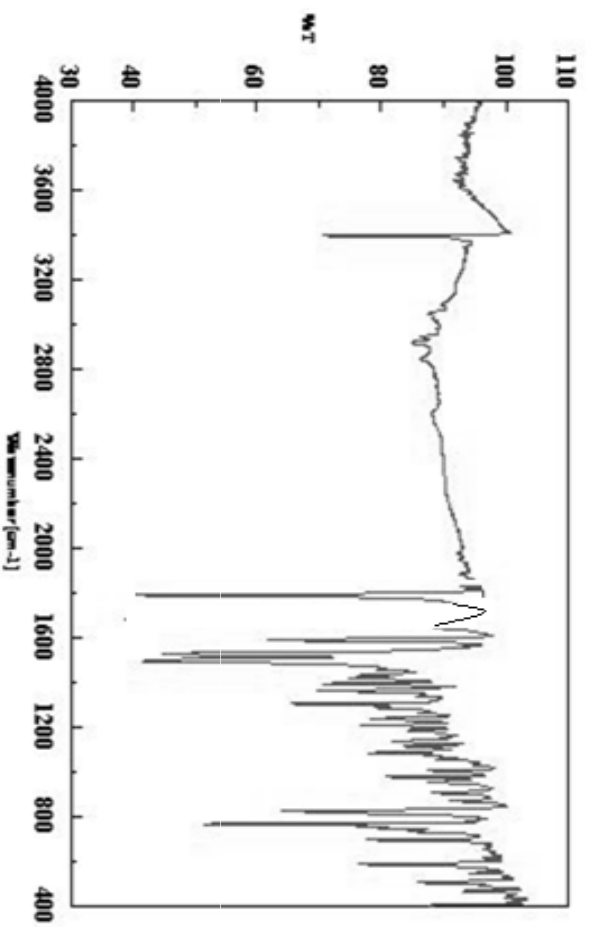


Fig. 4.9 IR (KBr) spectrum of ethyl 4H-thiochromeno[3,4-d]isoxazole-3-carboxylate (5)

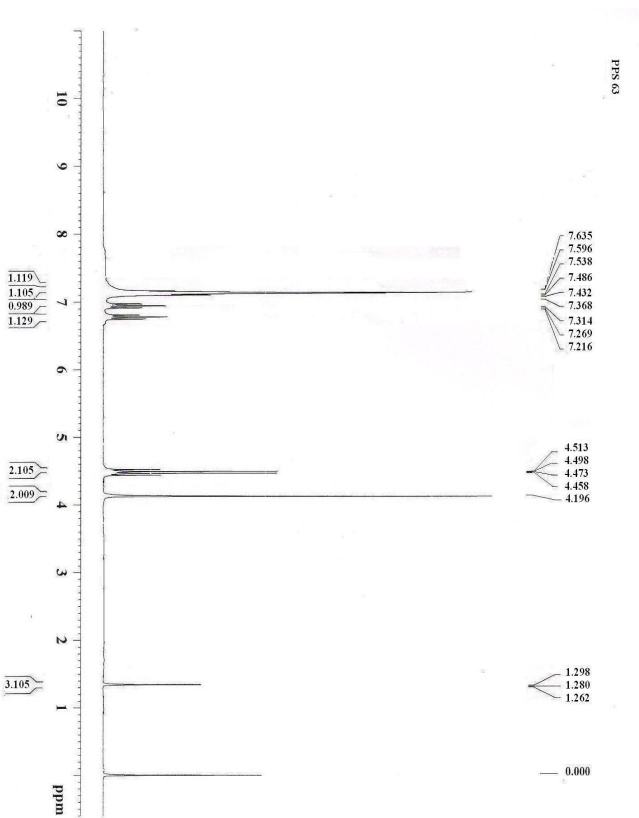


Fig. 4.10 ¹H-NMR (CDCl₃) spectrum of ethyl 4H-thiochromeno[3,4-d]isoxazole-3-carboxylate (5)

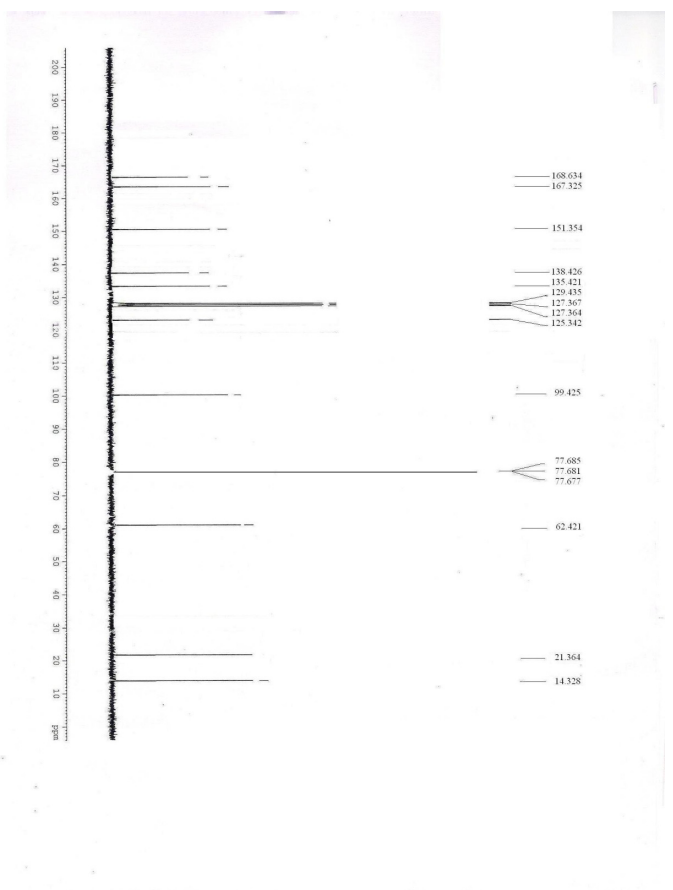


Fig. 4.11 ¹³C-NMR (CDCl₃) spectrum of ethyl 4H-thiochromeno[3,4-d]isoxazole-3-carboxylate (5)

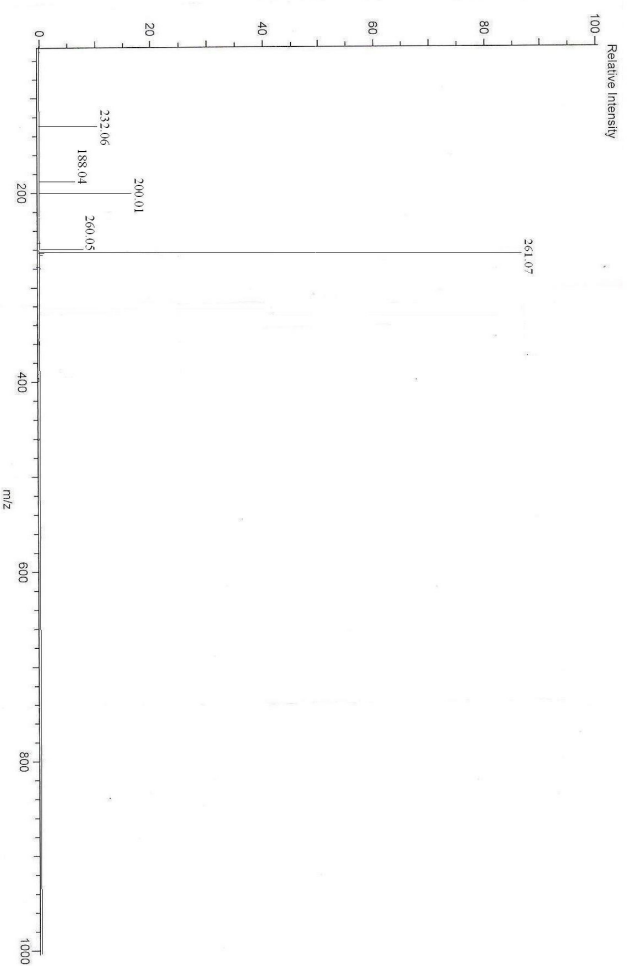


Fig. 4.12 Mass (ESD) spectrum of ethyl 4H-thiochromeno[3,4-d]isoxazole-3-carboxylate (5)

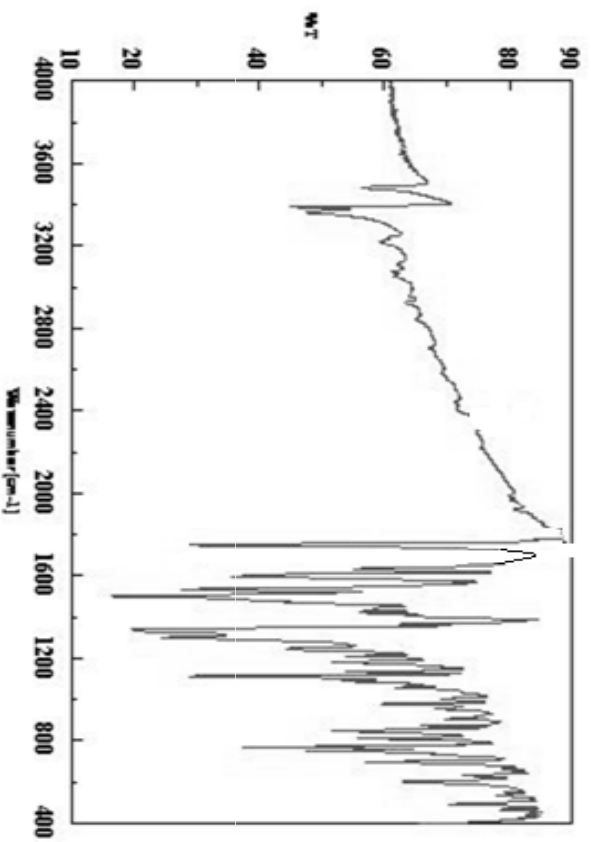


Fig. 4.13 IR (KBr) spectrum of ethyl-2,5-dihydro-2-oxo-1H-thiochromeno[4,3-d]pyrimidine-4-carboxylate (6)

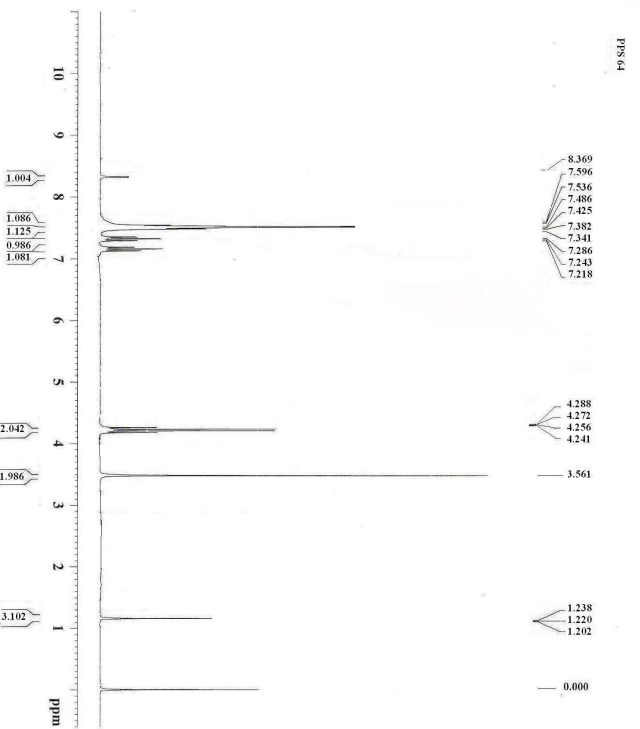
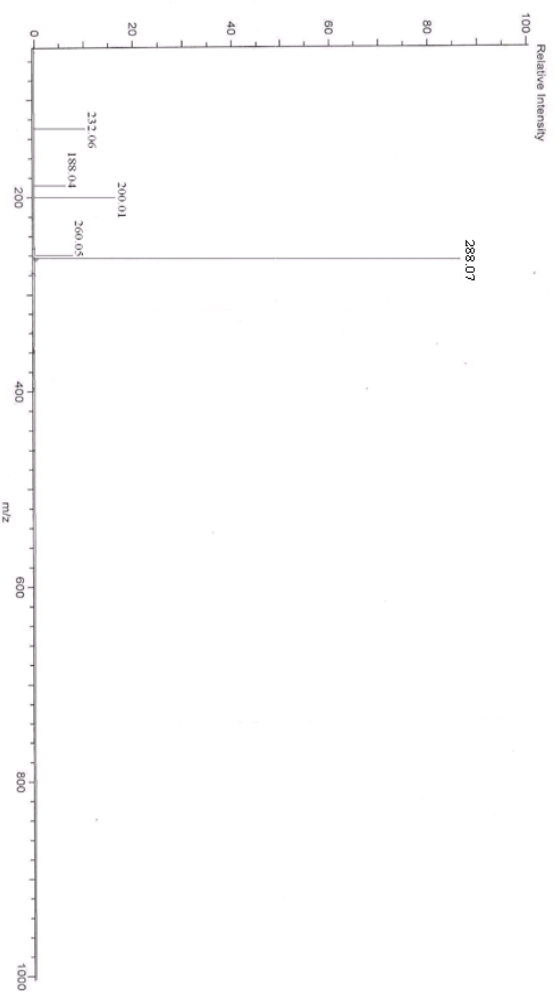
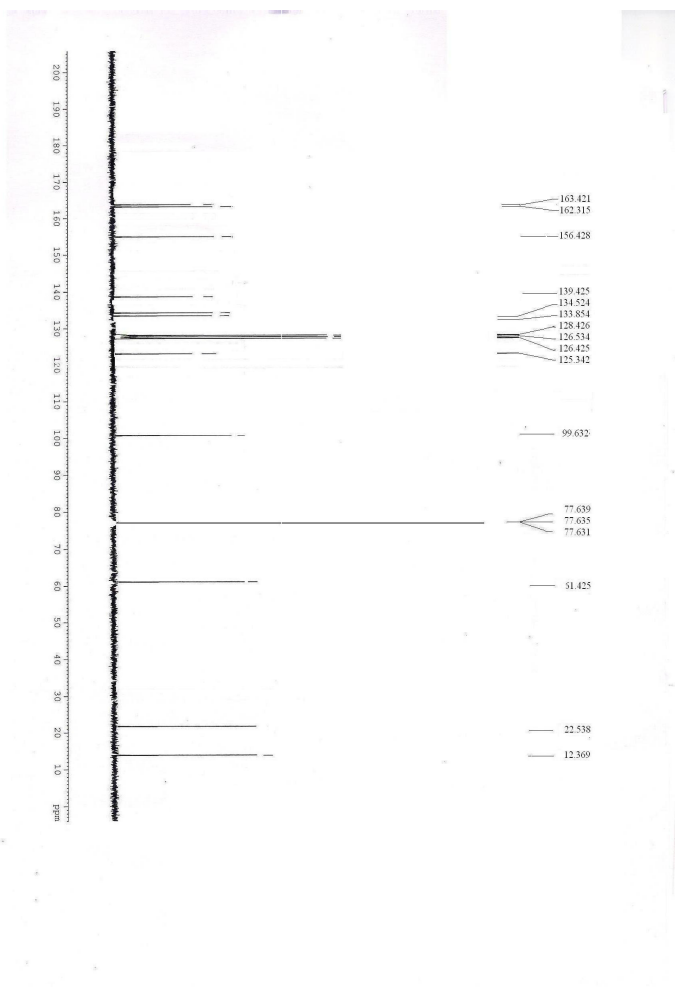


Fig. 4.14 ¹H-NMR (DMSO-d₆) spectrum of ethyl-2,5-dihydro-2-oxo-1H-thiochromeno[4,3-d]pyrimidine-4-carboxylate (6)



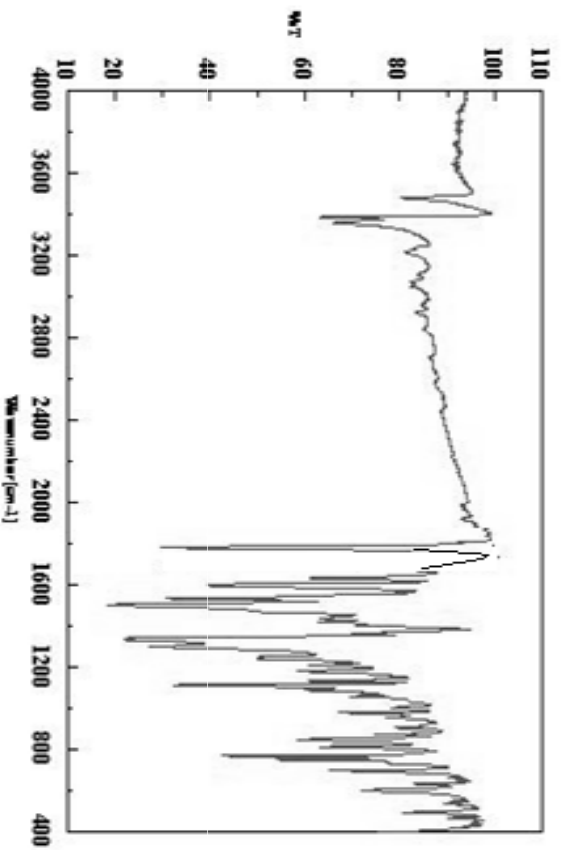


Fig. 4.17 IR (KBr) spectrum of ethyl-2,5-dihydro-2-thioxo-1H-thiochromeno[4,3-d]pyrimidine-4-carboxylate (7)

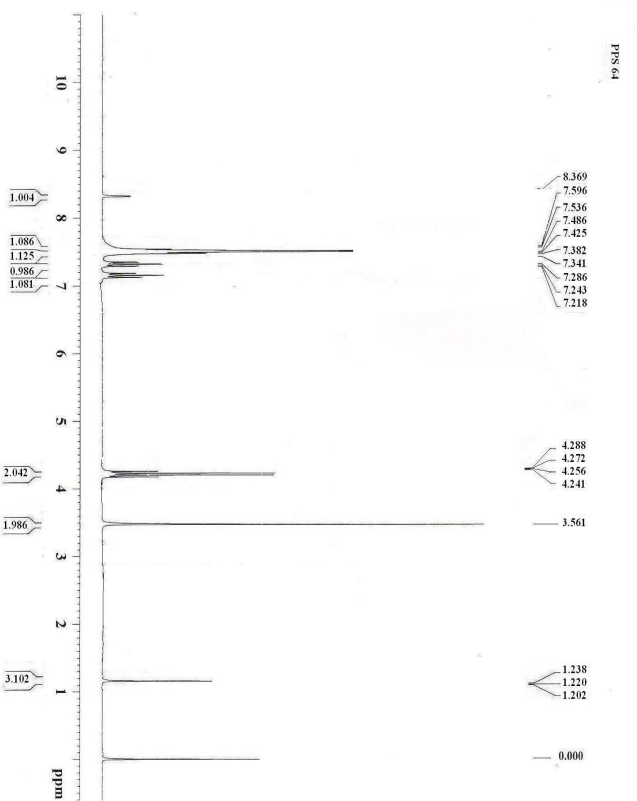


Fig. 4.18 ¹H-NMR (CDCl₃+DMSO-d₆) spectrum of ethyl-2,5-dihydro-2-thioxo-1H-thiochromeno[4,3-d]pyrimidine-4-carboxylate (7)

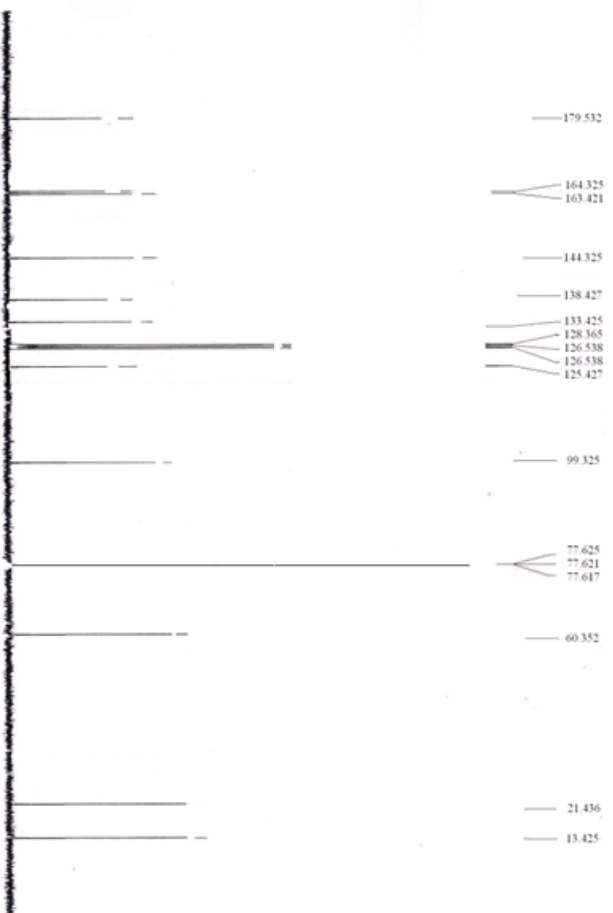


Fig. 4.19 ¹³C-NMR (CDCl₃+DMSO-d₆) spectrum of ethyl-2,5-dihydro-2-thioxo-1H-thiochromenol[4,3-thiochromenol[4,3-d]pyrimidine-4-carboxylate (7)

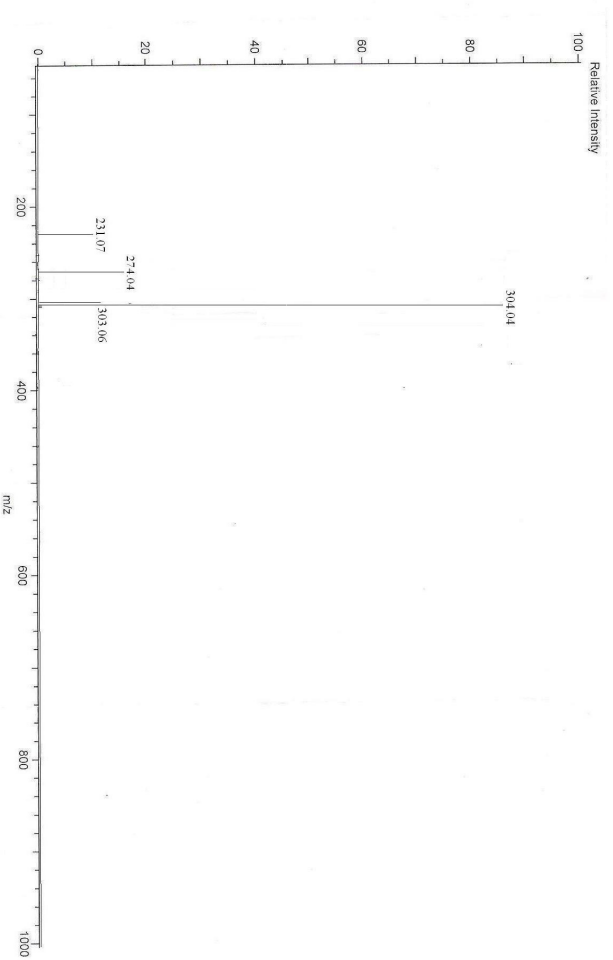


Fig. 4.20 Mass (ESI) spectrum of ethyl-2,5-dihydro-2-thioxo-1H-thiochromenol[4,3-d]pyrimidine-4-carboxylate (7)

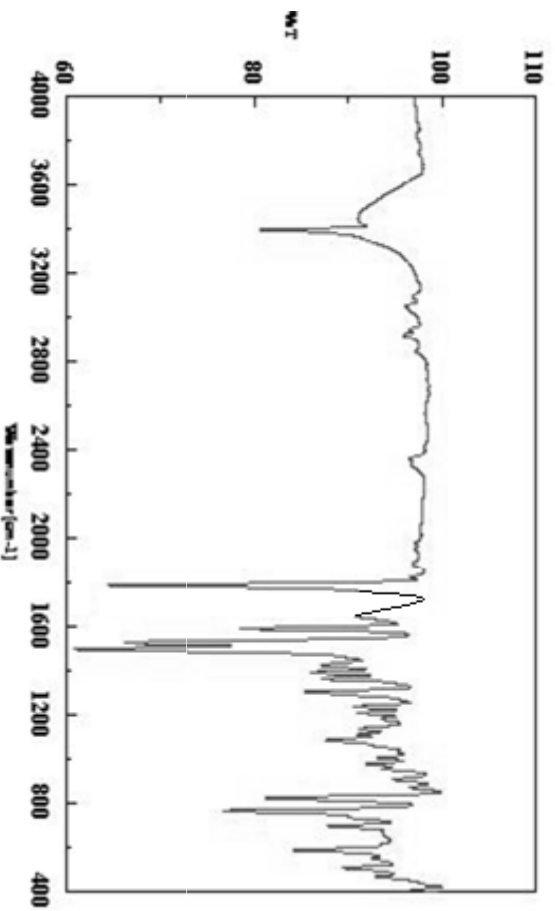


Fig. 4.21 IR (KBr) spectrum of ethyl 1,4-dihydro-1H-thiochromenol[5,4-c]benzodiazepine-4-carboxylate (8)

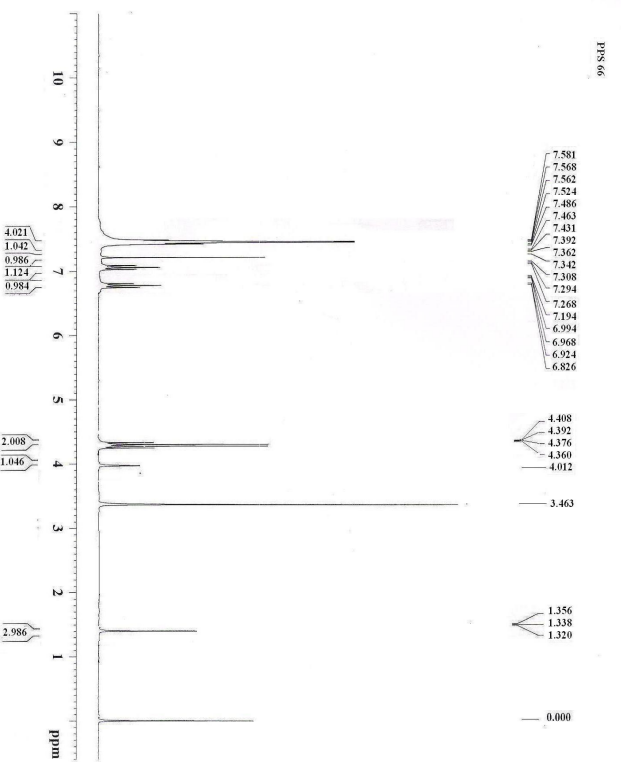


Fig. 4.23 ¹³C-NMR (CDCl₃+DMSO-d₆) spectrum of ethyl 1,4-dihydro-1H-thiochromenol[5,4-c]benzodiazepine-4-carboxylate (8)

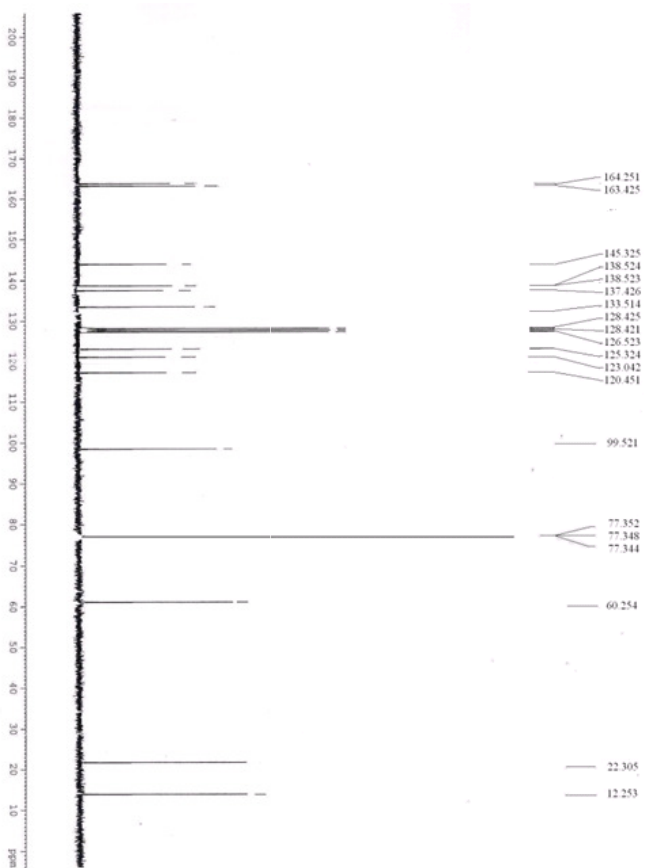


Fig. 4.24 Mass (ESI) spectrum of ethyl 1,4-dihydro-1H-thiochromeno[5,4-c]benzodiazepine-4-carboxylate (8)

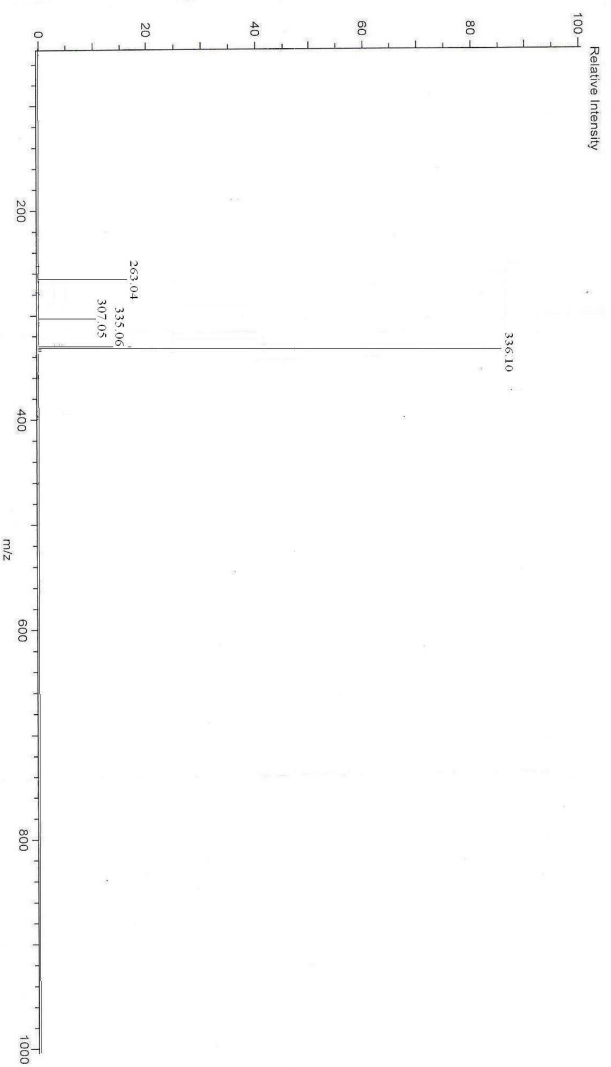


Fig. 4.22¹H-NMR (CDCl₃+DMSO-d₆) spectrum of ethyl 1,4-dihydro-1H-thiochromeno[5,4-c]benzodiazepine-4-carboxylate (8)

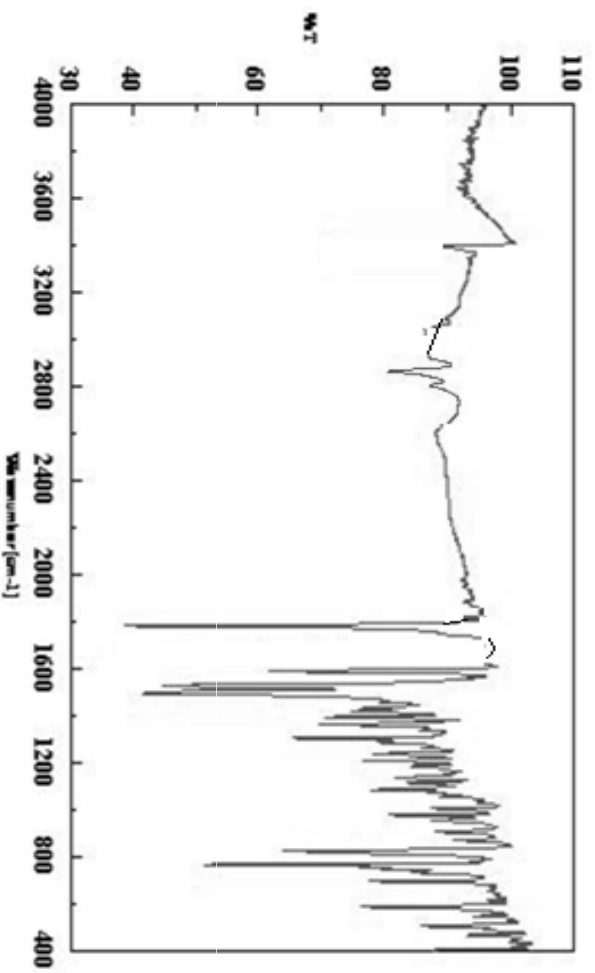


Fig. 4.25 IR (KBr) spectrum of ethyl 2,3-diphenyl-2,3-dihydro-1H-thiochromeno[5,4-c]diazepine-5-carboxylate (9)

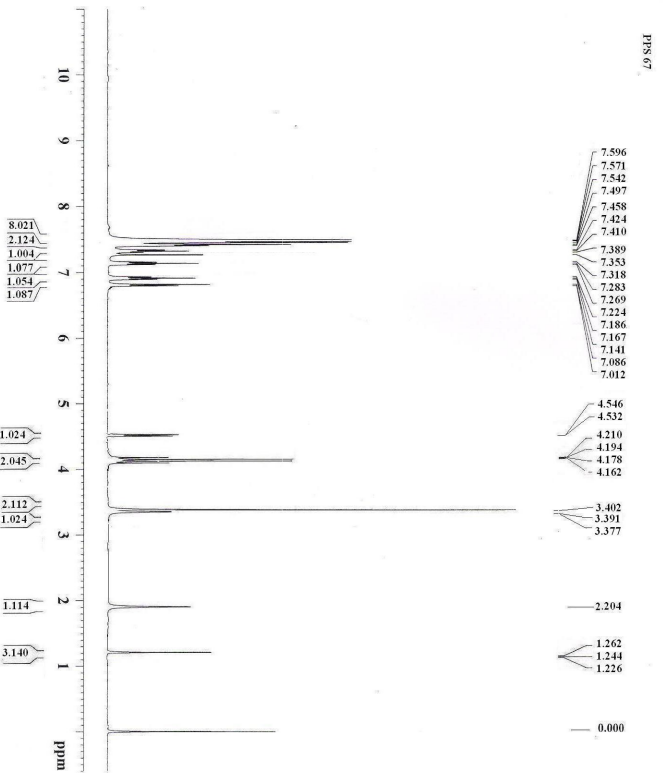


Fig. 4.26 ¹H-NMR (CDCl₃) spectrum of ethyl 2,3-diphenyl-2,3-dihydro-1H-thiochromeno[5,4-c]diazepine-5-carboxylate (9)

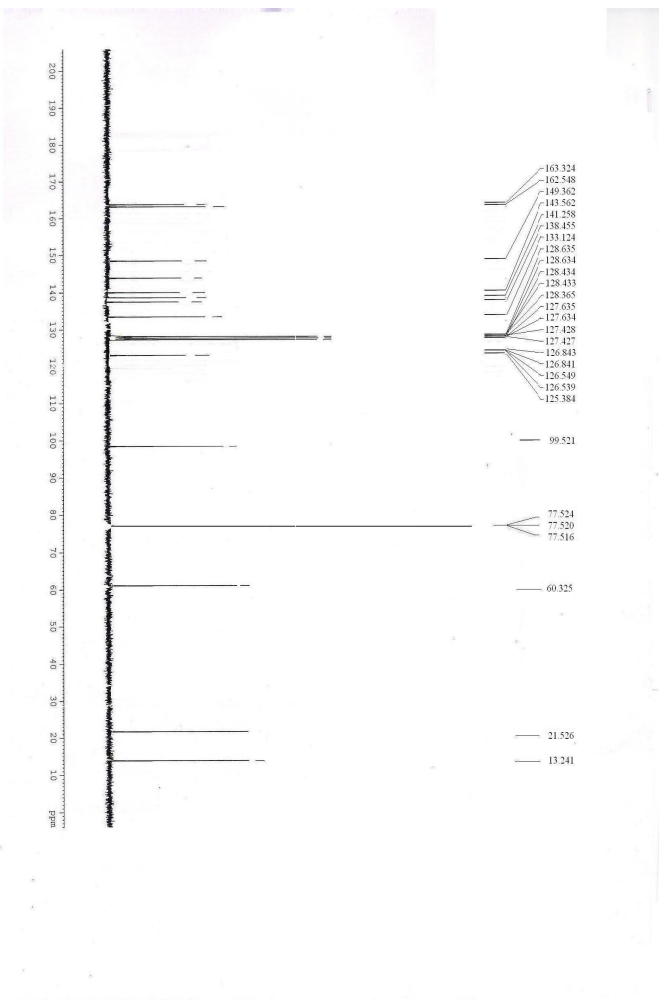


Fig. 4.27 $^1\text{H-NMR}$ ($\text{DMSO-}d_6$) spectrum of ethyl 2,3-diphenyl-2,3-dihydro-1H-thiochromeno[5,4-thiochromeno]5,4-c[diazepine-5-carboxylate (9)

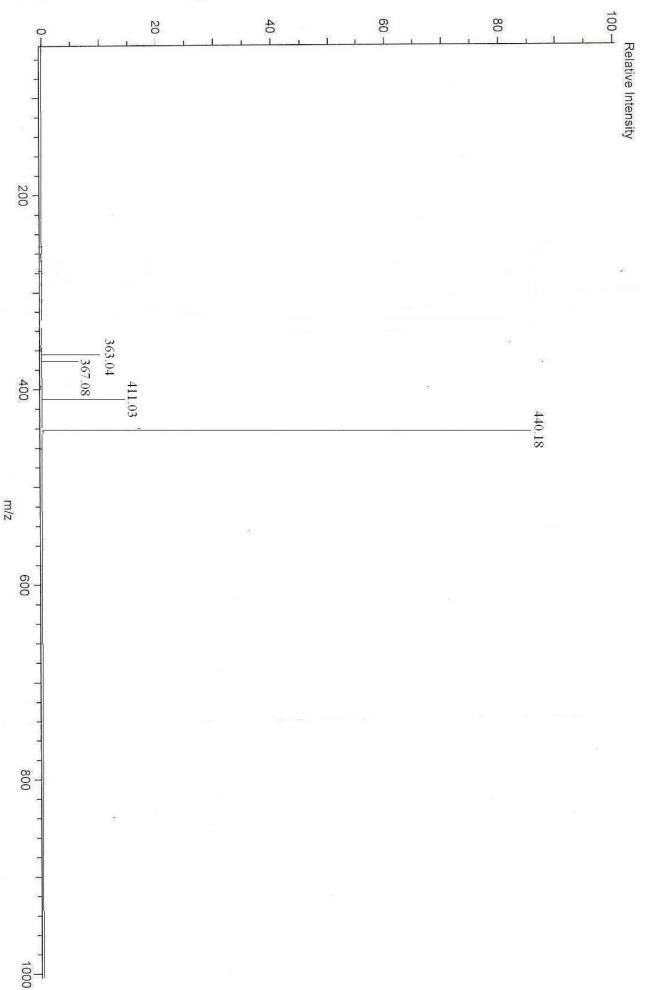


Fig. 4.28 Mass (ESI) spectrum of ethyl 2,3-diphenyl-2,3-dihydro-1H-thiochromeno[5,4-c[diazepine-5-carboxylate (9)

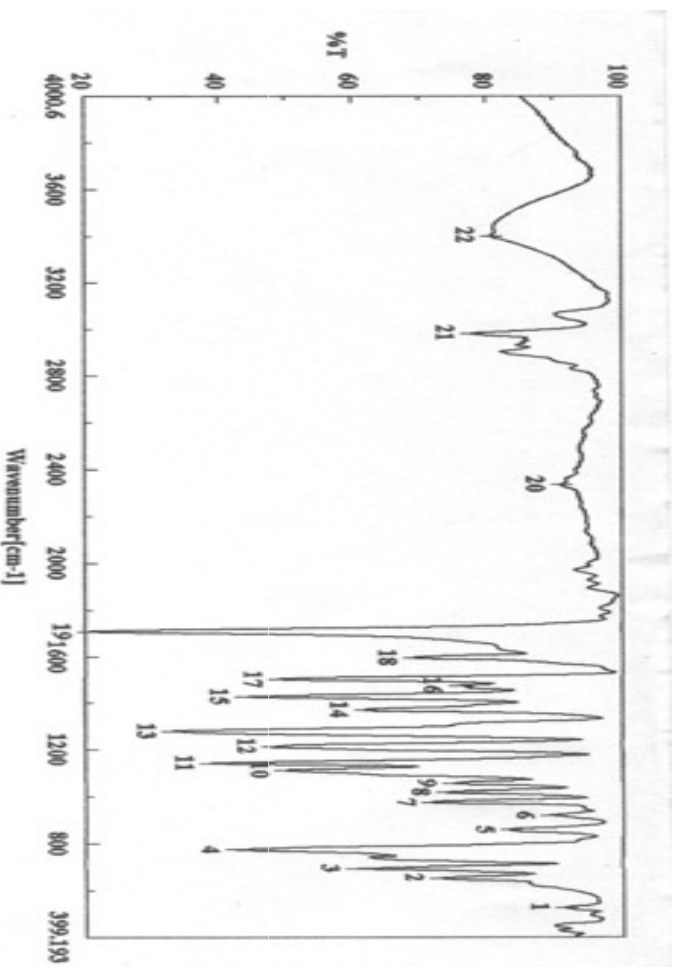


Fig. 4.29 IR (KBr) spectrum of ethyl 1-phenyl-4,5-dihydro-1H-[1]benzothiepinol[5,4-c]pyrazole-3-carboxylate (12)

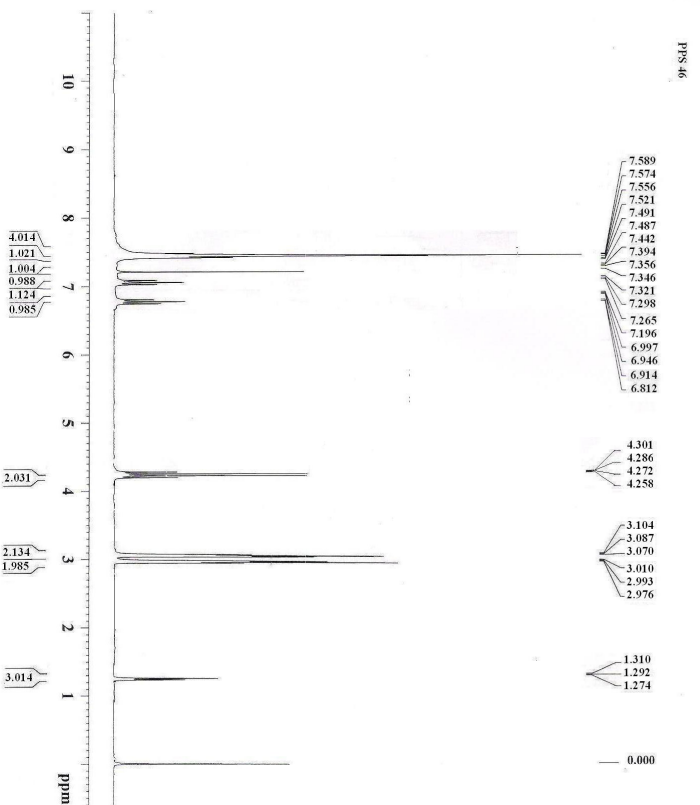


Fig. 4.30 ¹H-NMR (CDCl₃) spectrum of ethyl 1-phenyl-4,5-dihydro-1H-[1]benzothiepinol[5,4-c]pyrazole-3-carboxylate (12)

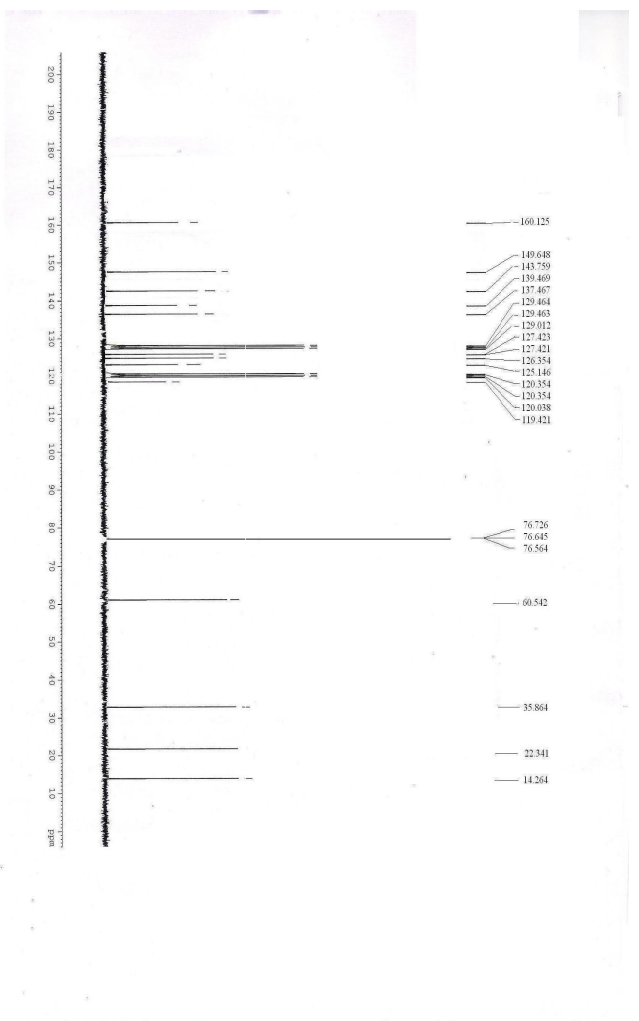


Fig. 4.31 ¹³C-NMR spectrum(CDCl₃) of ethyl 1-phenyl-4,5-dihydro-1H-[1]benzothiepinol[5,4-c]pyrazole-3-carboxylate (12)

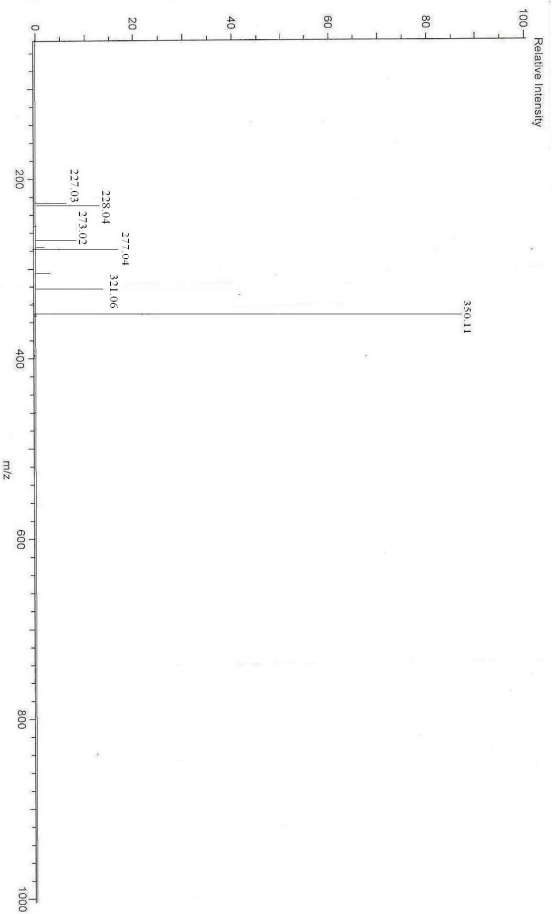


Fig. 4.32 Mass (ESI) spectrum of ethyl 1-phenyl-4,5-dihydro-1H-[1]benzothiepinol[5,4-c]pyrazole-3-carboxylate (12)

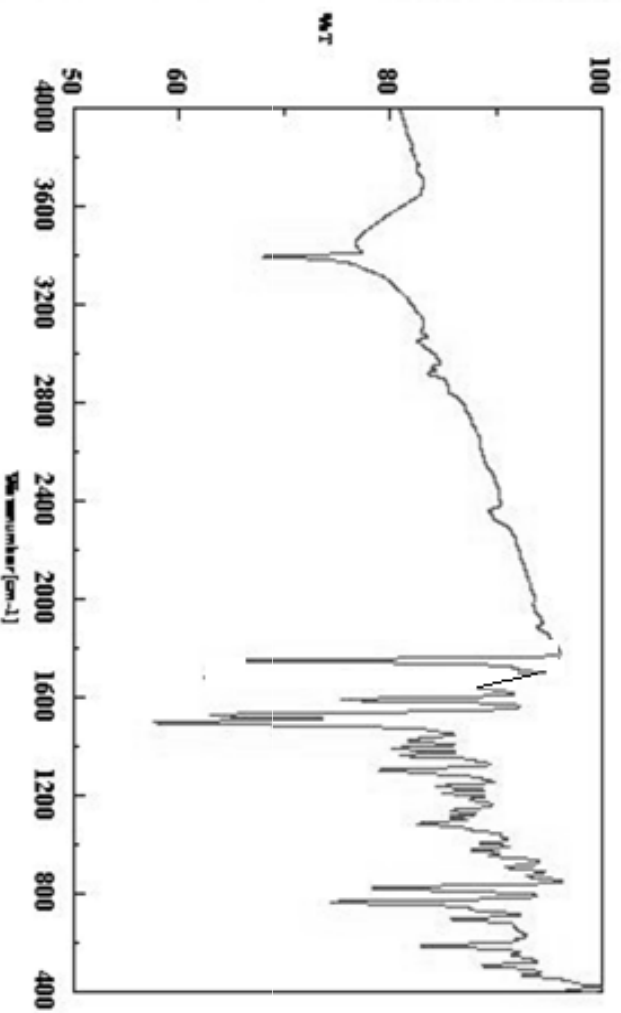


Fig. 4.33 IR (KBr) spectrum of ethyl 4,5-dihydro-1H-[1]benzothiepinol[5,4-c]pyrazole-3-carboxylate (13)

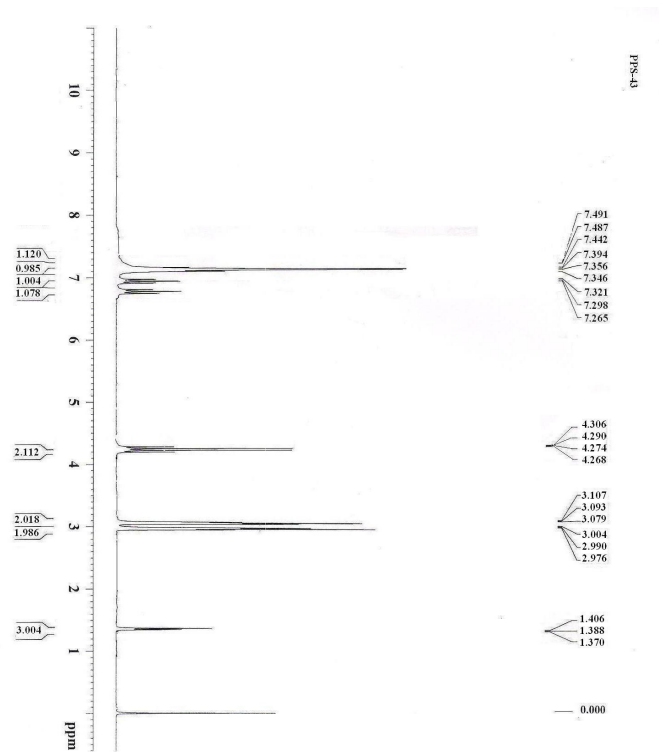
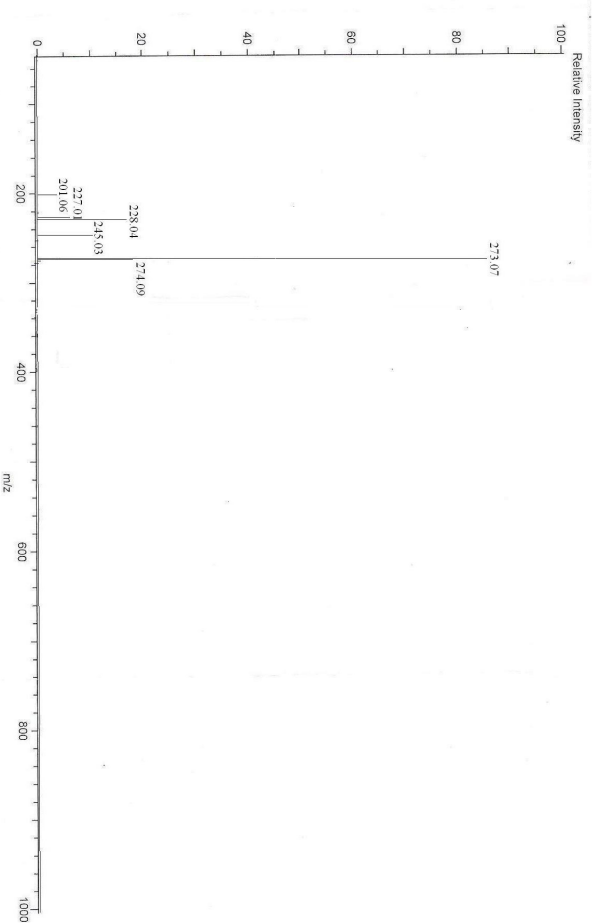
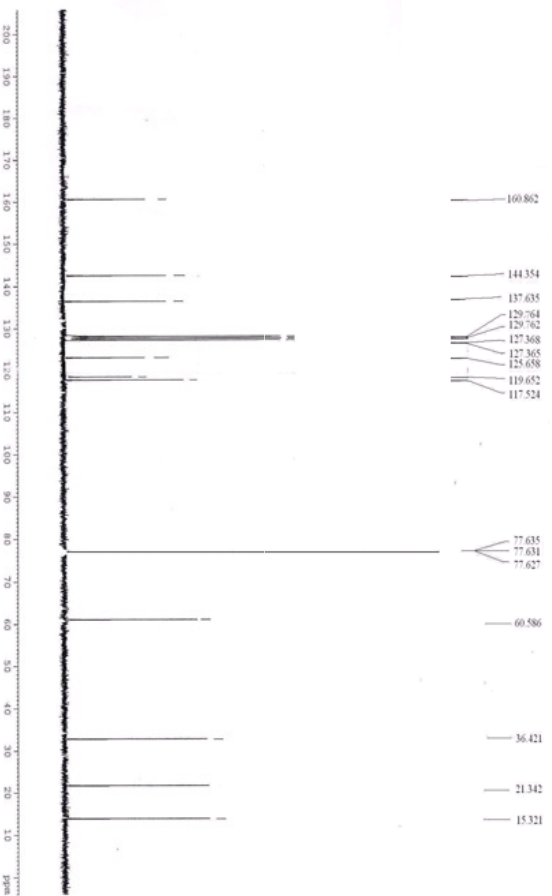


Fig. 4.34 ¹H-NMR (CDCl₃) spectrum of ethyl 4,5-dihydro-1H-[1]benzothiepinol[5,4-c]pyrazole-3-carboxylate (13)



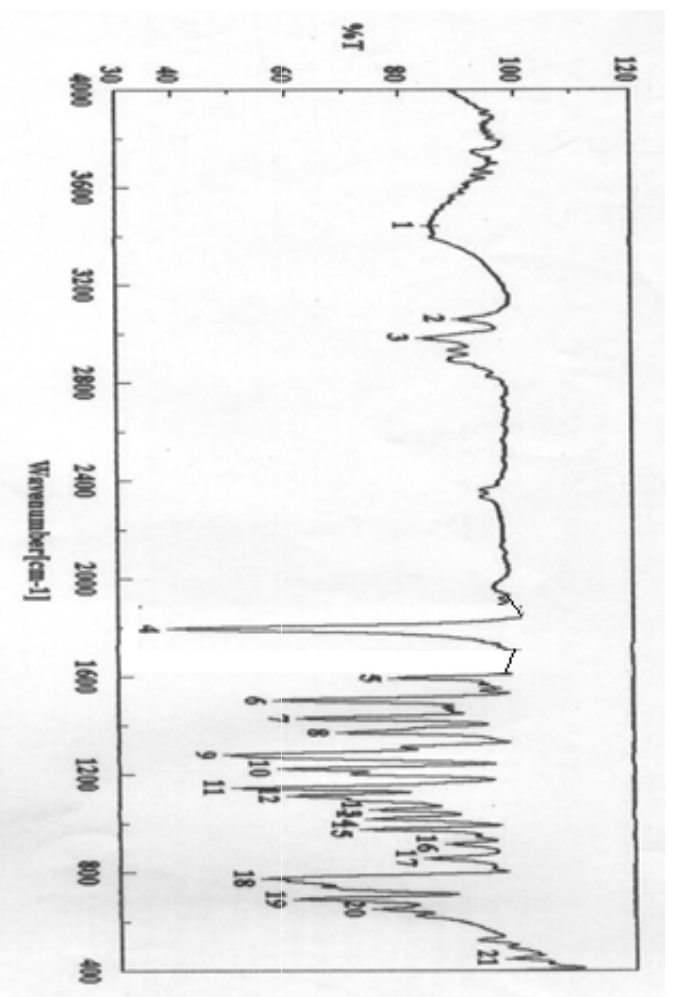


Fig. 4.37 IR (KBr) spectrum of ethyl 4,5-dihydro[1]benzothiepinol[4,5-d]isoxazole-3-carboxylate (14)

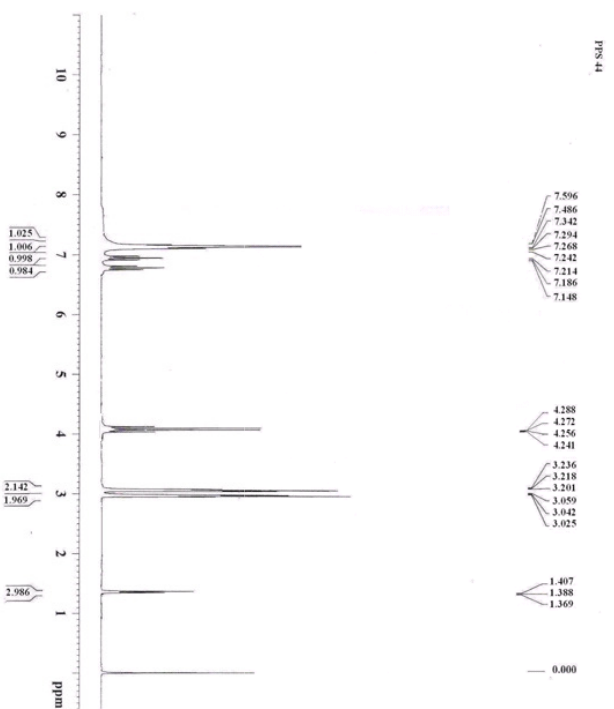


Fig. 4.38 ¹H-NMR (CDCl₃) spectrum of ethyl 4,5-dihydro[1]benzothiepinol[4,5-d]isoxazole-3-carboxylate (14)

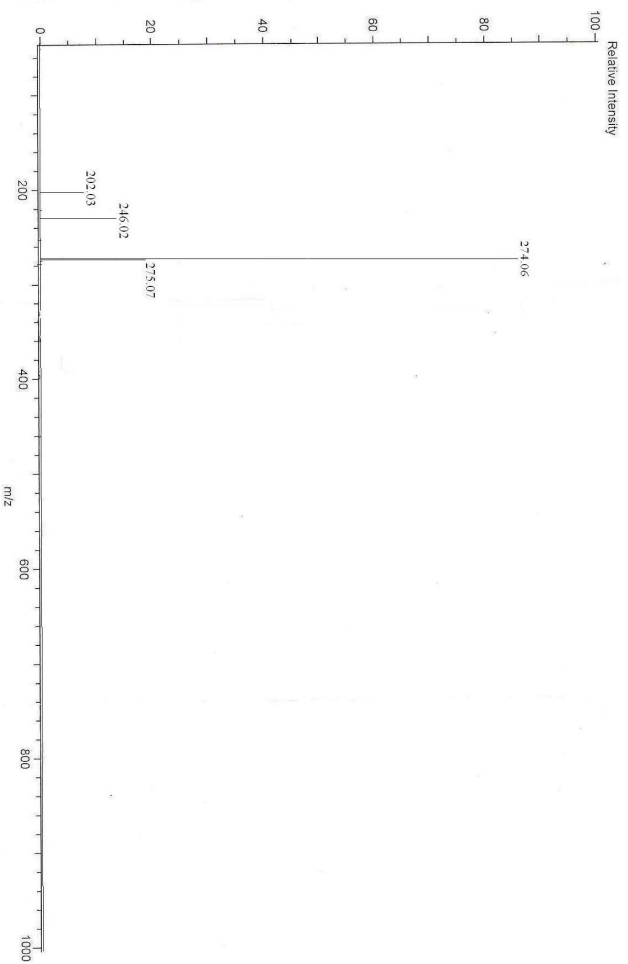
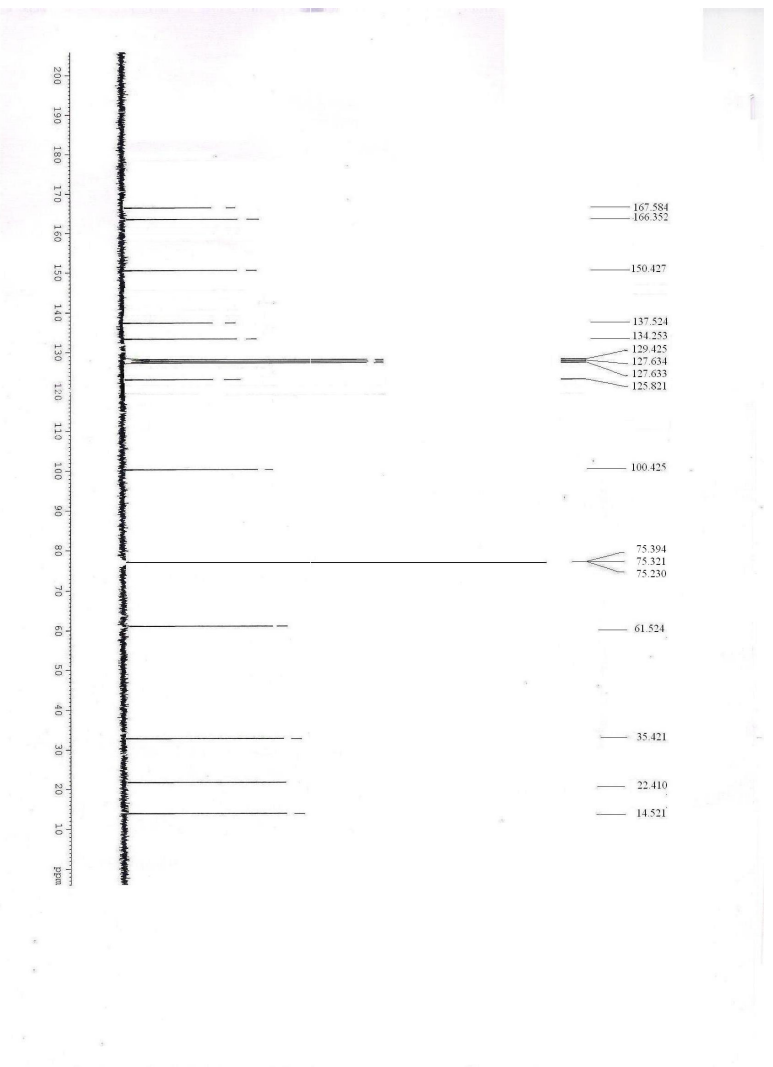


Fig. 4.40 Mass (ESI) spectrum of ethyl 4,5-dihydro[1]benzothiepinol[4,5-d]isoxazole-3-carboxylate (14)

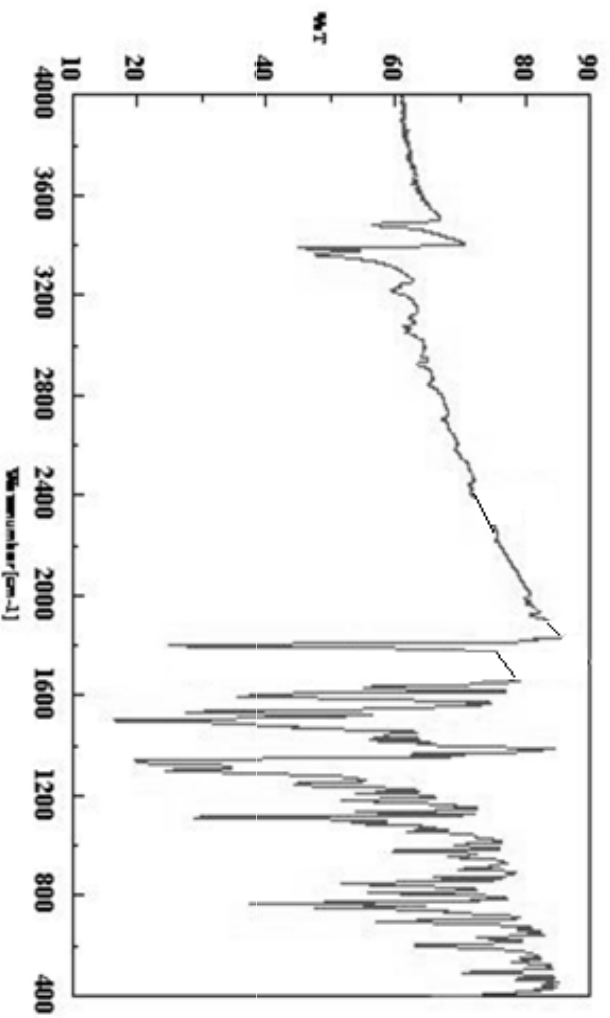


Fig. 4.41 IR (KBr) spectrum of ethyl 2-oxo-1,2,5,6-tetrahydro[1]benzothiepinol[5,4-d]pyrimidine-4-carboxylate (15)

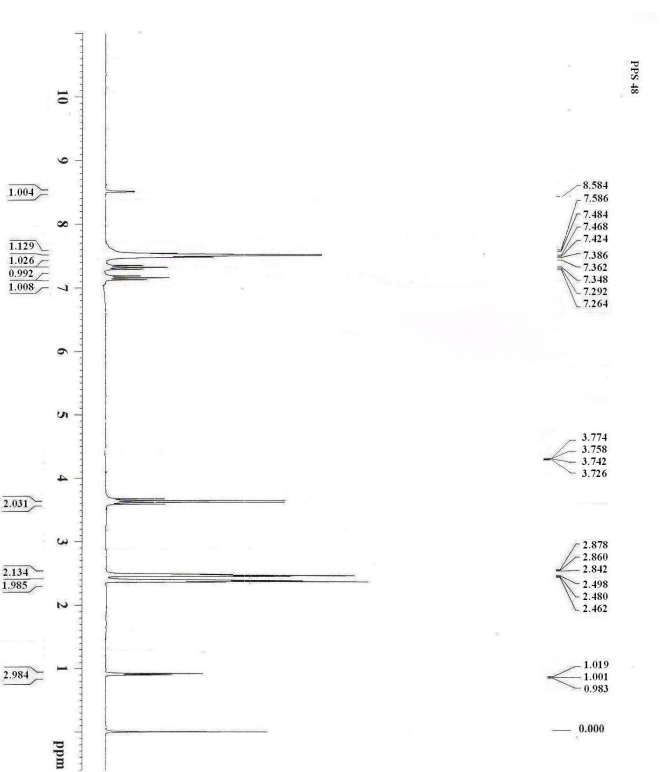


Fig. 4.42 ¹H-NMR (DMSO-d₆) spectrum of ethyl 2-oxo-1,2,5,6-tetrahydro[1]benzothiepinol[5,4-d]pyrimidine-4-carboxylate (15)

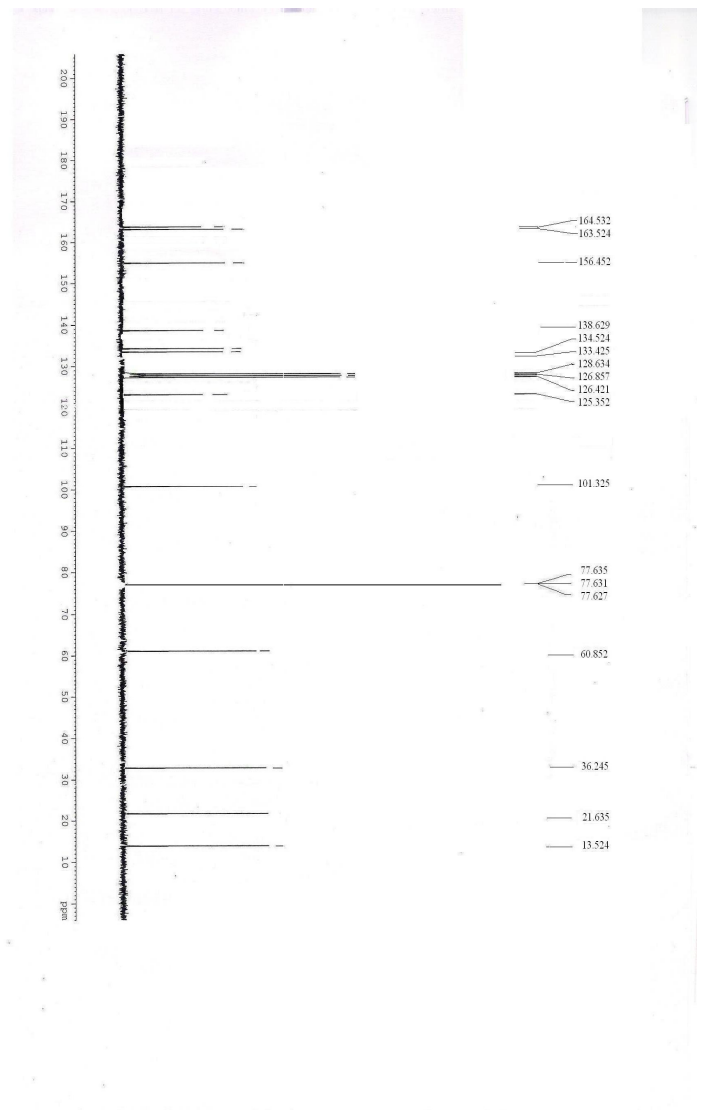


Fig. 4.4313C-NMR (DMSO-d6) spectrum of ethyl-2-oxo-1,2,5,6-tetrahydro[1]benzothiepinol[5,4-tetrahydro]pyrimidine-4-carboxylate (15)

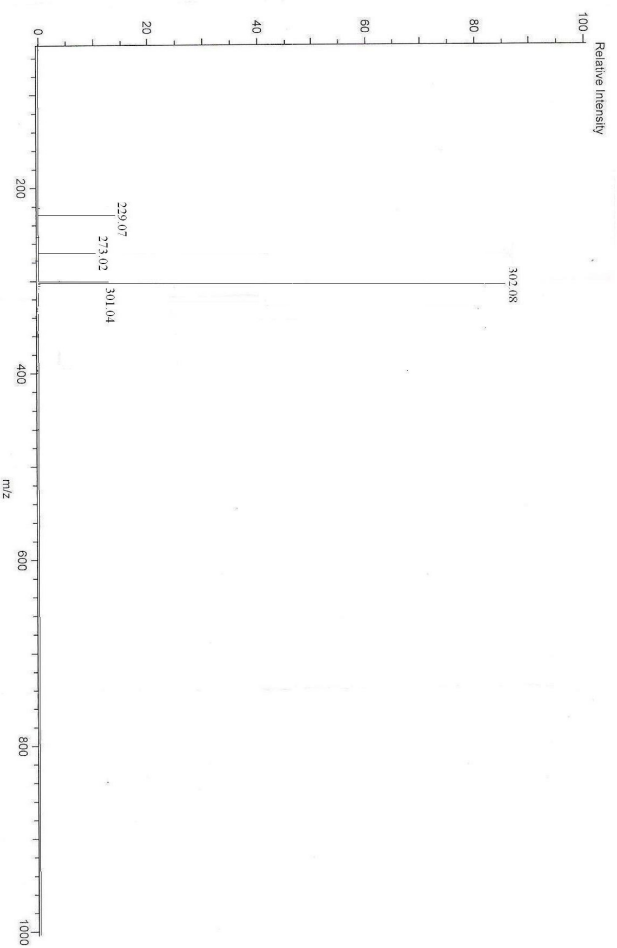


Fig. 4.44 Mass (ESI) spectrum of ethyl-2-oxo-1,2,5,6-tetrahydro[1]benzothiepinol[5,4-dipyrimidine-4-carboxylate (15)

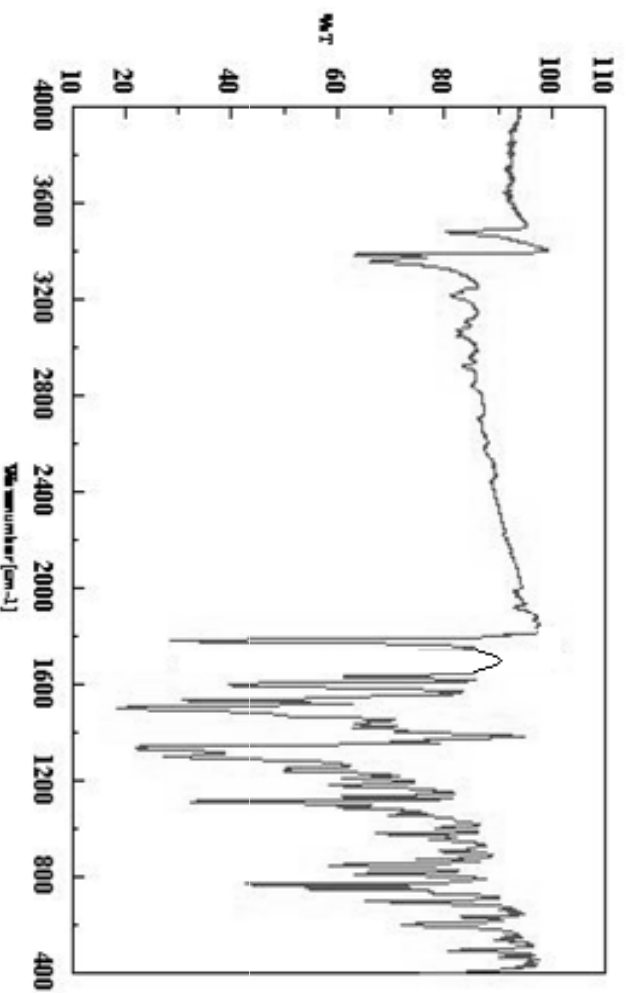


Fig. 4.45 IR (KBr) spectrum of ethyl 2-thioxo-1,2,5,6-tetrahydro[1]benzothiepinol[5,4-d]pyrimidine-4-carboxylate (16)

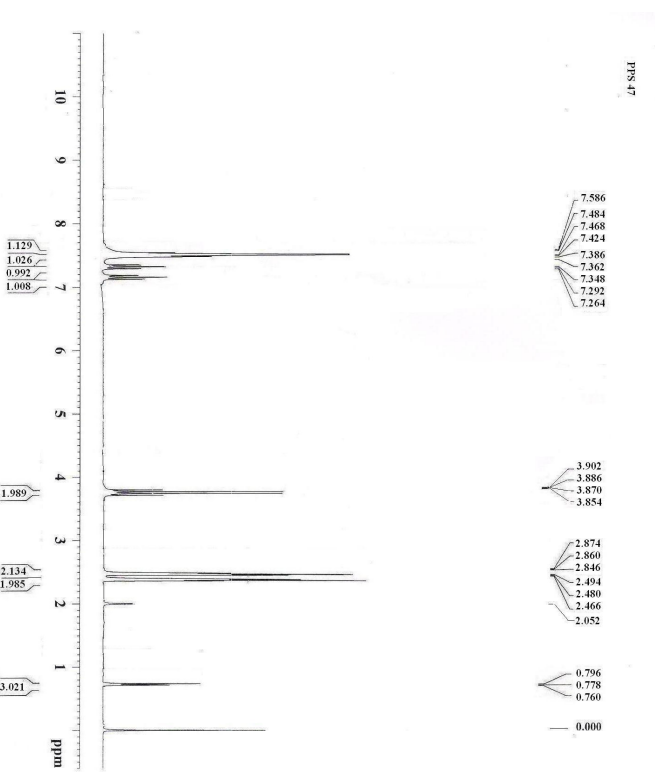


Fig. 4.46 ¹H-NMR (CDCl₃, DMSO-d₆) spectrum of Ethyl 2-thioxo-1,2,5,6-tetrahydro[1]benzothiepinol[5,4-d]pyrimidine-4-carboxylate (16)

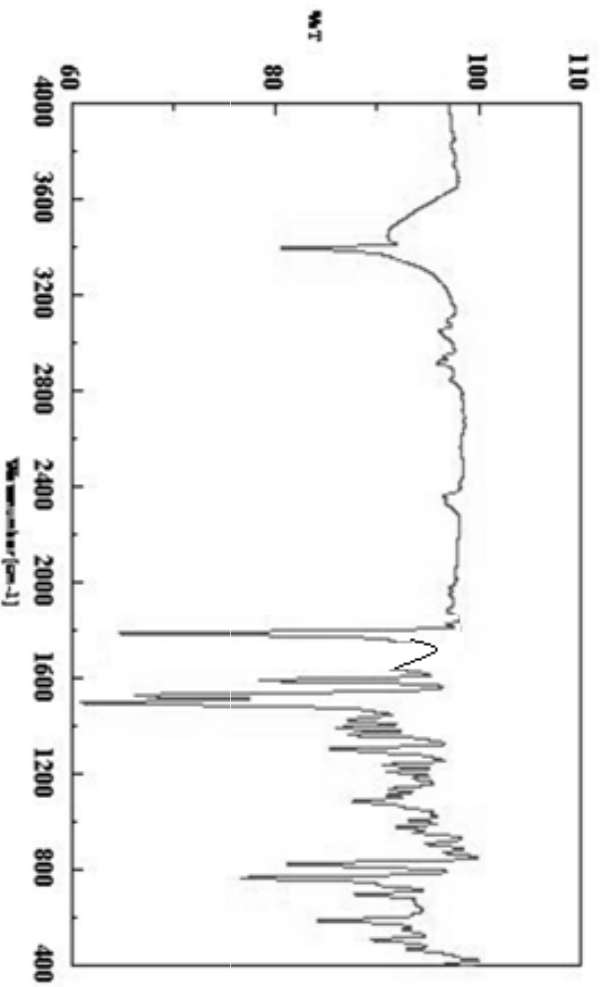


Fig. 4.49 IR (KBr) spectrum of ethyl 1,4-dihydro-1H-benzothiepine [5,4-c] benzodiazepine-4-carboxylate (17)

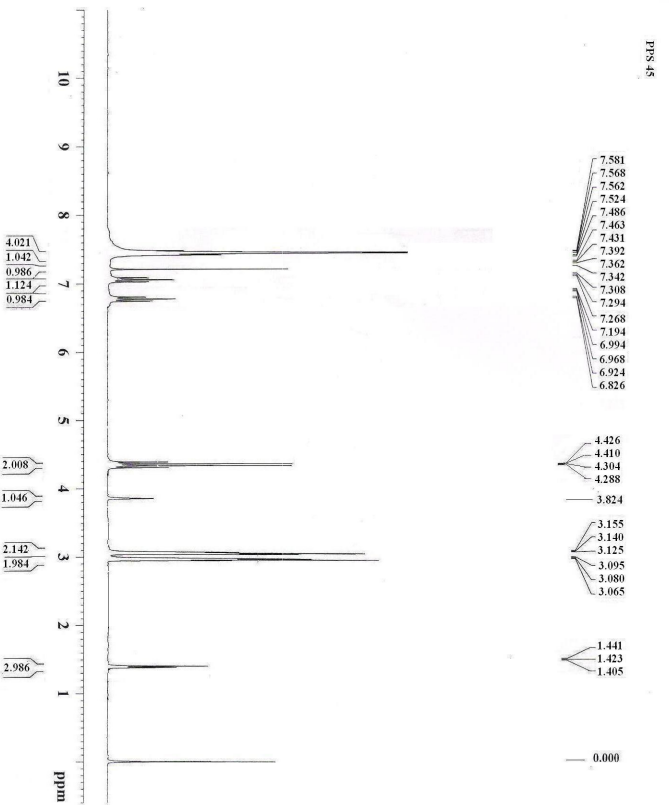


Fig. 4.50 ¹H-NMR (DMSO-d₆) spectrum of ethyl 1,4-dihydro-1H-benzothiepine [5,4-c] benzodiazepine-4-carboxylate (17)

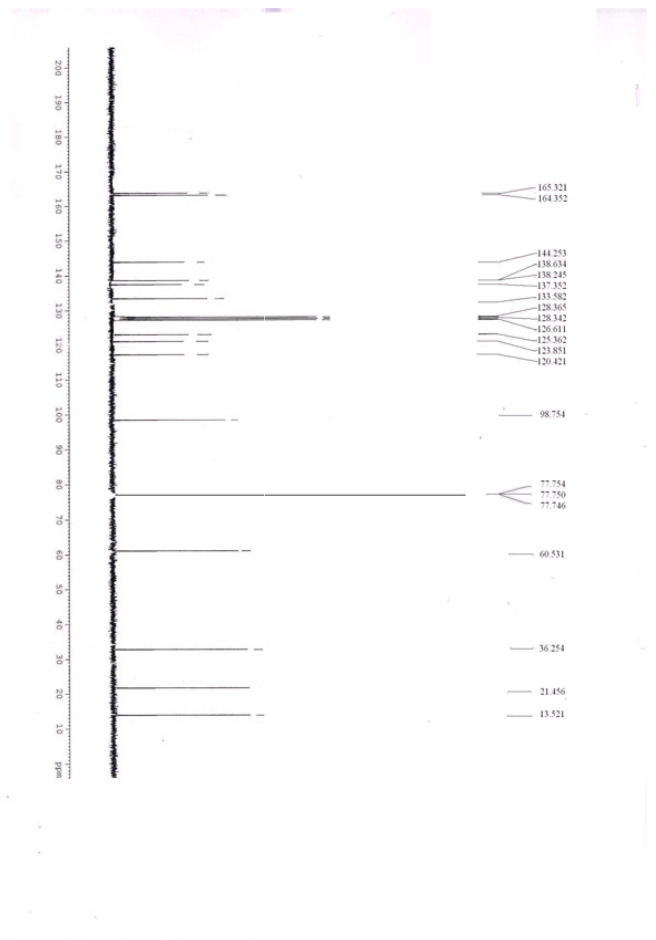


Fig. 4.51 ^{13}C -NMR (DMSO- d_6) spectrum of ethyl 1,4-dihydro-1H-benzothiepine [5,4-c] benzodiazepine-4-carboxylate (17)

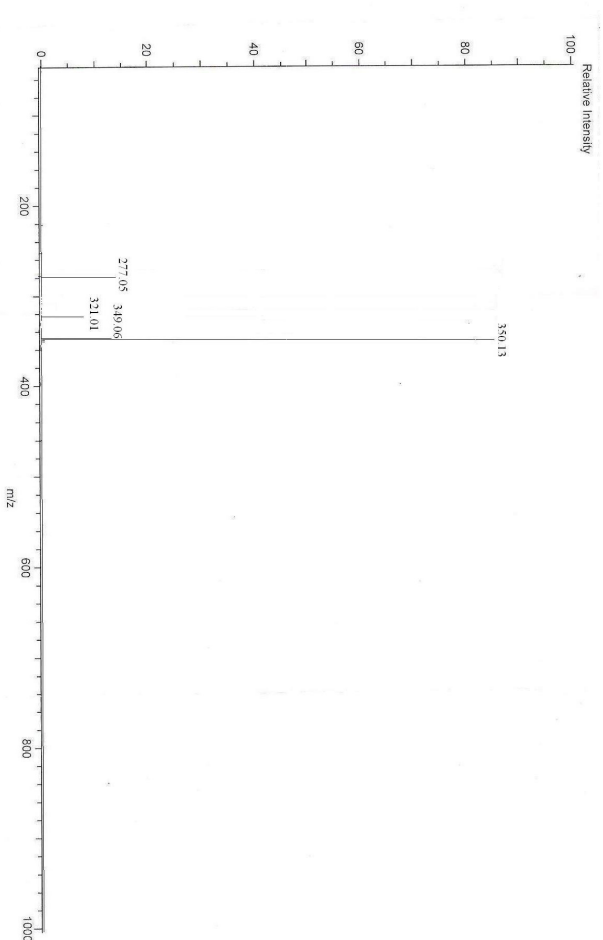


Fig. 4.52 Mass (ESI) spectrum of ethyl 1,4-dihydro-1H-benzothiepine [5,4-c] benzodiazepine-4-carboxylate (17)

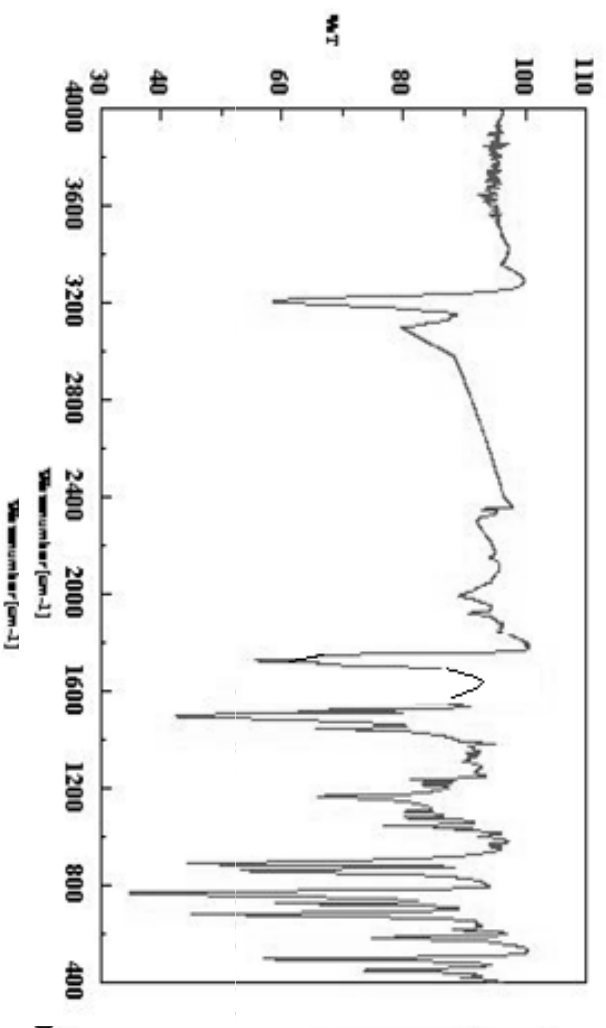


Fig. 4.53 IR (KBr) spectrum of ethyl 2,3-diphenyl-2,3-dihydro-1H-benzothiepine [5,4-c]diazepine-5-carboxylate (18)

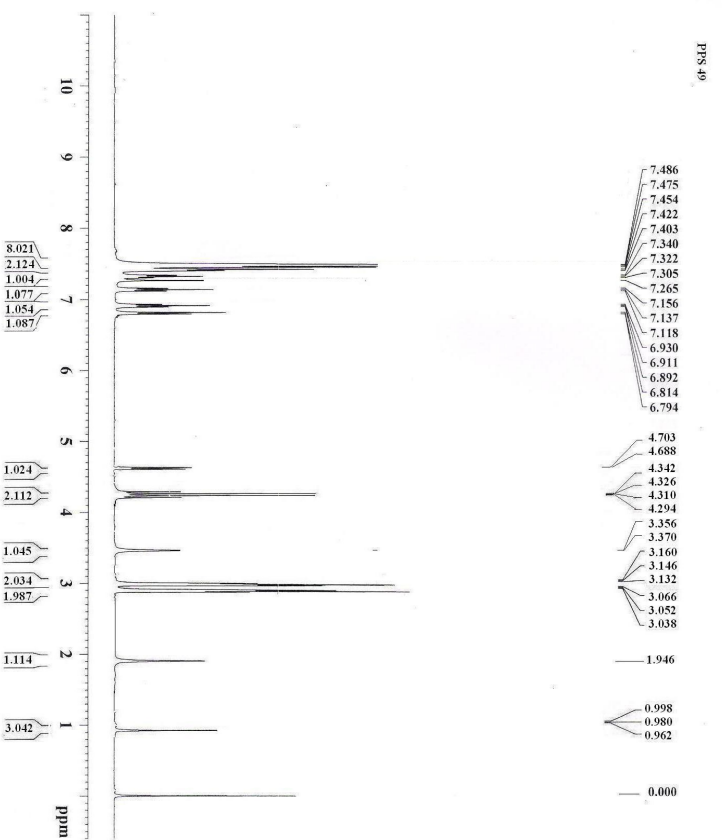


Fig. 4.54 1H-NMR (DMSO-d6) spectrum of ethyl 2,3-diphenyl-2,3-dihydro-1H-benzothiepine [5,4-c]diazepine-5-carboxylate (18)

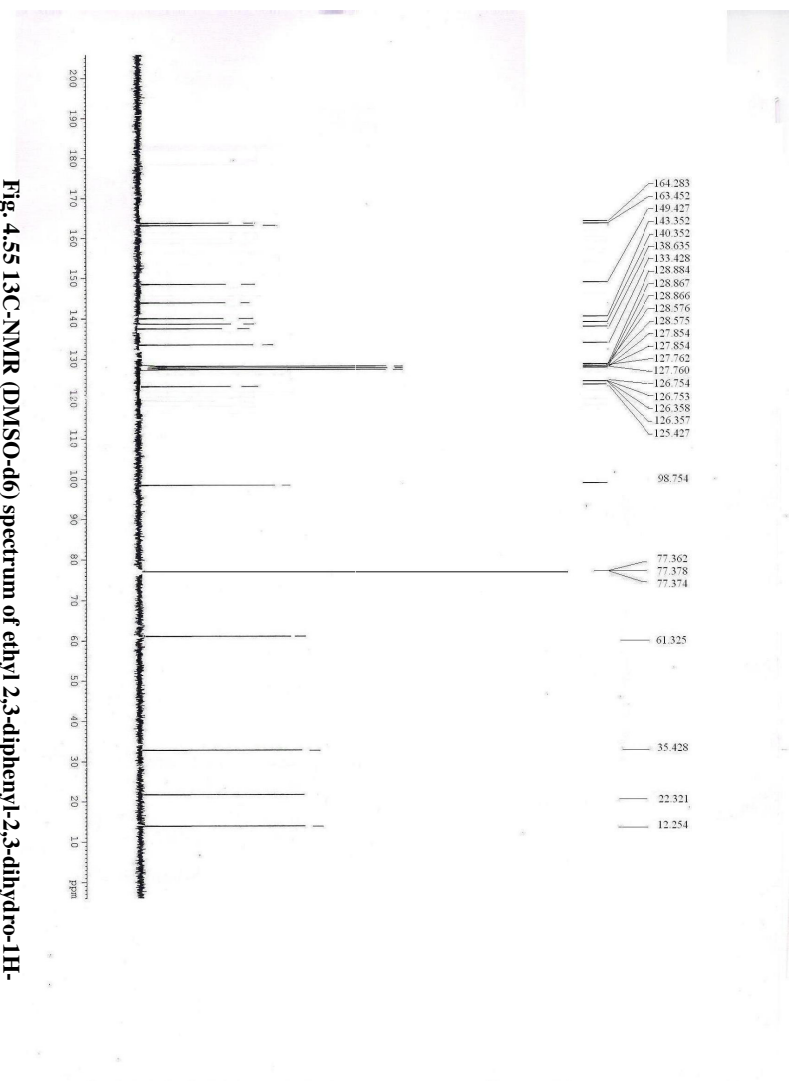


Fig. 4.55 ^{13}C -NMR (DMSO- d_6) spectrum of ethyl 2,3-diphenyl-2,3-dihydro-1H-benzothiepine [5,4-benzothiepine] [5,4-c]diazepine-5-carboxylate (18)

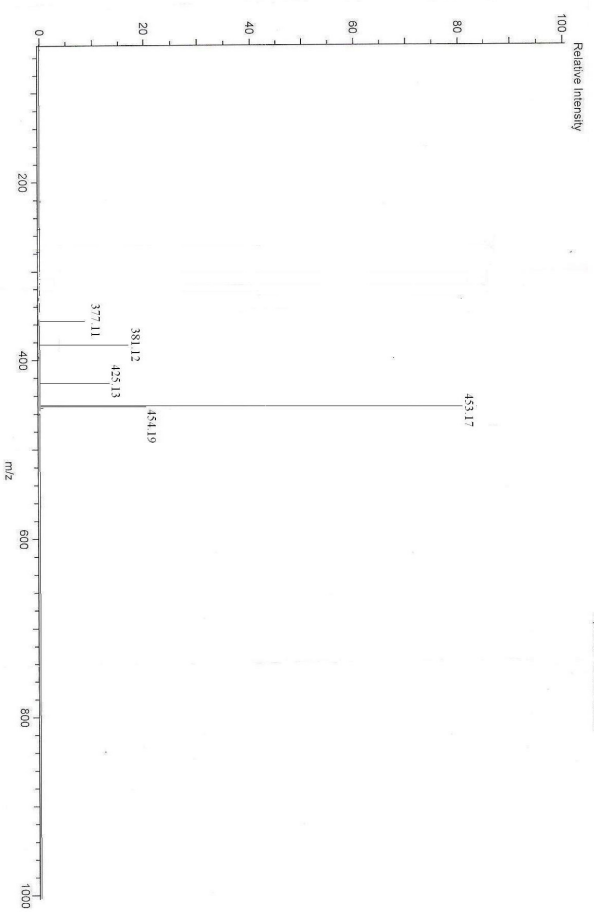


Fig. 4.56 Mass (ESI) spectrum of ethyl 2,3-diphenyl-2,3-dihydro-1H-benzothiepine [5,4-c]diazepine-5-carboxylate (18)