SUPPLEMENTERY MATERIAL

Microwave-assisted synthesis, molecular docking studies of 1,2,3- Triazole based carbazole derivatives as antimicrobial, antioxidant, anticancer agents

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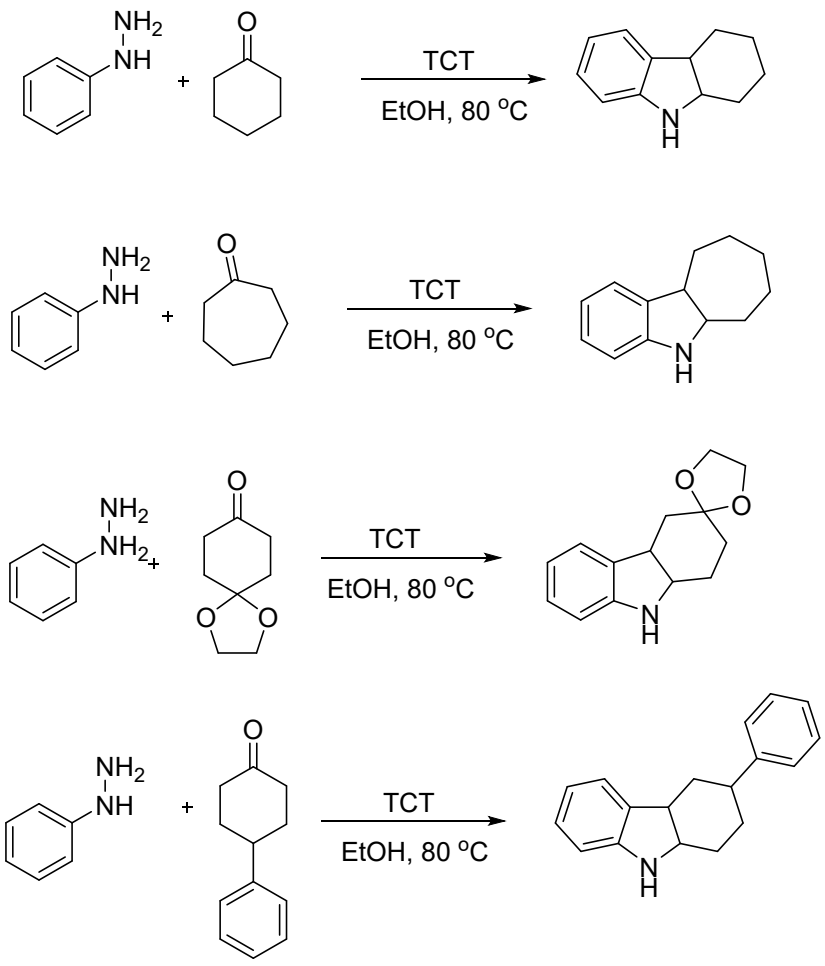
1. Representation of synthesis of compound **1(a-d) ……** p2-p2
2. Spectral copies of the intermediates and target compounds **4(a-u**z….. p3-p8

Representation of synthesis of compound **1 &2(n)**



Copies of ^{1}H NMR, ^{13}C NMR, MASS and IR of synthesized compounds:

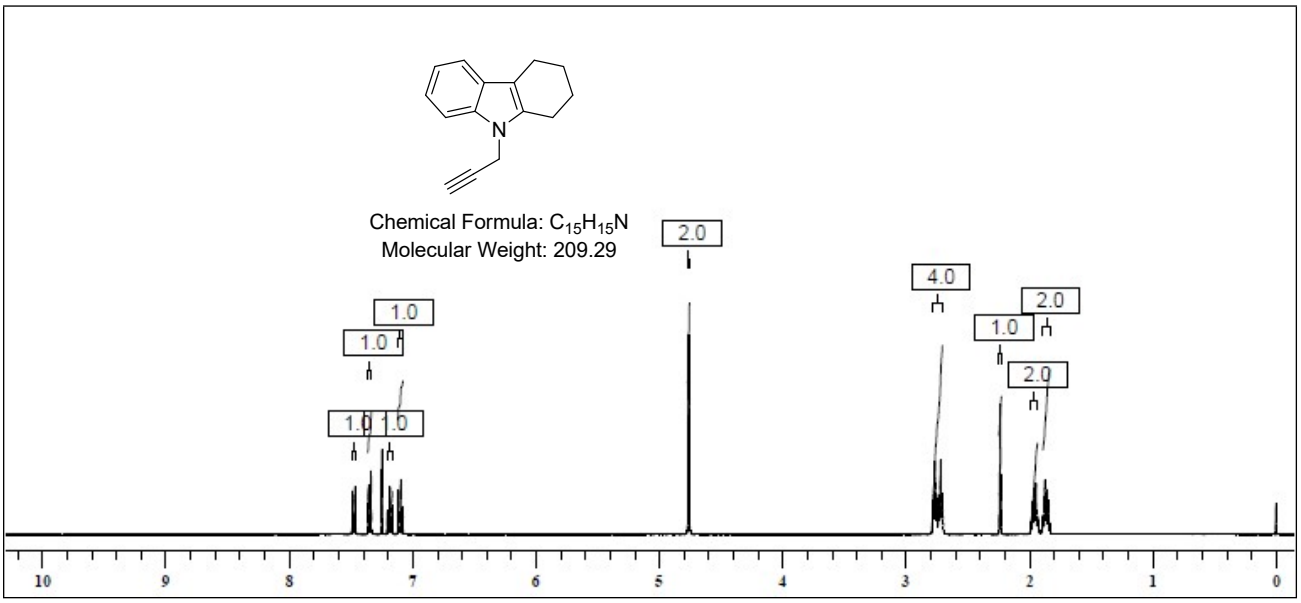


Figure S1: ^{1}H NMR (400 MHz, $CDCl_3$) spectrum of 9-(prop-2-yn-1-yl)-2,3,4,9-tetrahydro-1*H*-fluorene **2**

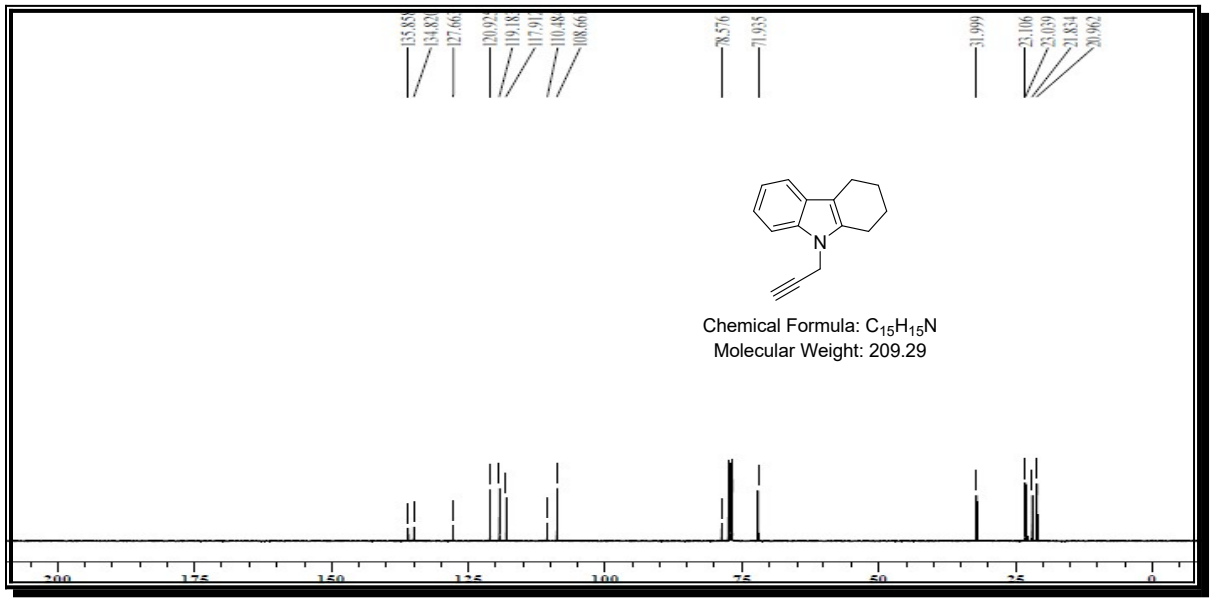


Figure S2: ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of 9-(prop-2-yn-1-yl)-2,3,4,9-tetrahydro-1*H*-fluorene **2**

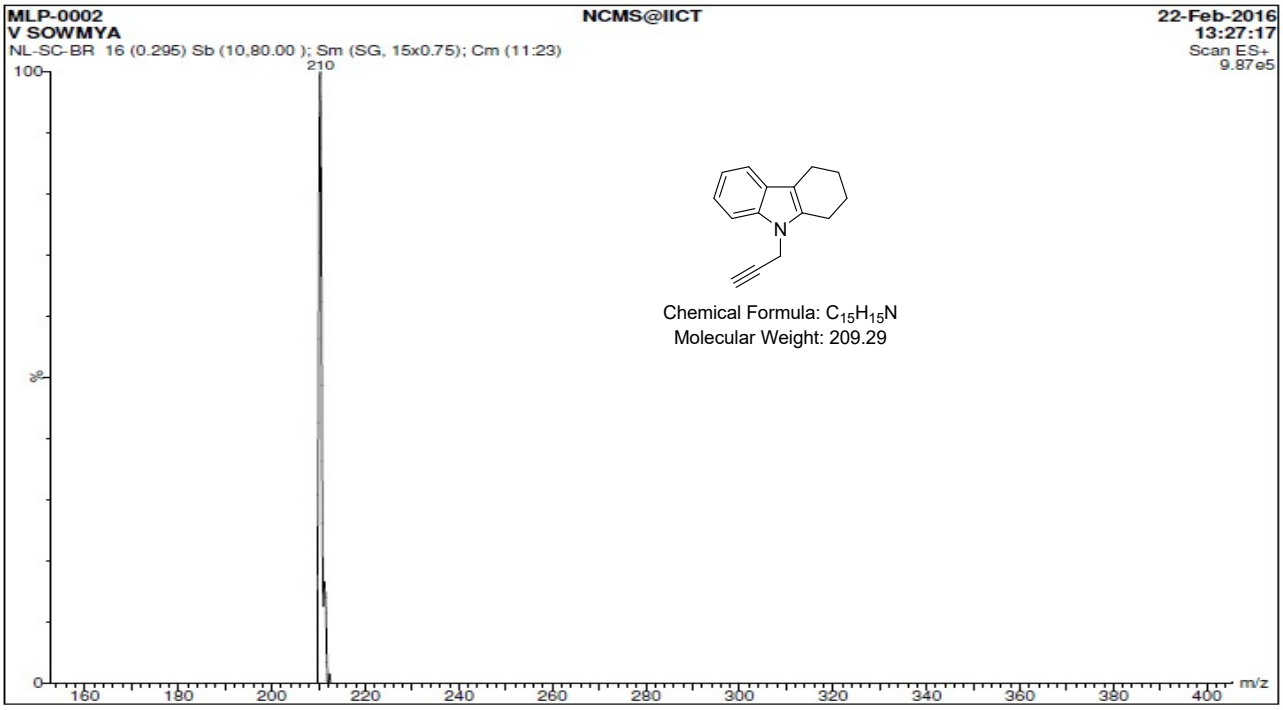


Figure S3: Mass (ES^+) spectrum of compound 9-(prop-2-yn-1-yl)-2,3,4,9-tetrahydro-1*H*-fluorene **2**

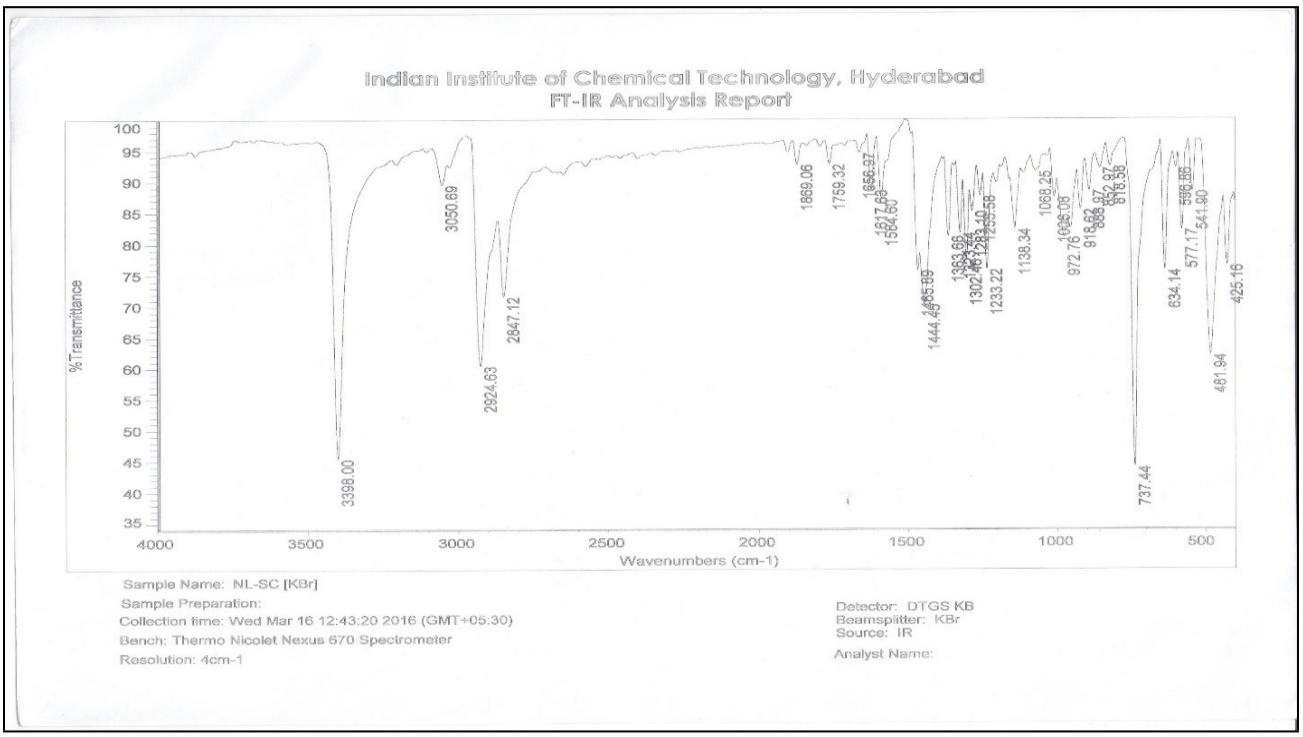


Figure S4: IR (KBr, cm^{-}) spectrum of compound 9-(prop-2-yn-1-yl)-2,3,4,9-tetrahydro-1*H*-fluorene **2**

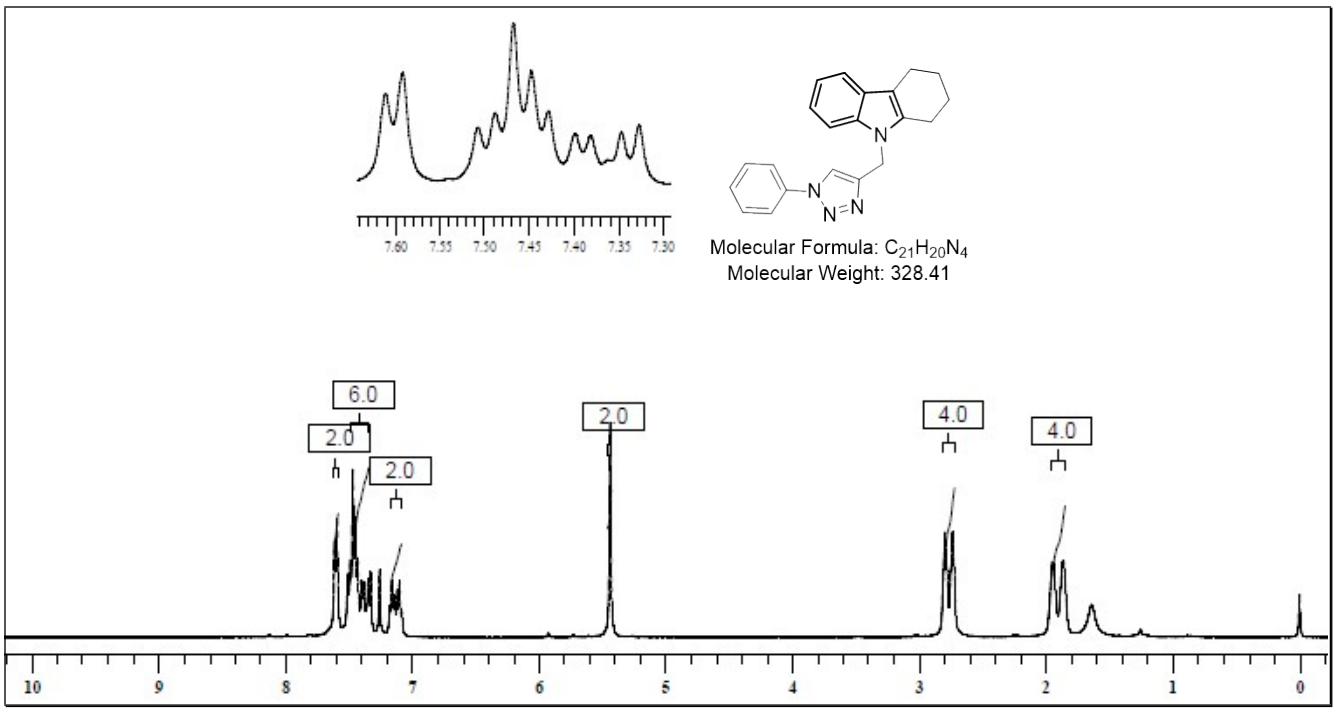


Figure S5: ^{1}H NMR (400 MHz, $CDCl_3$) spectrum of 9-((1-phenyl-1*H*-1,2,3-triazol-4-yl)methyl)-2,3,4,9-tetrahydro-1*H*-carbazole **(4a)**

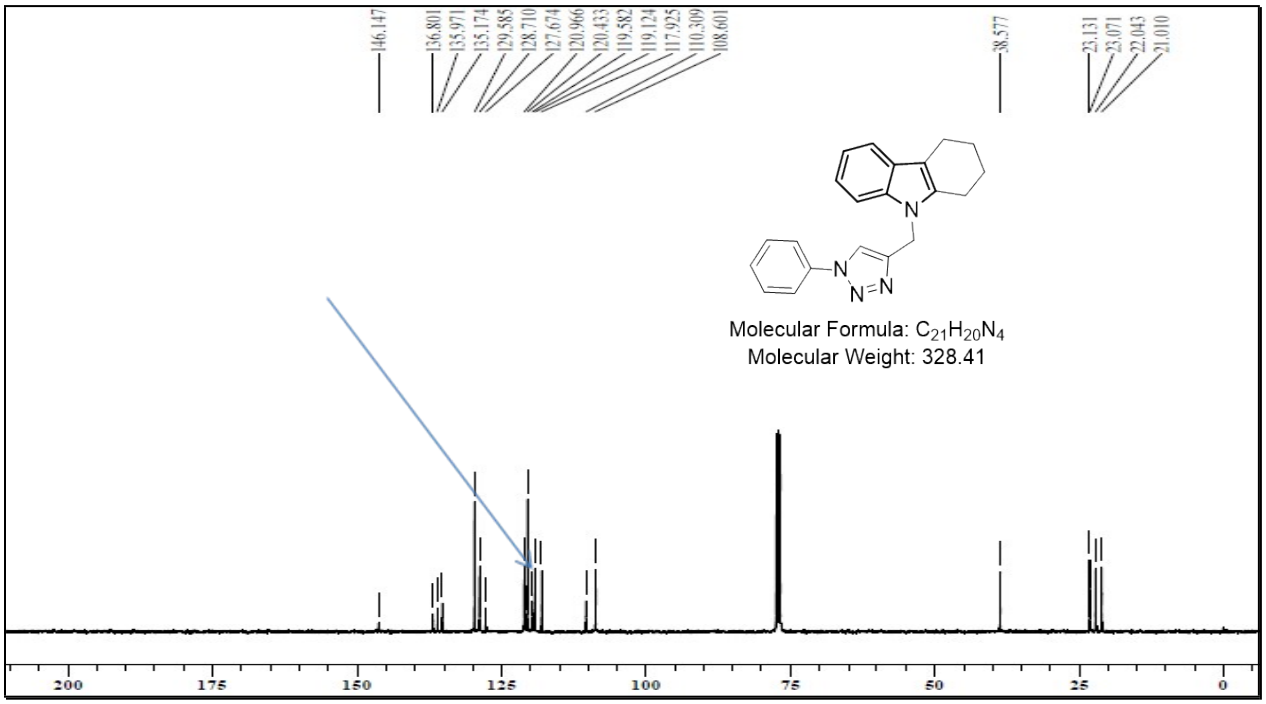


Figure S6: ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of 9-((1-phenyl-1*H*-1,2,3-triazol-4-yl)methyl)-2,3,4,9-tetrahydro-1*H*-carbazole **(4a)**

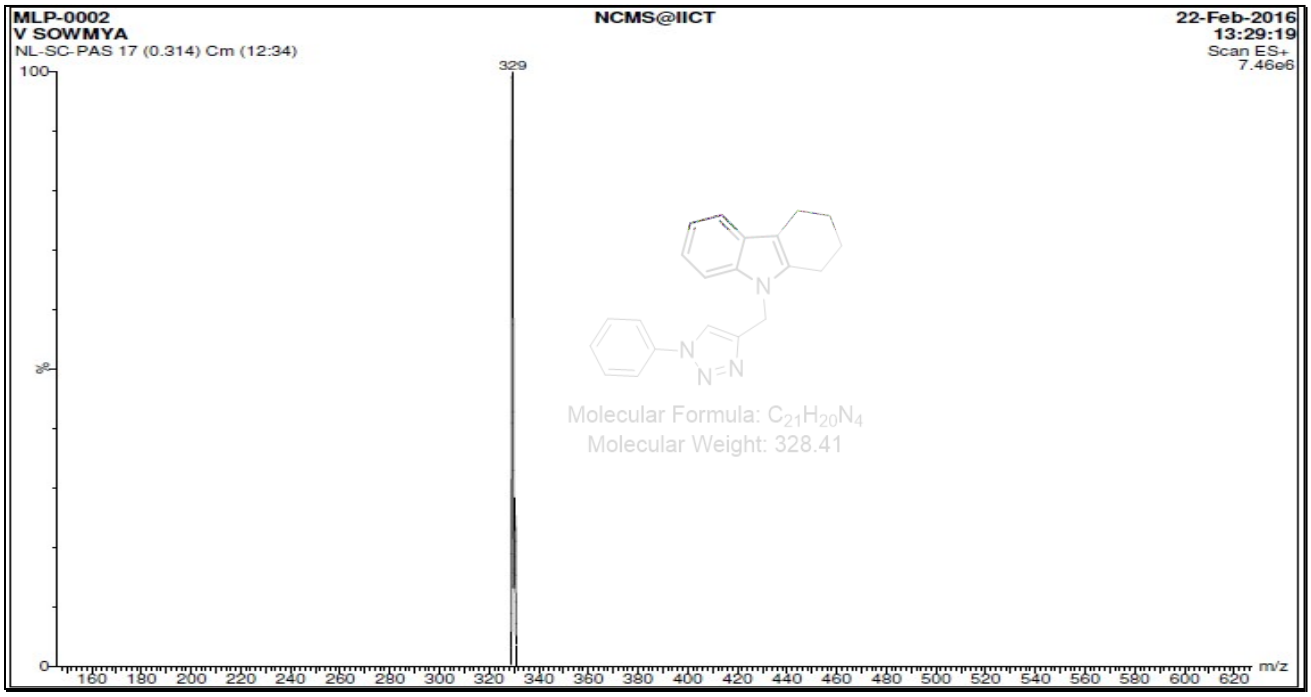


Figure S7: Mass (ES^+) spectrum of compound 9-((1-phenyl-1*H*-1,2,3-triazol-4-yl)methyl)-2,3,4,9-tetrahydro-1*H*-carbazole **(4a)**

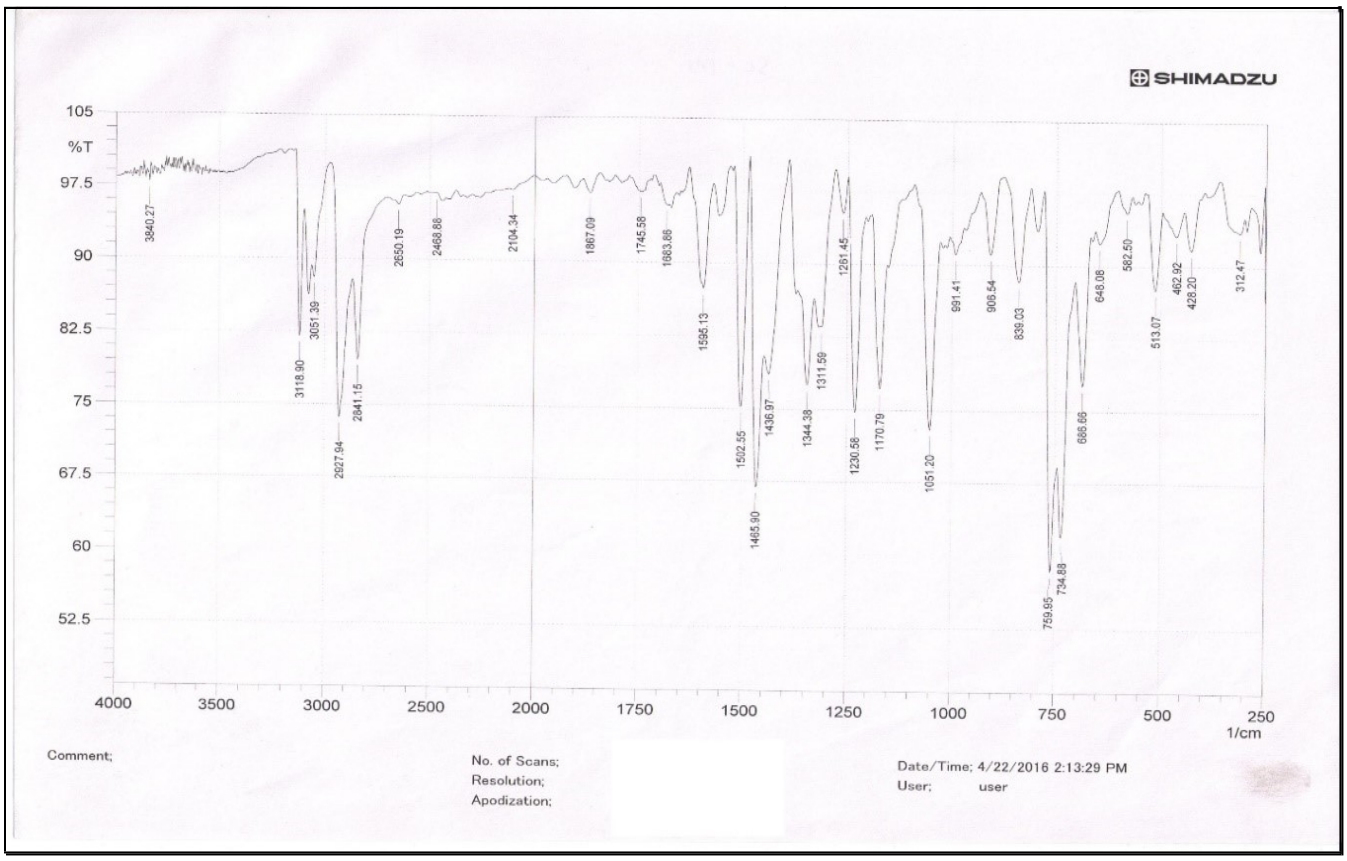


Figure S8: IR (KBr, cm^{-}) spectrum of compound 9-((1-phenyl-1*H*-1,2,3-triazol-4-yl)methyl)-2,3,4,9-tetrahydro-1*H*-carbazole **(4a)**

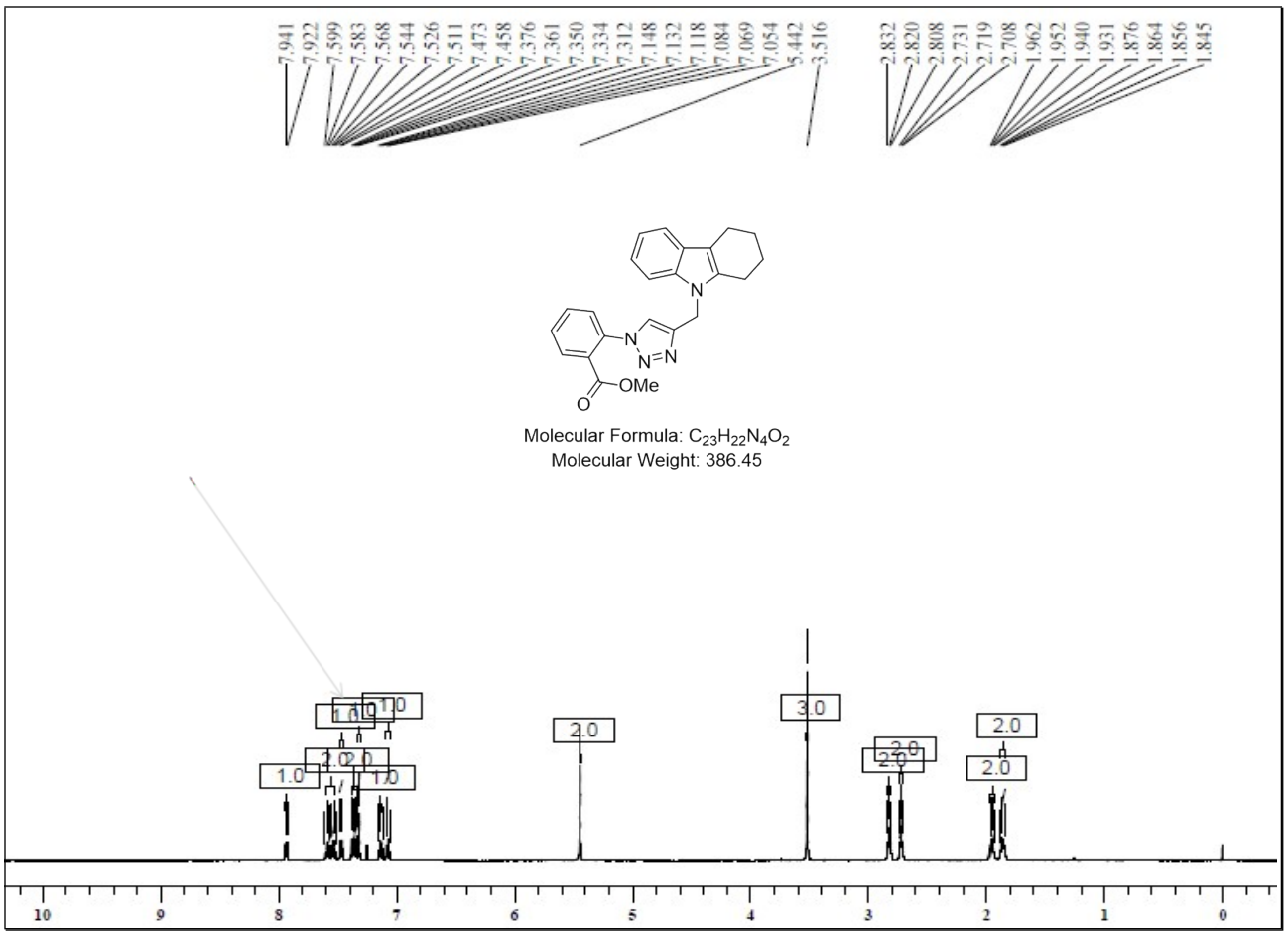


Figure S9: ^{1}H NMR (400 MHz, $CDCl_3$) of methyl 2-(4-((3,4-dihydro-1*H*-carbazol-9(2*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)benzoate **(4b)**

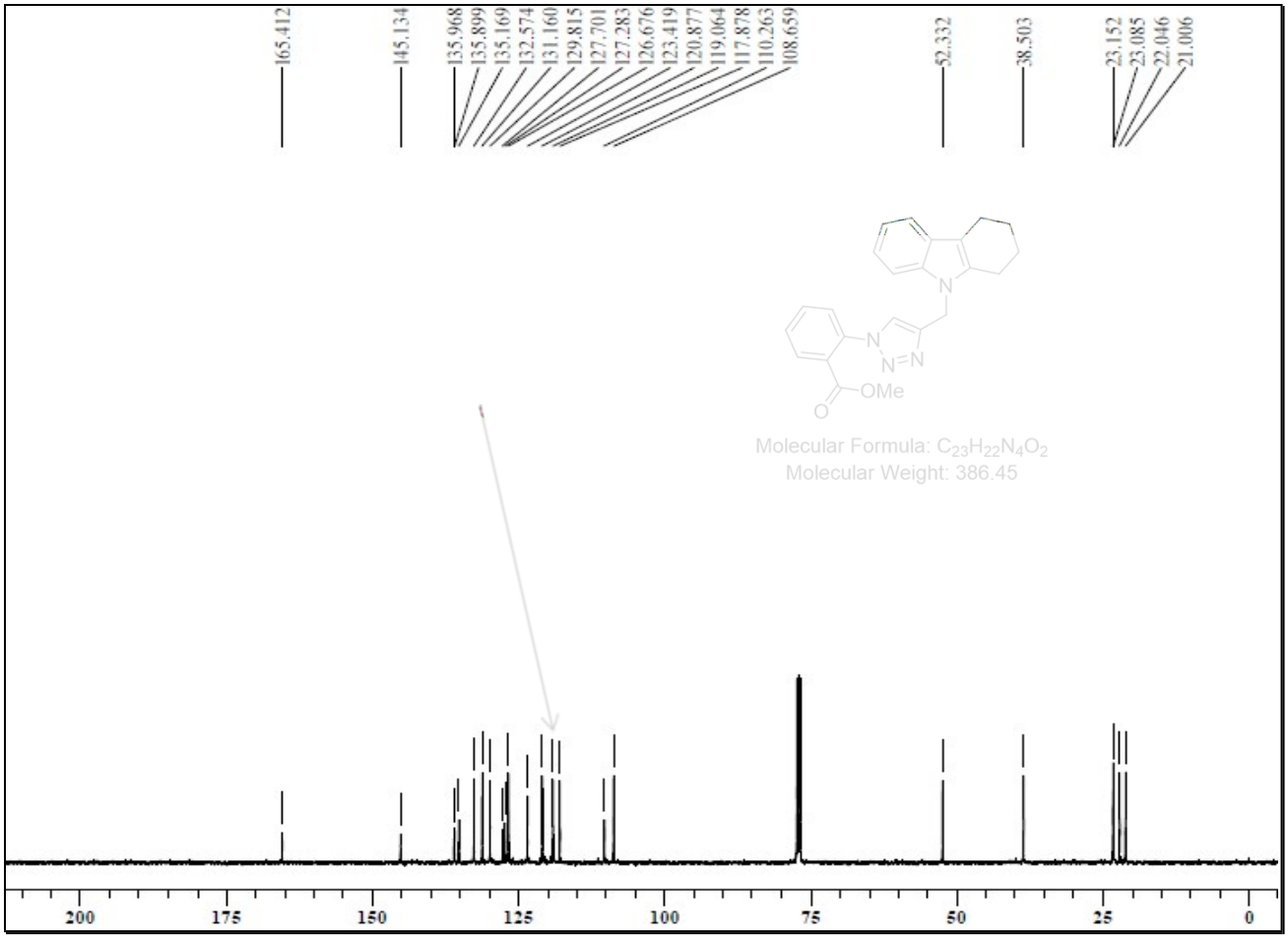


Figure S10: ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of compound methyl 2-(4-((3,4-dihydro-1*H*-carbazol-9(2*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)benzoate **(4b)**

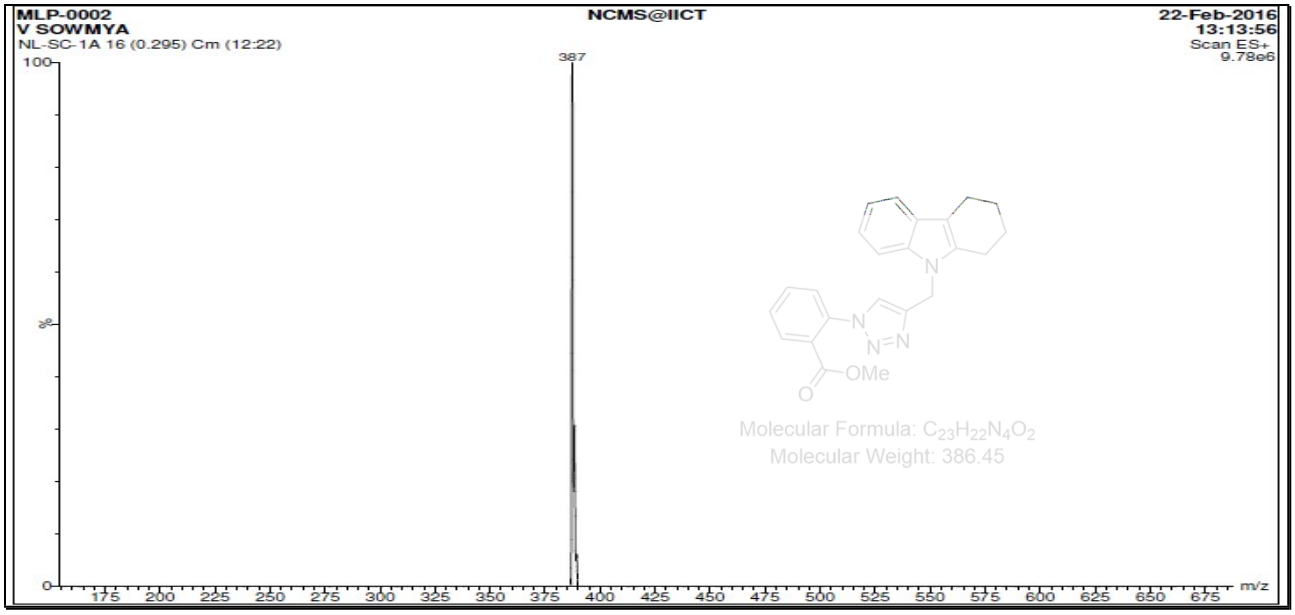


Figure S11: Mass (ES^+) spectrum of methyl 2-(4-((3,4-dihydro-1*H*-carbazol-9(2*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)benzoate **(4b)**

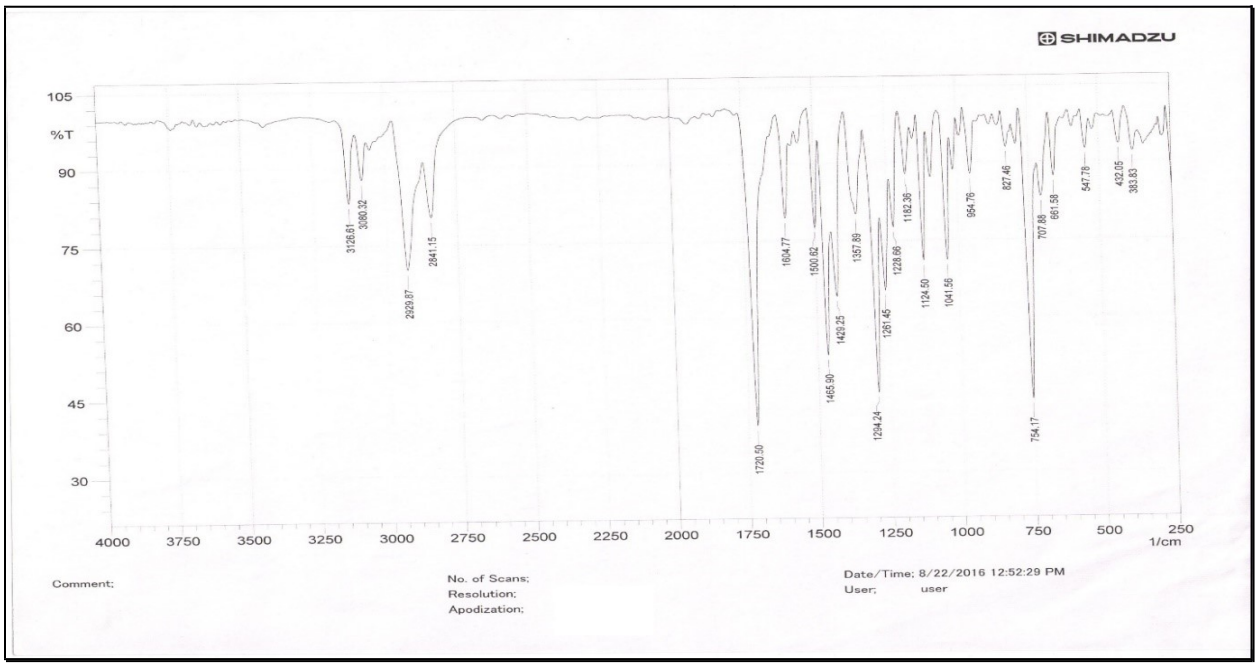


Figure S12: IR (KBr, cm^-) spectrum of methyl 2-(4-((3,4-dihydro-1*H*-carbazol-9(2*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)benzoate **(4b)**

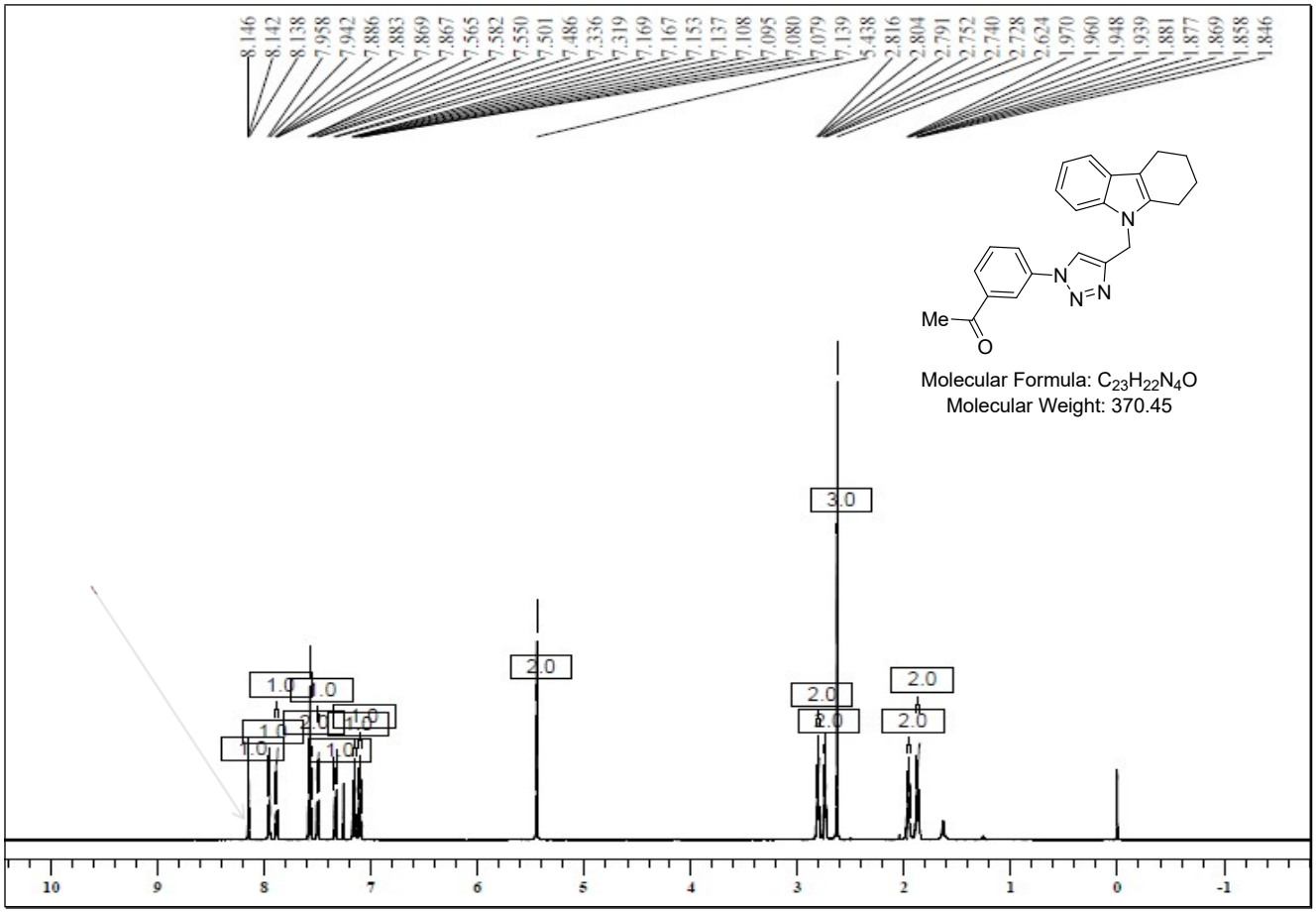


Figure S13: ^{1}H NMR (400 MHz, $CDCl_3$) of 1-(3-(4-((3,4-dihydro-1*H*-carbazol-9(2*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)phenyl)ethanone **(4c)**

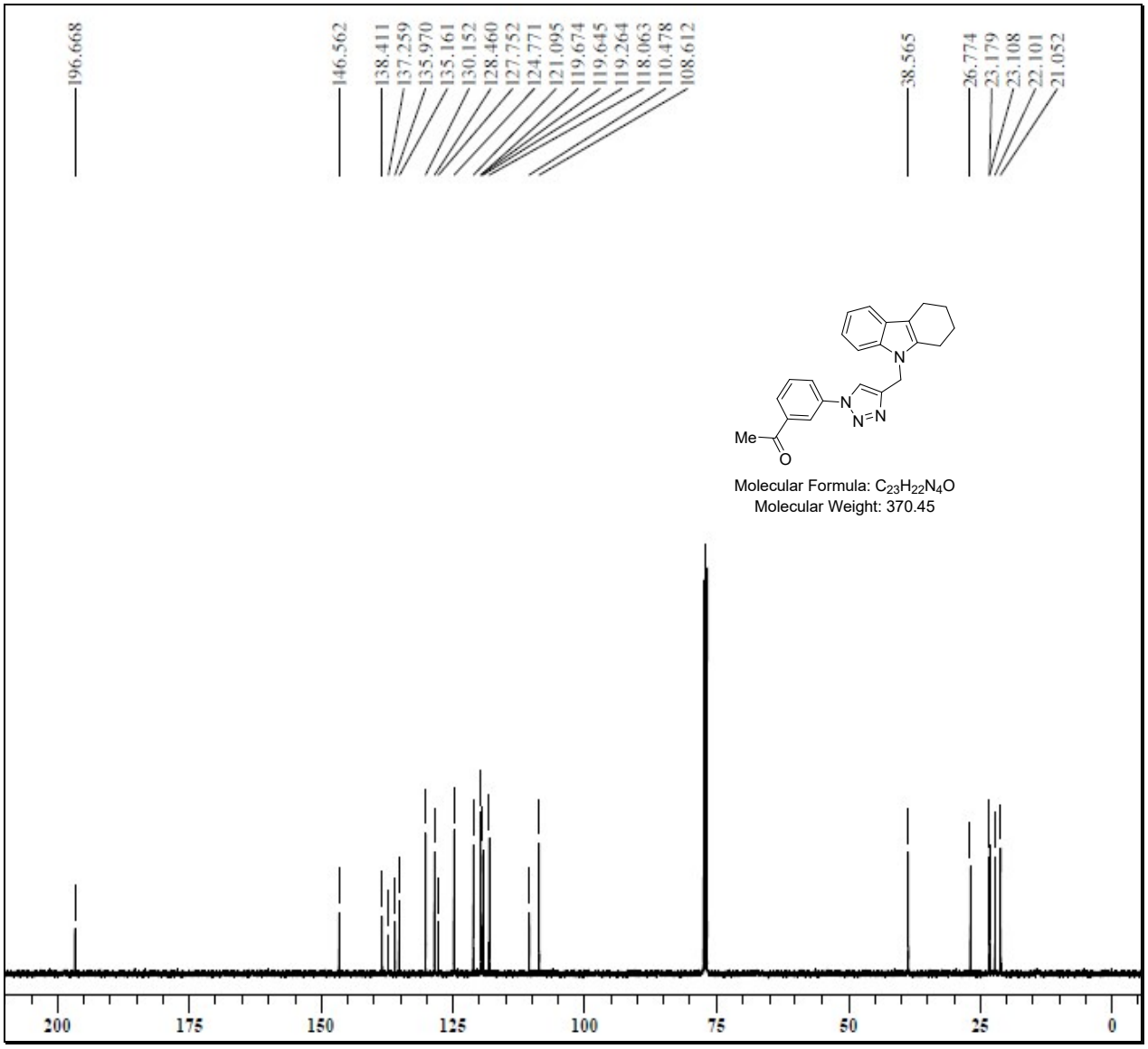


Figure S14: ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of 1-(3-(4-((3,4-dihydro-1*H*-carbazol-9(2*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)phenyl)ethanone **(4c)**

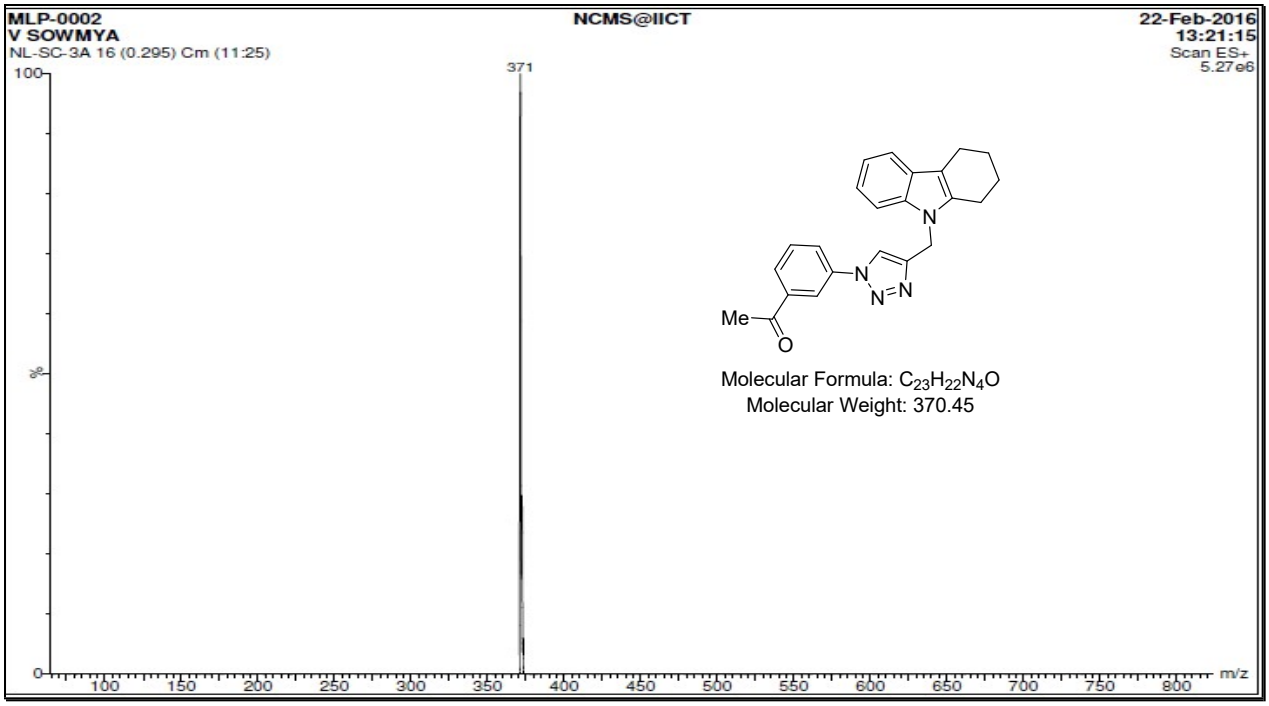


Figure S15: Mass (ES^+) spectrum of 1-(3-(4-((3,4-dihydro-1*H*-carbazol-9(2*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)phenyl)ethanone **(4c)**

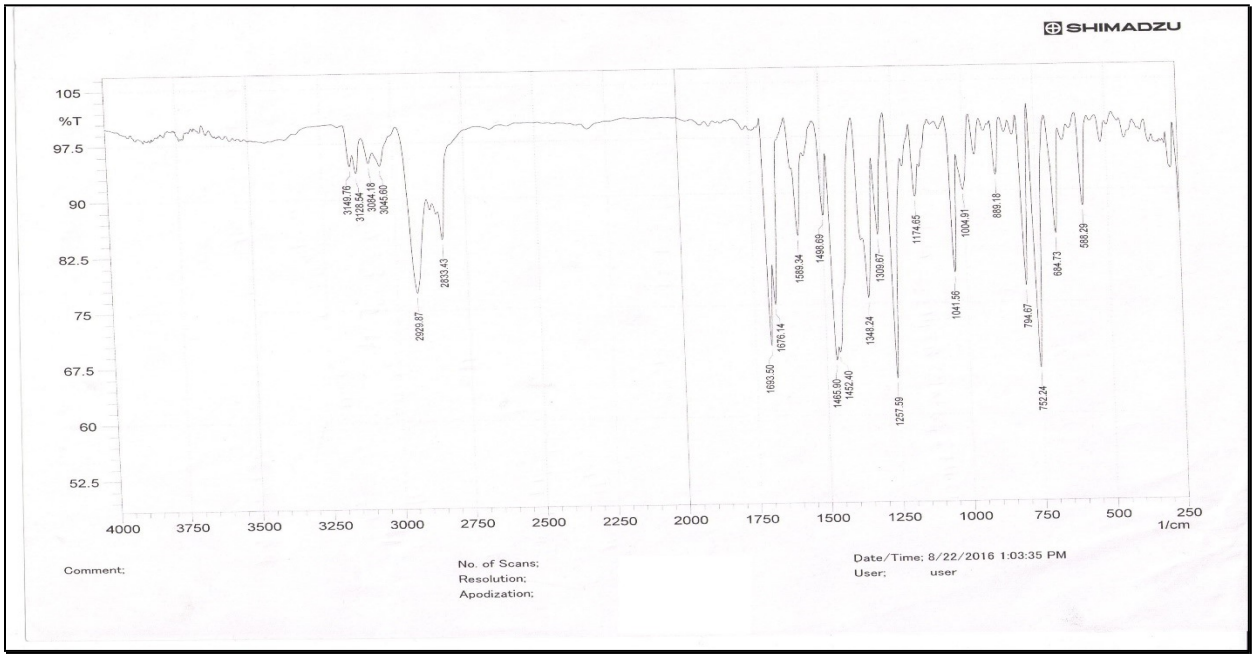


Figure S16: IR (KBr, cm^-) spectrum of 1-(3-(4-((3,4-dihydro-1*H*-carbazol-9(2*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)phenyl)ethanone **(4c)**

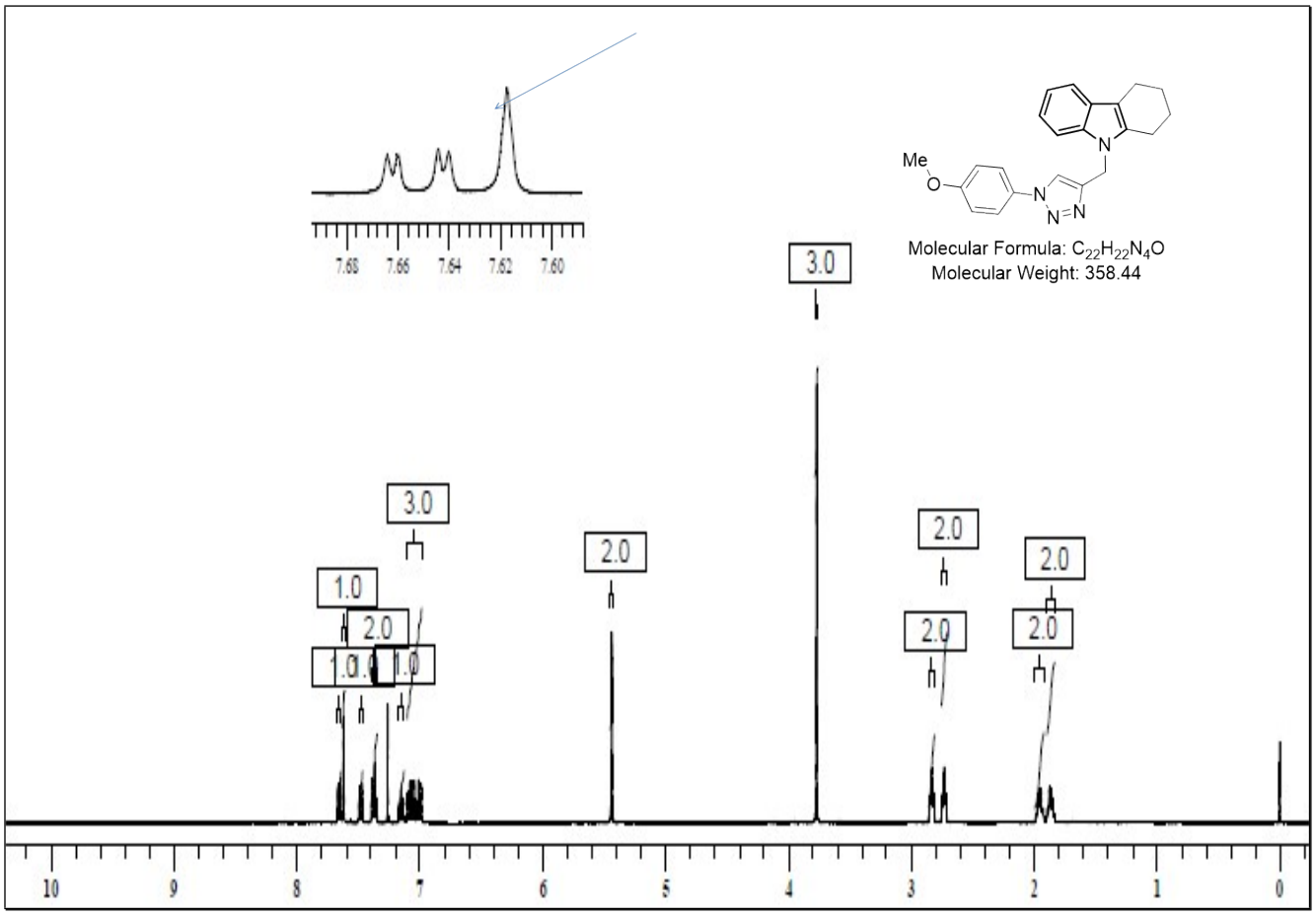


Figure S17: ^{1}H NMR (400 MHz, $CDCl_3$) of 9-((1-(4-methoxyphenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-2,3,4,9-tetrahydro-1*H*-carbazole **(4d)**

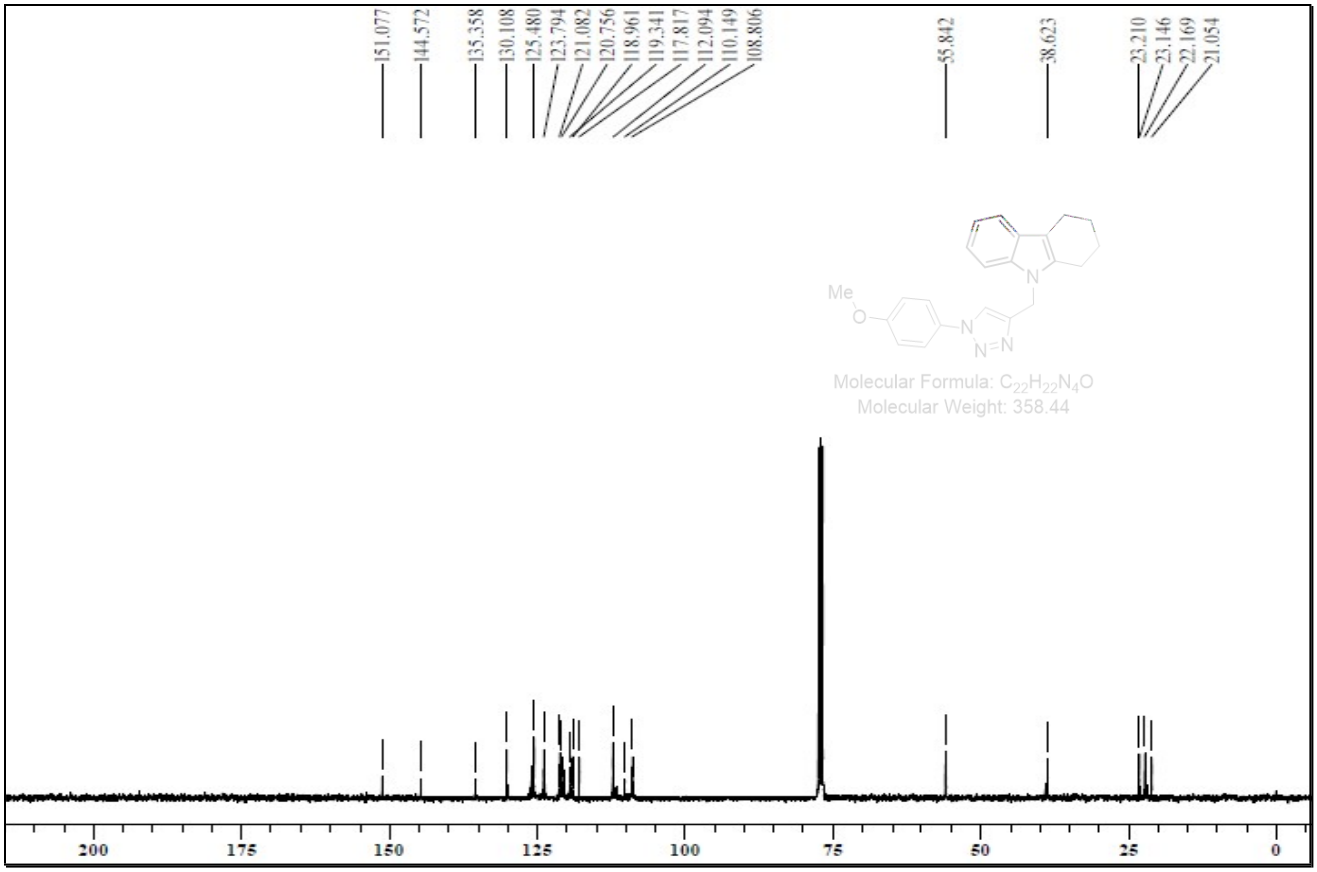


Figure S18: ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of 9-((1-(4-methoxyphenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-2,3,4,9-tetrahydro-1*H*-carbazole **(4d)**

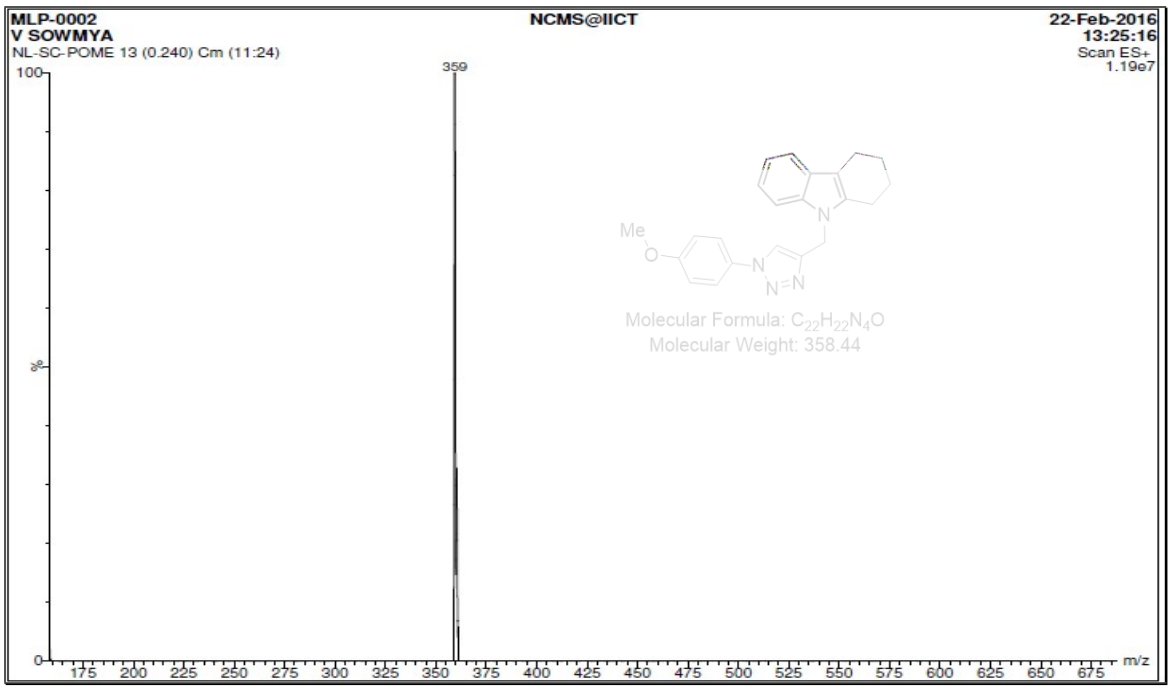


Figure S19: Mass (ES^+) spectrum of 9-((1-(4-methoxyphenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-2,3,4,9-tetrahydro-1*H*-carbazole **(4d)**

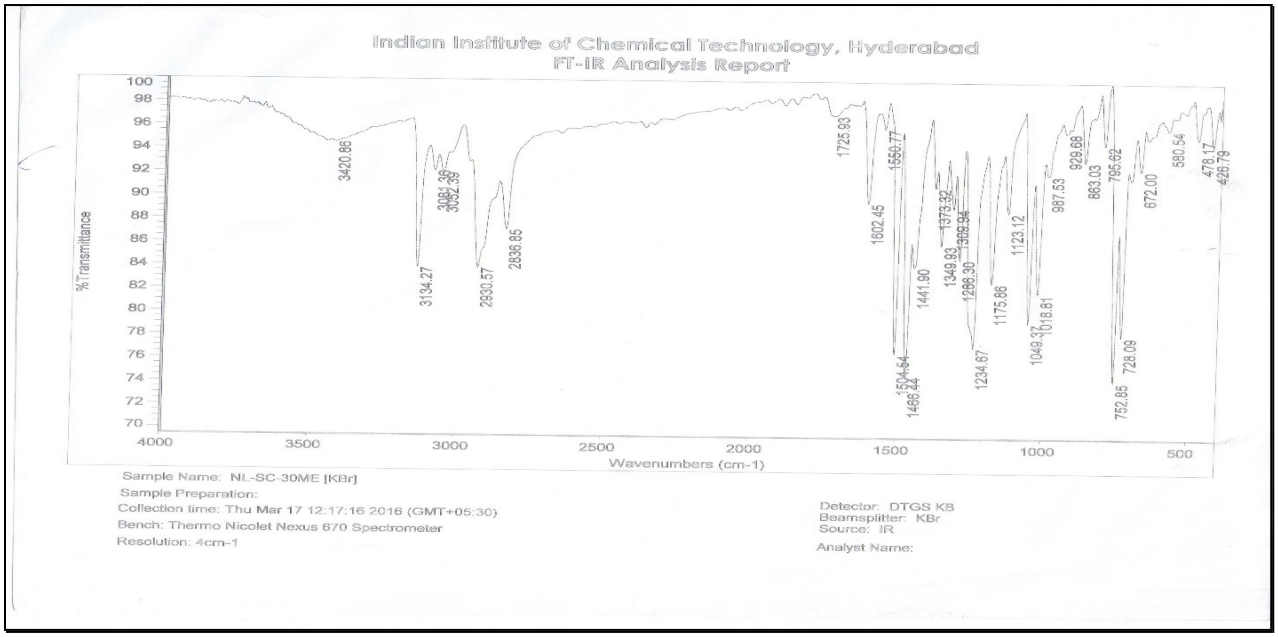


Figure S20: IR (KBr, cm^-) spectrum of 9-((1-(4-methoxyphenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-2,3,4,9-tetrahydro-1*H*-carbazole **(4d)**

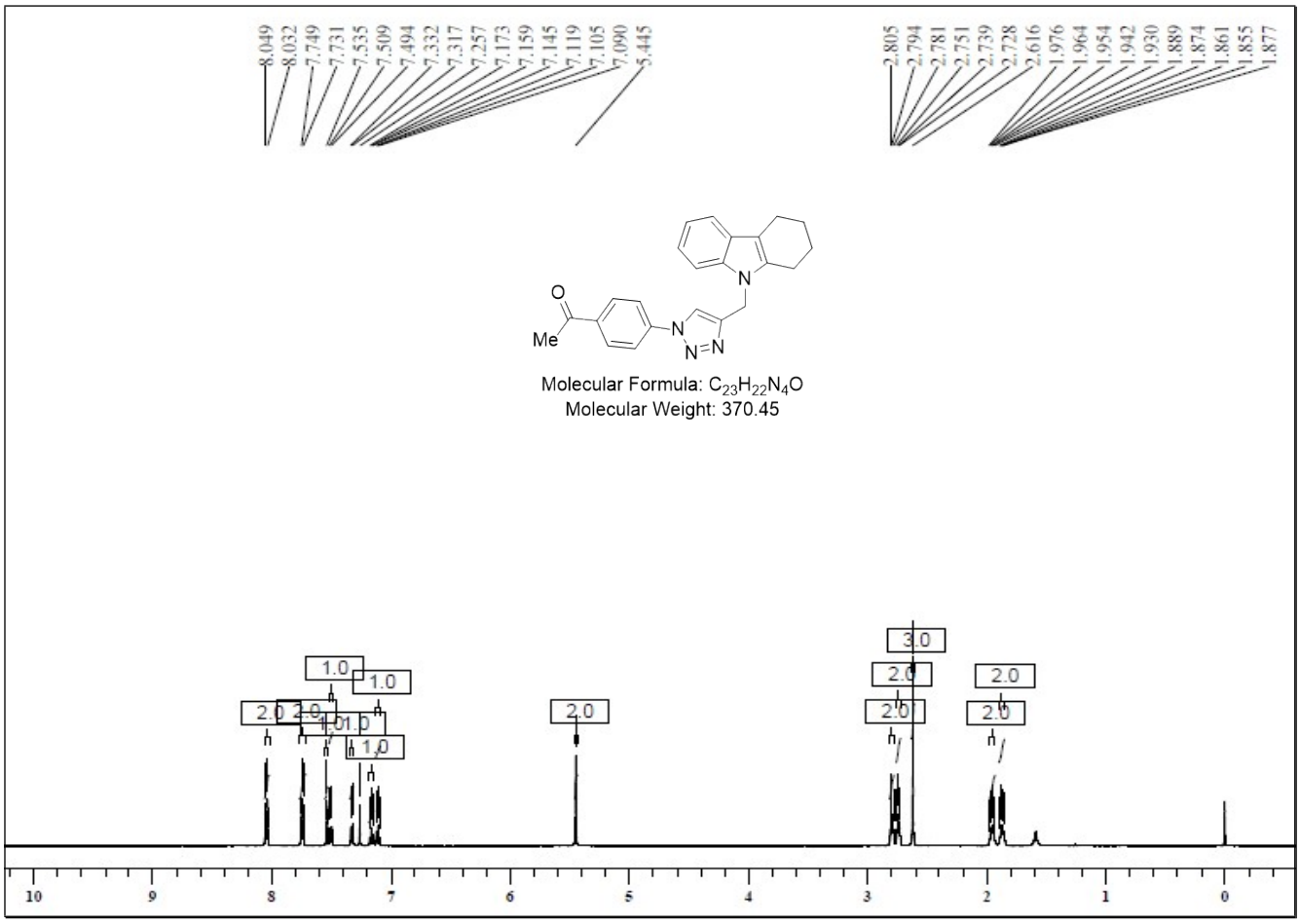


Figure S21: ^{1}H NMR (400 MHz, $CDCl_3$) of 1-(4-(4-((3,4-dihydro-1*H*-carbazol-9(2*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)phenyl)ethanone **(4e)**

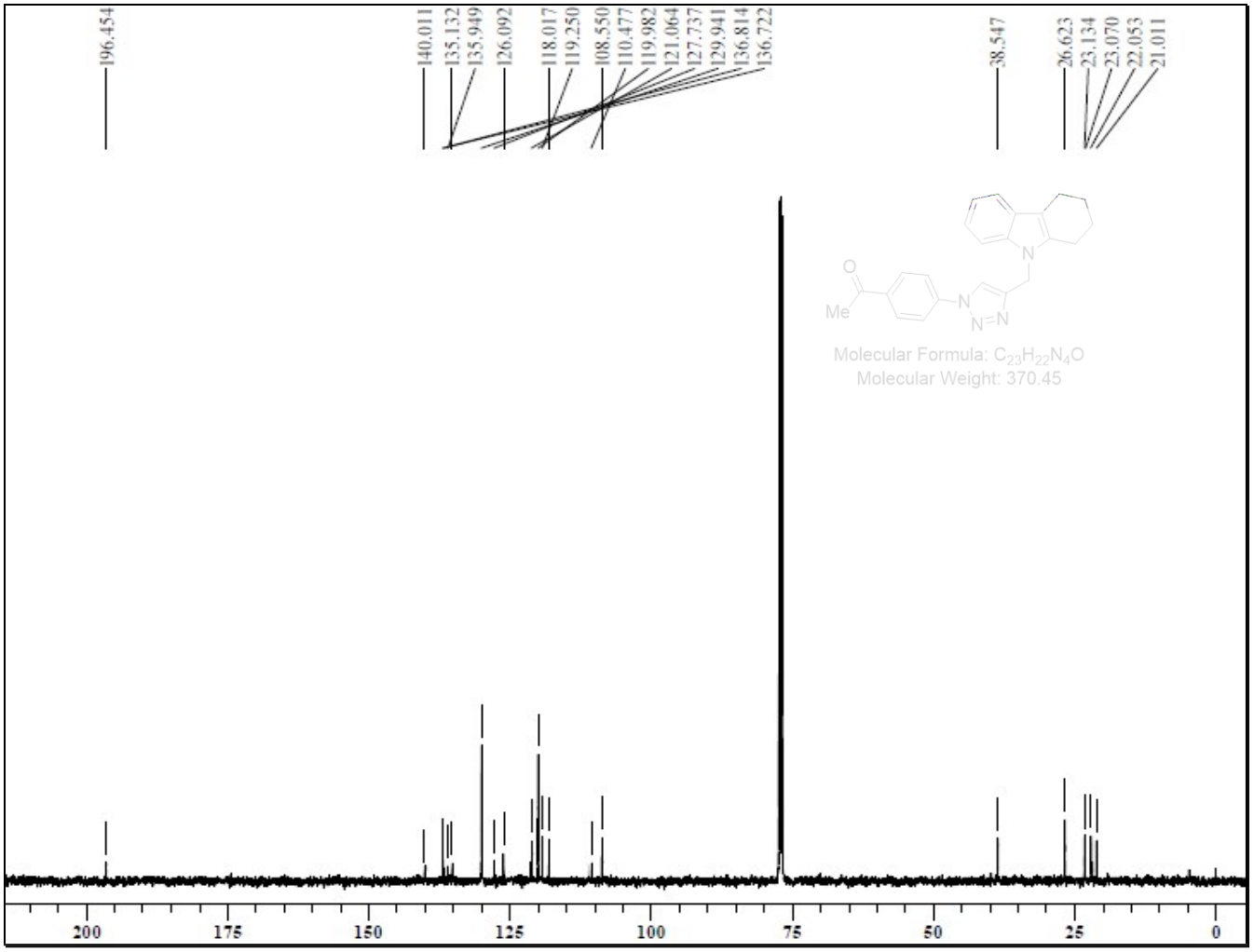


Figure S22: ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of 1-(4-(4-((3,4-dihydro-1*H*-carbazol-9(2*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)phenyl)ethanone **(4e)**

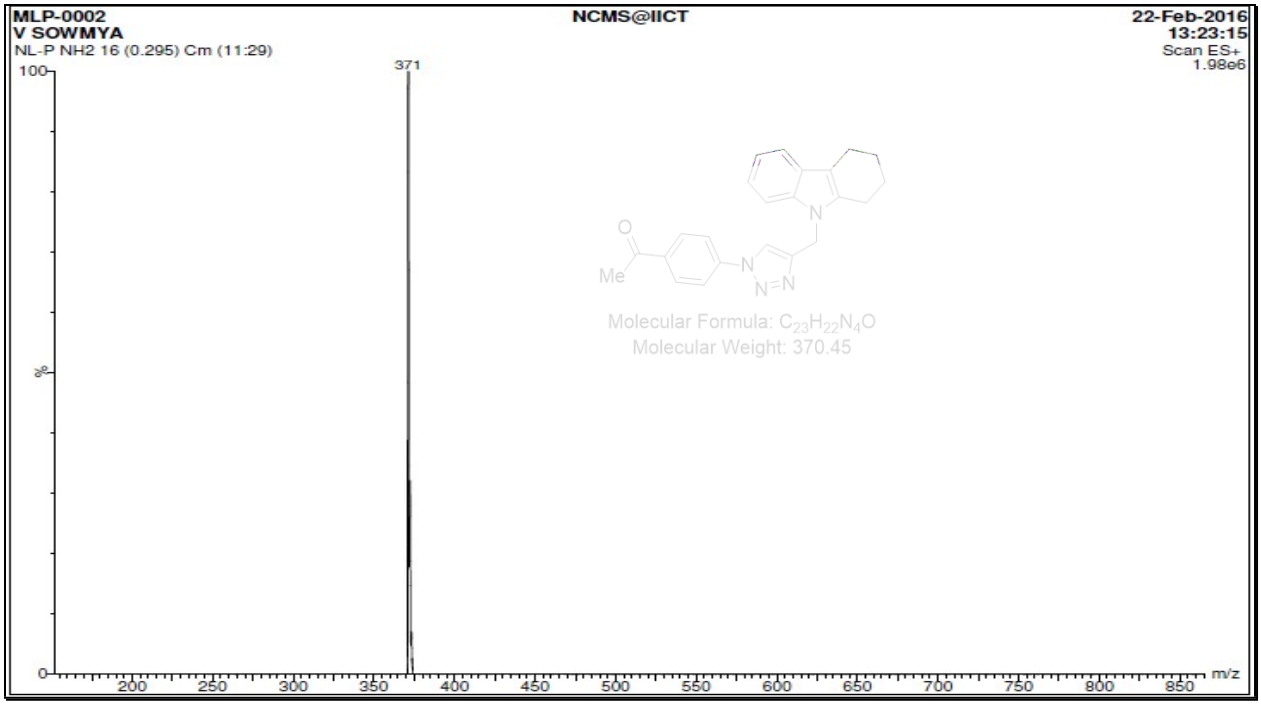


Figure S23: Mass (ES^+) spectrum of 1-(4-(4-((3,4-dihydro-1*H*-carbazol-9(2*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)phenyl)ethanone **(4e)**

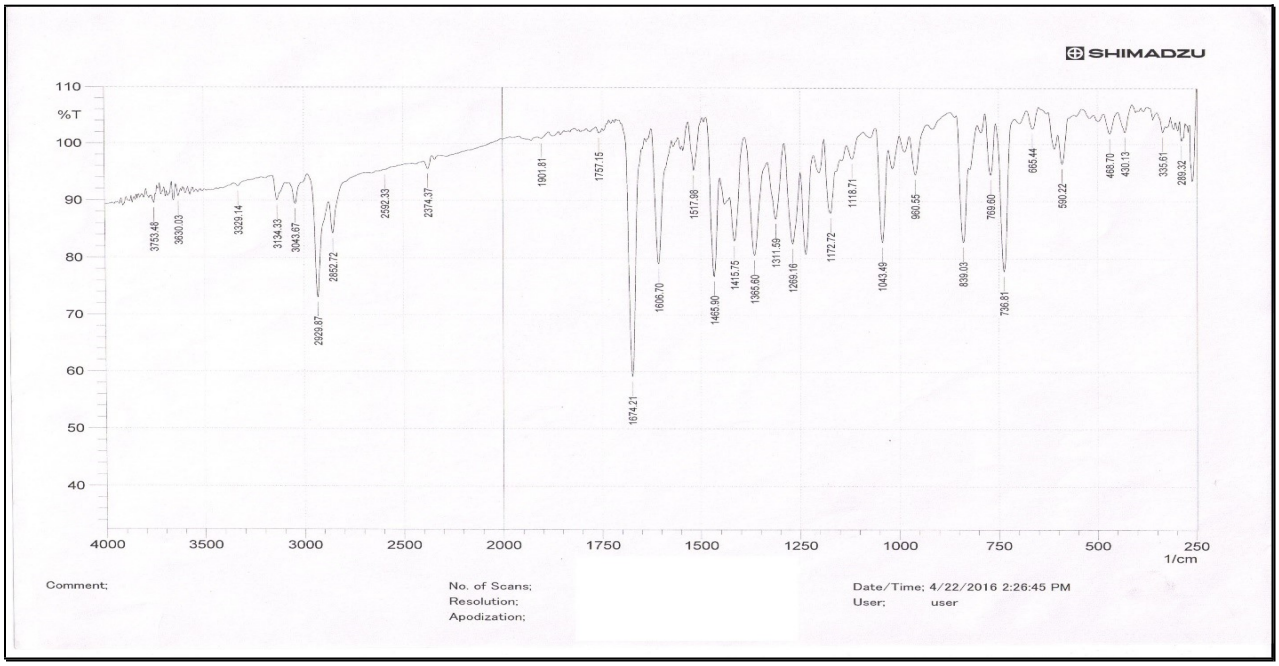


Figure S24: IR (KBr, cm^-) spectrum of 1-(4-(4-((3,4-dihydro-1*H*-carbazol-9(2H)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)phenyl)ethanone **(4e)**

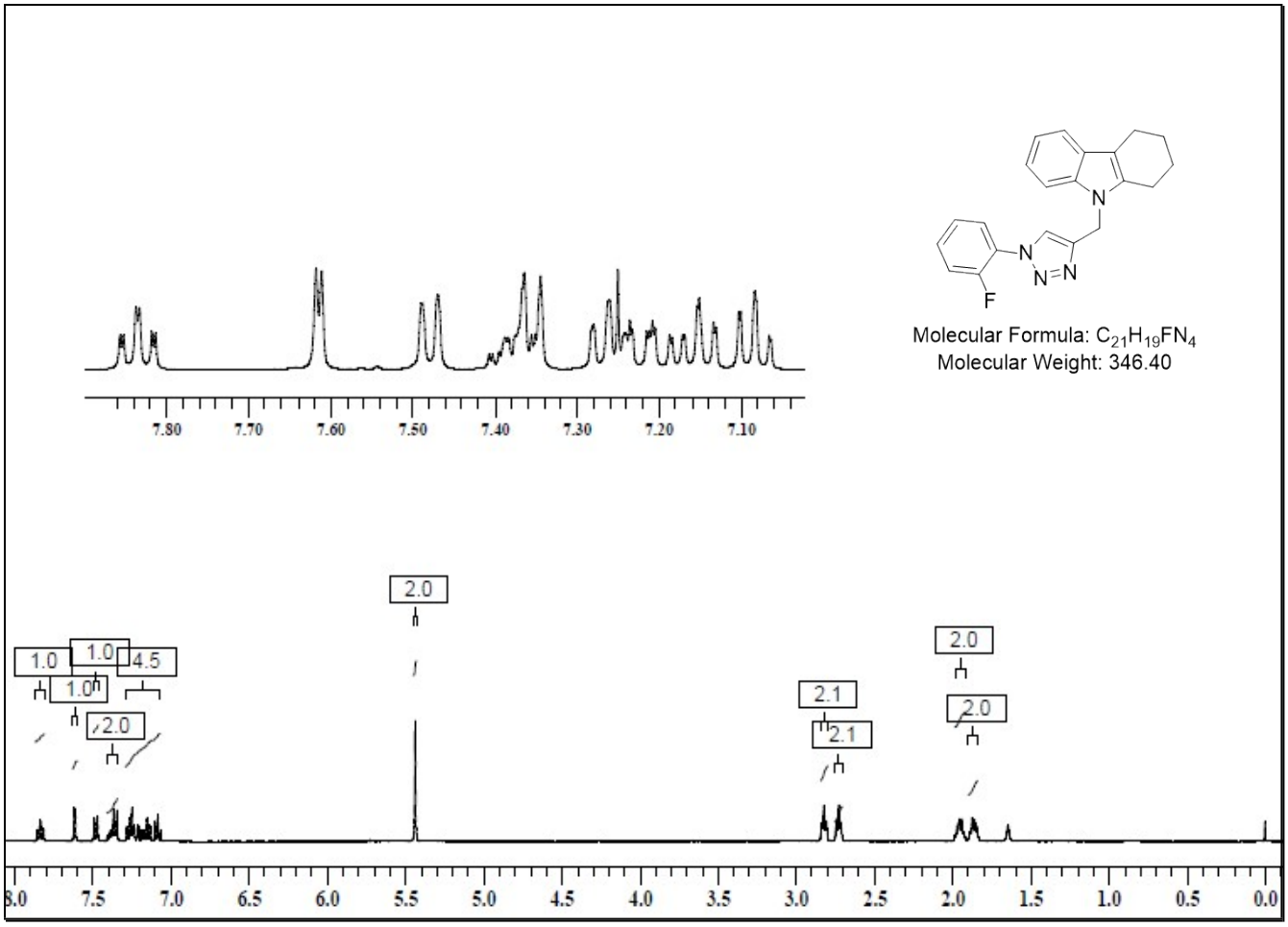


Figure S25: ^{1}H NMR (400 MHz, $CDCl_3$) of 9-((1-(2-fluorophenyl)-1H-1,2,3-triazol-4-yl)methyl)-2,3,4,9-tetrahydro-1H-carbazole **(4f)**

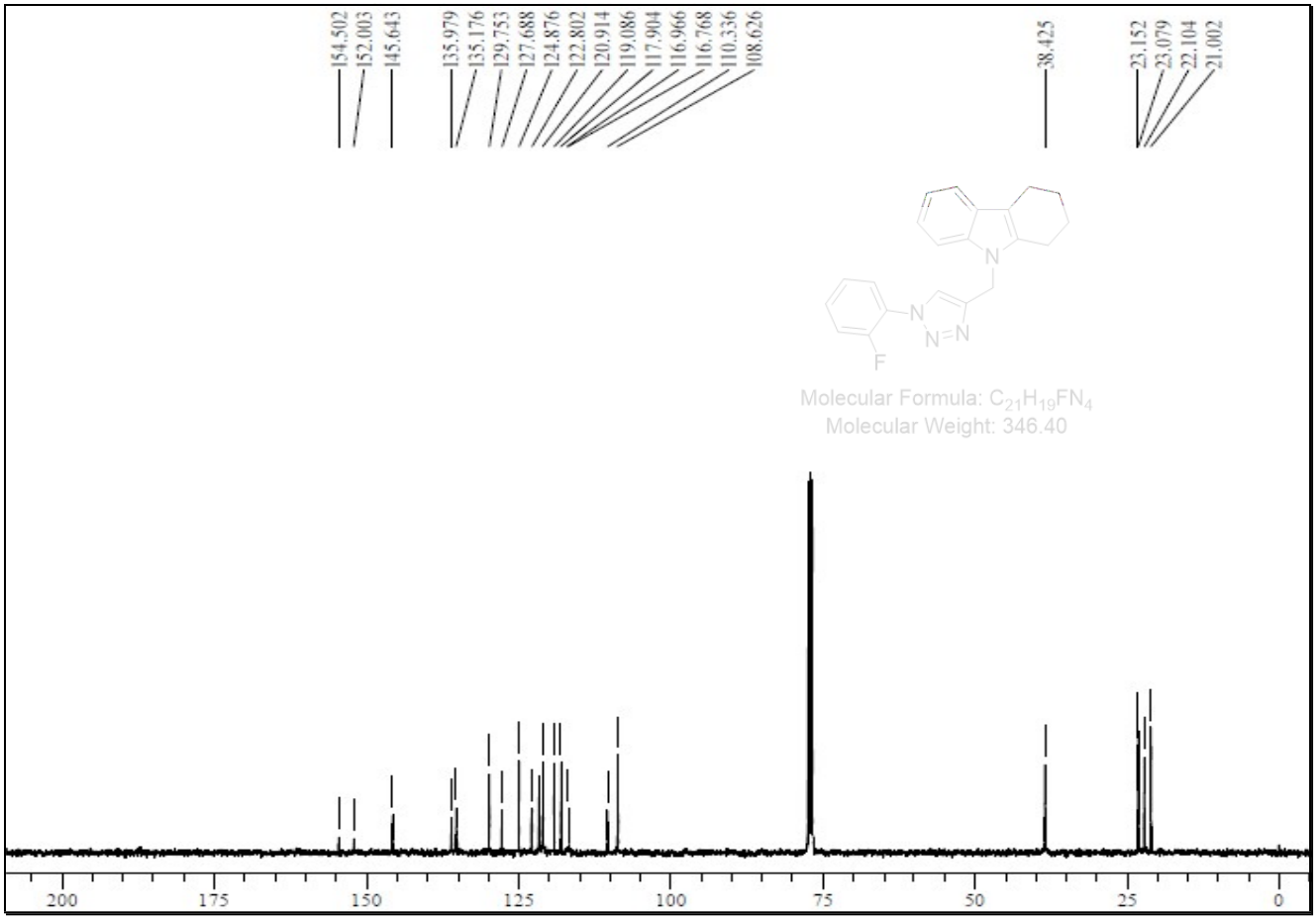


Figure S26: ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of 9-((1-(2-fluorophenyl)-1H-1,2,3-triazol-4-yl)methyl)-2,3,4,9-tetrahydro-1H-carbazole **(4f)**

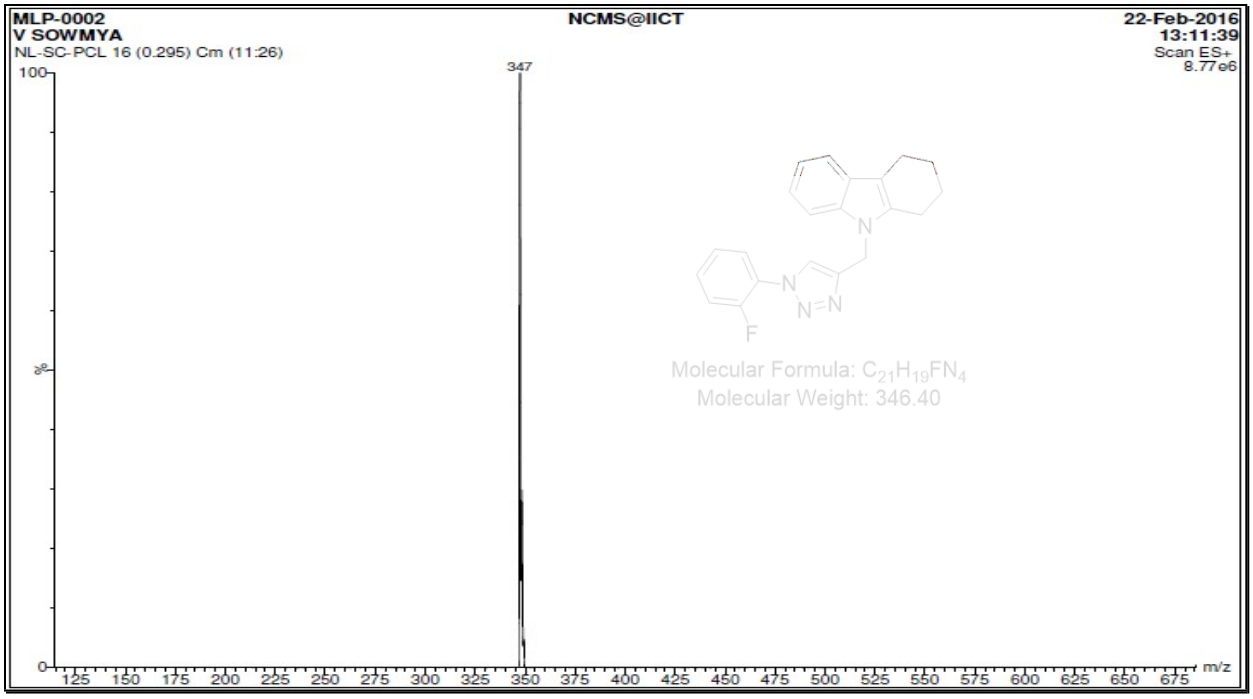


Figure S27: Mass (ES^+) spectrum of 9-((1-(2-fluorophenyl)-1H-1,2,3-triazol-4-yl)methyl)-2,3,4,9-tetrahydro-1H-carbazole **(4f)**

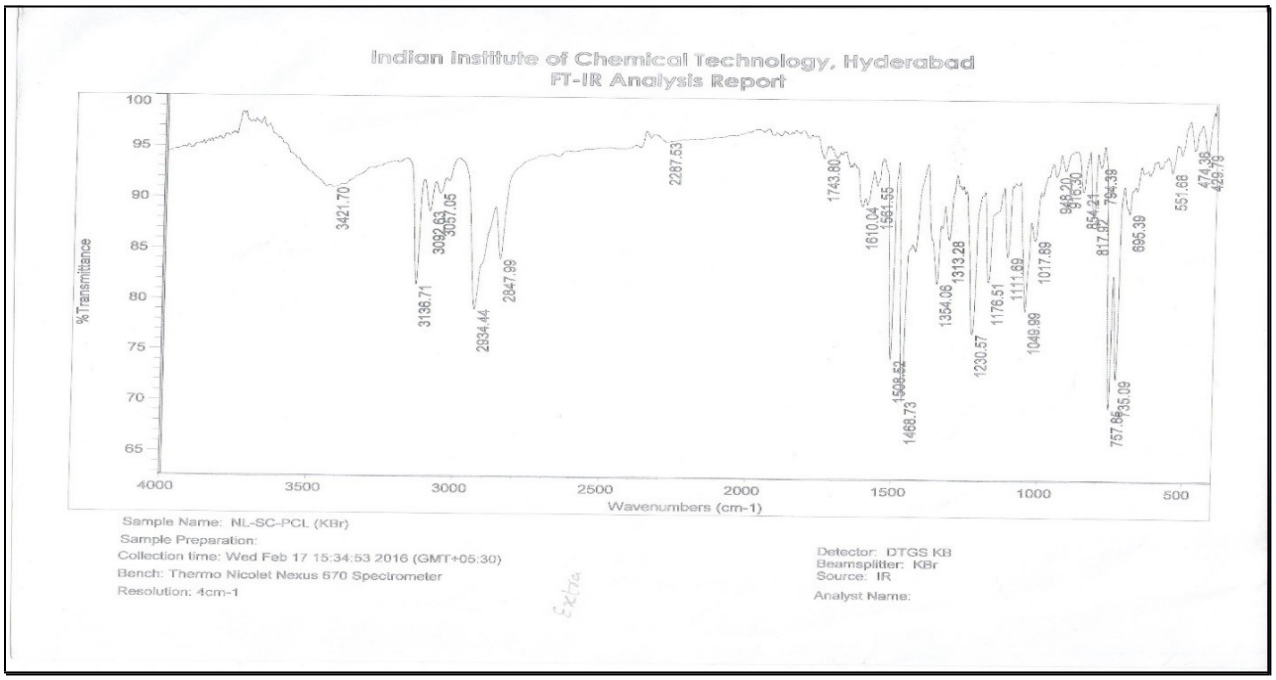


Figure S28: IR (KBr, cm^-) spectrum of compound 9-((1-(2-fluorophenyl)-1H-1,2,3-triazol-4-yl)methyl)-2,3,4,9-tetrahydro-1H-carbazole **(4f)**

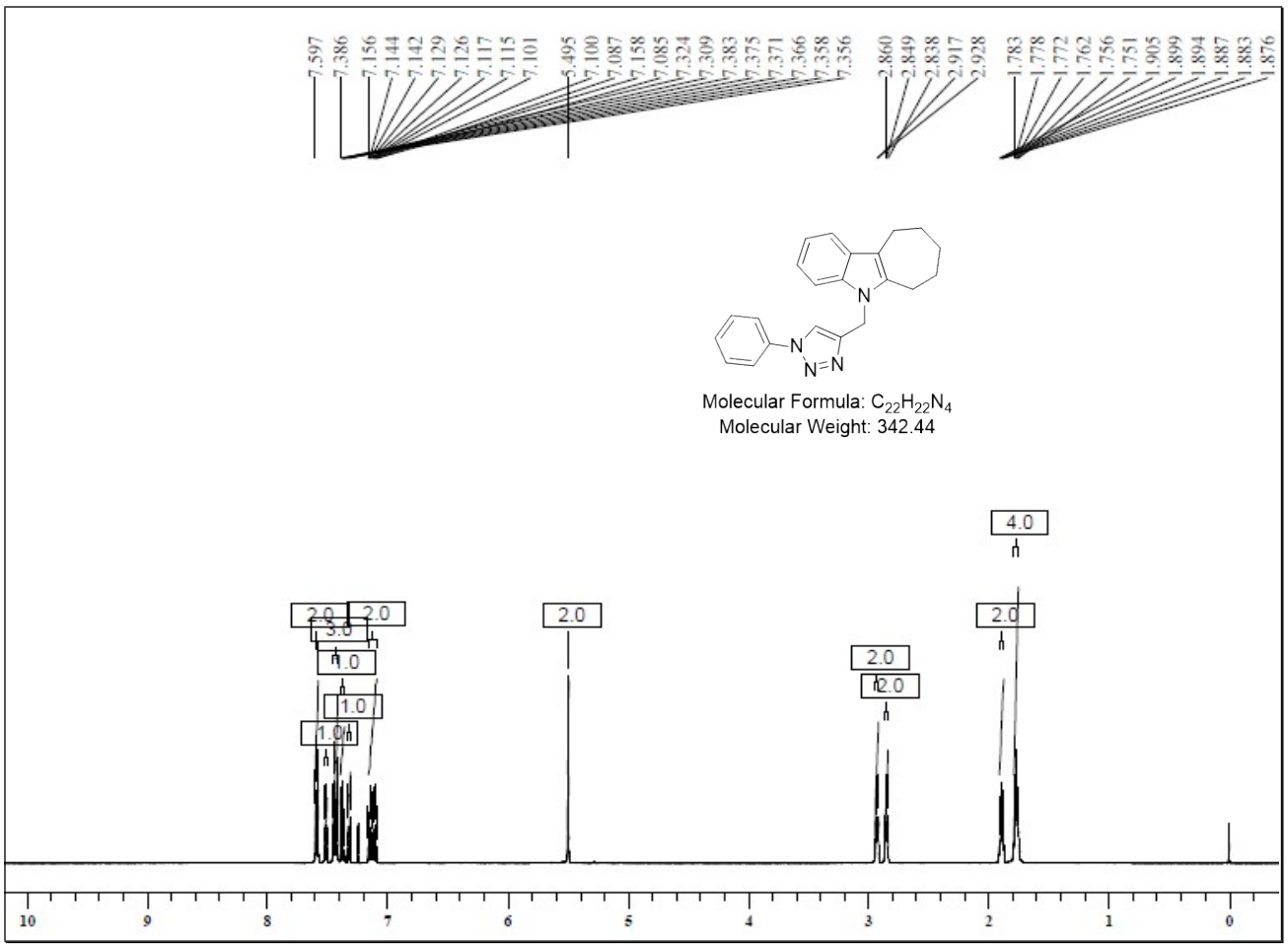


Figure S29: ^{1}H NMR (400 MHz, $CDCl_3$) of 5-((1-phenyl-1*H*-1,2,3-triazol-4-yl)methyl)-5,6,7,8,9,10-hexahydrocyclohepta[b]indole **(4g)**

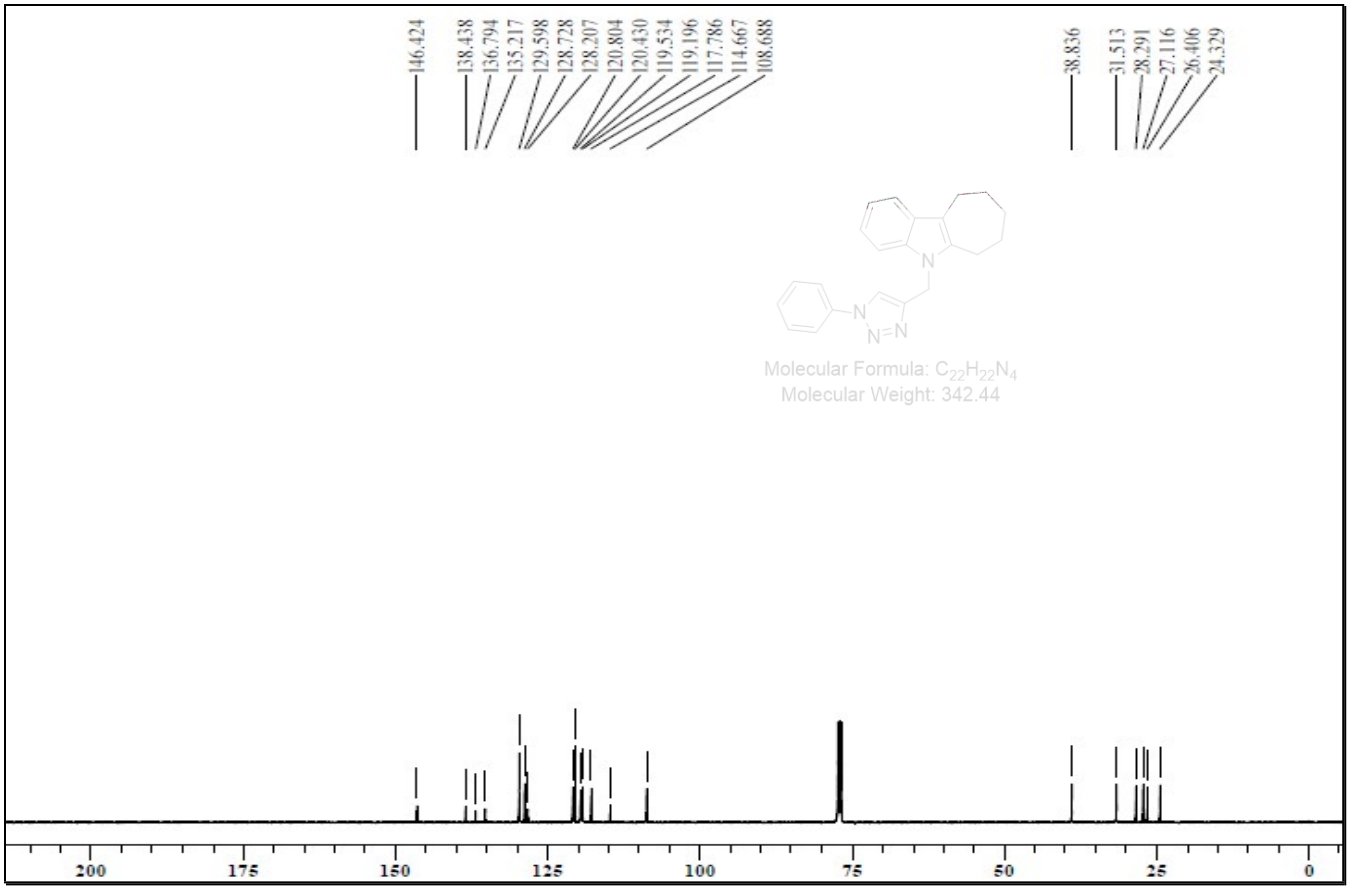


Figure S30: ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of 5-((1-phenyl-1*H*-1,2,3-triazol-4-yl)methyl) 5,6,7,8,9,10-hexahydrocyclohepta[b]indole **(4g)**

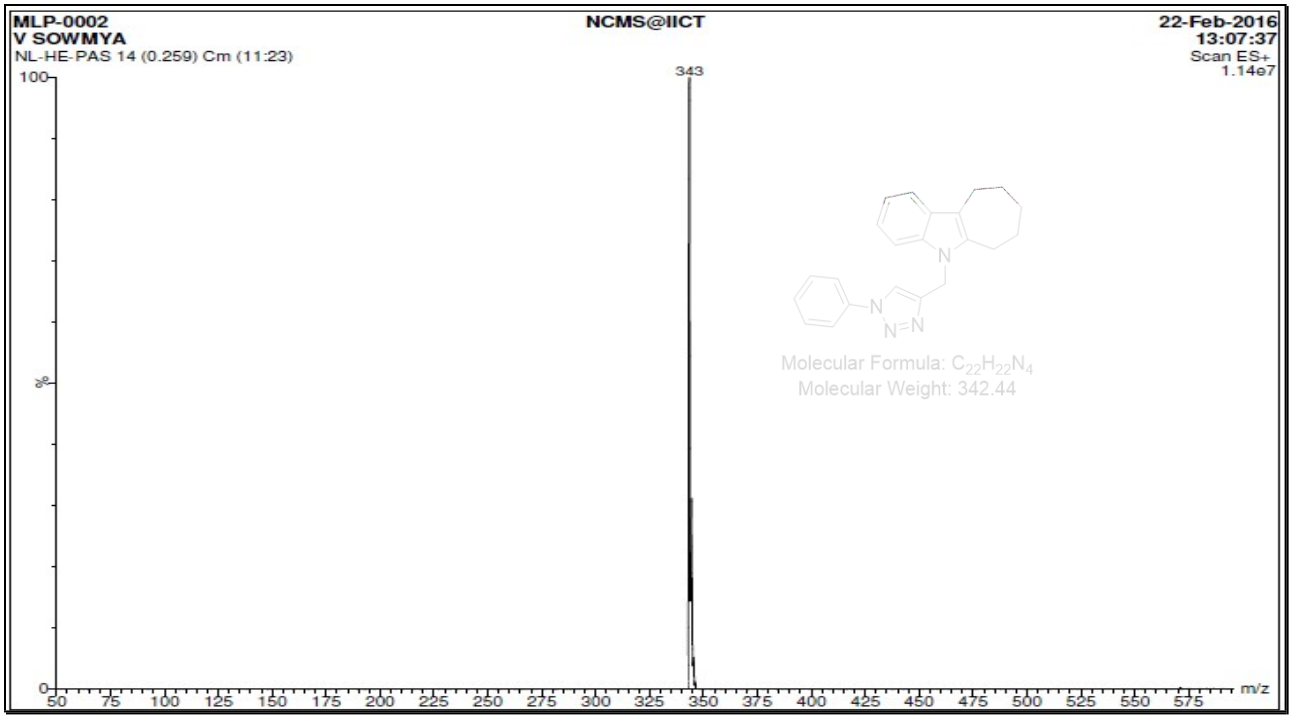


Figure S31: Mass (ES^+) spectrum of 5-((1-phenyl-1*H*-1,2,3-triazol-4-yl)methyl)-5,6,7,8,9,10-hexahydrocyclohepta[b]indole **(4g)**

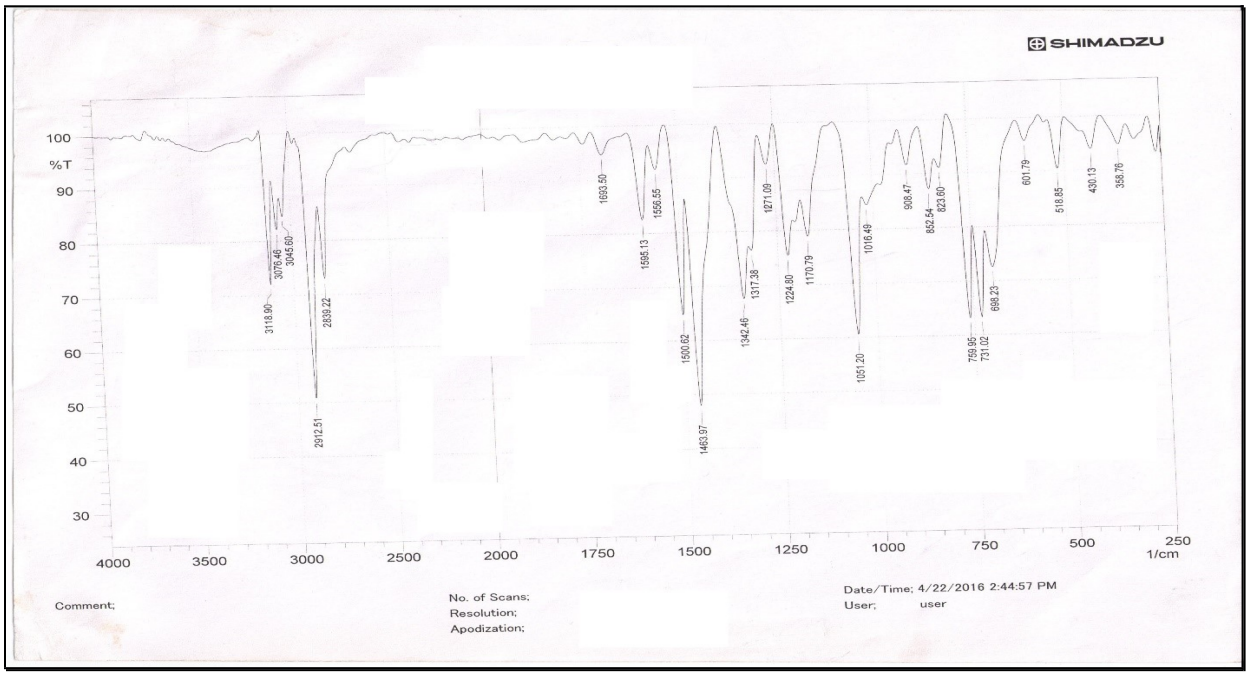


Figure S32: IR (KBr, cm^-) spectrum of compound 5-((1-phenyl-1*H*-1,2,3-triazol-4-yl)methyl)-5,6,7,8,9,10-hexahydrocyclohepta[b]indole **(4g)**

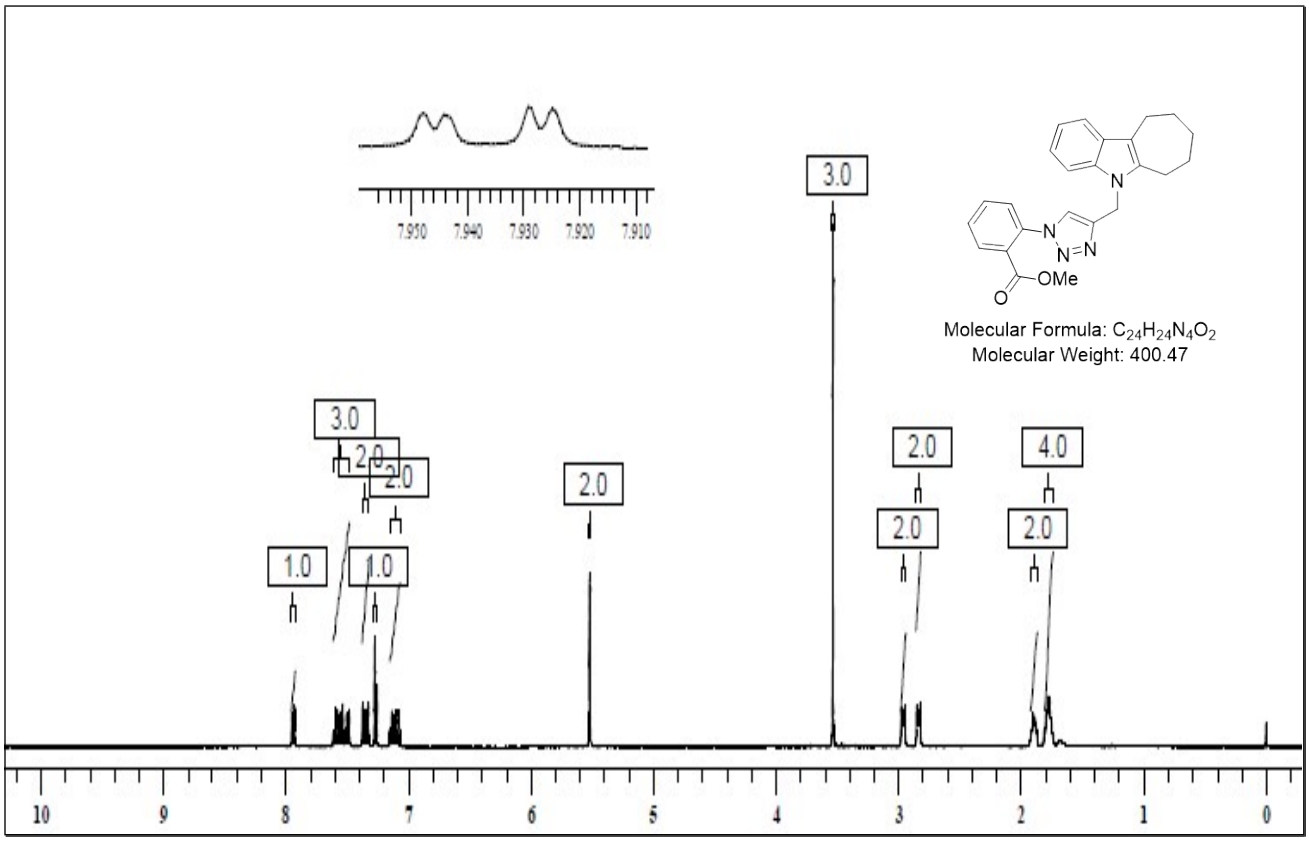


Figure S33: ^{1}H NMR (400 MHz, $CDCl_3$) of methyl 2-(4-((7,8,9,10-tetrahydrocyclohepta[b]indol-5(6*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)benzoate **(4h)**

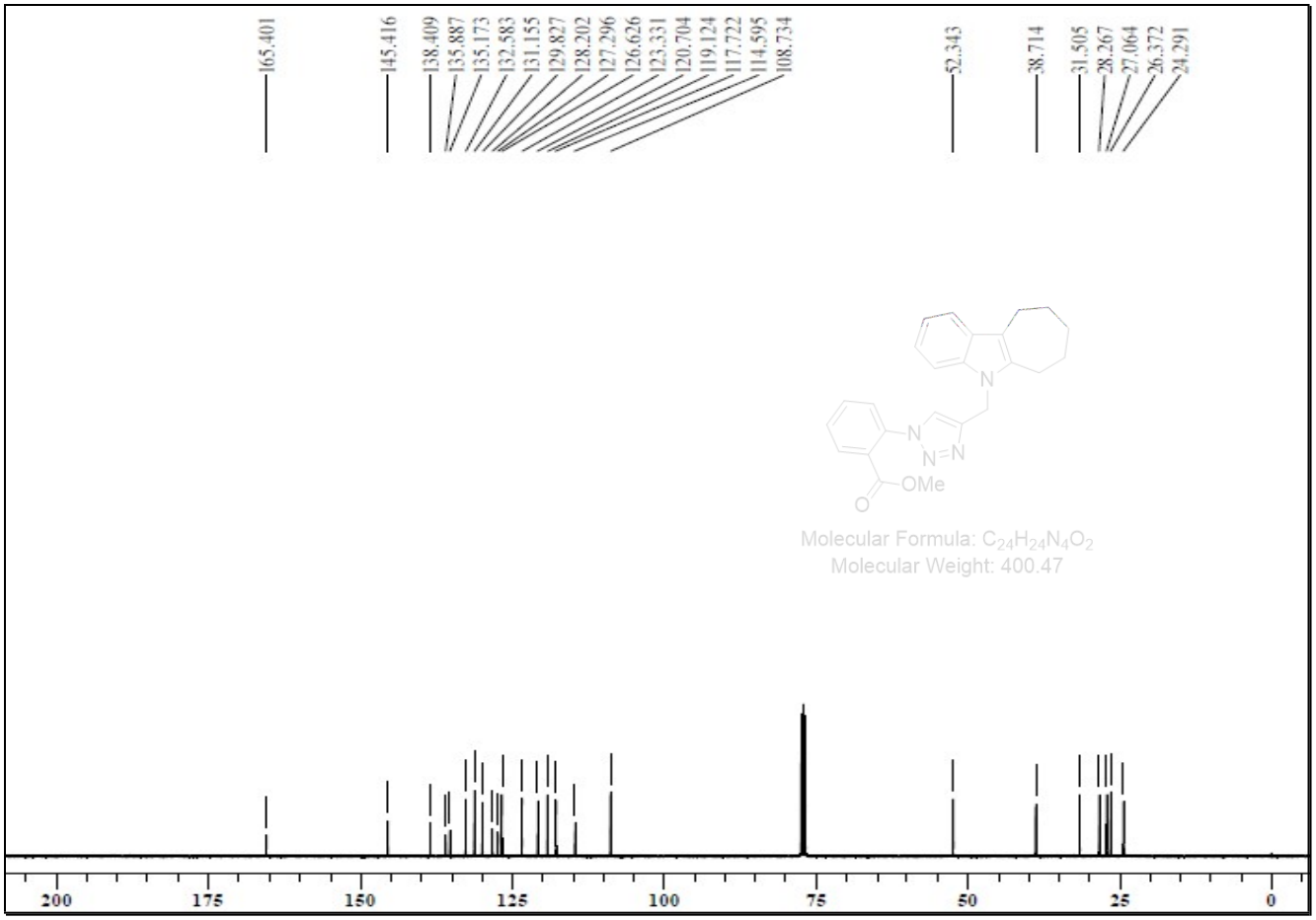


Figure S34: ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of methyl 2-(4-((7,8,9,10-tetrahydrocyclohepta[b]indol-5(6*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)benzoate **(4h)**

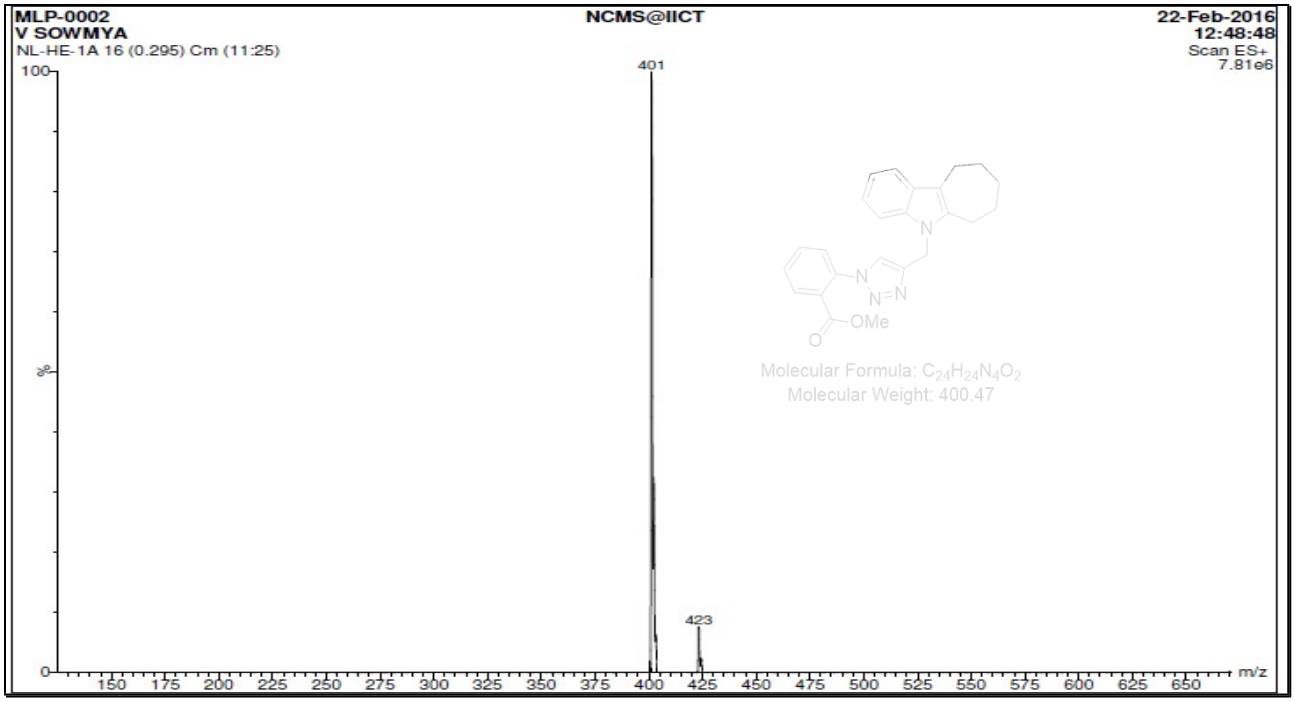


Figure S35: Mass (ES^+) spectrum of compound methyl 2-(4-((7,8,9,10-tetrahydrocyclohepta[b]indol-5(6*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)benzoate **(4h)**

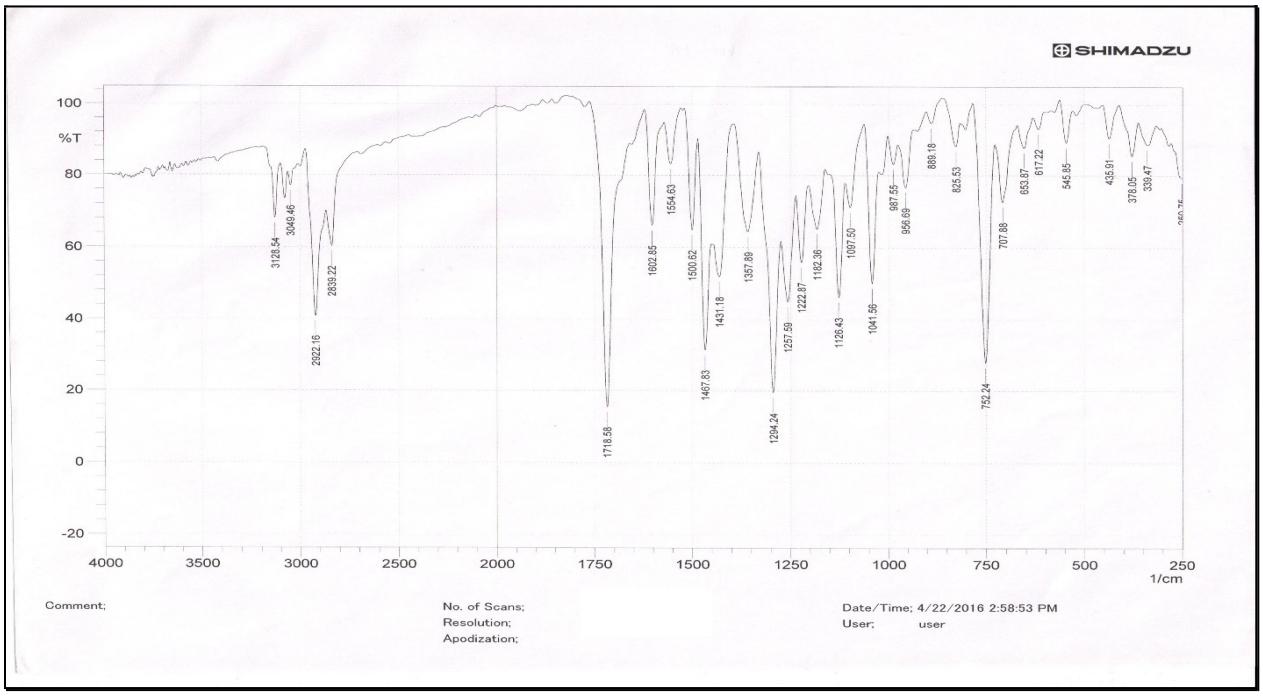


Figure S36: IR (KBr, cm^-) spectrum of compound methyl 2-(4-((7,8,9,10-tetrahydrocyclohepta[b]indol-5(6*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)benzoate **(4h)**

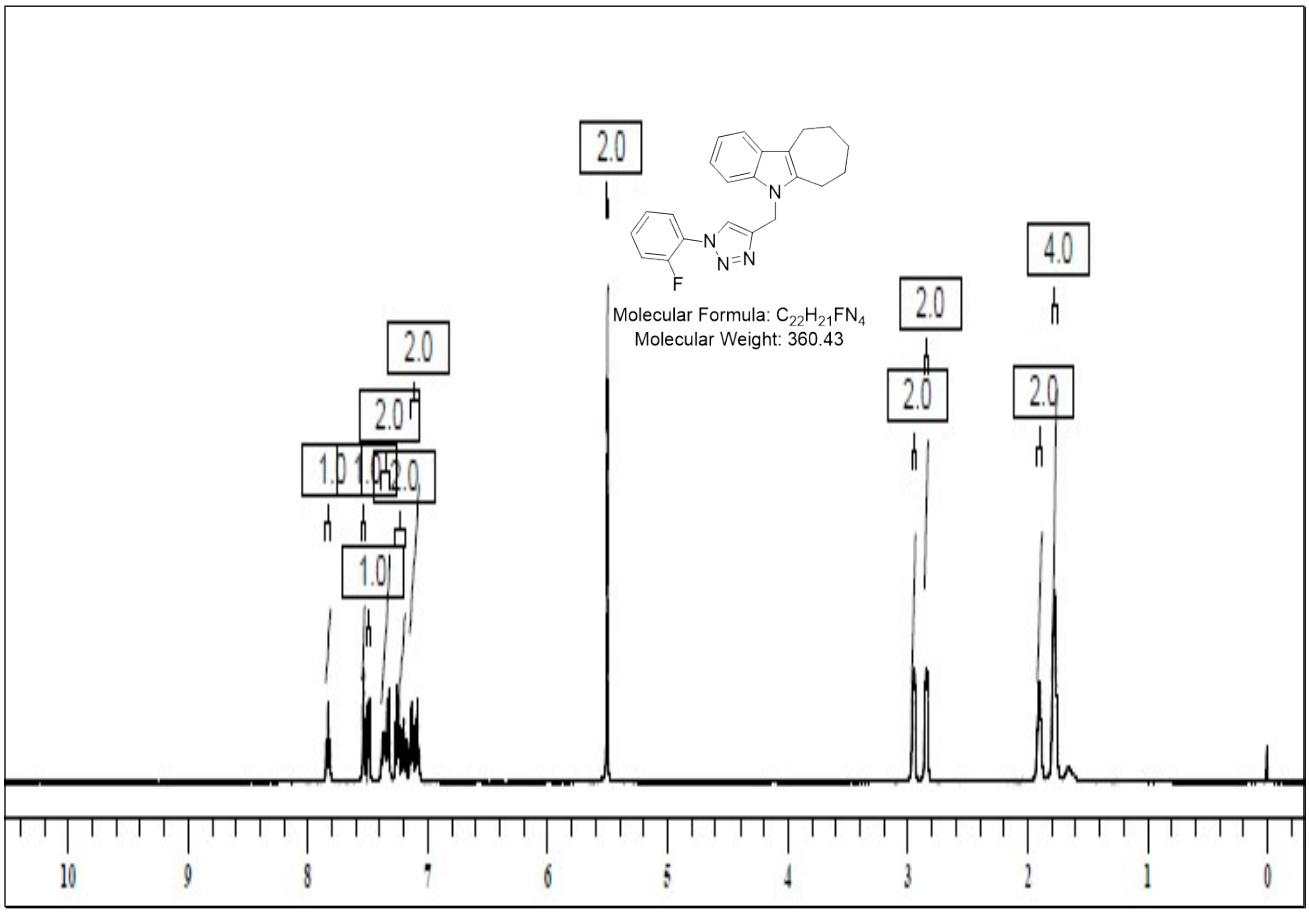


Figure S37: ^{1}H NMR (400 MHz, $CDCl_3$) of 5-((1-(2-fluorophenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-5,6,7,8,9,10-hexahydrocyclohepta[b]indole **(4i)**

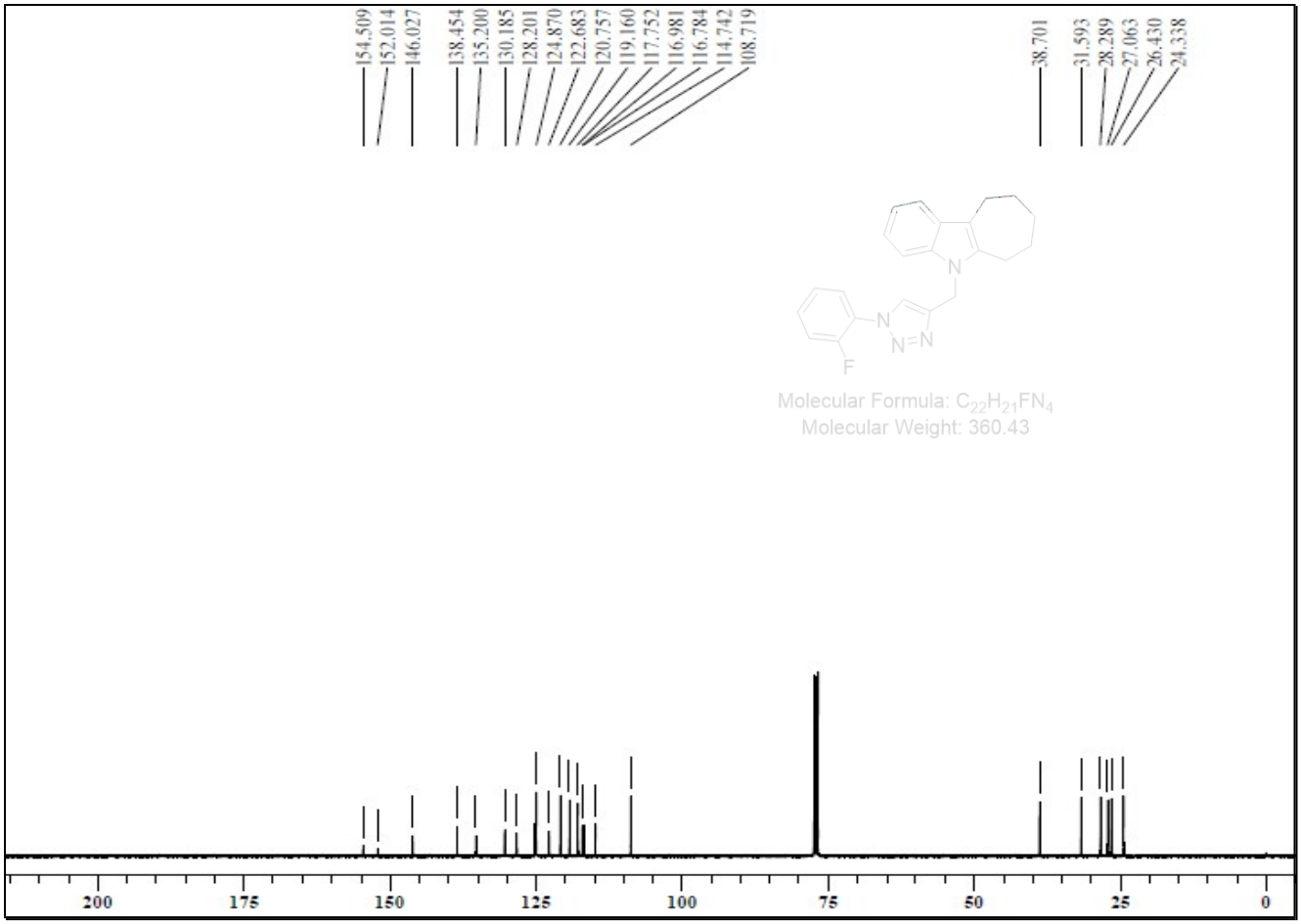


Figure S38: ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of 5-((1-(2-fluorophenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-5,6,7,8,9,10-hexahydrocyclohepta[b]indole **(4i)**

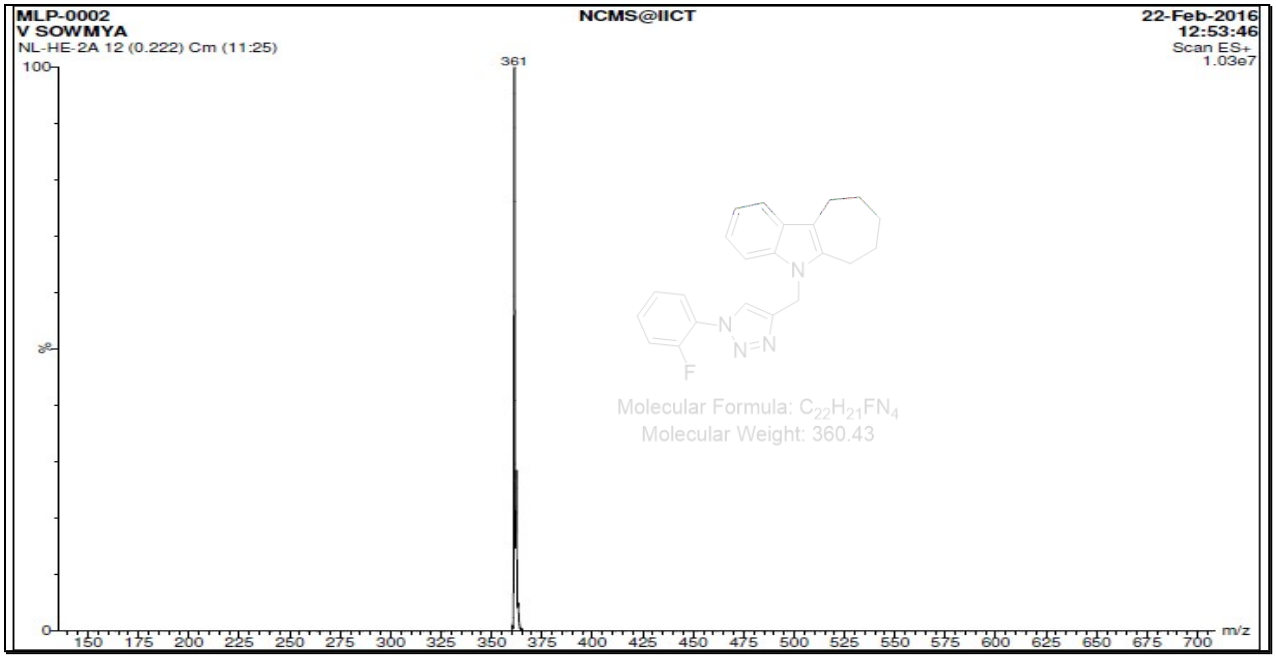


Figure S39: Mass (ES^+) spectrum of 5-((1-(2-fluorophenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-5,6,7,8,9,10-hexahydrocyclohepta[b]indole **(4i)**

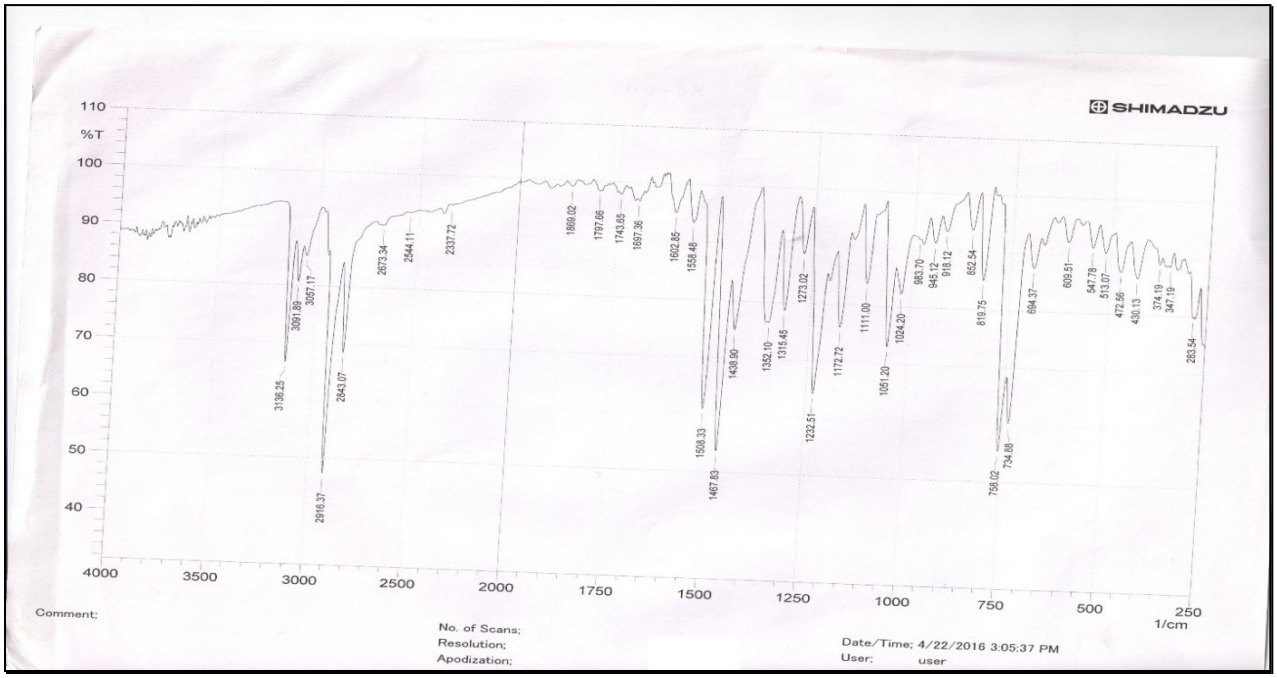


Figure S40: IR (KBr, cm^-) spectrum of 5-((1-(2-fluorophenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-5,6,7,8,9,10-hexahydrocyclohepta[b]indole **(4i)**

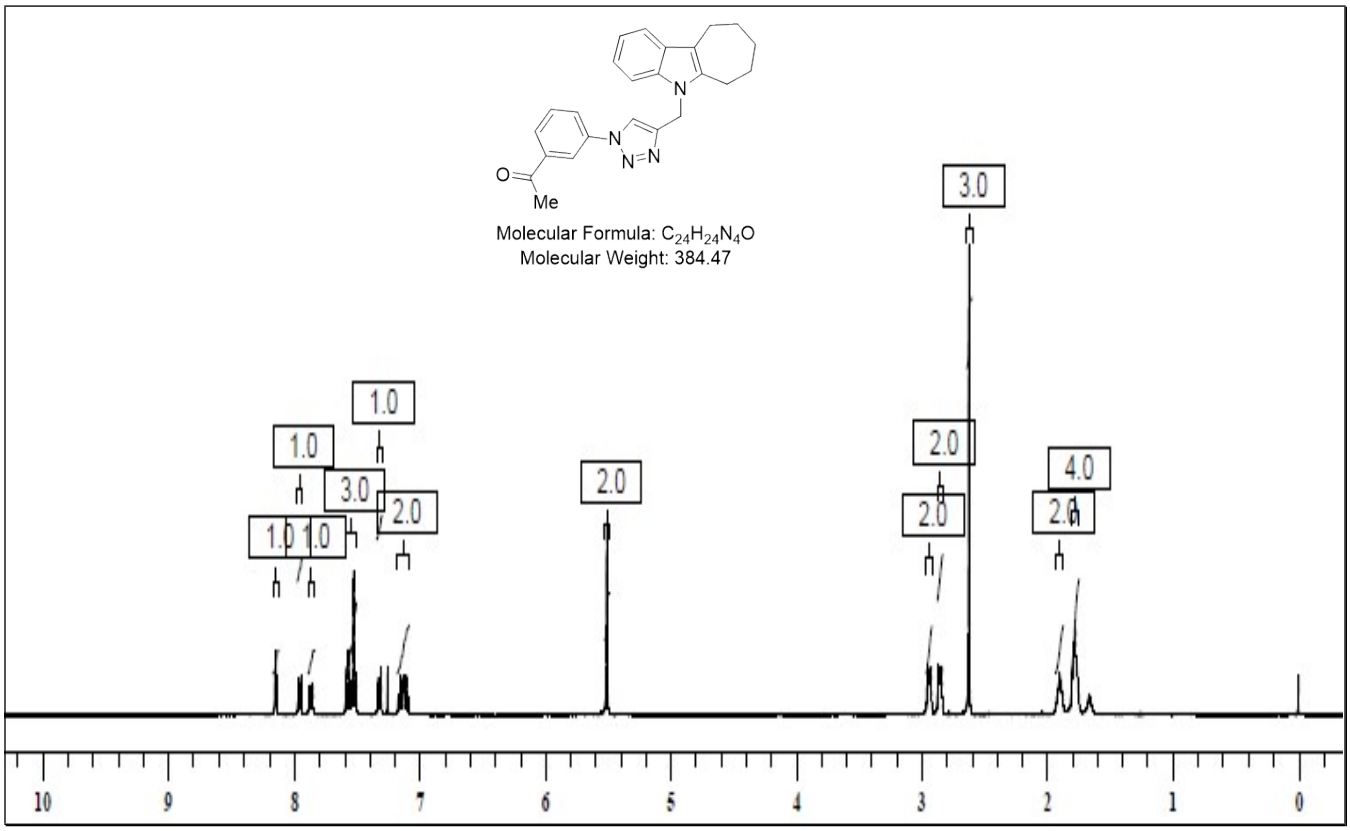


Figure S41: ^{1}H NMR (400 MHz, $CDCl_3$) of 1-(3-(4-((7,8,9,10-tetrahydrocyclohepta[b]indol-5(6*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)phenyl)ethanone **(4j)**

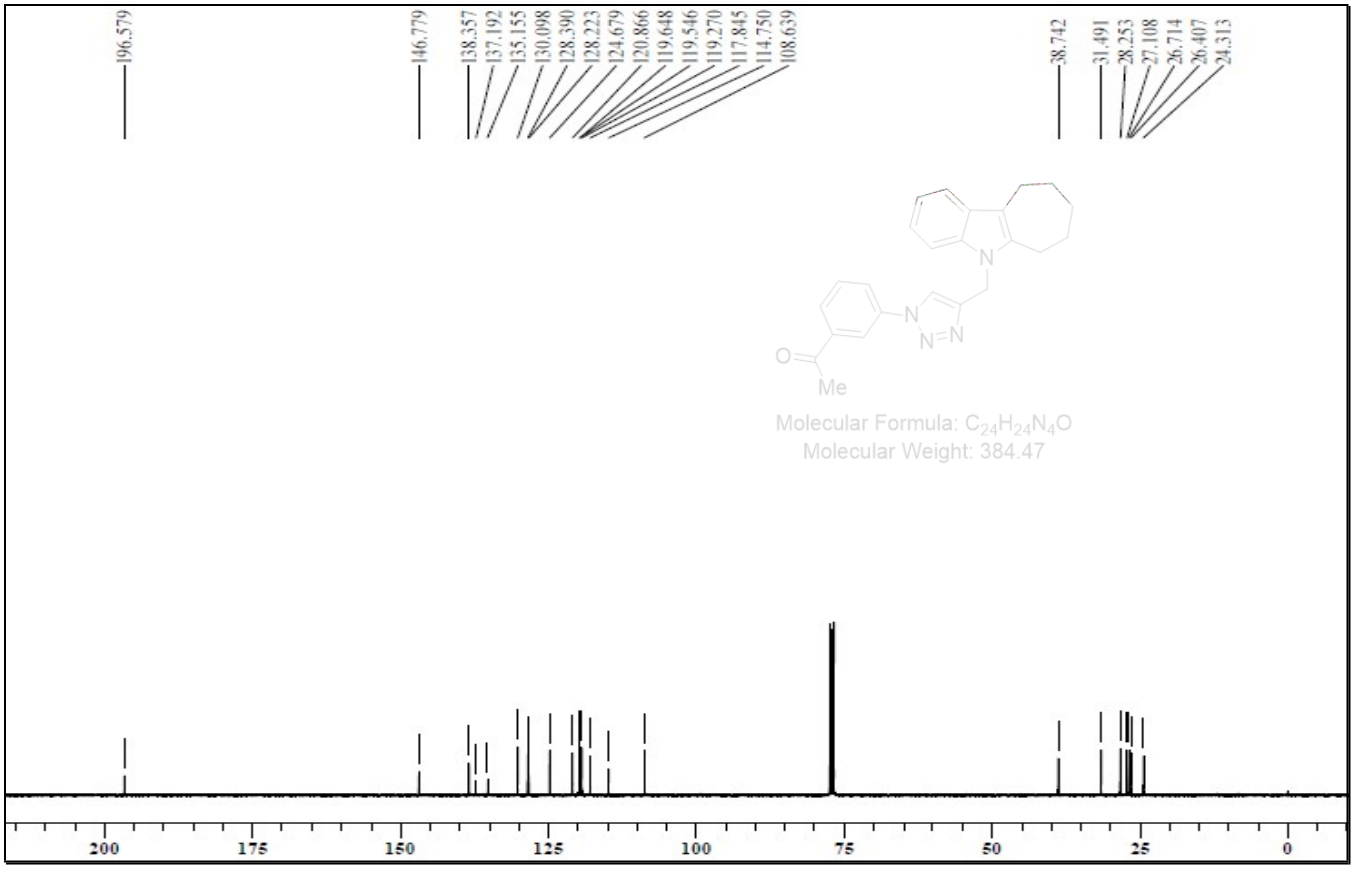


Figure S42: ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of 1-(3-(4-((7,8,9,10-tetrahydrocyclohepta[b]indol-5(6*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)phenyl)ethanone **(4j)**

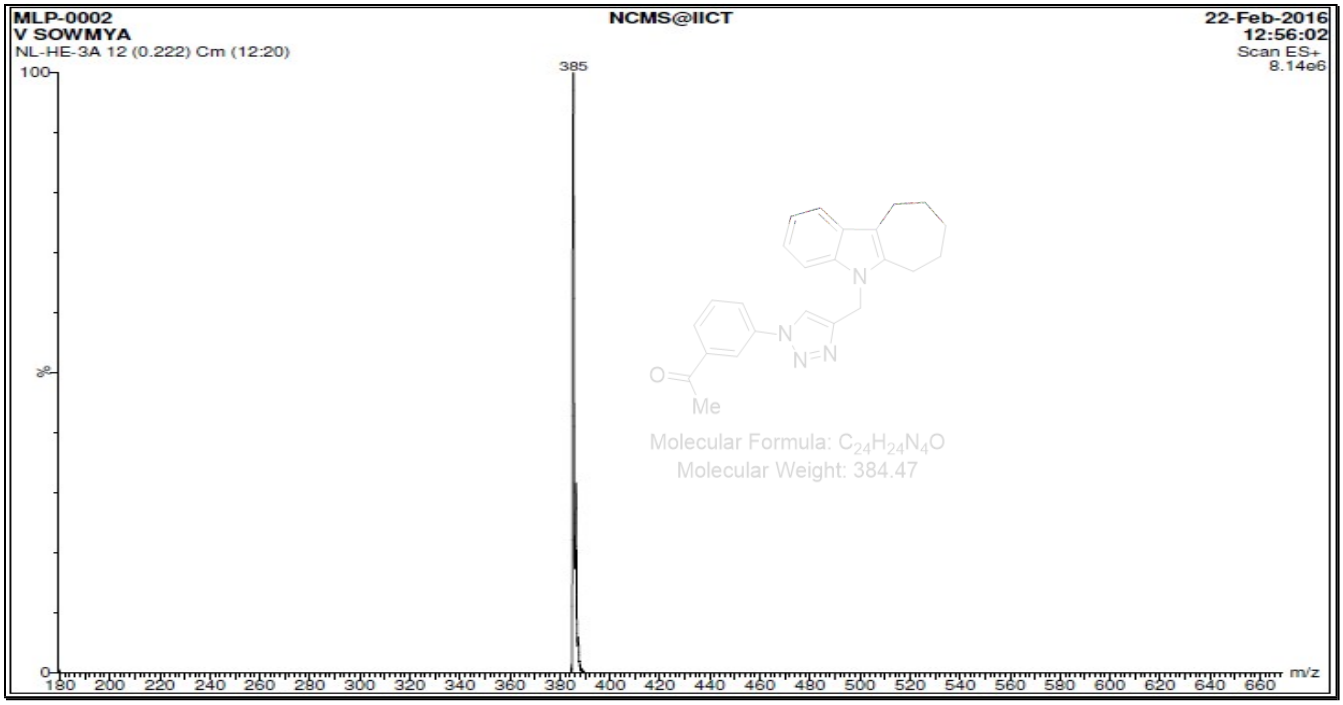


Figure S43: Mass (ES$^+$) spectrum of 1-(3-(4-((7,8,9,10-tetrahydrocyclohepta[b]indol-5(6*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)phenyl)ethanone **(4j)**

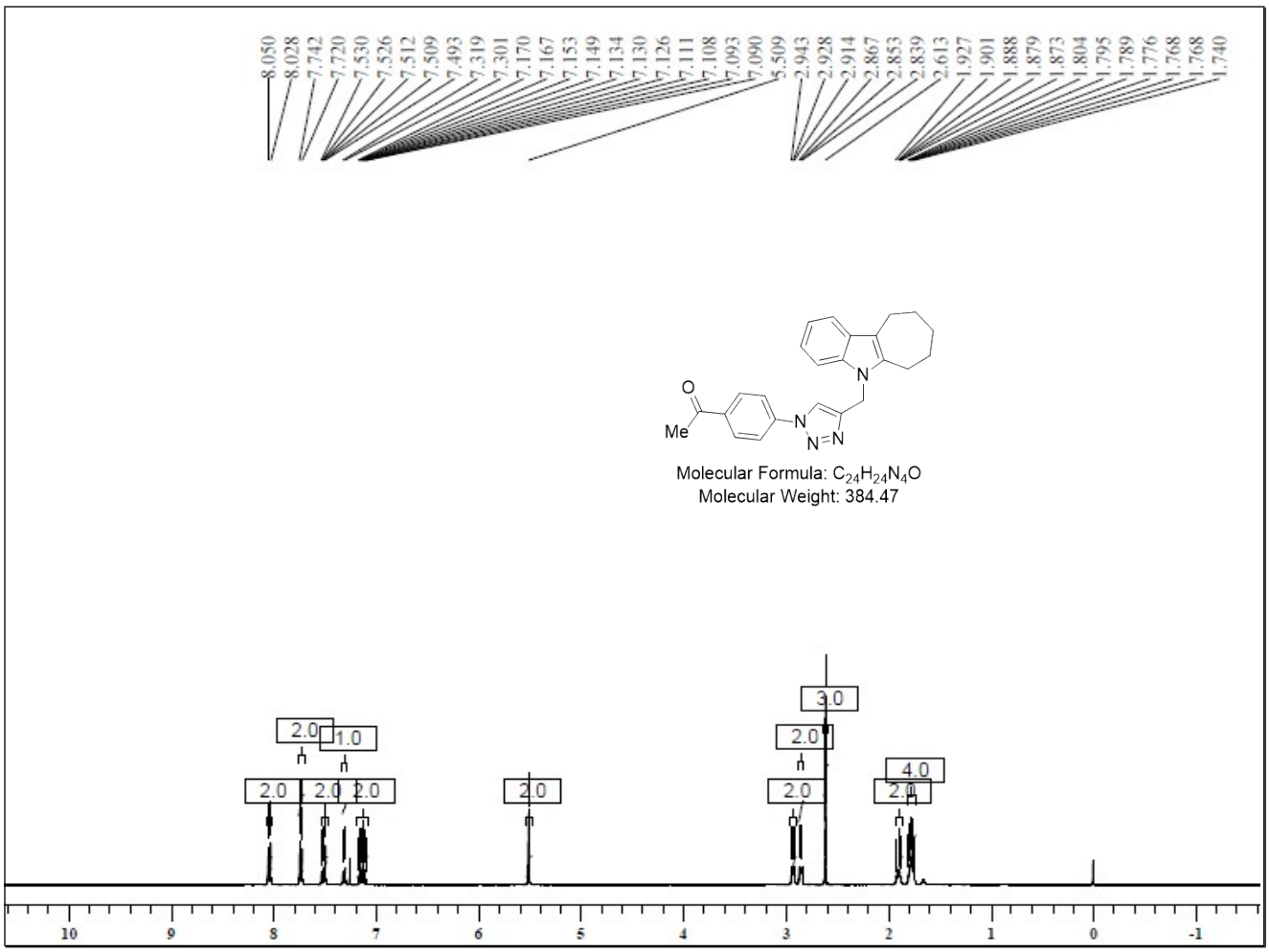


Figure S44: ^{1}H NMR (400 MHz, $CDCl_3$) of 1-(4-(4-((7,8,9,10-tetrahydrocyclohepta[b]indol-5(6*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)phenyl)ethanone **(4k)**

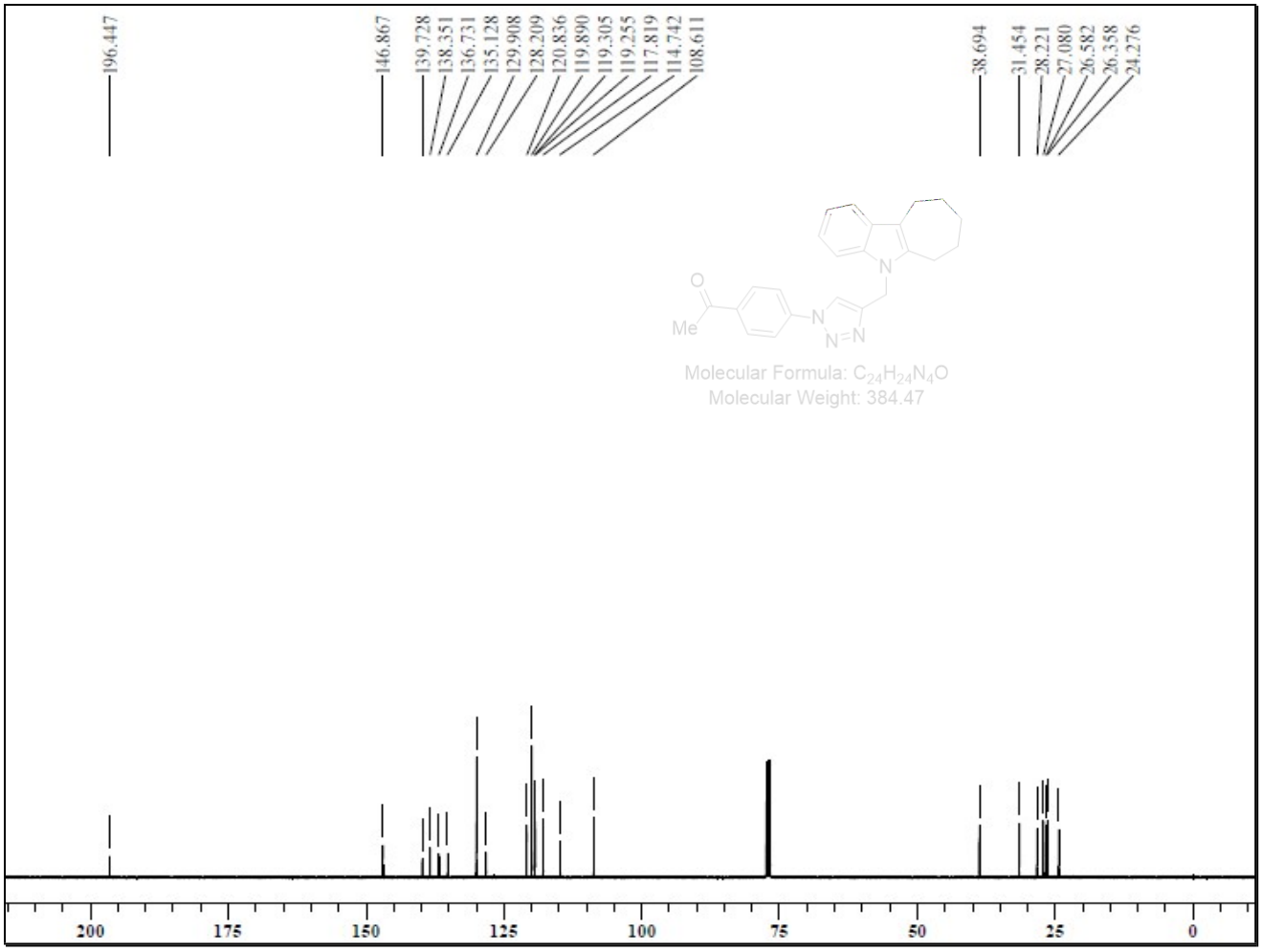


Figure S45: ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of 1-(4-(4-((7,8,9,10-tetrahydrocyclohepta[b]indol-5(6*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)phenyl)ethanone**(4k)**

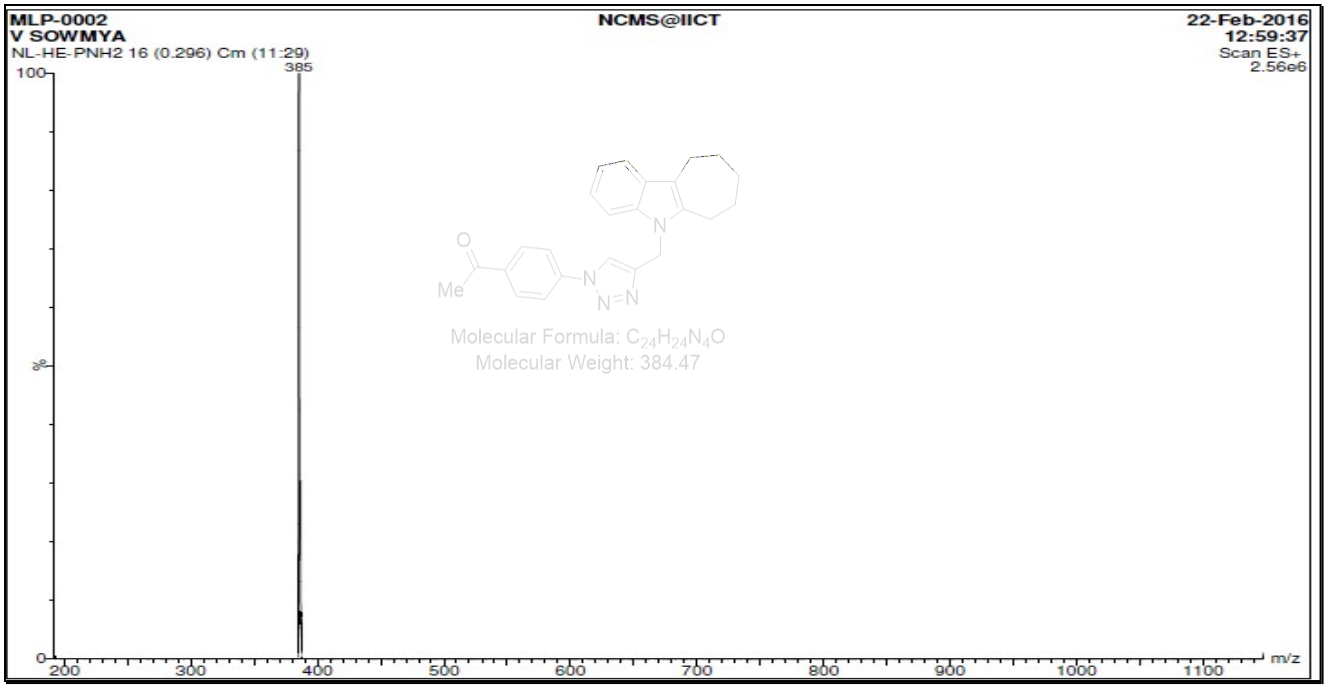


Figure S46: Mass (ES^+) spectrum of 1-(4-(4-((7,8,9,10-tetrahydrocyclohepta[b]indol-5(6*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)phenyl)ethanone9 **(4k)**

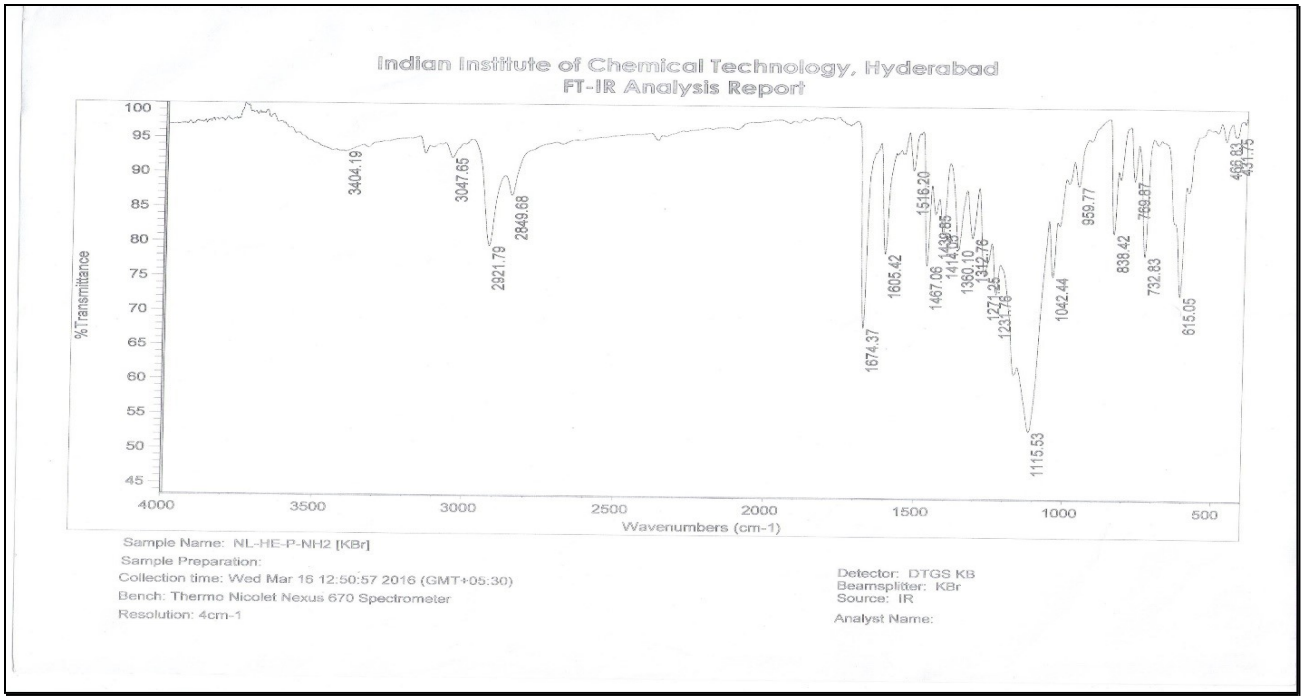


Figure S47: IR (KBr, cm^-) spectrum of 1-(4-(4-((7,8,9,10-tetrahydrocyclohepta[b]indol-5(6*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)phenyl)ethanone **(4k)**

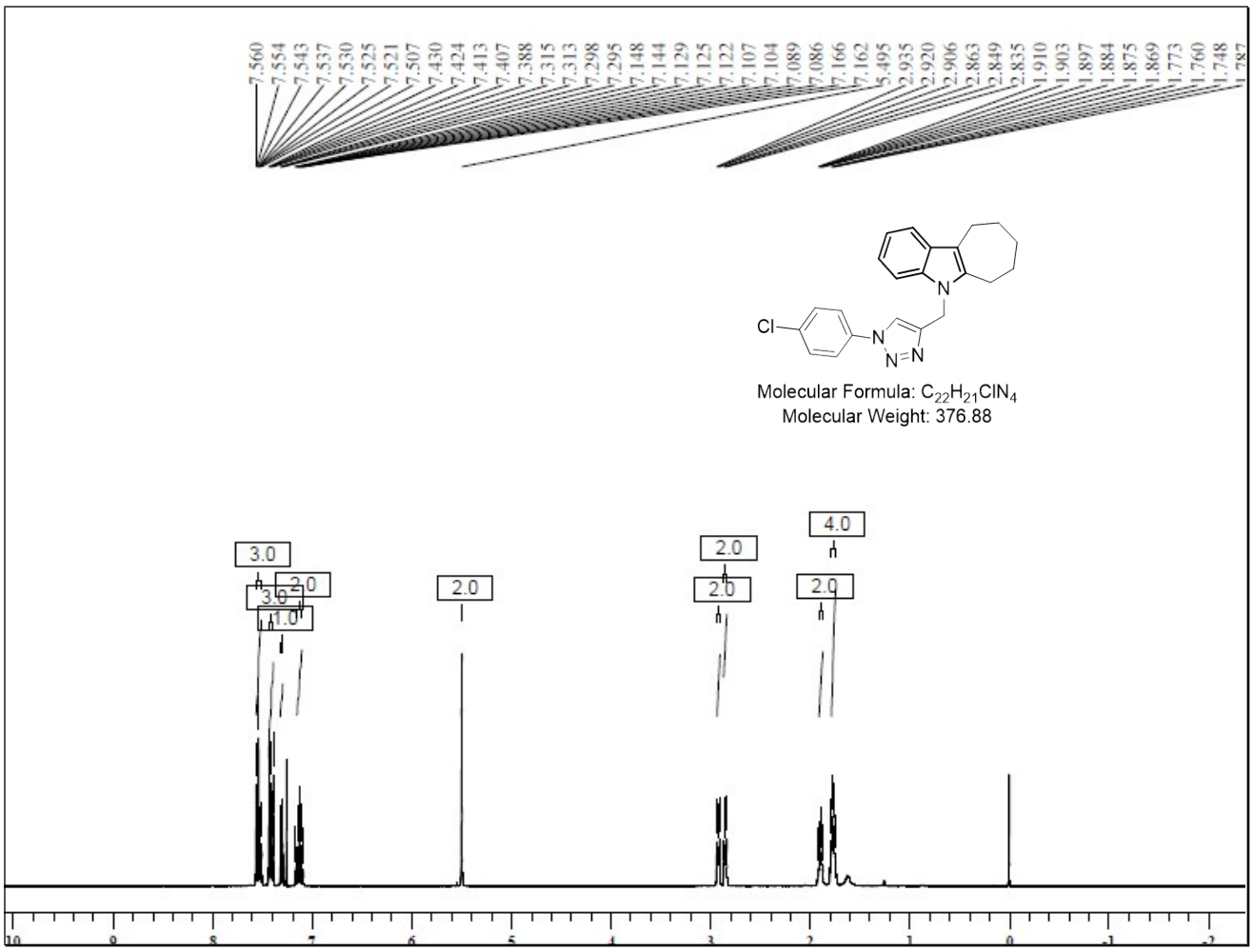


Figure S48: ^{1}H NMR (400 MHz, $CDCl_3$) of 5-((1-(4-chlorophenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-5,6,7,8,9,10-hexahydrocyclohepta[b]indole **(4l)**

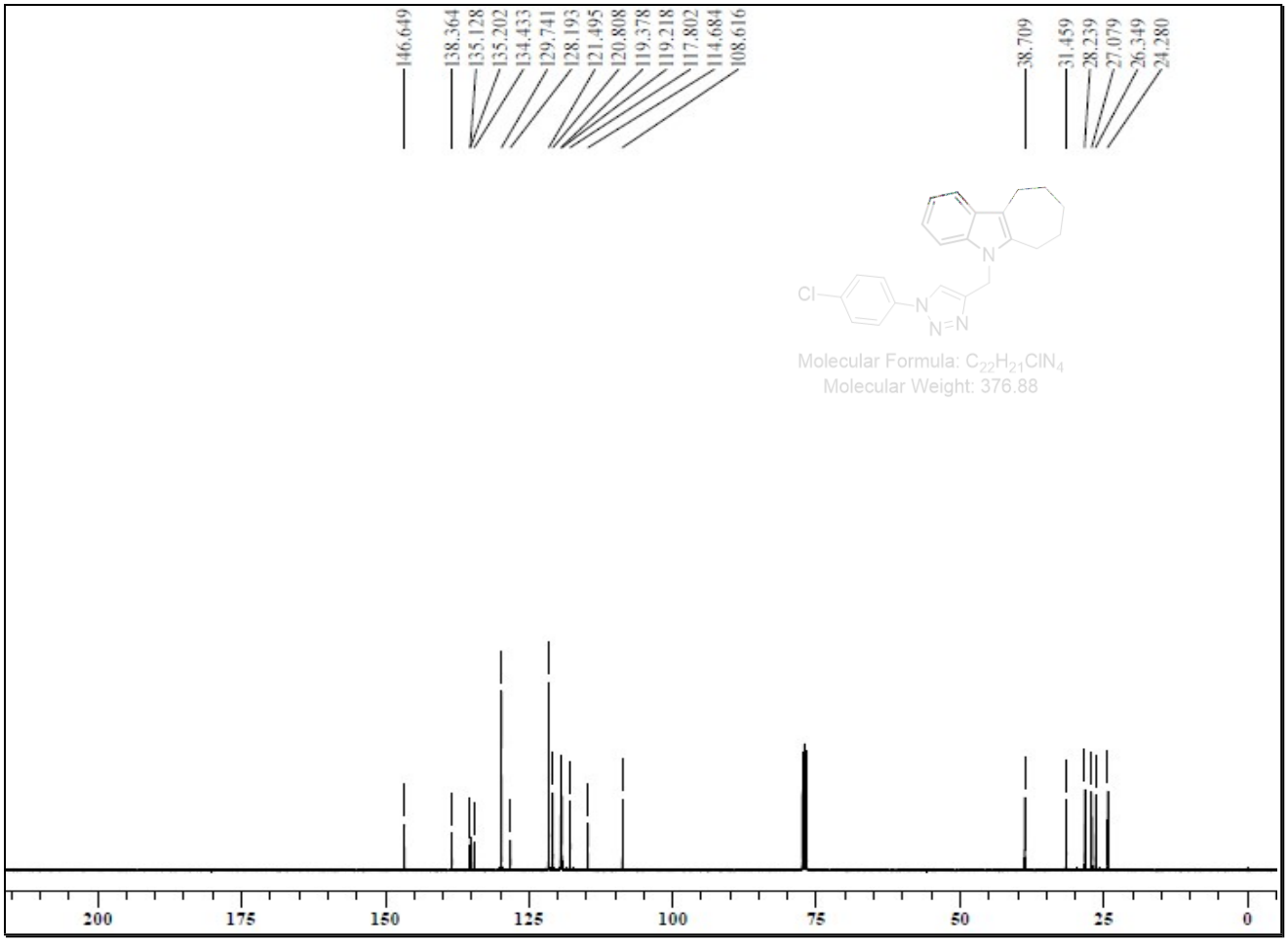


Figure S49: ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of 5-((1-(4-chlorophenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-5,6,7,8,9,10-hexahydrocyclohepta[b]indole **(4l)**

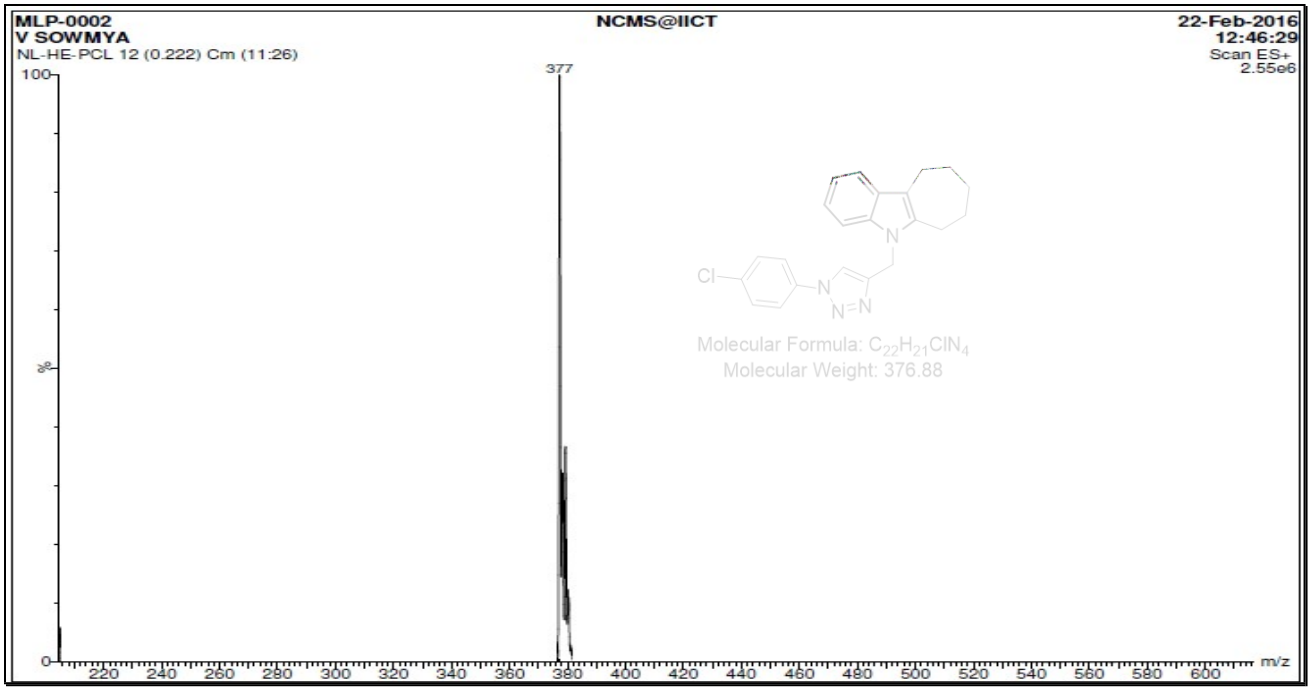


Figure S50: Mass (ES^+) spectrum of 5-((1-(4-chlorophenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-5,6,7,8,9,10-hexahydrocyclohepta[b]indole **(4l)**

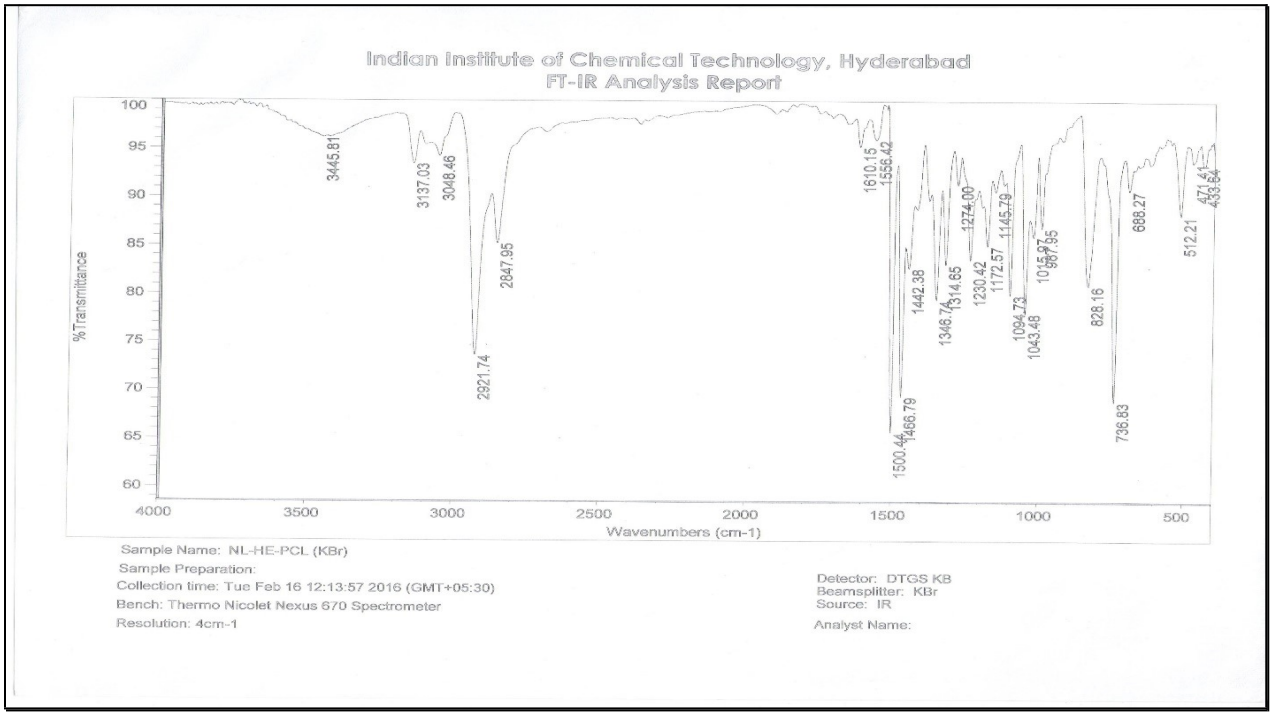


Figure S51: IR (KBr, cm^-) spectrum of 5-((1-(4-chlorophenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-5,6,7,8,9,10-hexahydrocyclohepta[b]indole **(4l)**

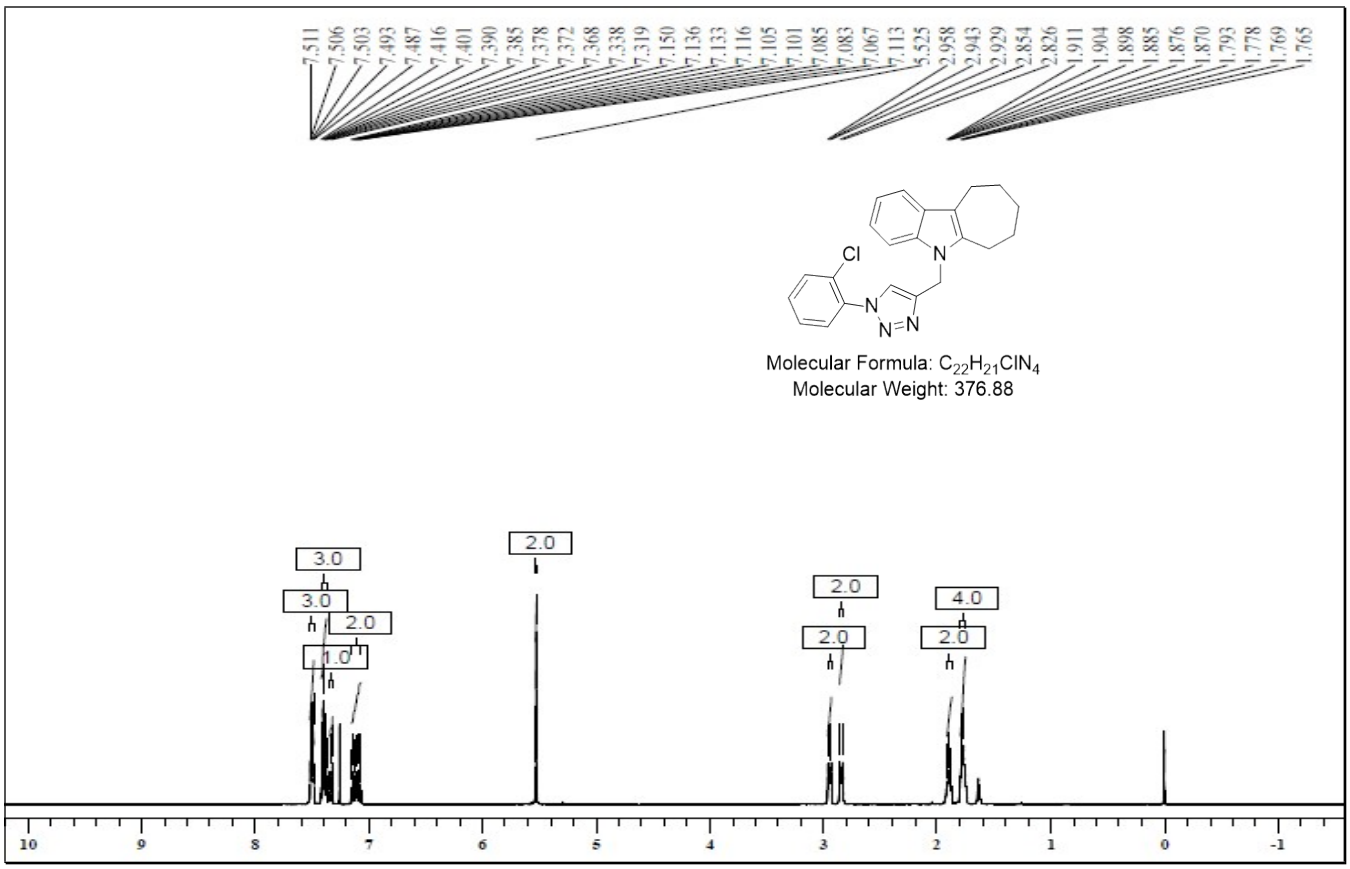


Figure S52: ^{1}H NMR (400 MHz, $CDCl_3$) of 4-(4-((7,8,9,10-tetrahydrocyclohepta[b]indol-5(6*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)phenyl hypochlorite **(4m)**

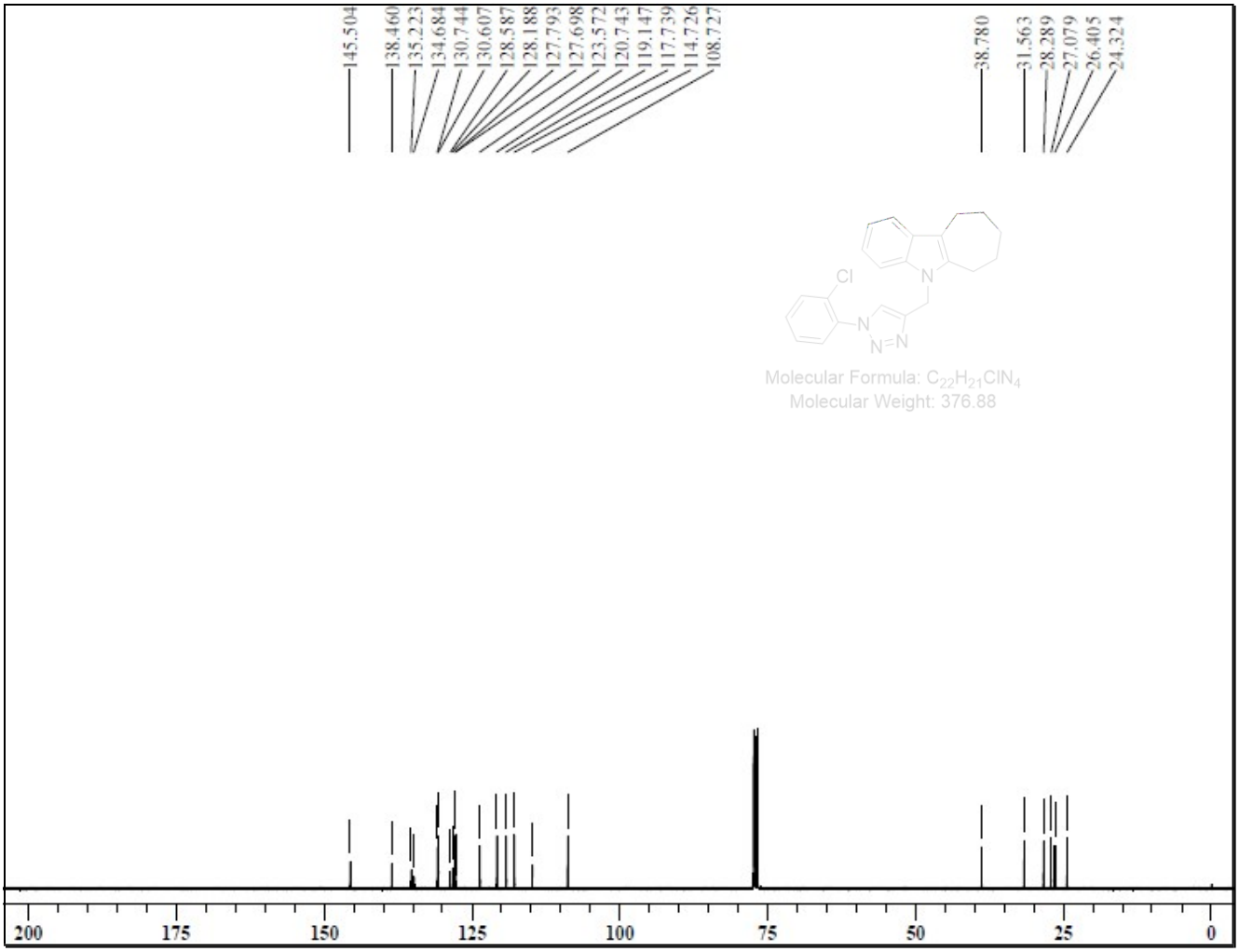


Figure S53: ^{13}C NMR (100 MHz, $CDCl_3$) of 4-(4-((7,8,9,10-tetrahydrocyclohepta[b]indol-5(6*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)phenyl hypochlorite **(4m)**

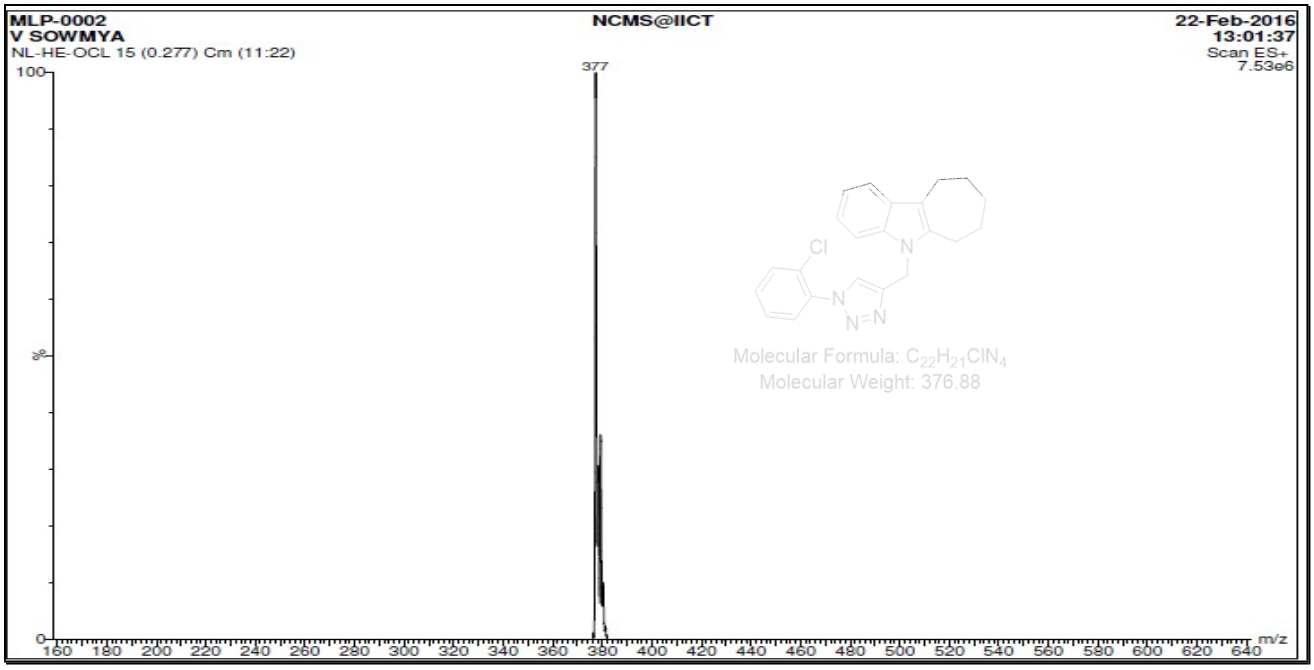


Figure S54: Mass (ES^+) spectrum of 4-(4-((7, 8, 9, 10-tetrahydrocyclohepta[b]indol-5(6*H*)-yl)methyl)- 1*H*-1,2,3-triazol-1-yl)phenyl hypochlorite **(4m)**

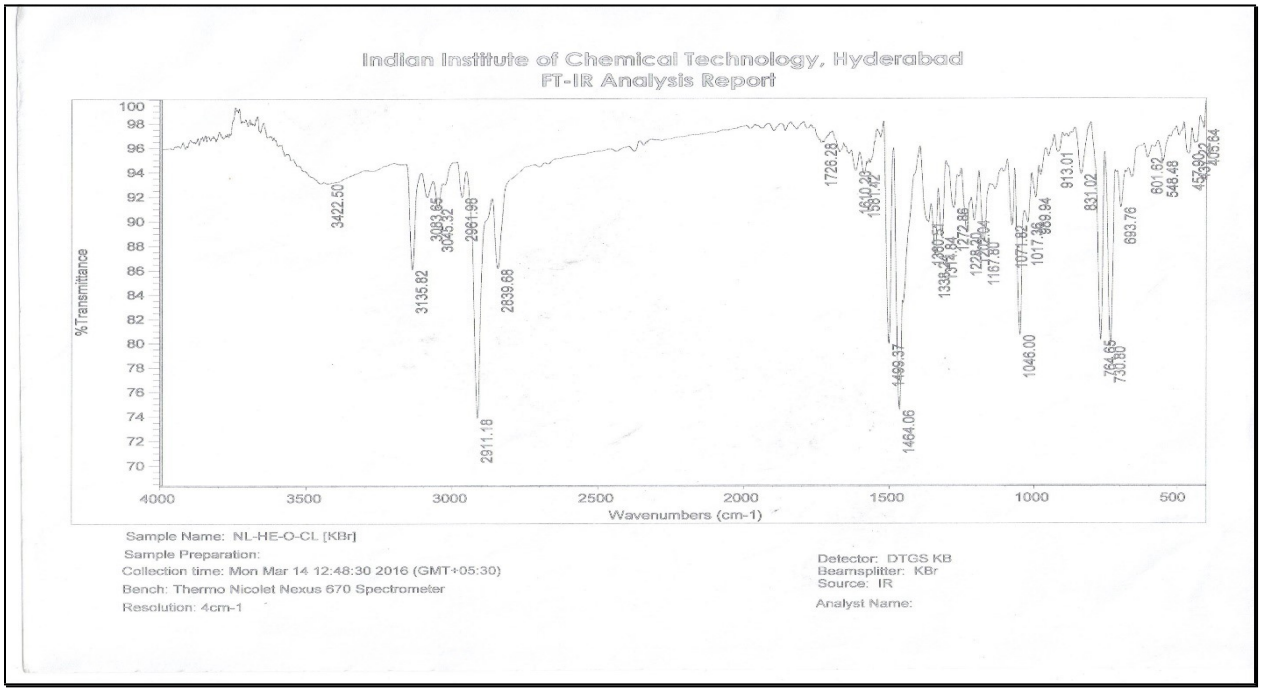


Figure S55: IR (KBr, cm^-) spectrum of 4-(4-((7,8,9,10-tetrahydrocyclohepta[b]indol-5(6*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)phenyl hypochlorite **(4m)**

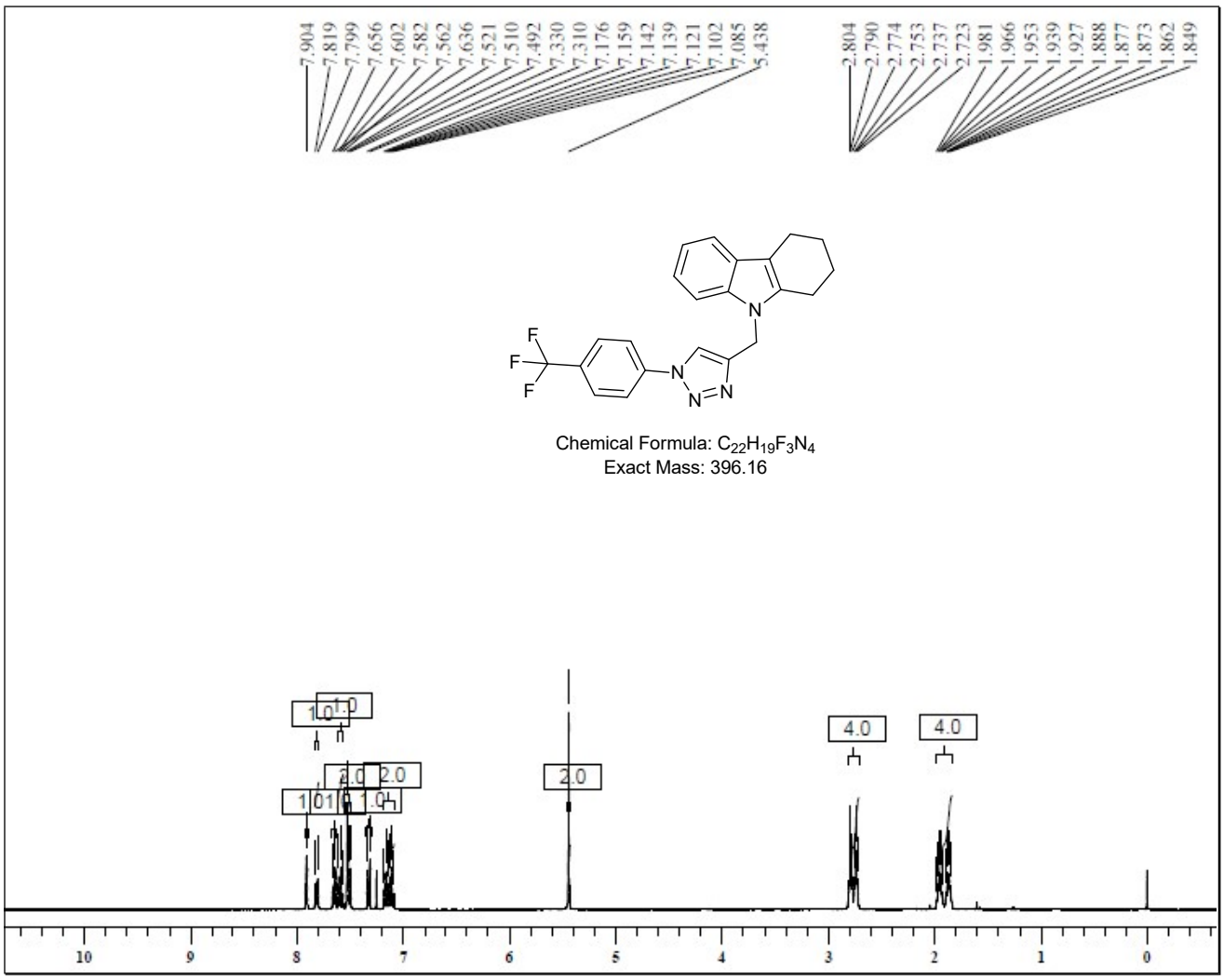


Figure S56: ^{1}H NMR (400 MHz, $CDCl_3$) of 9-((1-(4-(trifluoromethyl)phenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-2,3,4,9-tetrahydro-1*H*-carbazole (**4n**)

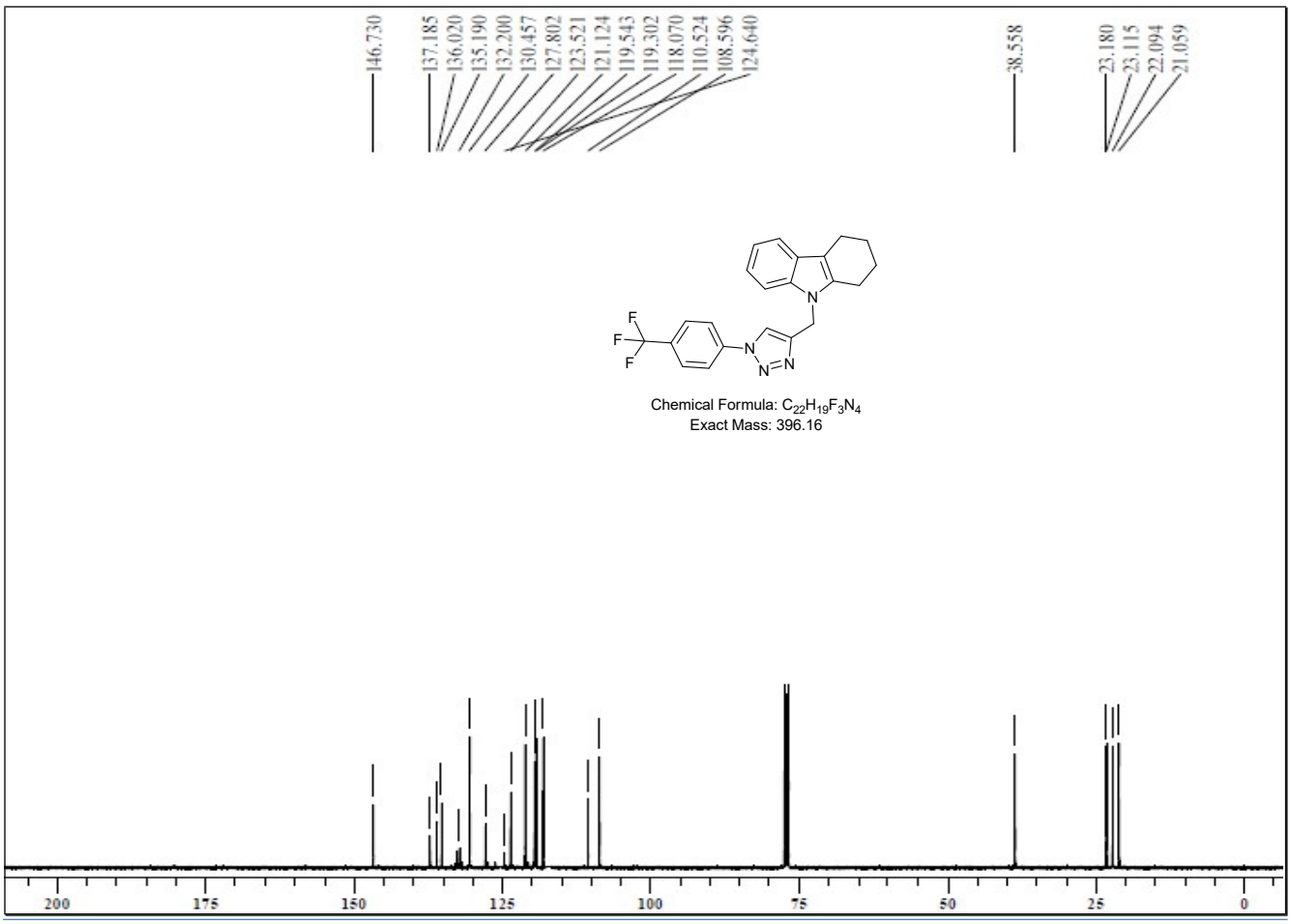


Figure S57: ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of 9-((1-(4-(trifluoromethyl)phenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-2,3,4,9-tetrahydro-1*H*-carbazole (**4n**)

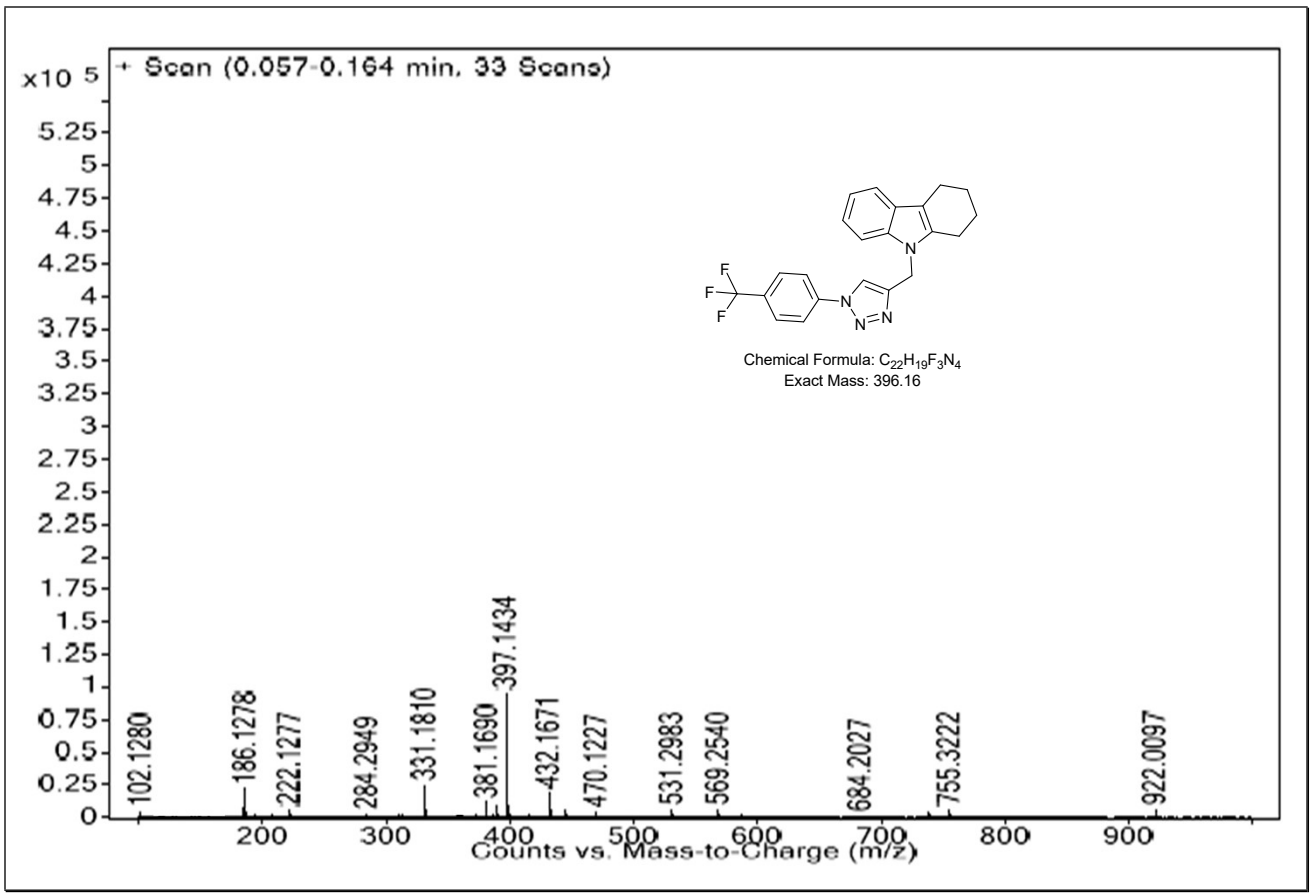


Figure S58: Mass (ES^+) spectrum of 9-((1-(4-(trifluoromethyl)phenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-2,3,4,9-tetrahydro-1*H*-carbazole (**4n**)

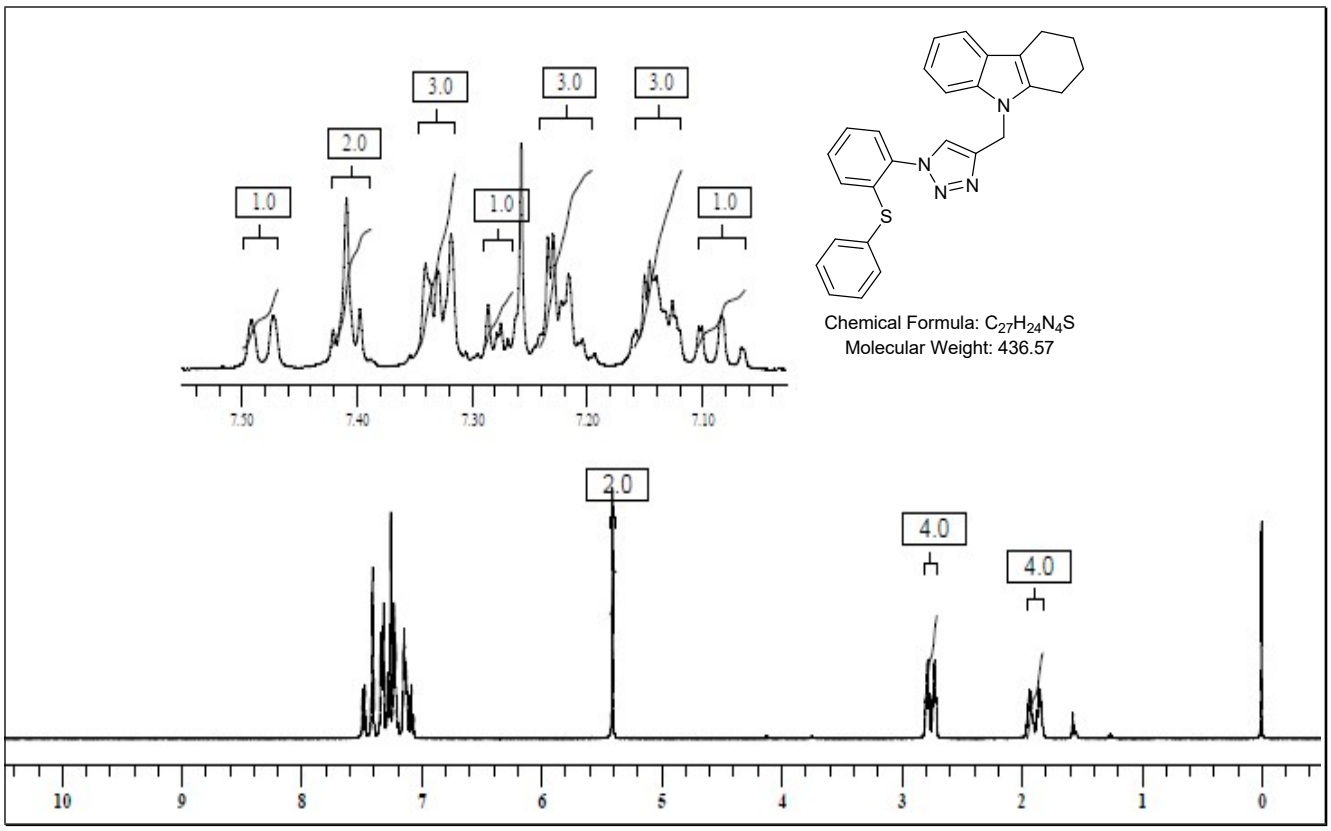


Figure S59: ^{1}H NMR (400 MHz, $CDCl_3$) of 9-((1-(2-(phenylthio)phenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-2,3,4,9-tetrahydro-1*H*-carbazole (**4o**)

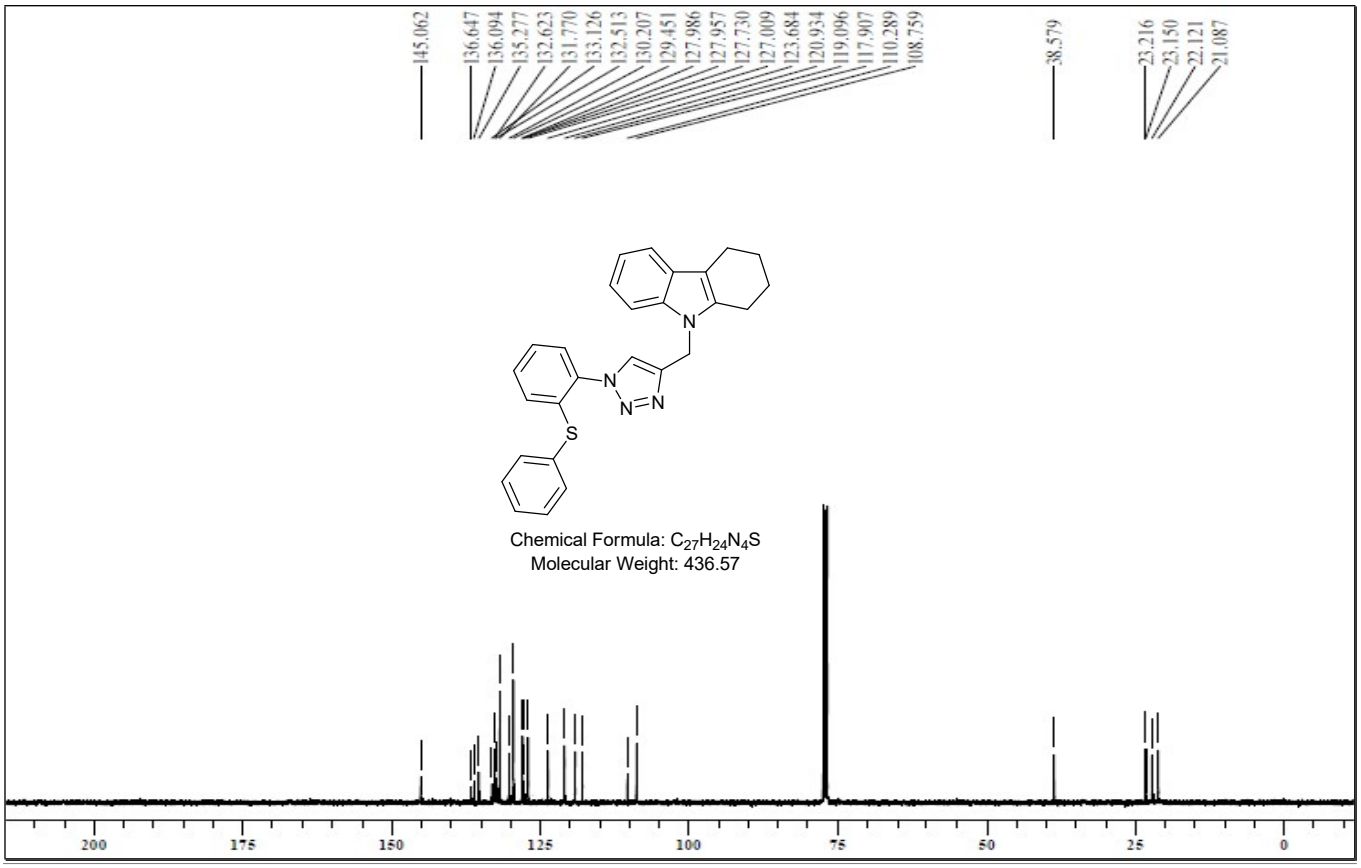


Figure S60: ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of 9-((1-(2-(phenylthio)phenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-2,3,4,9-tetrahydro-1*H*-carbazole (**4o**)

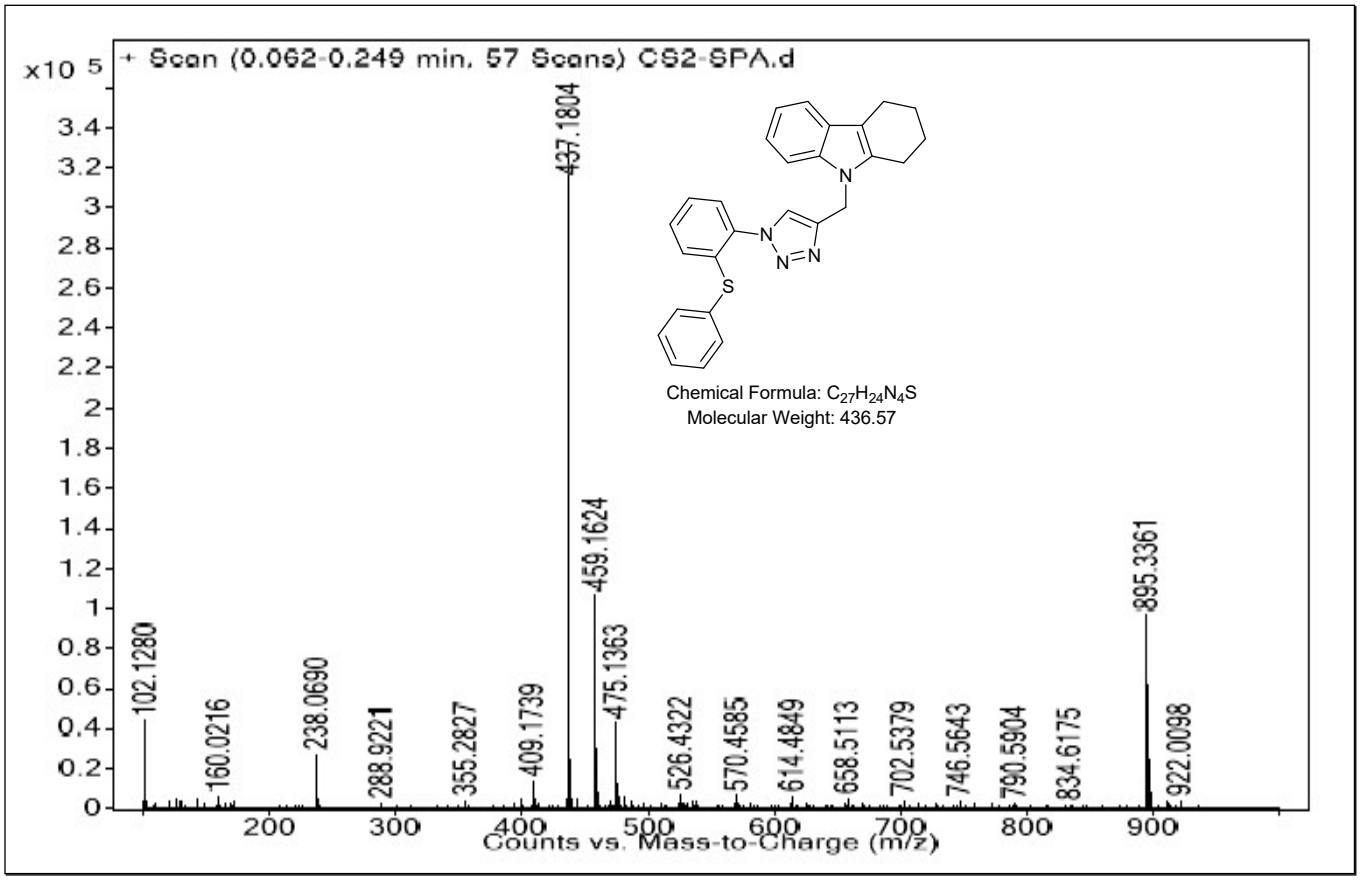


Figure S61: Mass (ES^+) spectrum of 9-((1-(2-(phenylthio)phenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-2,3,4,9-tetrahydro-1*H*-carbazole (**4o**)

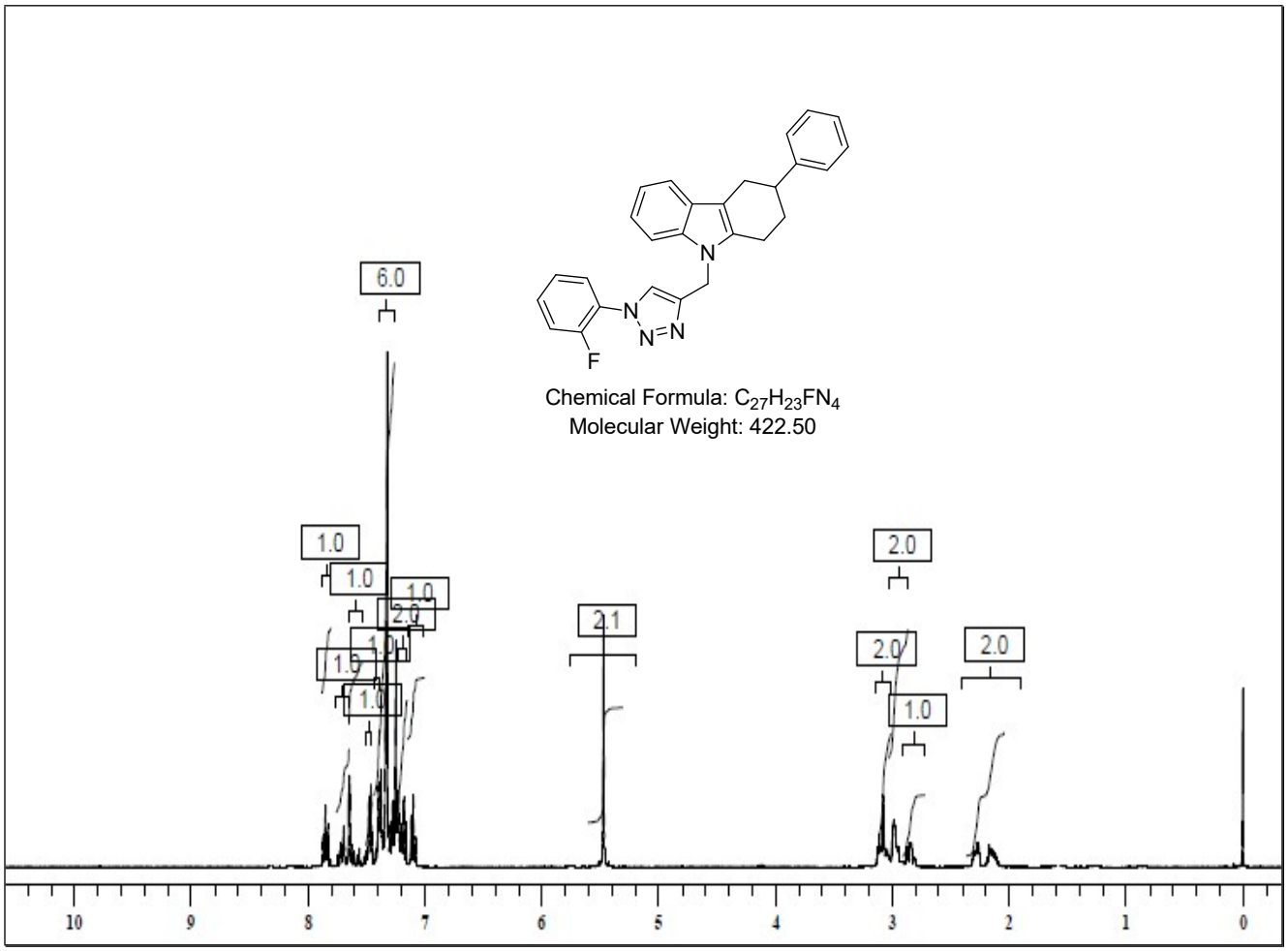


Figure S62: ^{1}H NMR (400 MHz, $CDCl_3$) of 9-((1-(2-fluorophenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-3-phenyl-2,3,4,9-tetrahydro-1*H*-carbazole (**4p**)

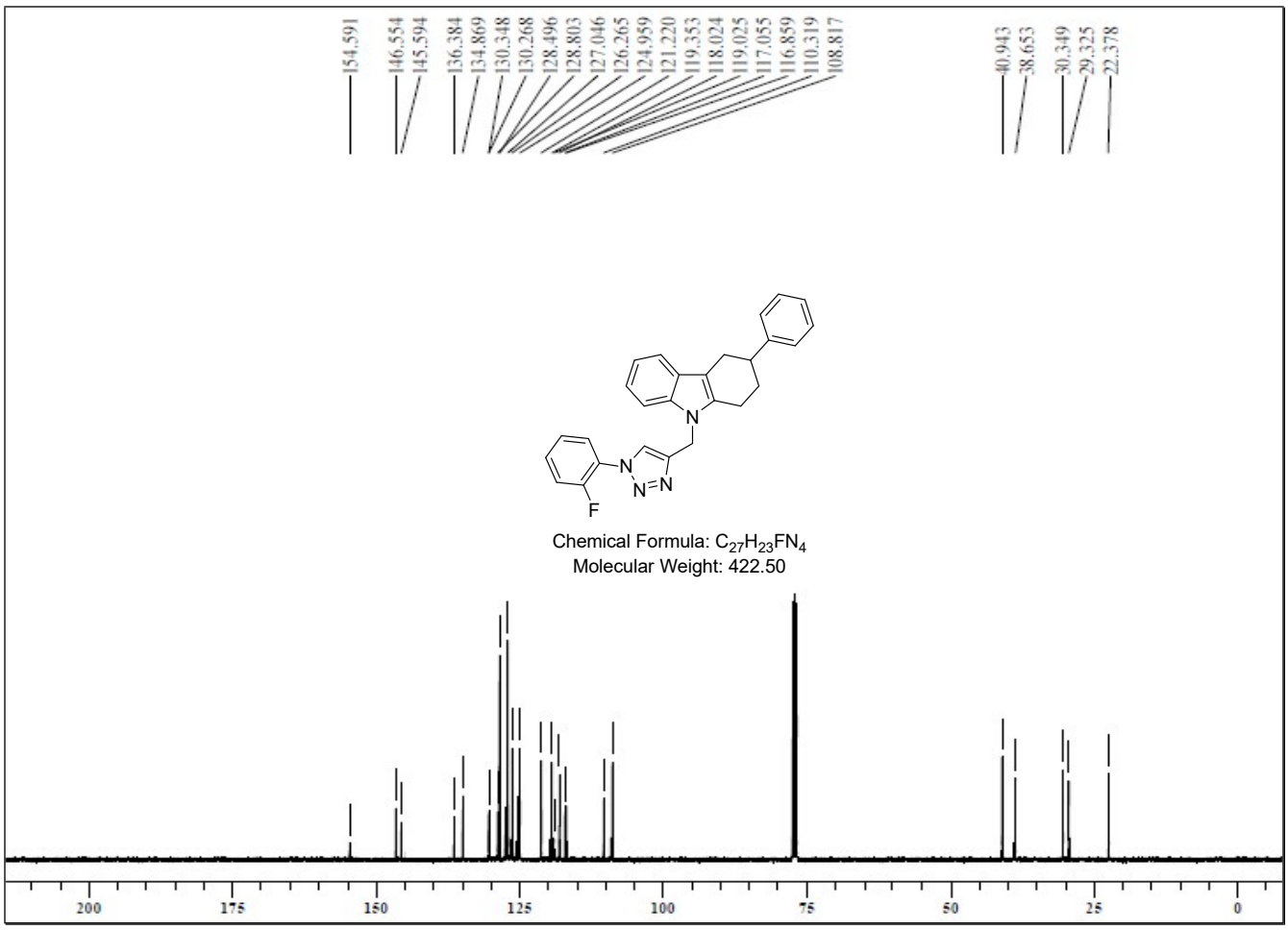


Figure S63: ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of 9-((1-(2-fluorophenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-3-phenyl-2,3,4,9-tetrahydro-1*H*-carbazole (**4p**)

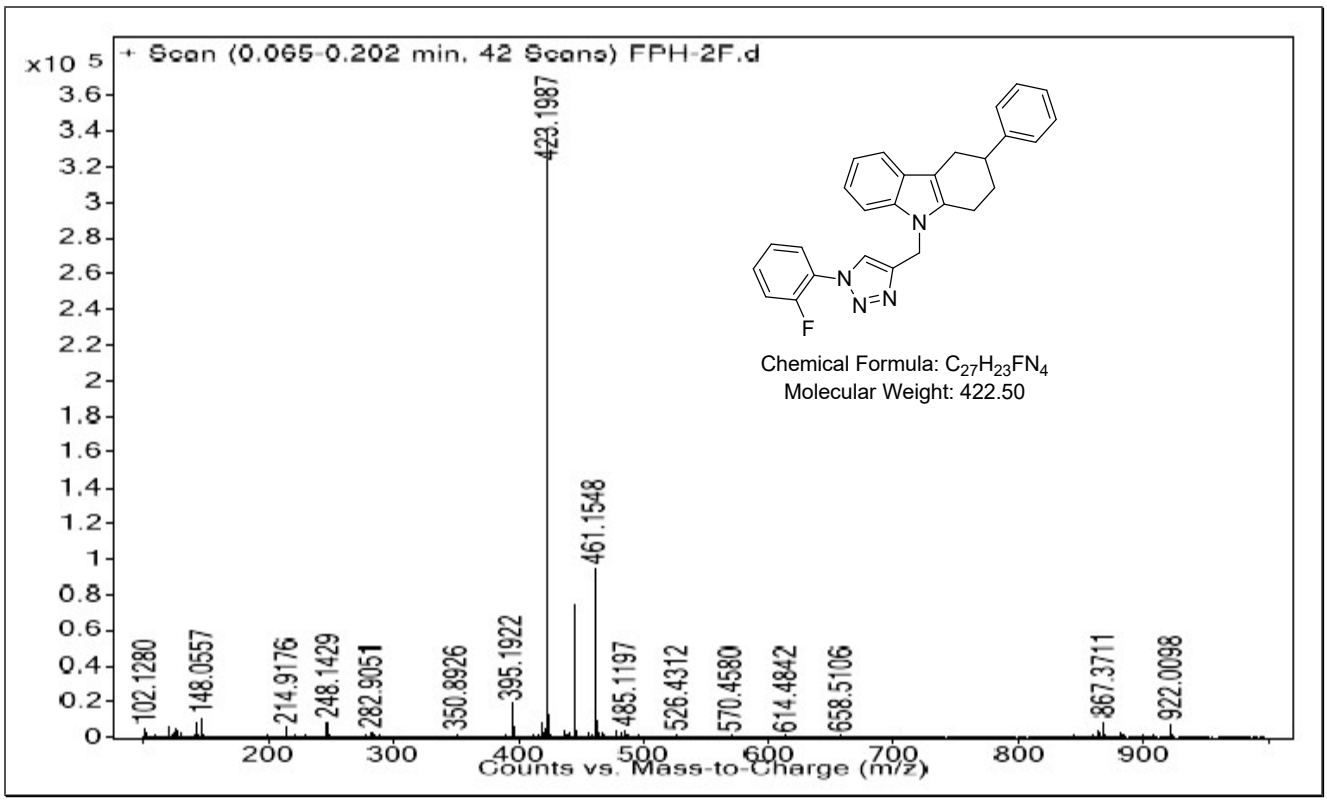


Figure S64: Mass (ES^+) spectrum of 9-((1-(2-fluorophenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-3-phenyl-2,3,4,9-tetrahydro-1*H*-carbazole (**4p**)

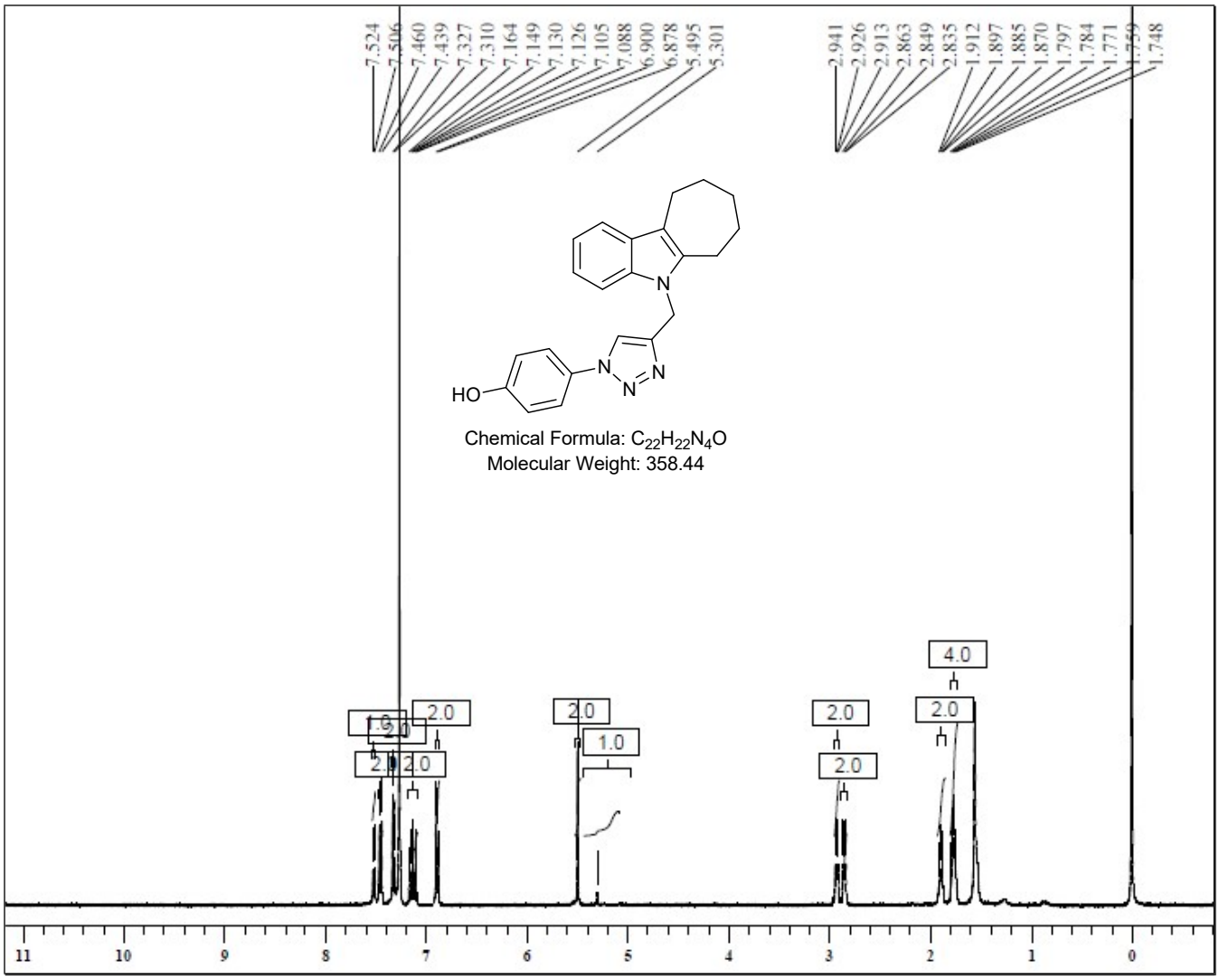


Figure S65: ^{1}H NMR (400 MHz, $CDCl_3$) of 4-(4-((7,8,9,10-tetrahydrocyclohepta[b]indol-5(6*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)phenol (**4q**)

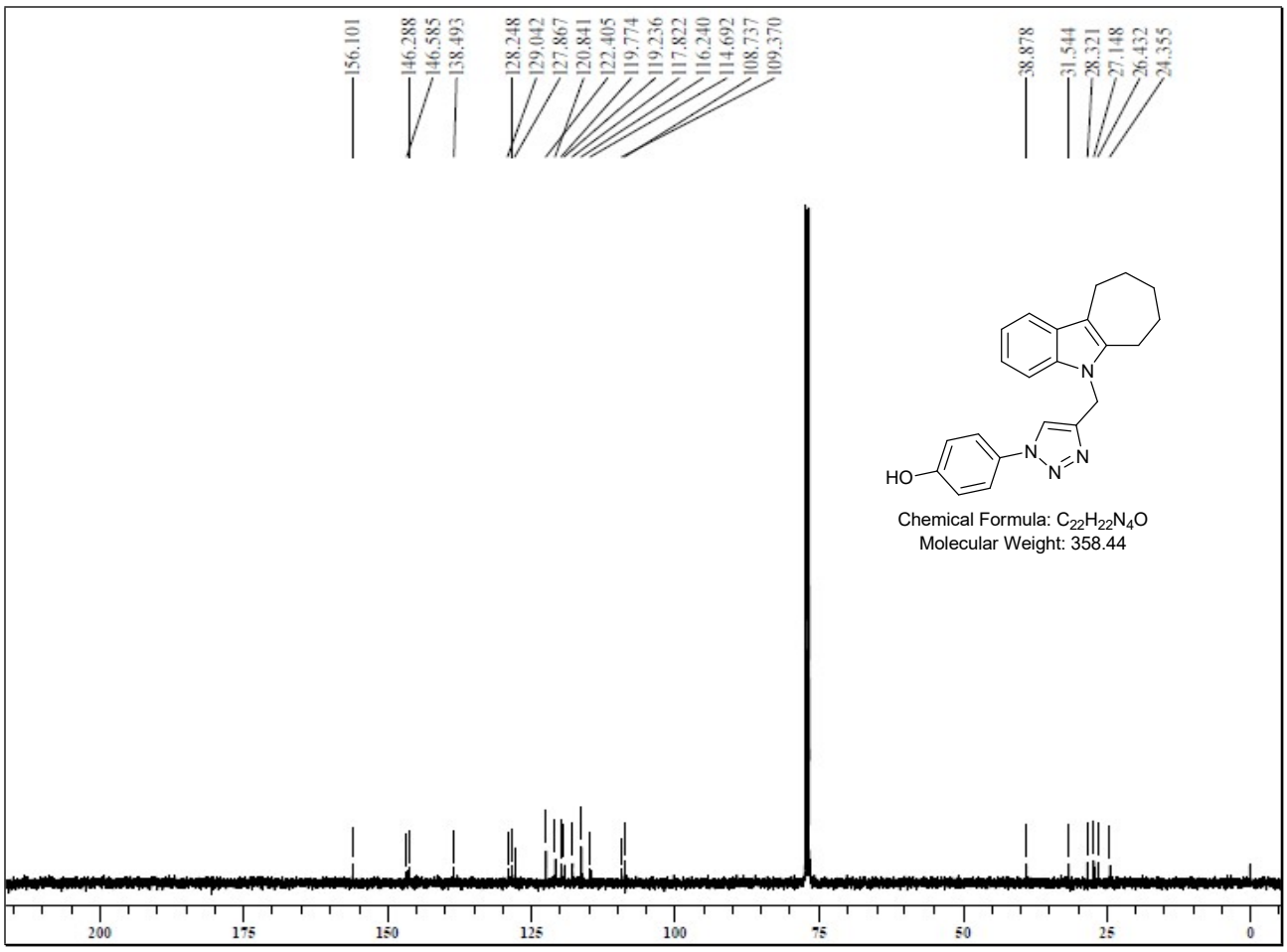


Figure S66: ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of 4-(4-((7,8,9,10-tetrahydrocyclohepta[b]indol-5(6*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)phenol (**4q**)

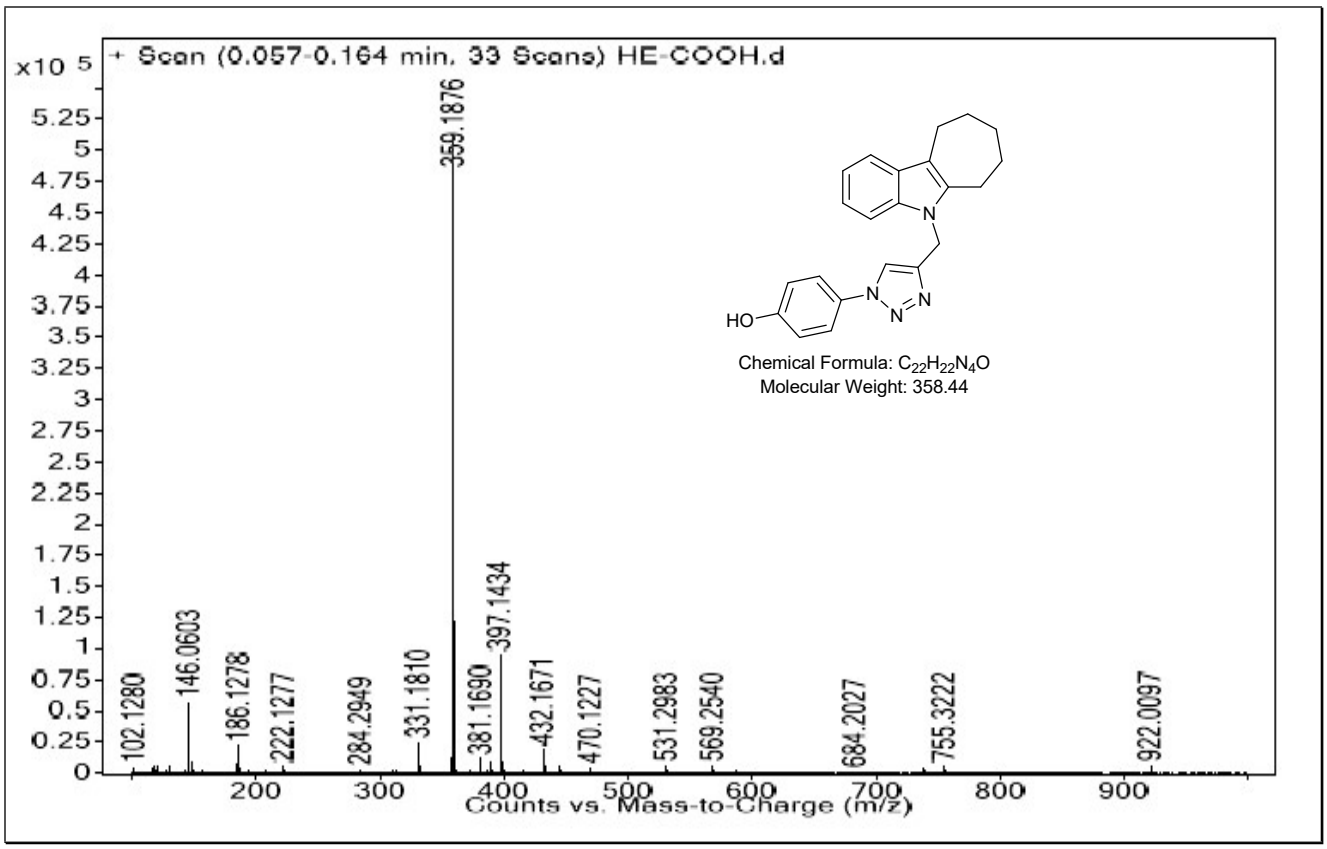


Figure S67: Mass (ES^+) spectrum of 4-(4-((7,8,9,10-tetrahydrocyclohepta[b]indol-5(6*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)phenol (**4q**)

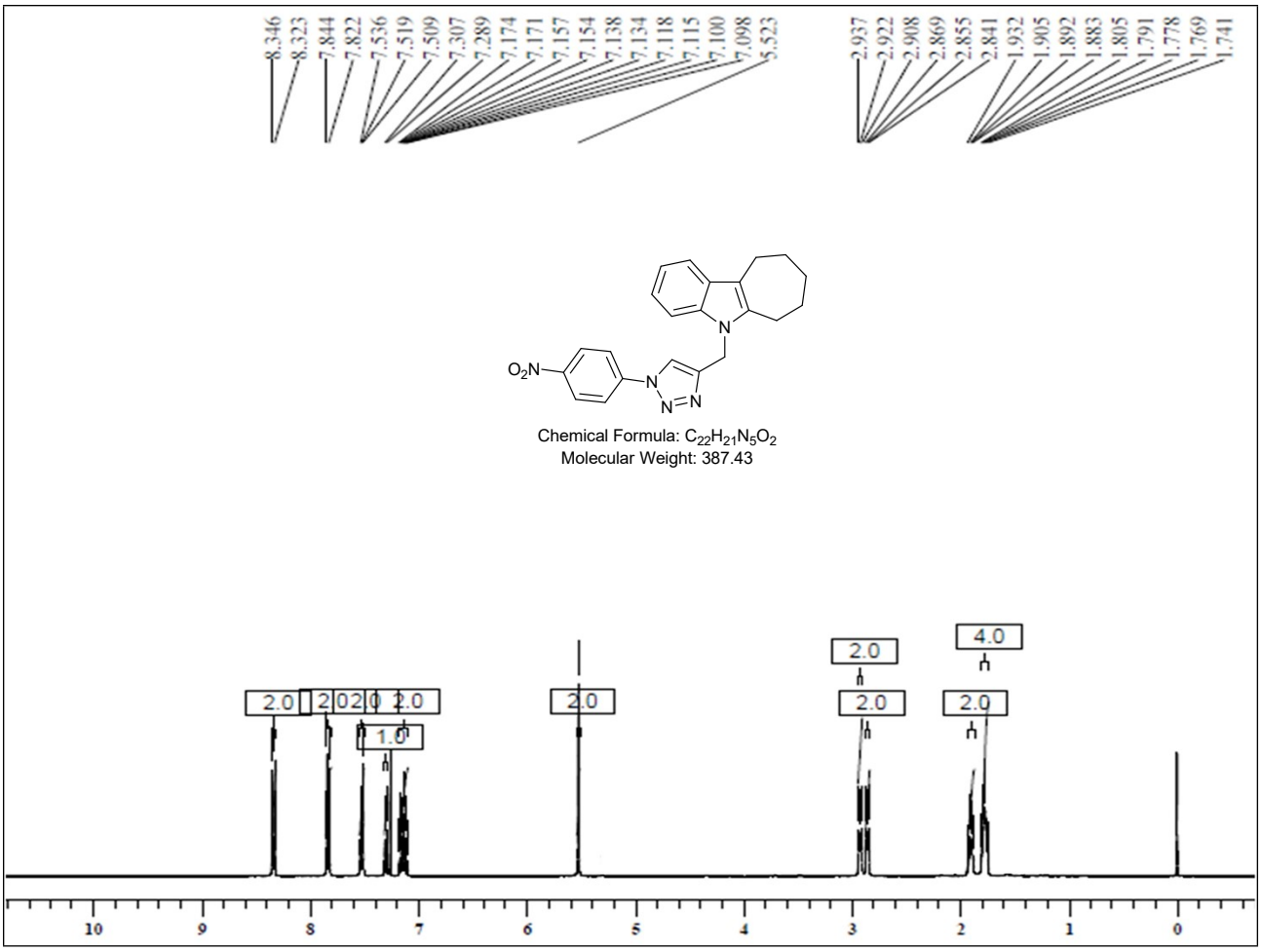


Figure S68: ^{1}H NMR (400 MHz, $CDCl_3$) of 5-((1-(4-nitrophenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-5,6,7,8,9,10 hexahydrocyclohepta[b]indole (**4r**)

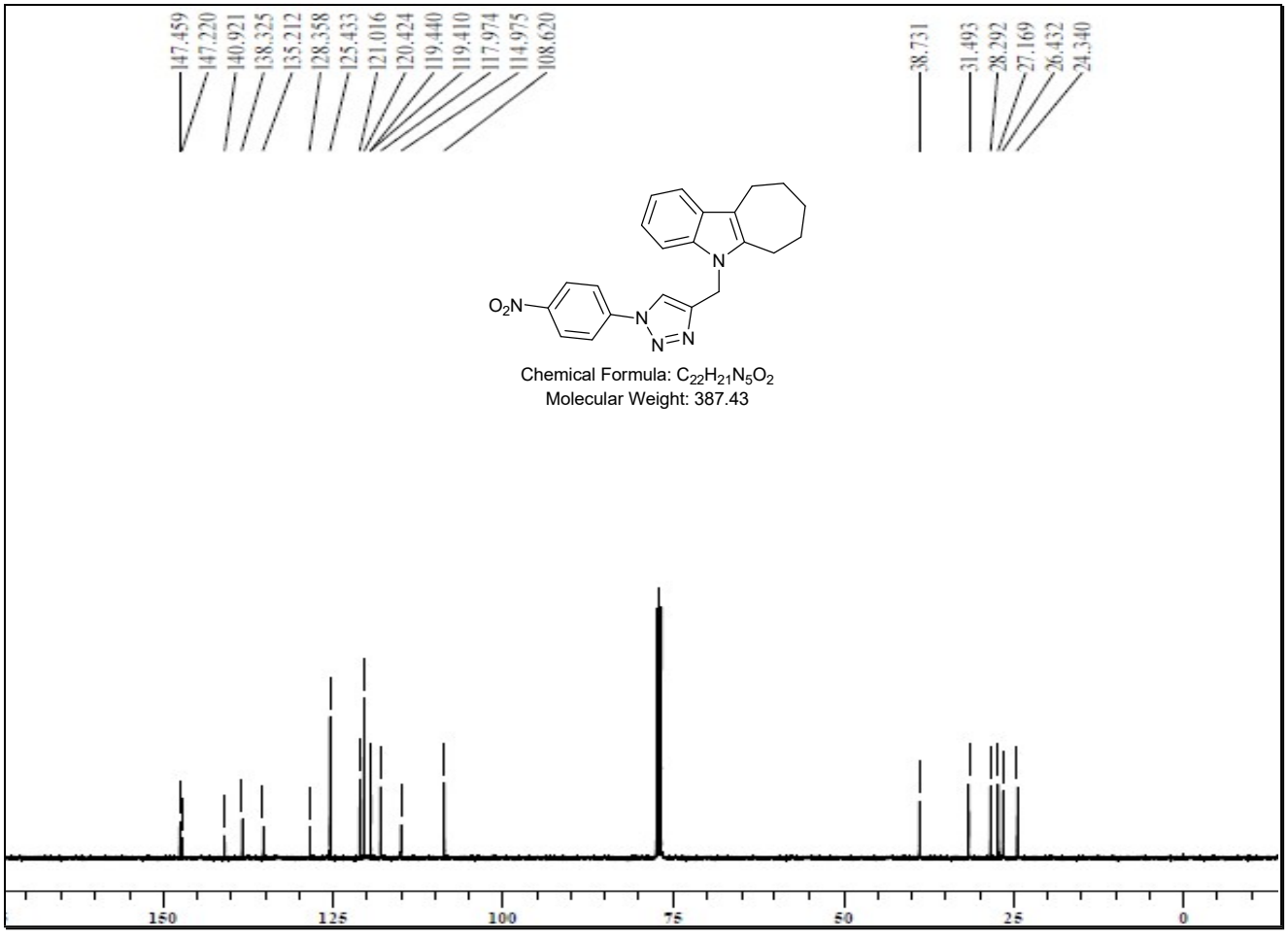


Figure S69: ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of 5-((1-(4-nitrophenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-5,6,7,8,9,10-hexahydrocyclohepta[b]indole (**4r**)

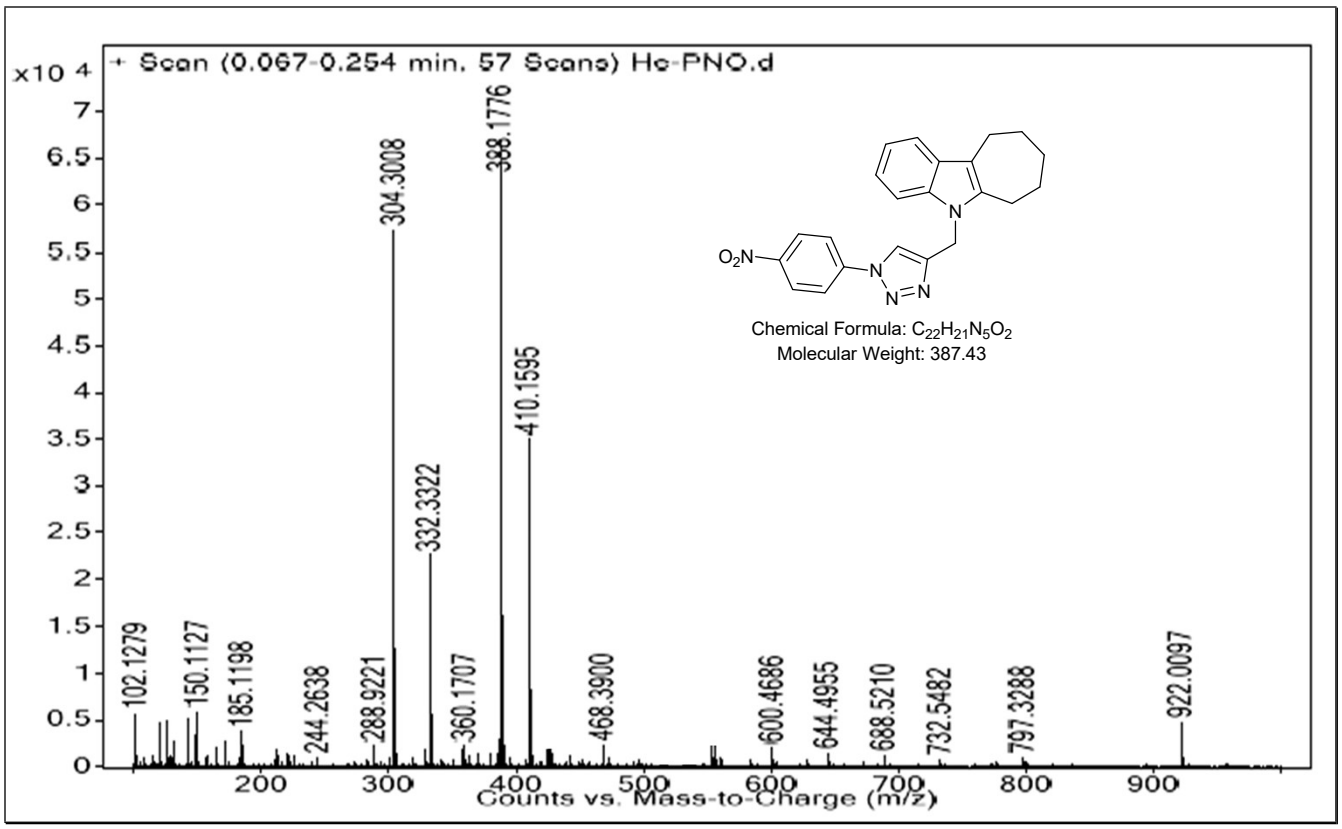


Figure S70: Mass (ES^+) spectrum of 5-((1-(4-nitrophenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-5,6,7,8,9,10-hexahydrocyclohepta[b]indole (**4r**)

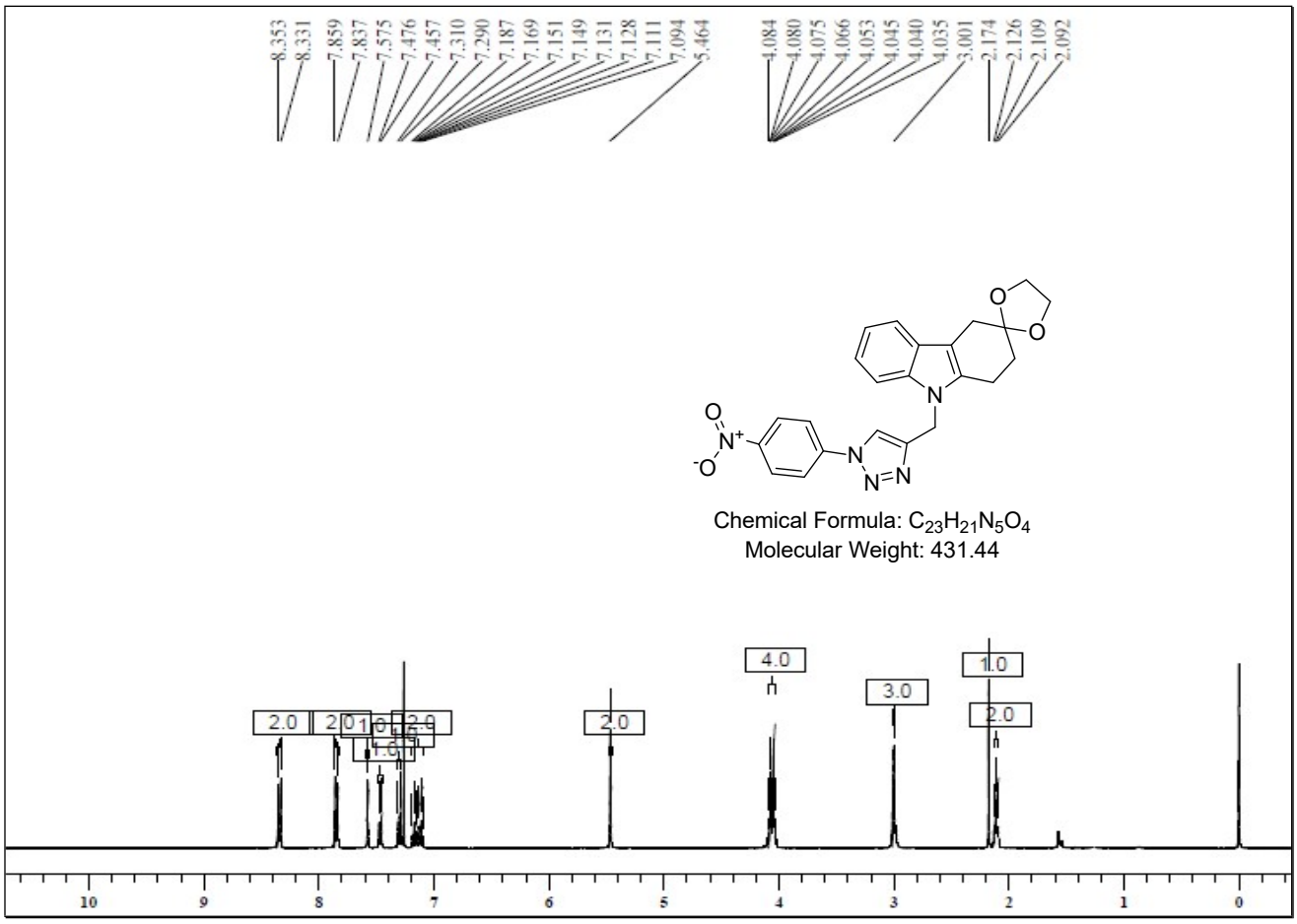


Figure S71: ^{1}H NMR (400 MHz, $CDCl_3$) of 9-((1-(4-nitrophenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-1,2,4,9-tetrahydrospiro[carbazole-3,2'-[1,3]dioxolane] (**4s**)

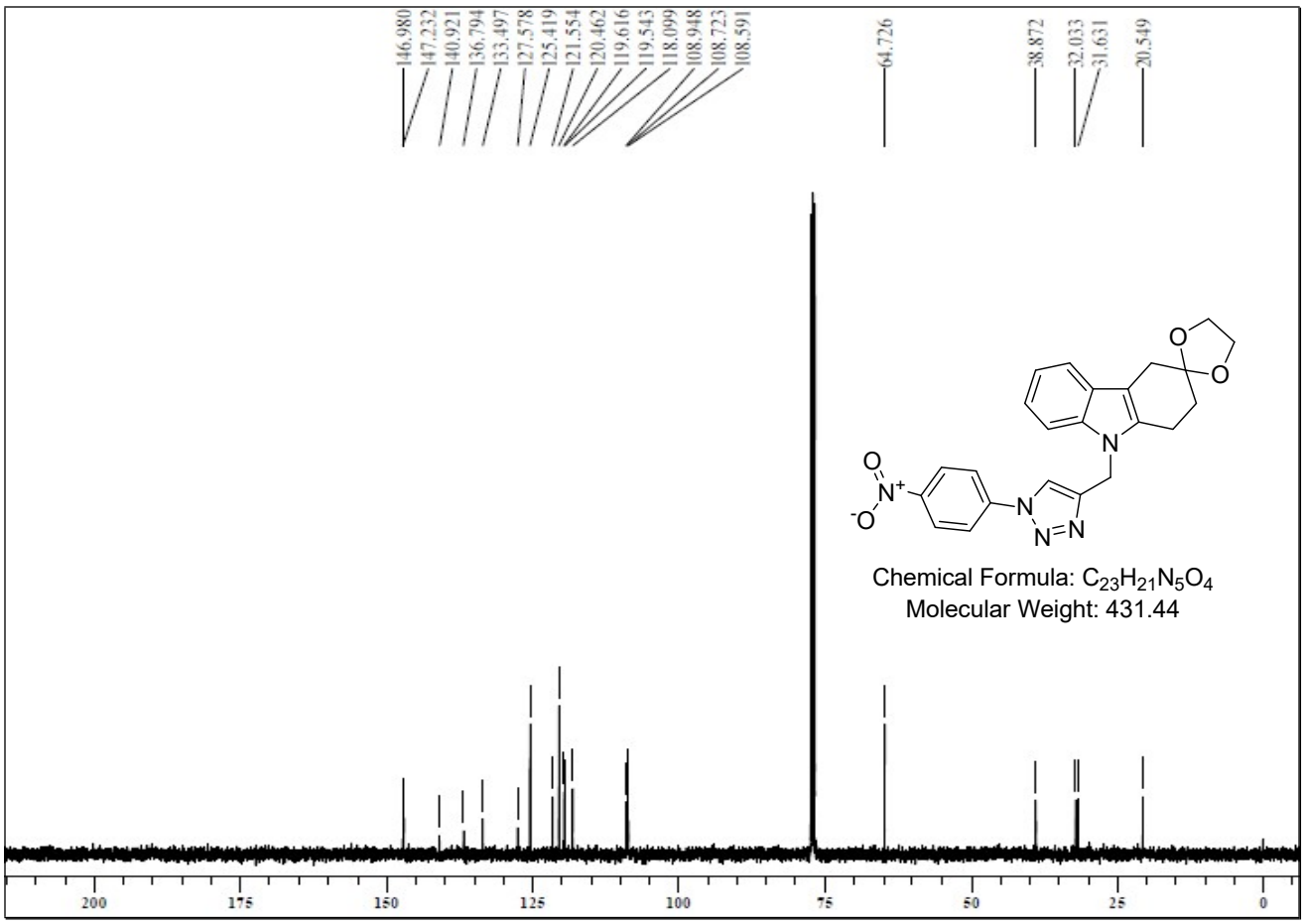


Figure S72: ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of 9-((1-(4-nitrophenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-1,2,4,9-tetrahydrospiro[carbazole-3,2'-[1,3]dioxolane] (**4s**)

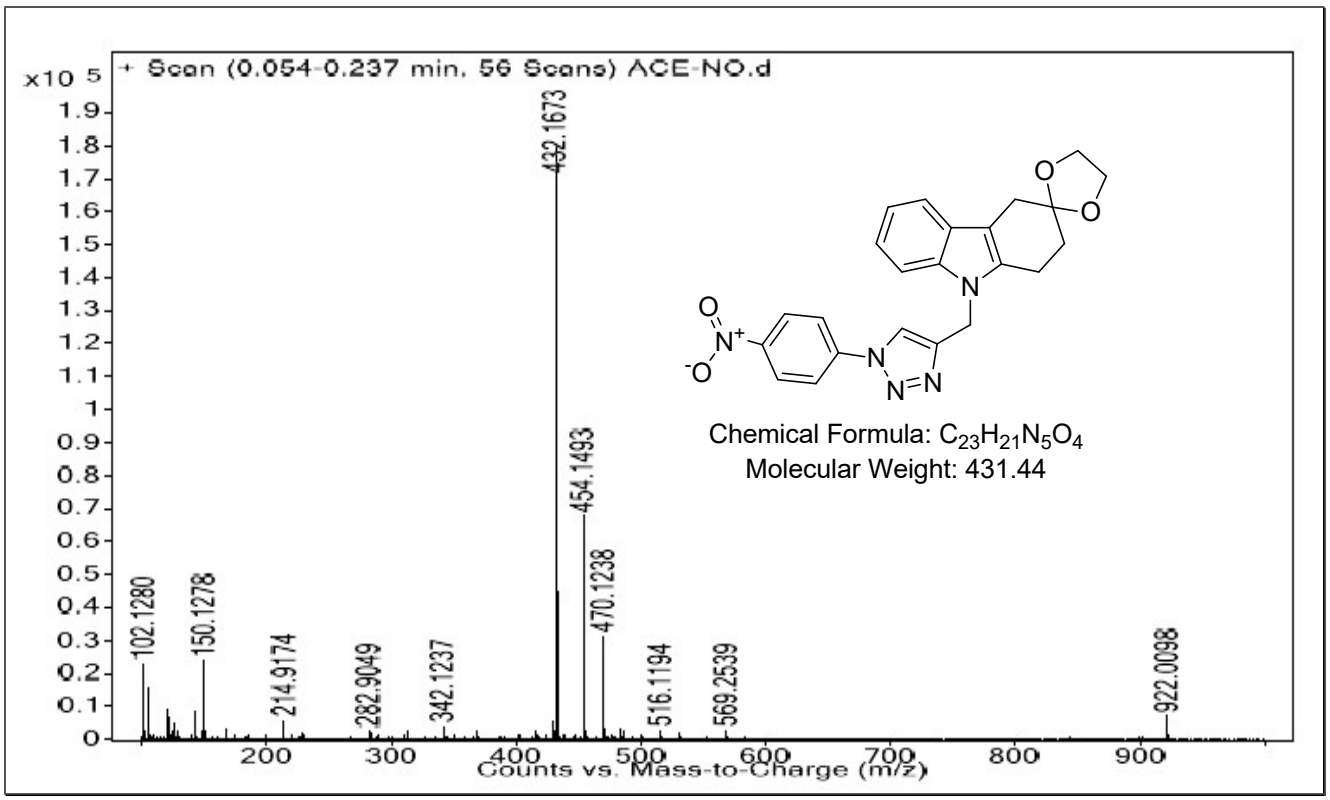


Figure S73: Mass (ES^+) spectrum of 9-((1-(4-nitrophenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-1,2,4,9-tetrahydrospiro[carbazole-3,2'-[1,3]dioxolane] (**4s**)

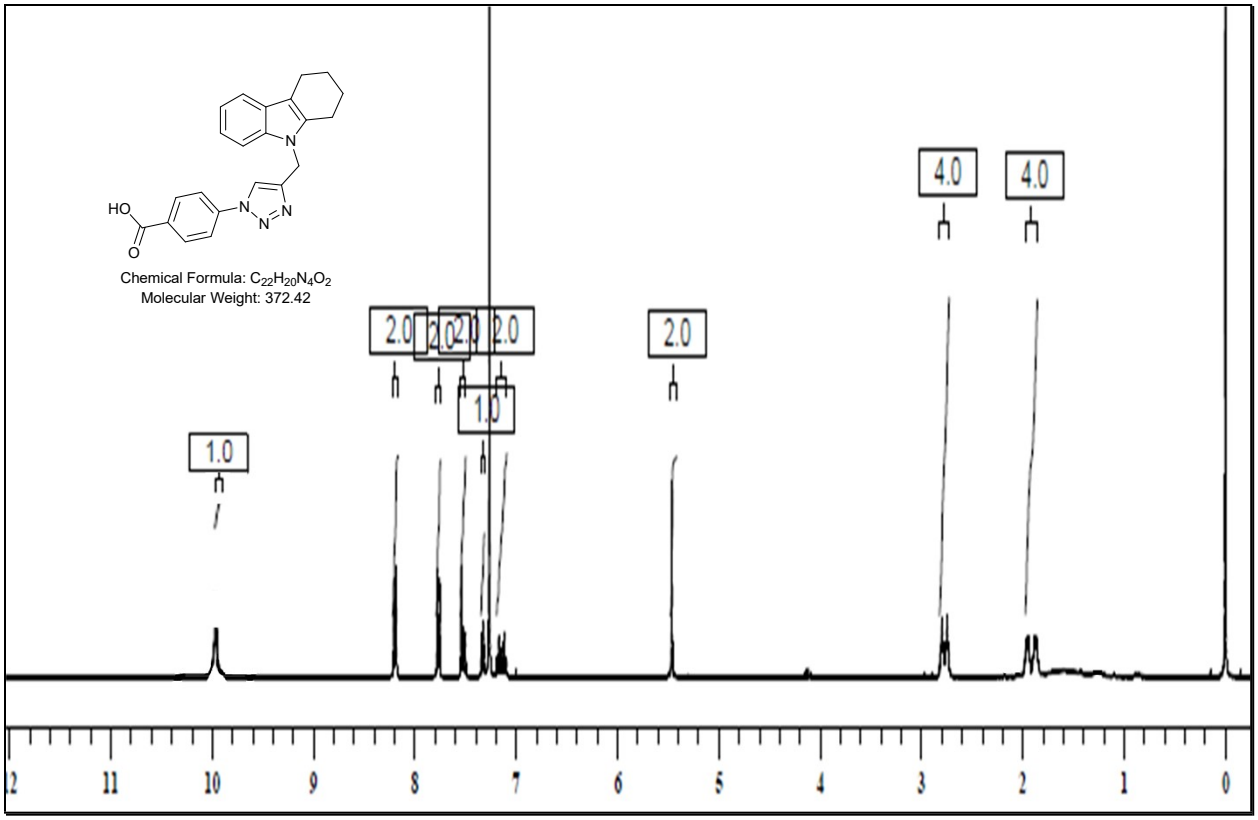


Figure S74: ^{1}H NMR (400 MHz, $CDCl_3$) of 4-(4-((3,4-dihydro-1*H*-carbazol-9(2*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)benzoic acid (**4t**)

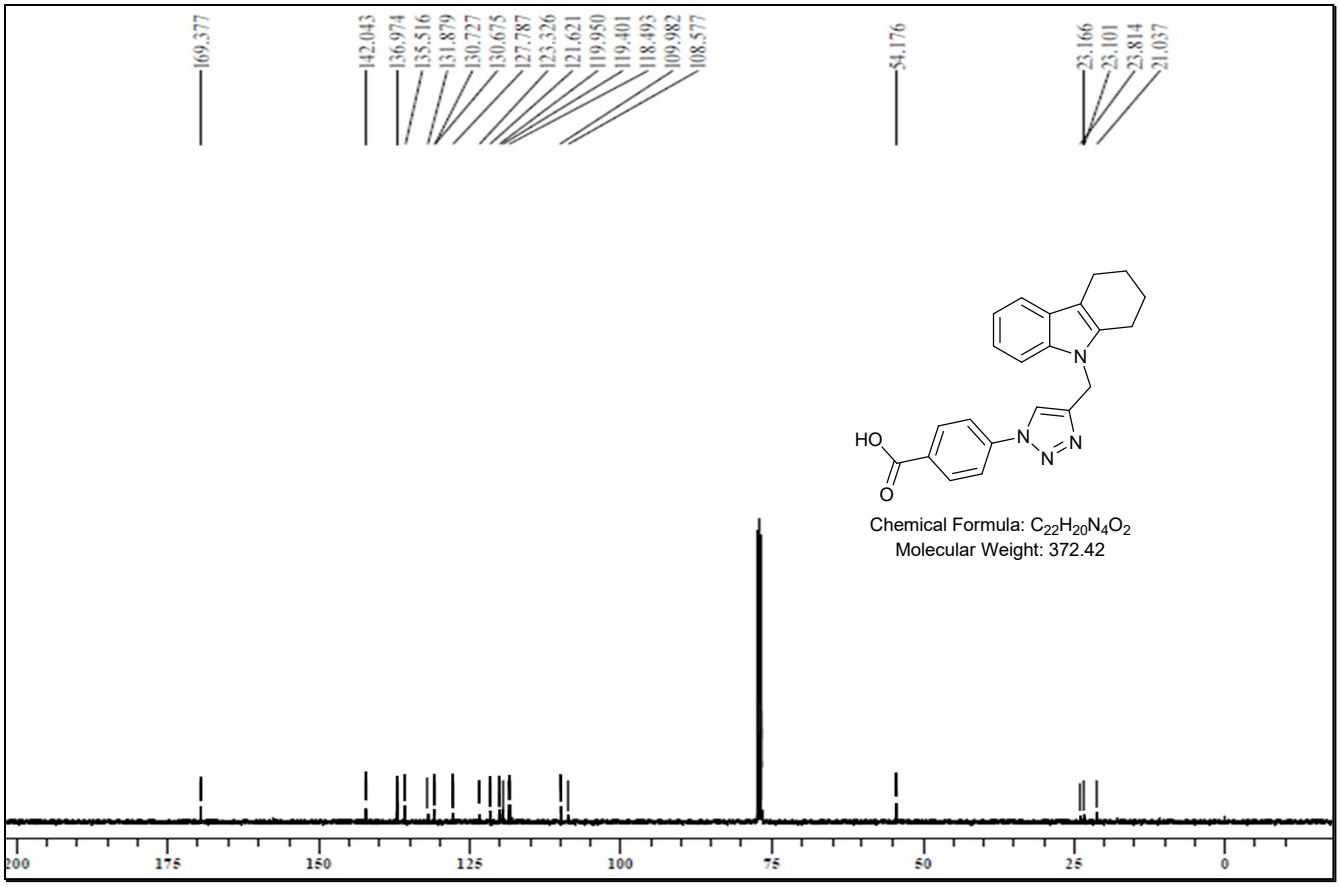


Figure S75: ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of 4-(4-((3,4-dihydro-1*H*-carbazol-9(2*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)benzoic acid (**4t**)

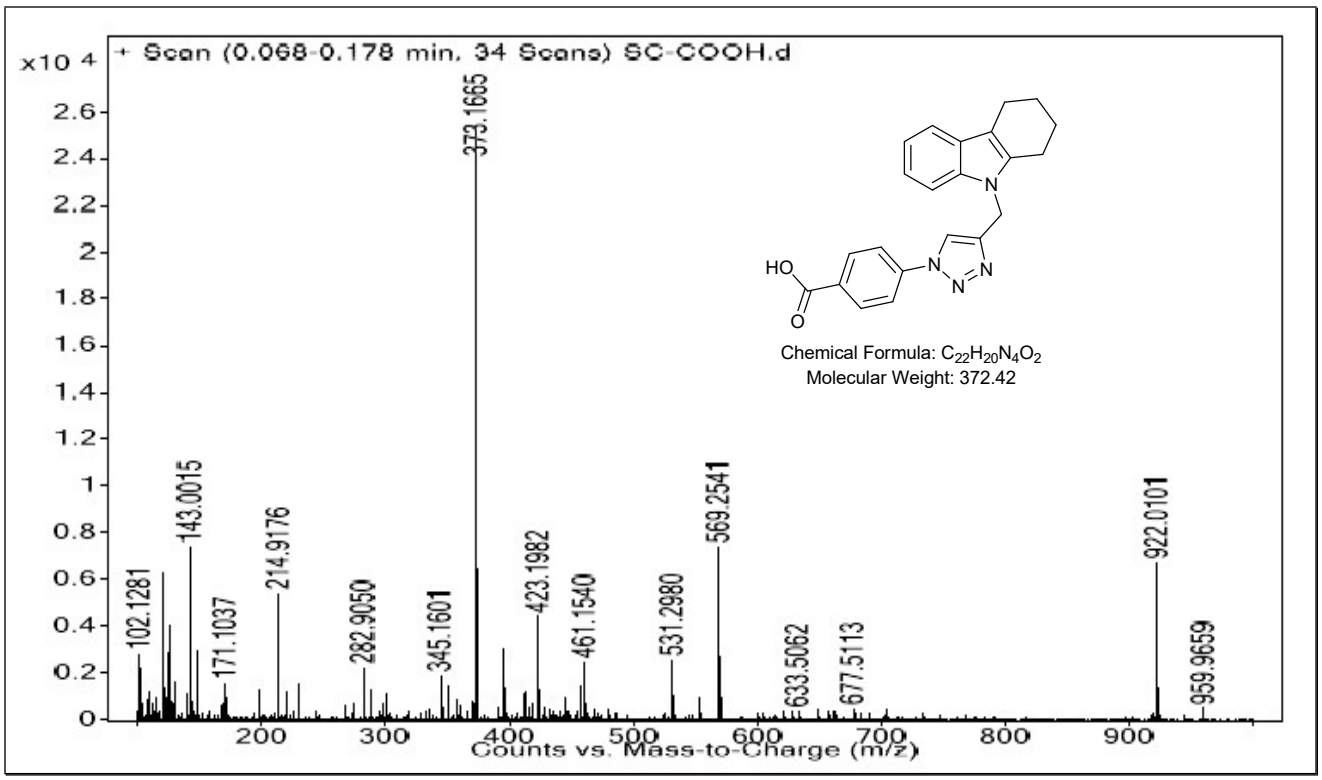


Figure S76: Mass (ES^+) spectrum of 4-(4-((3,4-dihydro-1*H*-carbazol-9(2*H*)-yl)methyl)-1*H*-1,2,3-triazol-1-yl)benzoic acid (**4t**)

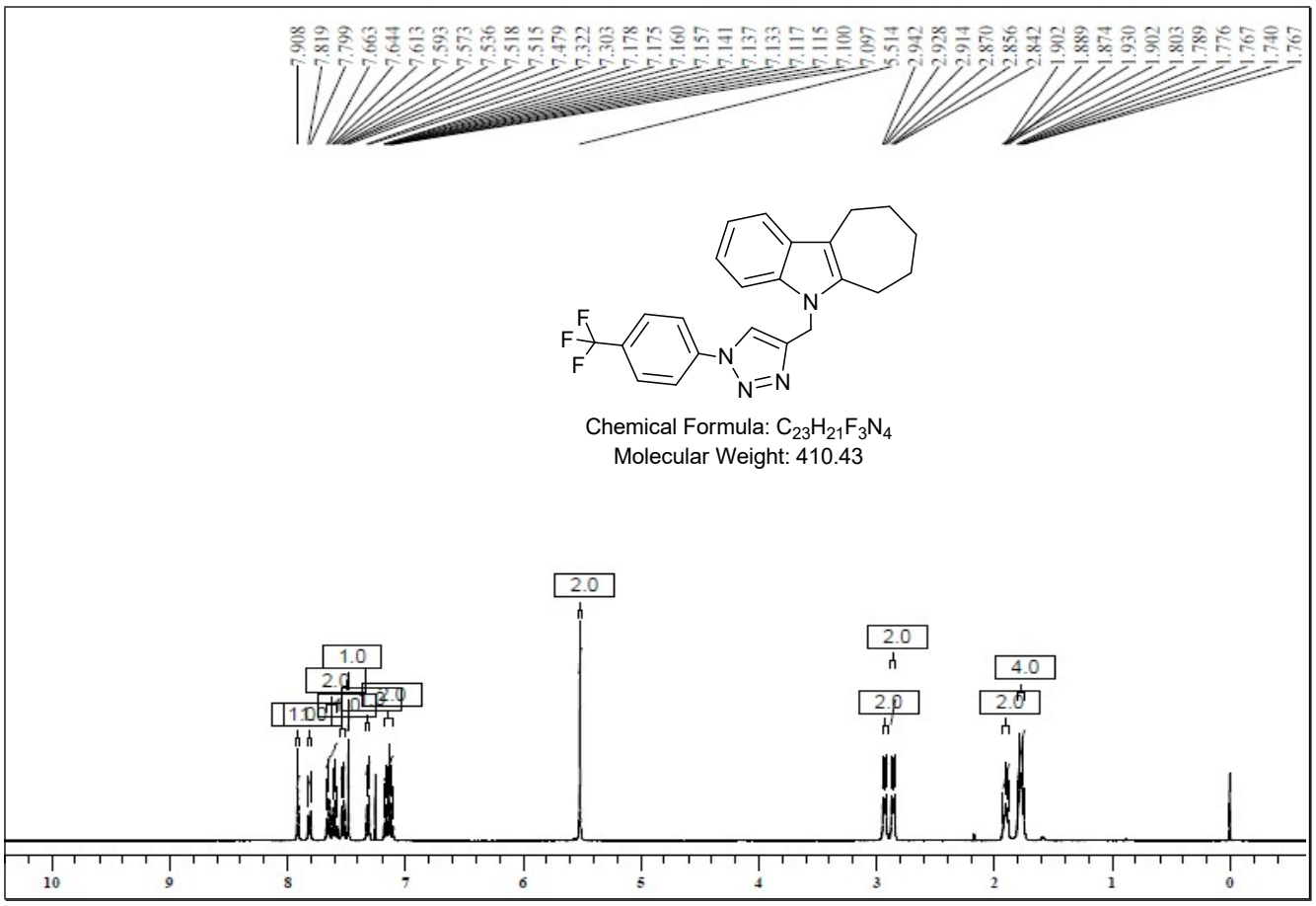


Figure S77: ^{1}H NMR (400 MHz, $CDCl_3$) of 5-((1-(4-(trifluoromethyl)phenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-5,6,7,8,9,10-hexahydrocyclohepta[b]indole (**4u**)

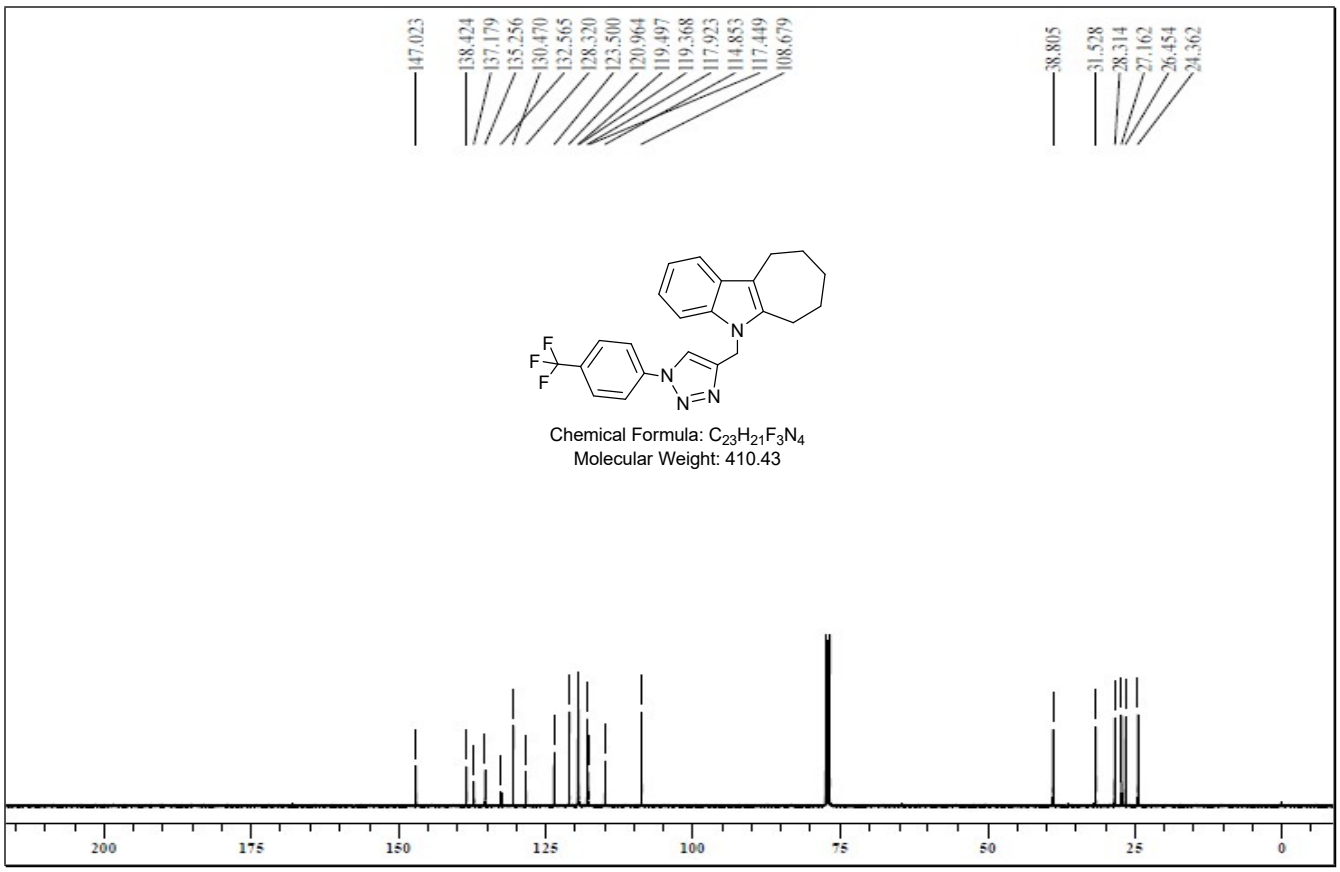


Figure S78: ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of 5-((1-(4-(trifluoromethyl)phenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-5,6,7,8,9,10-hexahydrocyclohepta[b]indole (**4u**)

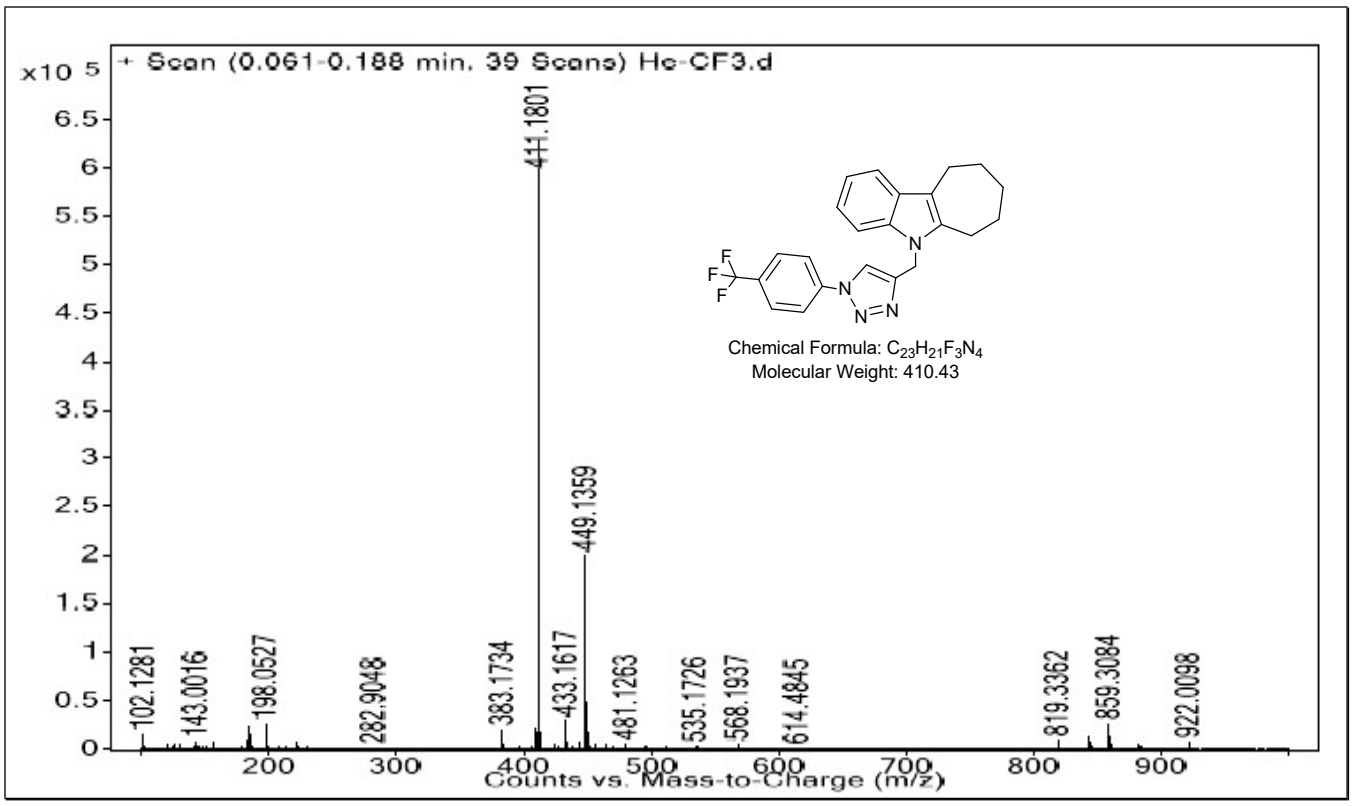


Figure S79: Mass (ES^+) spectrum of 5-((1-(4-(trifluoromethyl)phenyl)-1*H*-1,2,3-triazol-4-yl)methyl)-5,6,7,8,9,10-hexahydrocyclohepta[b]indole (**4u**)