

Supplementary Information

Preparation, characterization and application of MgFe₂O₄/Cu nanocomposite as a new magnetic catalyst for one-pot regioselective synthesis of β -thiol-1,4-disubstituted-1,2,3-triazoles

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FT-IR, ¹H NMR and ¹³C NMR spectra of β -Thiol-1,4-disubstituted-1,2,3-triazoles (**1-11**)b and FT-IR spectrum of 2-azido-2-phenylethanethiol intermediate are presented as following:

2-Phenyl-2-(4-phenyl-1H-1,2,3-triazol-1-yl)ethane-1-thiol (**1b**)

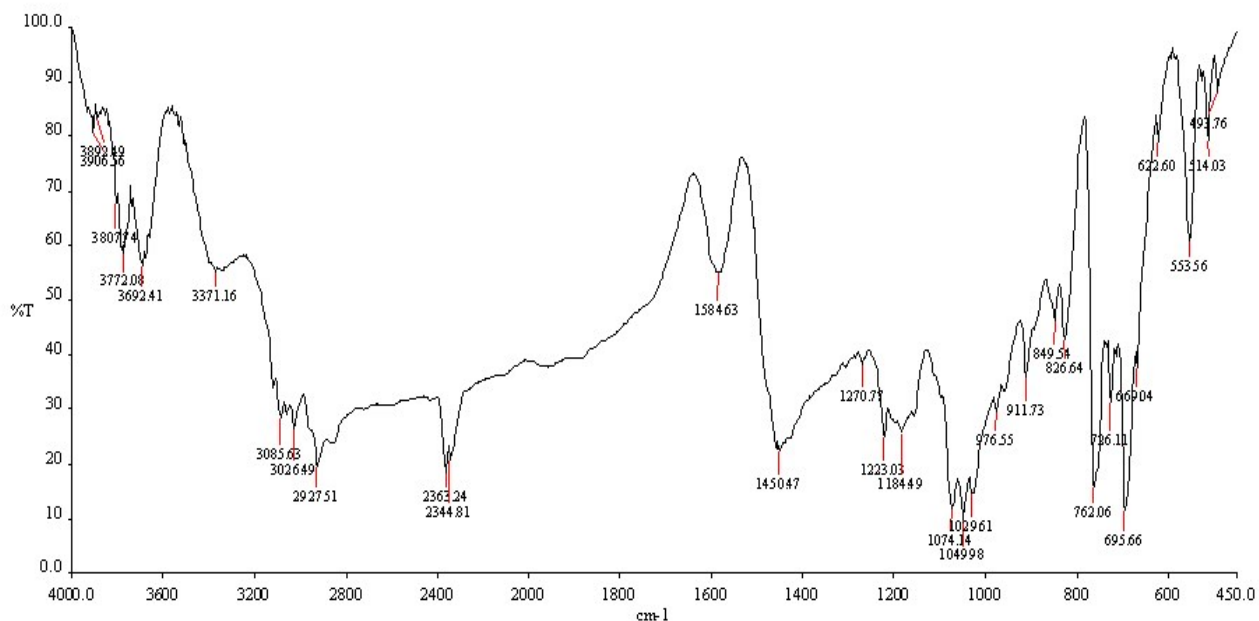
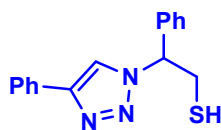


Figure S1. FT-IR Spectrum of 2-phenyl-2-(4-phenyl-1H-1,2,3-triazol-1-yl)ethane-1-thiol (**1b**)

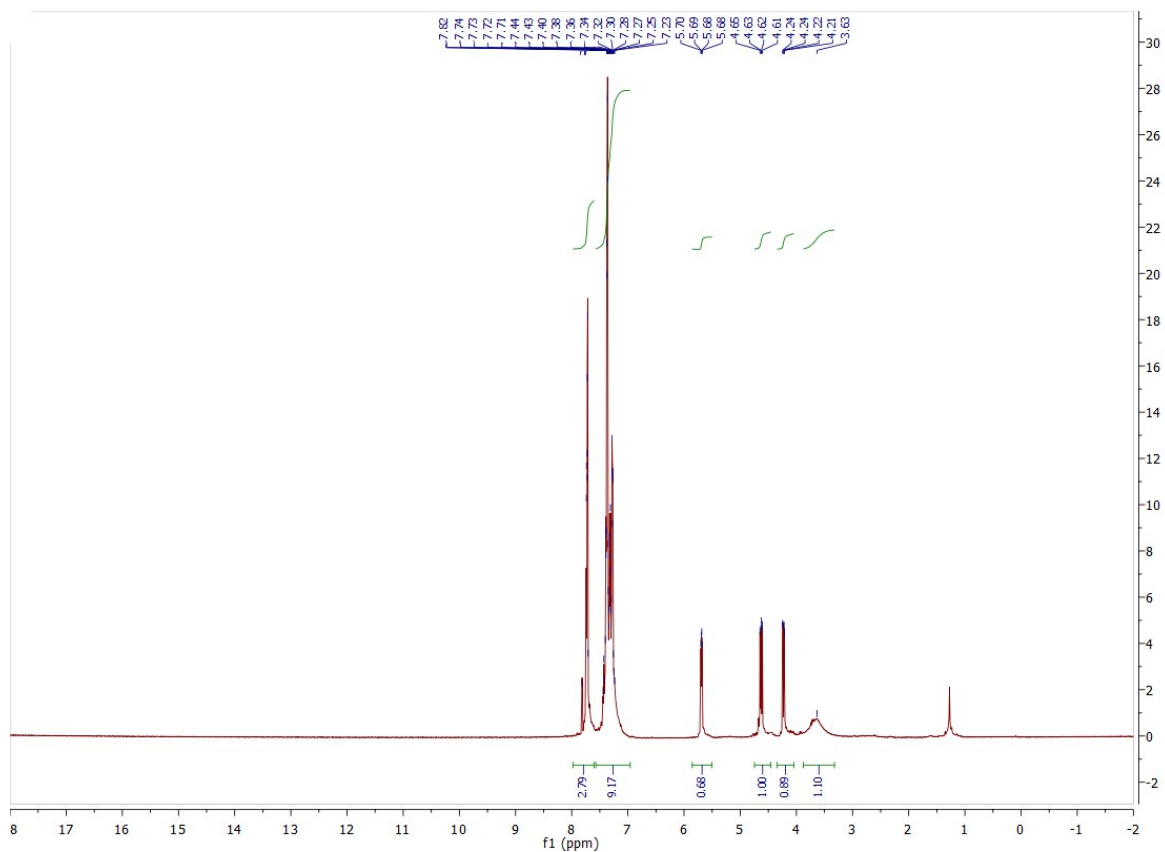


Figure S2. ¹H NMR Spectrum of 2-phenyl-2-(4-phenyl-1H-1,2,3-triazol-1-yl)ethane-1-thiol (**1b**)

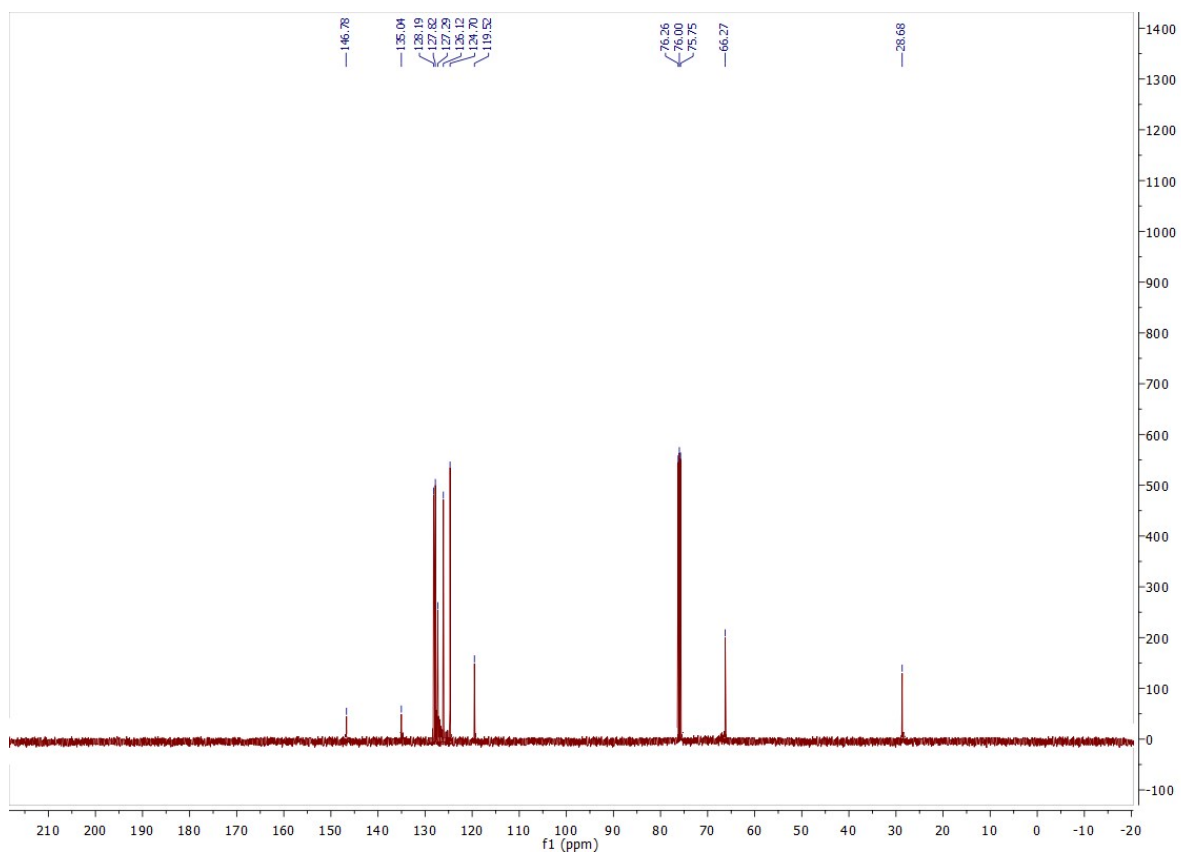


Figure S3. ¹³C NMR Spectrum of 2-phenyl-2-(4-phenyl-1H-1,2,3-triazol-1-yl)ethane-1-thiol (**1b**)
1-Phenoxy-3-(4-phenyl-1H-1,2,3-triazol-1-yl)propane-2-thiol (**2b**)

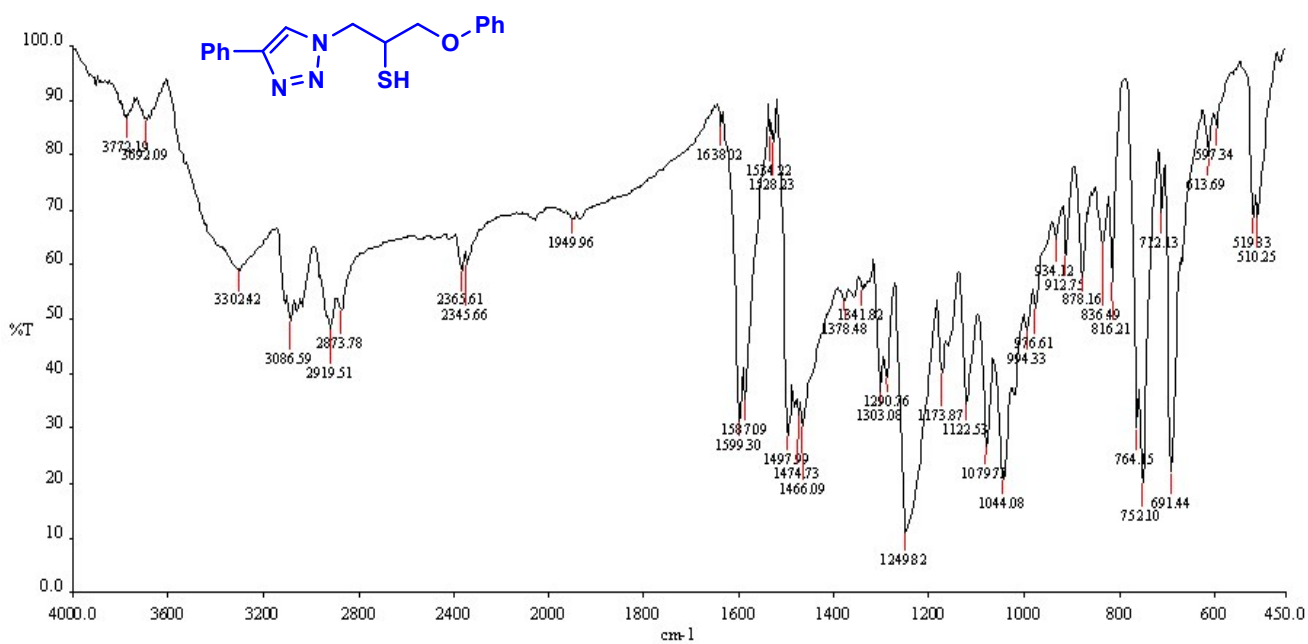


Figure S4. FT-IR Spectrum of 1-phenoxy-3-(4-phenyl-1H-1,2,3-triazol-1-yl)propane-2-thiol (2b)

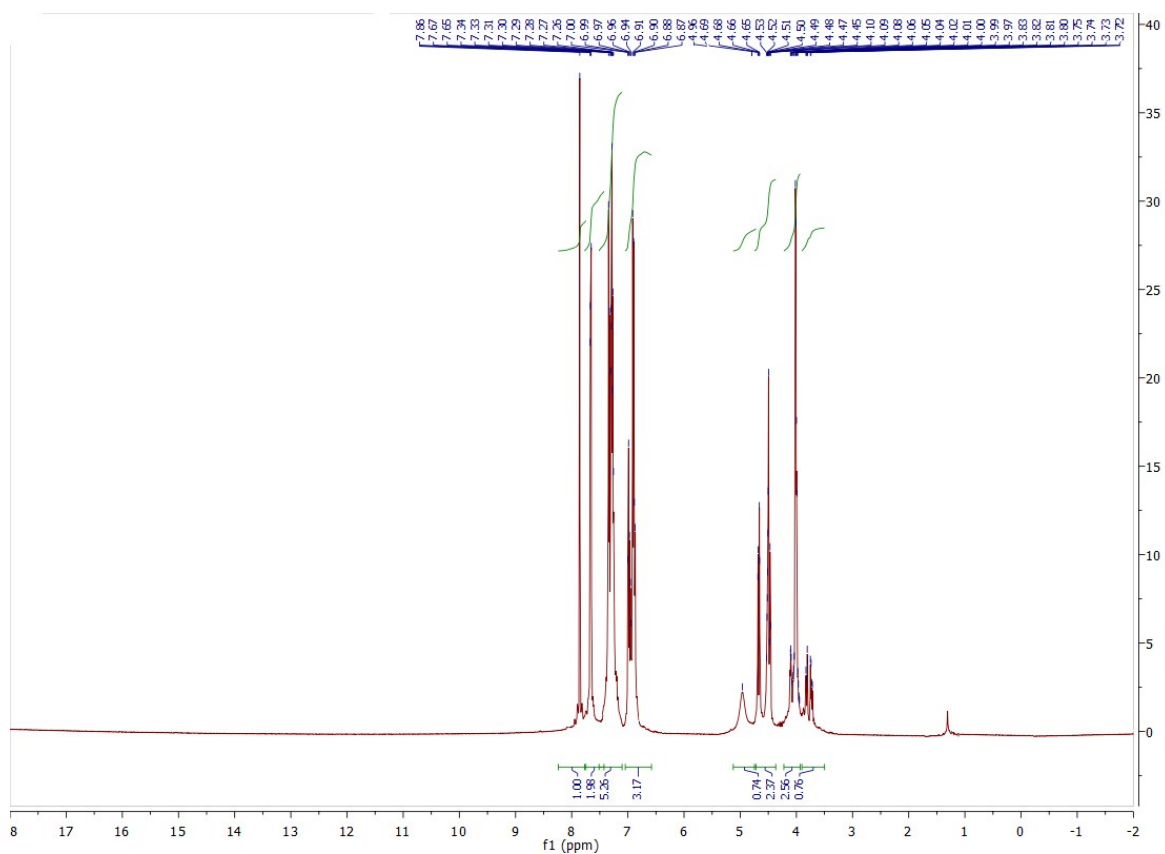


Figure S5. ¹H NMR Spectrum of 1-phenoxy-3-(4-phenyl-1H-1,2,3-triazol-1-yl)propane-2-thiol (2b)

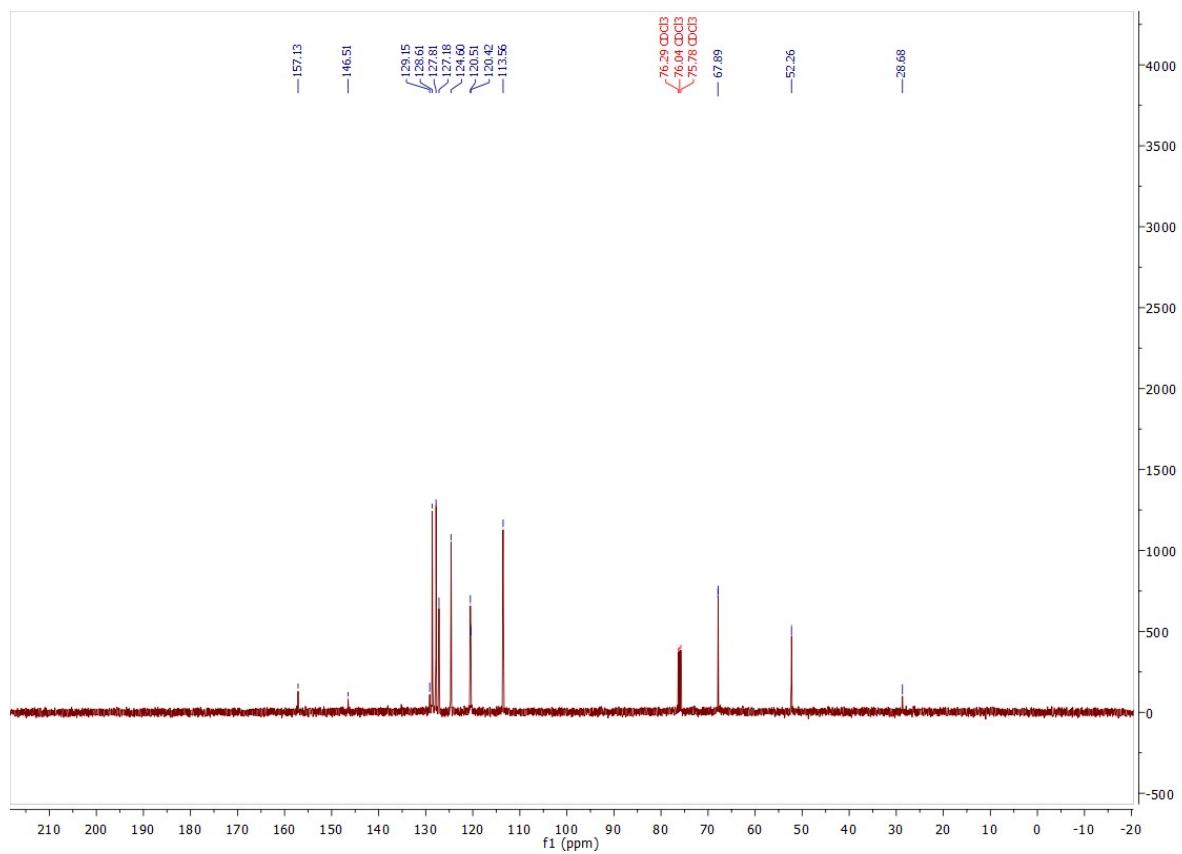
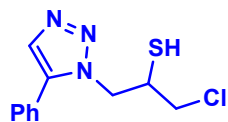


Figure S6. ¹³C NMR Spectrum of 1-phenoxy-3-(4-phenyl-1H-1,2,3-triazol-1-yl)propane-2-thiol (2b)

1-Chloro-3-(5-phenyl-1H-1,2,3-triazol-1-yl)propane-2-thiol (3b)



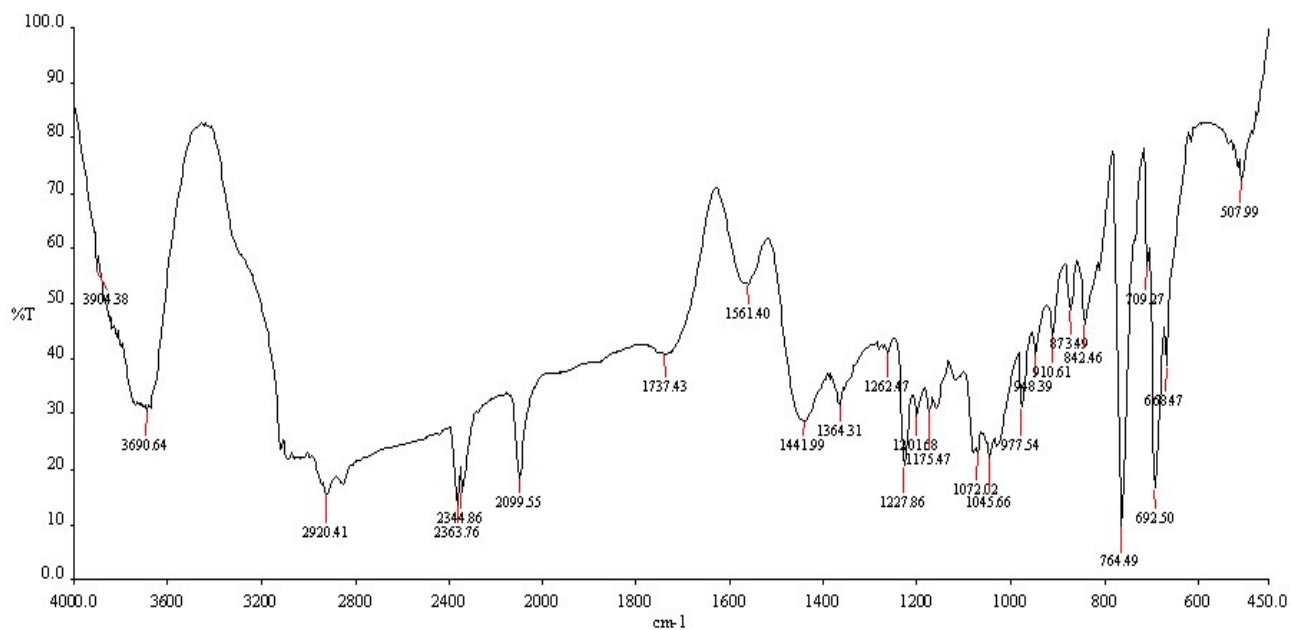


Figure S7. FT-IR Spectrum of 1-chloro-3-(5-phenyl-1H-1,2,3-triazol-1-yl)propane-2-thiol (3b)

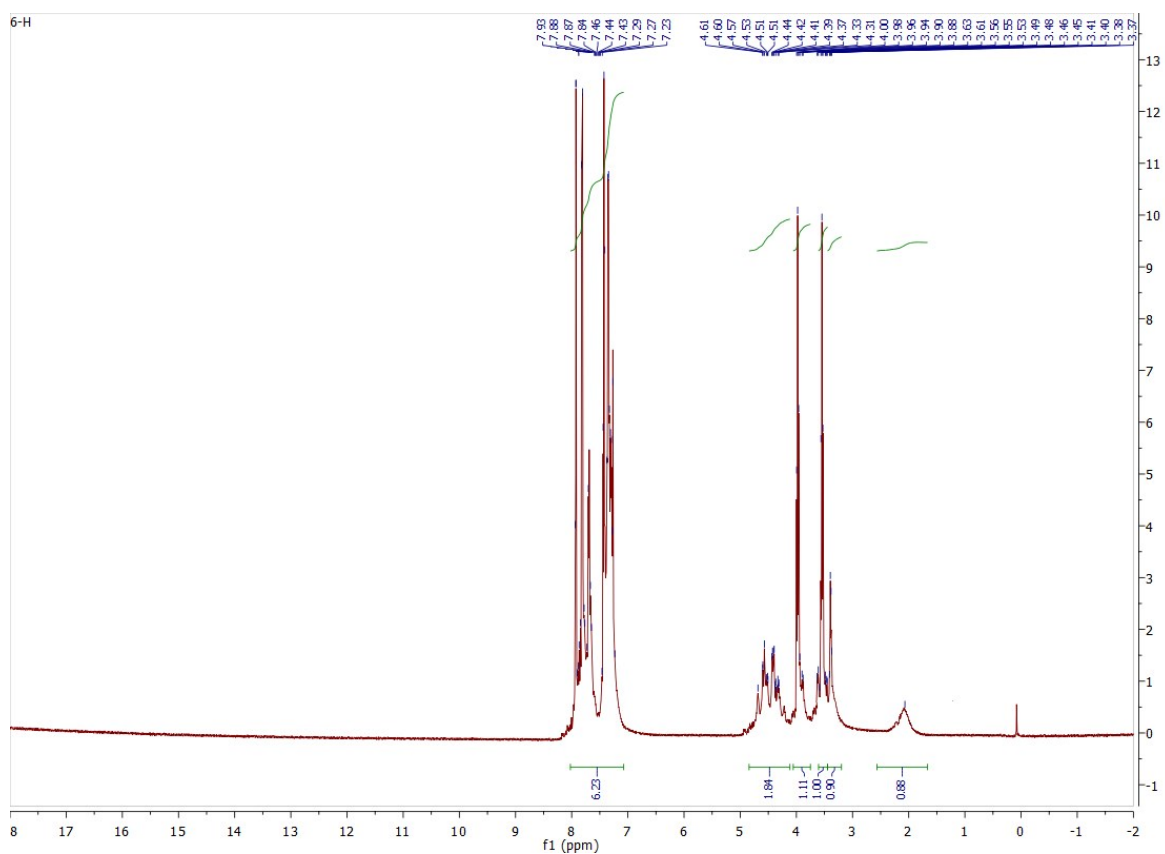


Figure S8. ¹H NMR Spectrum of 1-chloro-3-(5-phenyl-1H-1,2,3-triazol-1-yl)propane-2-thiol (3b)

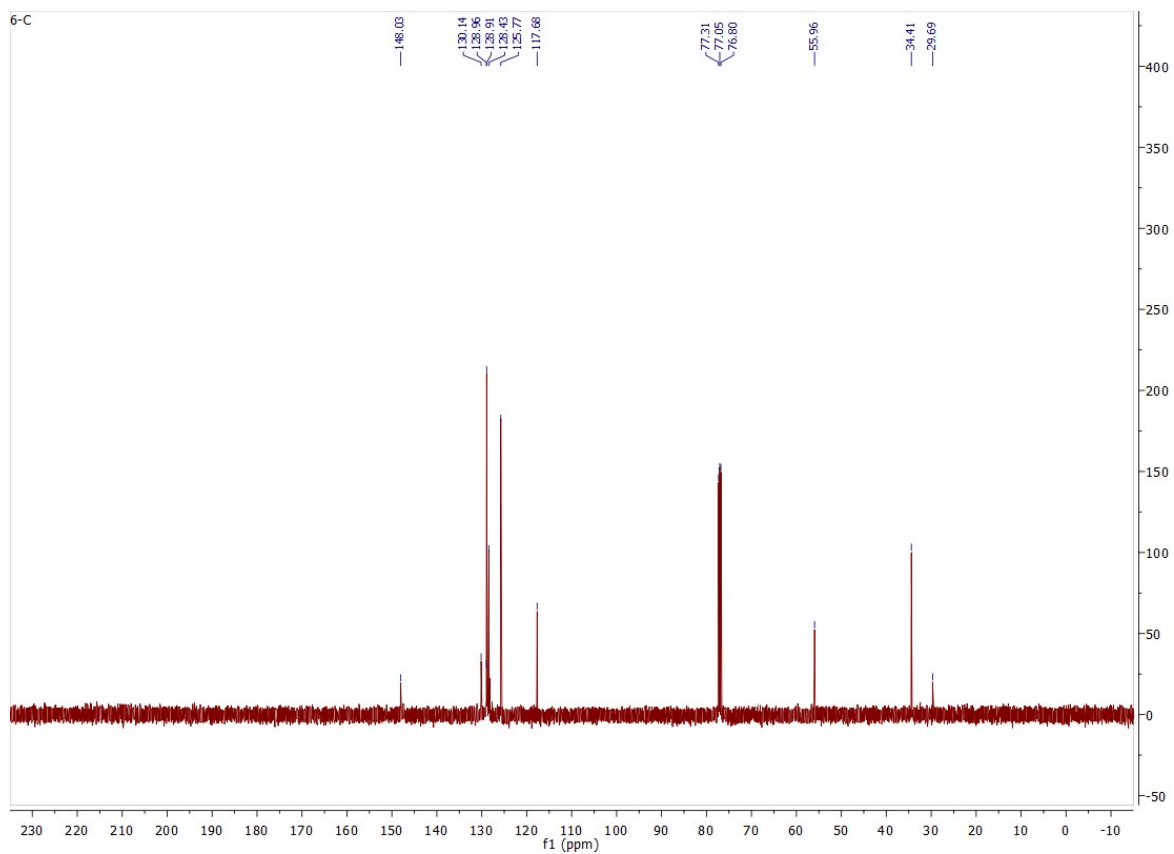
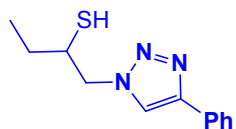


Figure S9. ^{13}C NMR Spectrum of 1-chloro-3-(5-phenyl-1H-1,2,3-triazol-1-yl)propane-2-thiol (3b)

1-(4-Phenyl-1H-1,2,3-triazol-1-yl)butane-2-thiol (4b)



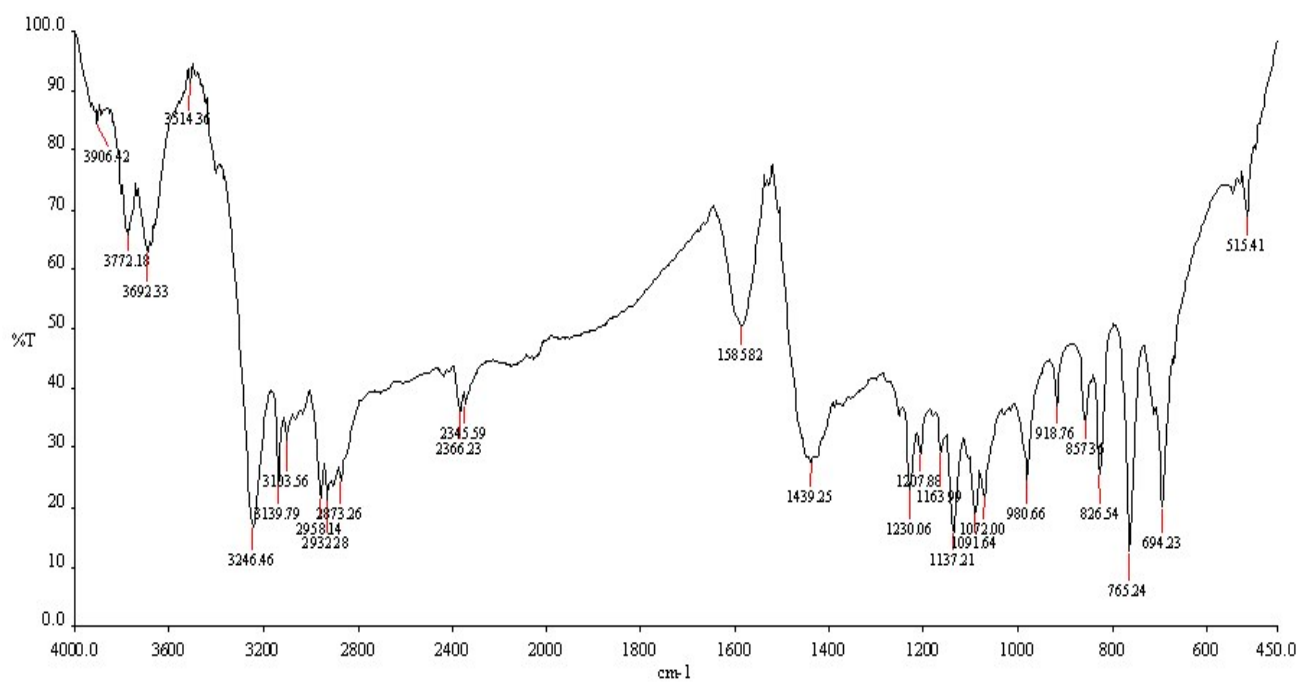


Figure S10. FT-IR Spectrum of 1-(4-phenyl-1*H*-1,2,3-triazol-1-yl)butane-2-thiol (4b)

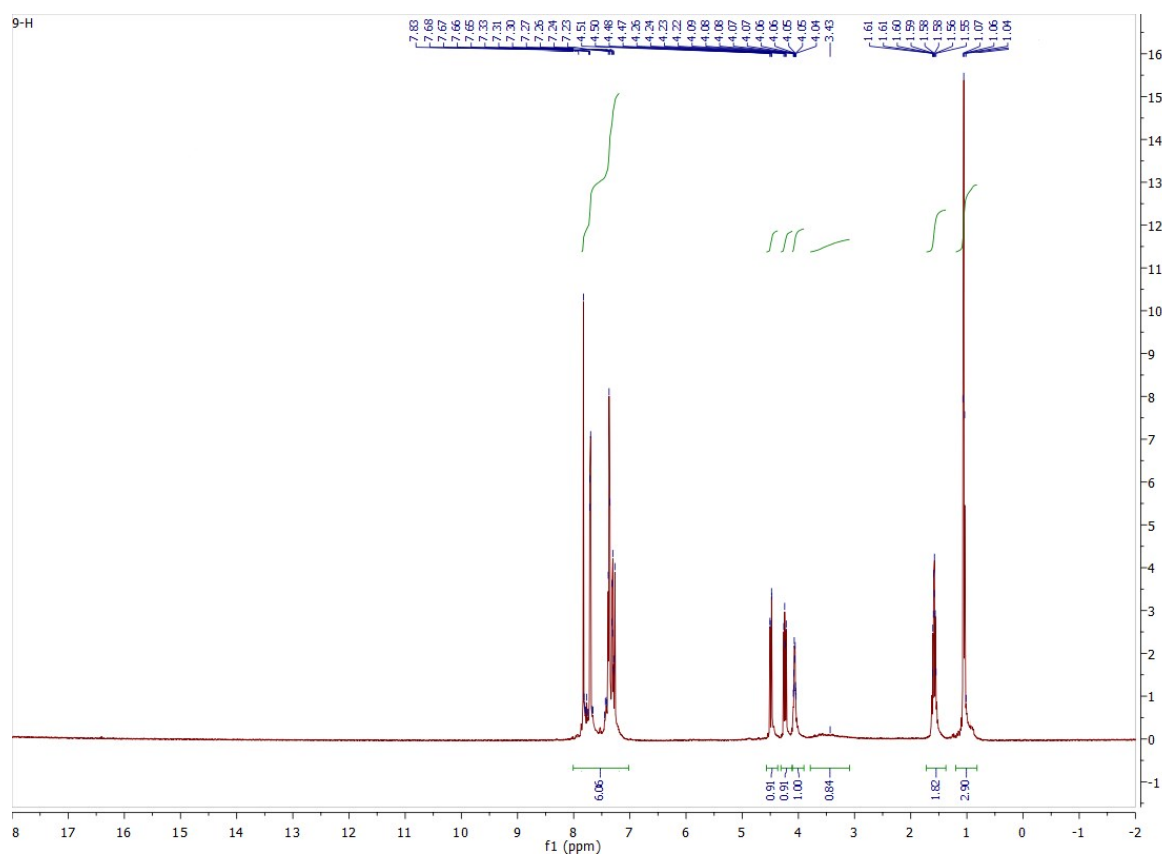


Figure S11. ¹H NMR Spectrum of 1-(4-phenyl-1*H*-1,2,3-triazol-1-yl)butane-2-thiol (4b)

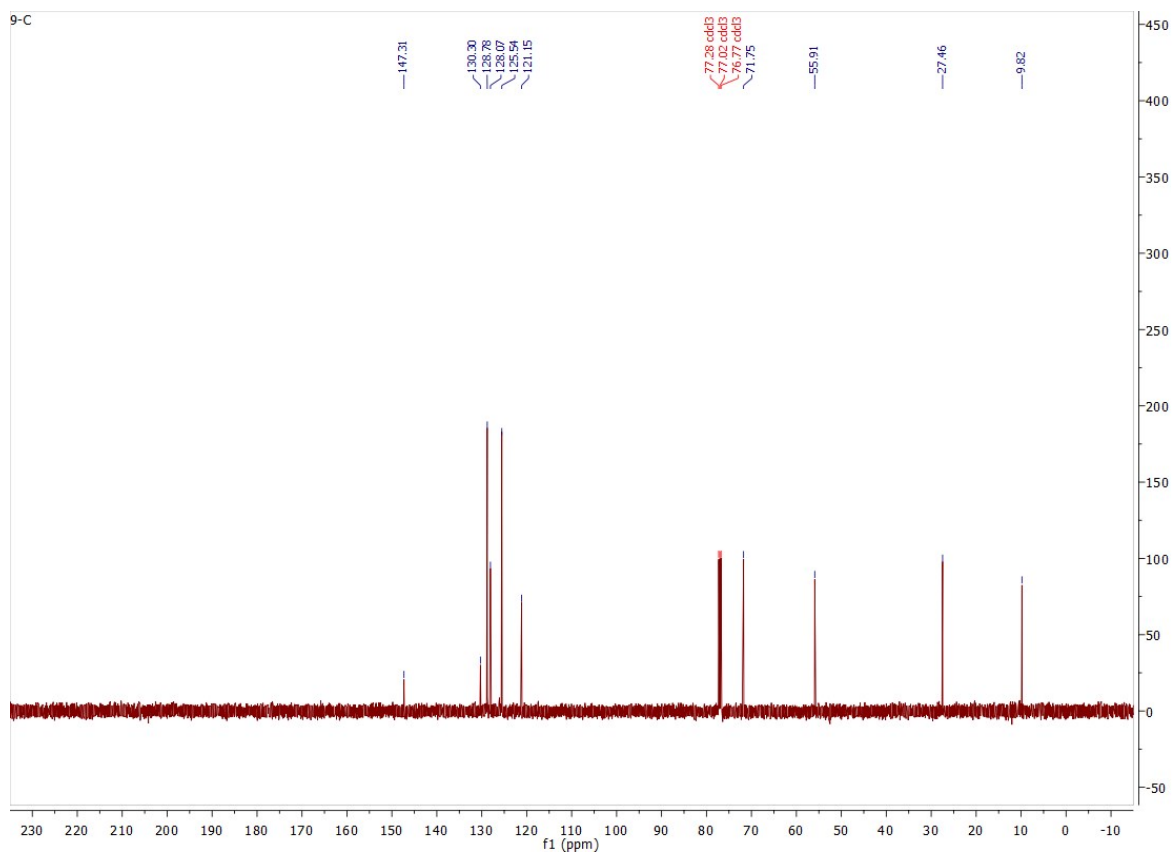


Figure S12. ^{13}C NMR Spectrum of 1-(4-phenyl-1*H*-1,2,3-triazol-1-yl)butane-2-thiol (**4b**)

*1-Isopropoxy-3-(4-phenyl-1*H*-1,2,3-triazol-1-yl)propane-2-thiol (5b)*

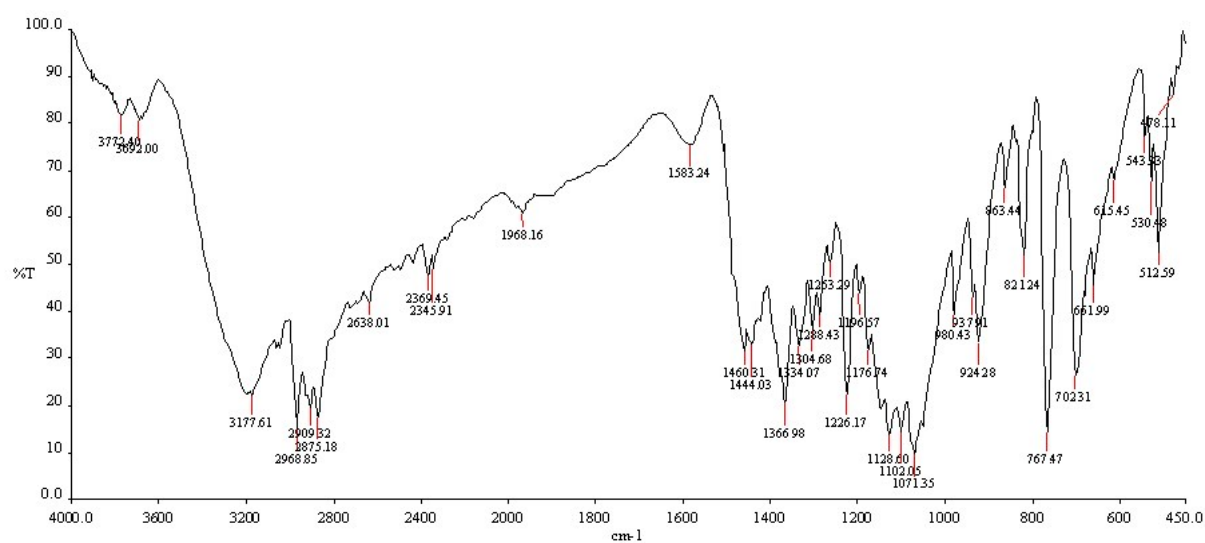
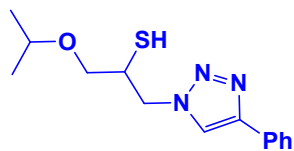


Figure S13. FT-IR Spectrum of 1-isopropoxy-3-(4-phenyl-1*H*-1,2,3-triazol-1-yl)propane-2-thiol (**5b**)

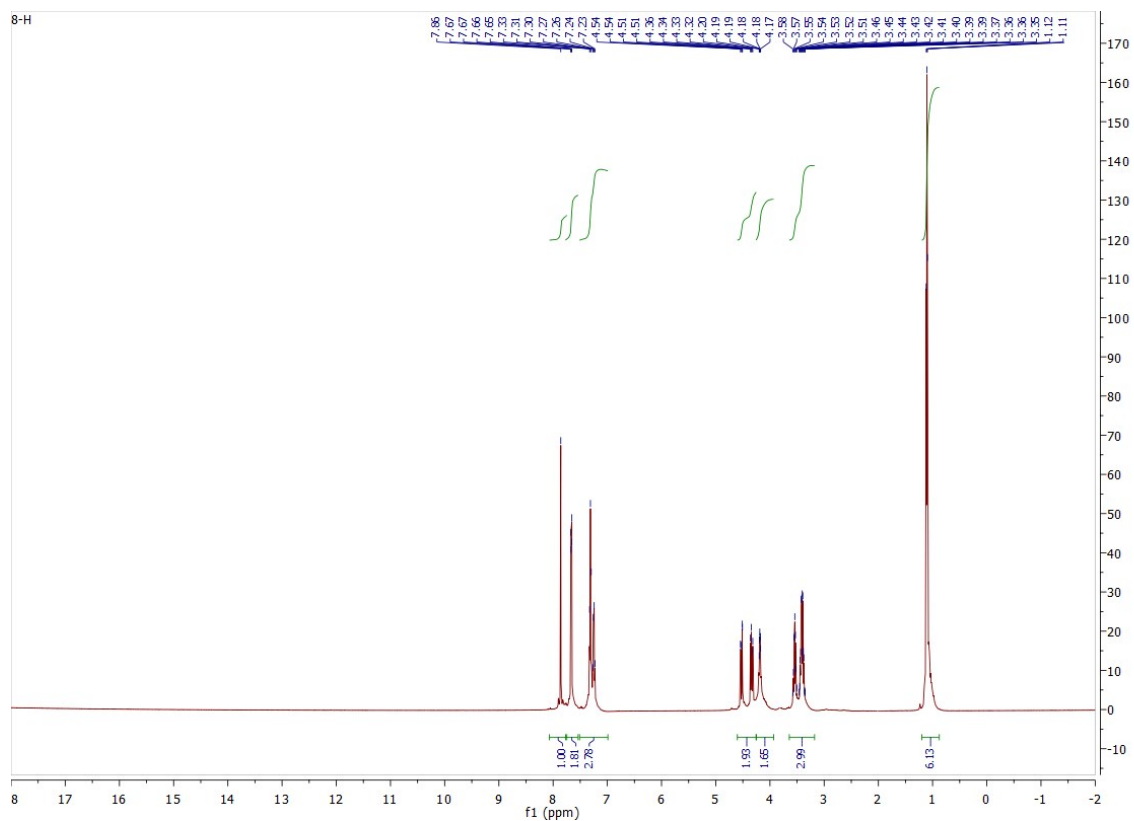


Figure S14. ^1H NMR Spectrum of 1-isopropoxy-3-(4-phenyl-1*H*-1,2,3-triazol-1-yl)propane-2-thiol (5b)

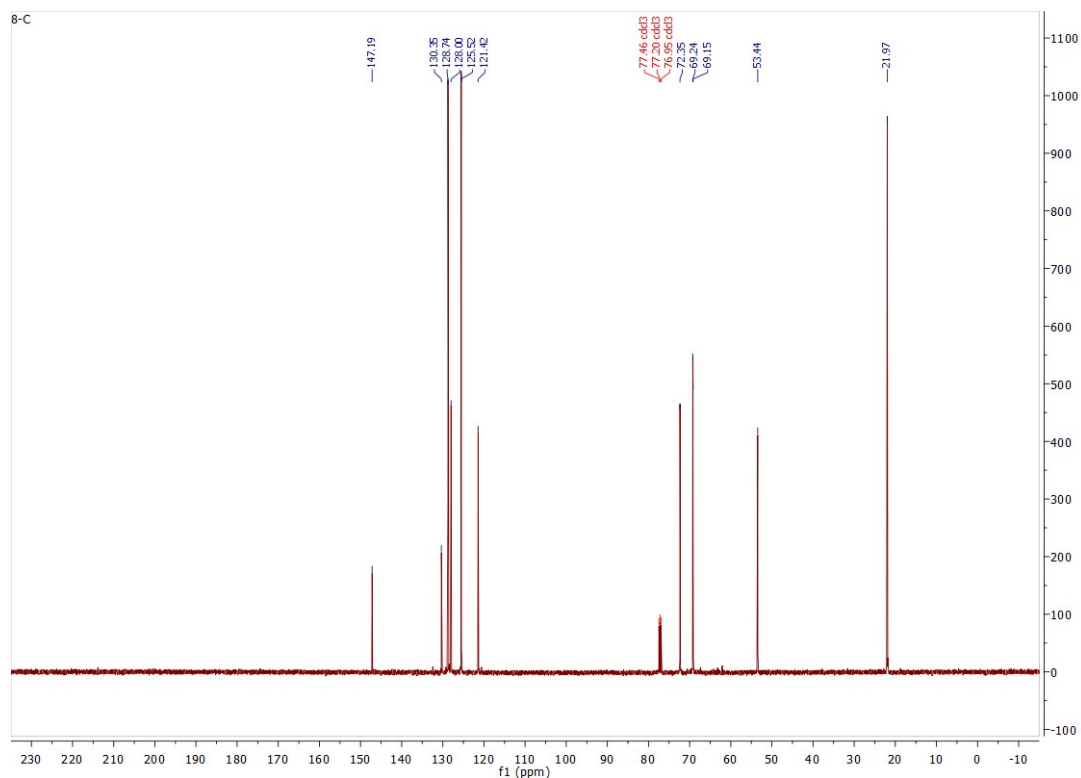


Figure S15. ^{13}C NMR Spectrum of 1-isopropoxy-3-(4-phenyl-1*H*-1,2,3-triazol-1-yl)propane-2-thiol (5b)

2-(4-Phenyl-1H-1,2,3-triazol-1-yl)cyclohexane-1-thiol (6b)

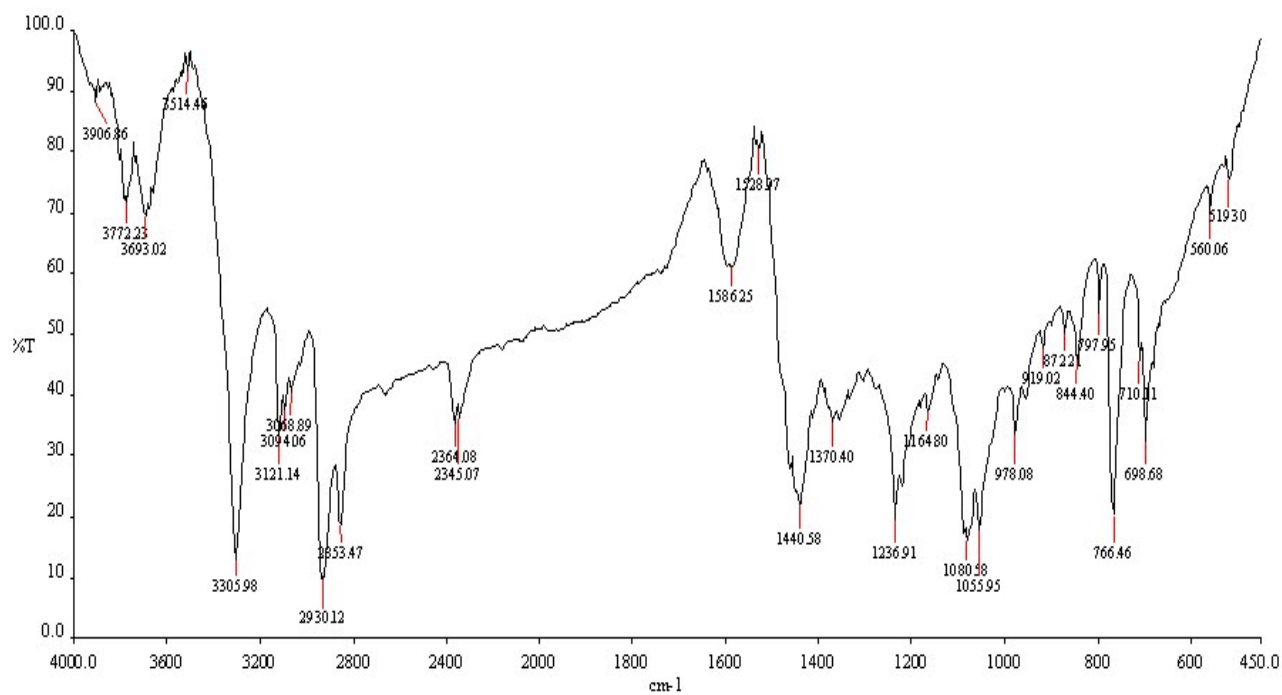
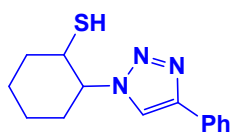


Figure S16. FT-IR Spectrum of 2-(4-phenyl-1H-1,2,3-triazol-1-yl)cyclohexane-1-thiol (6b)

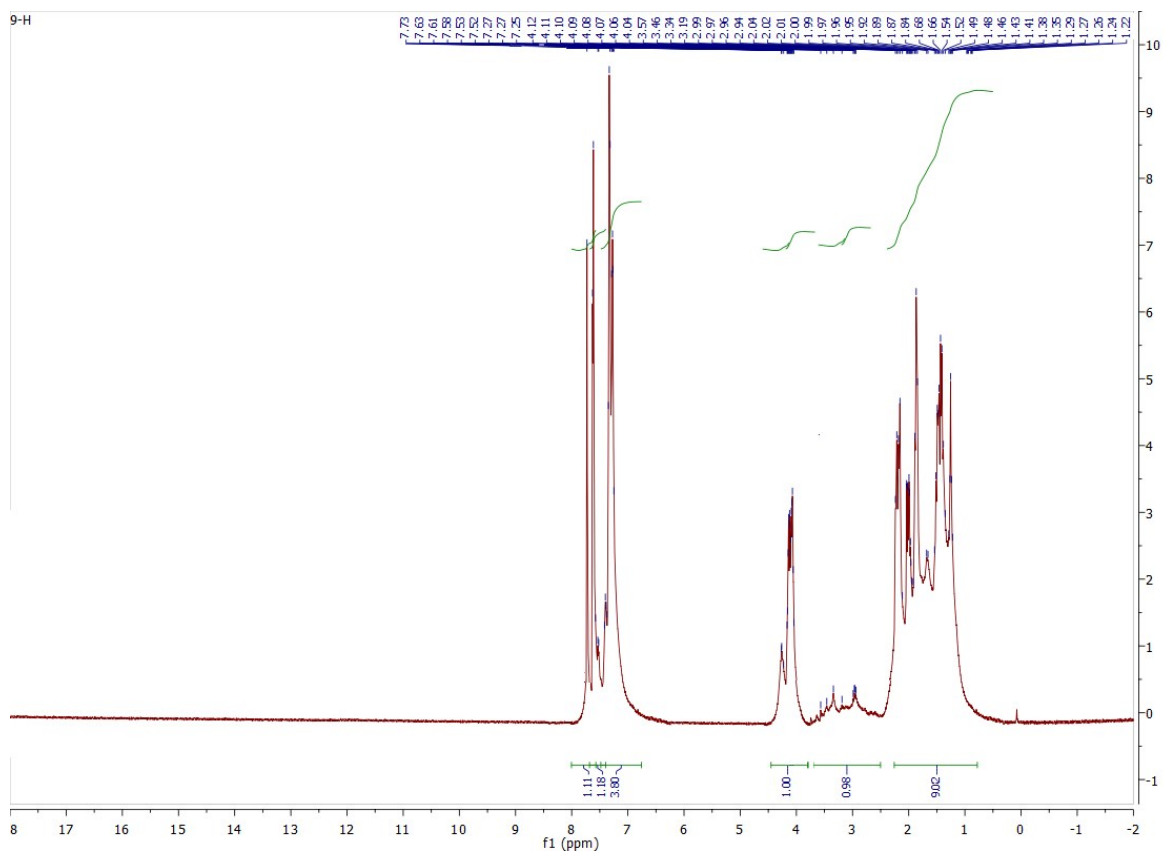


Figure S17. ¹H NMR Spectrum of 2-(4-phenyl-1*H*-1,2,3-triazol-1-yl)cyclohexane-1-thiol (**6b**)

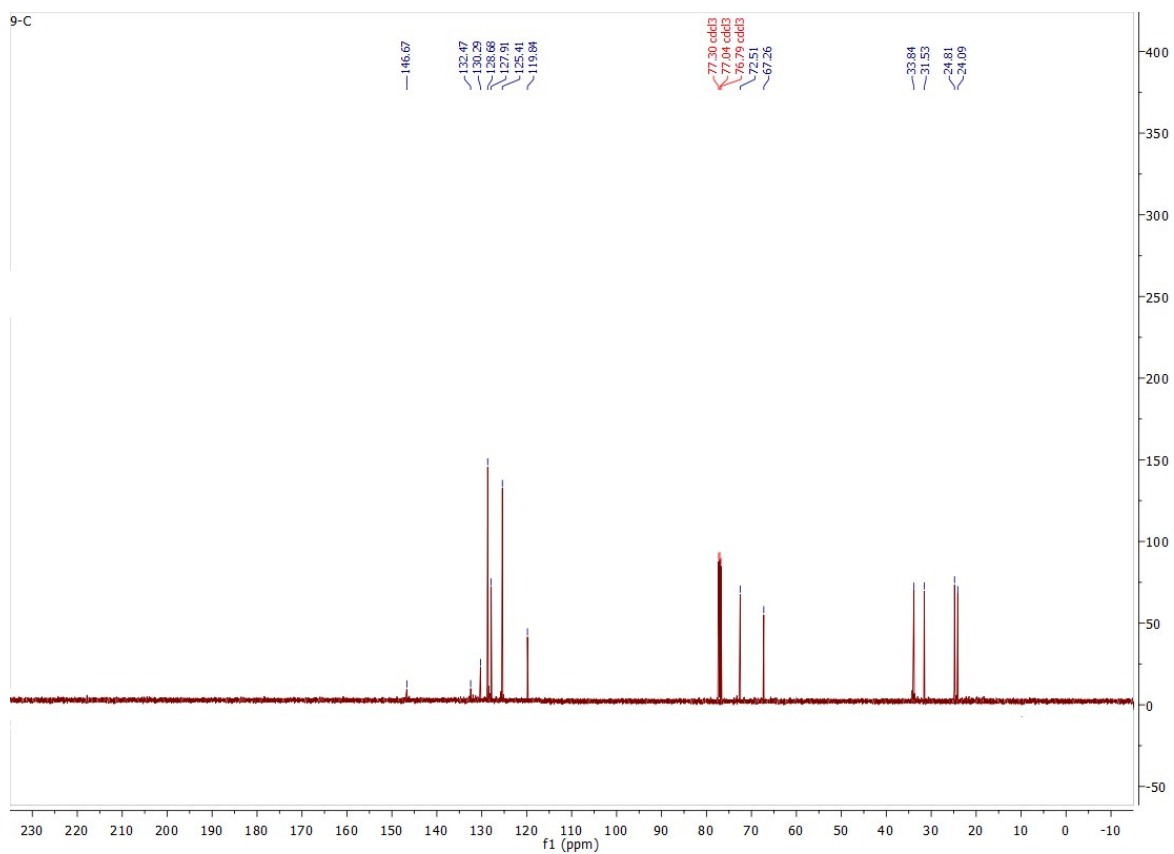


Figure S18. ¹³C NMR Spectrum of 2-(4-phenyl-1*H*-1,2,3-triazol-1-yl)cyclohexane-1-thiol (**6b**)

1-(Allyloxy)-3-(4-phenyl-1H-1,2,3-triazol-1-yl)propane-2-thiol (7b)

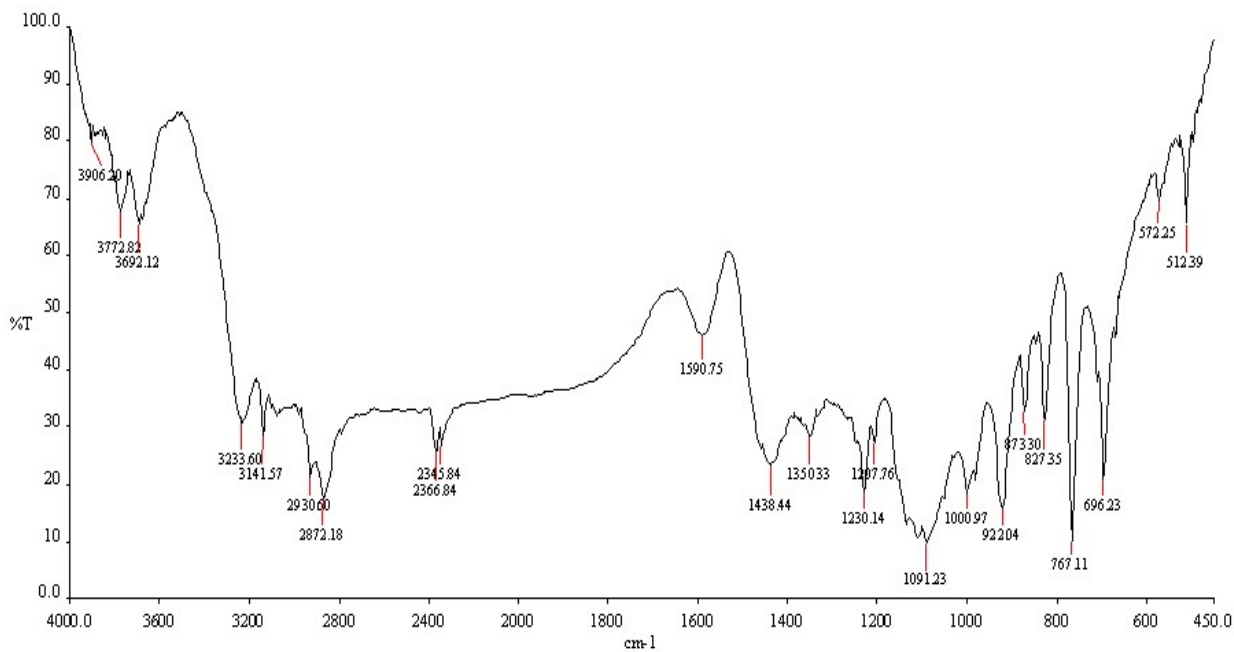
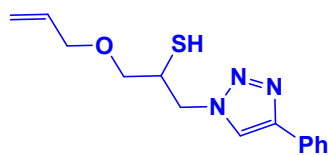


Figure S19. FT-IR Spectrum of 1-(allyloxy)-3-(4-phenyl-1H-1,2,3-triazol-1-yl)propane-2-thiol (7b)

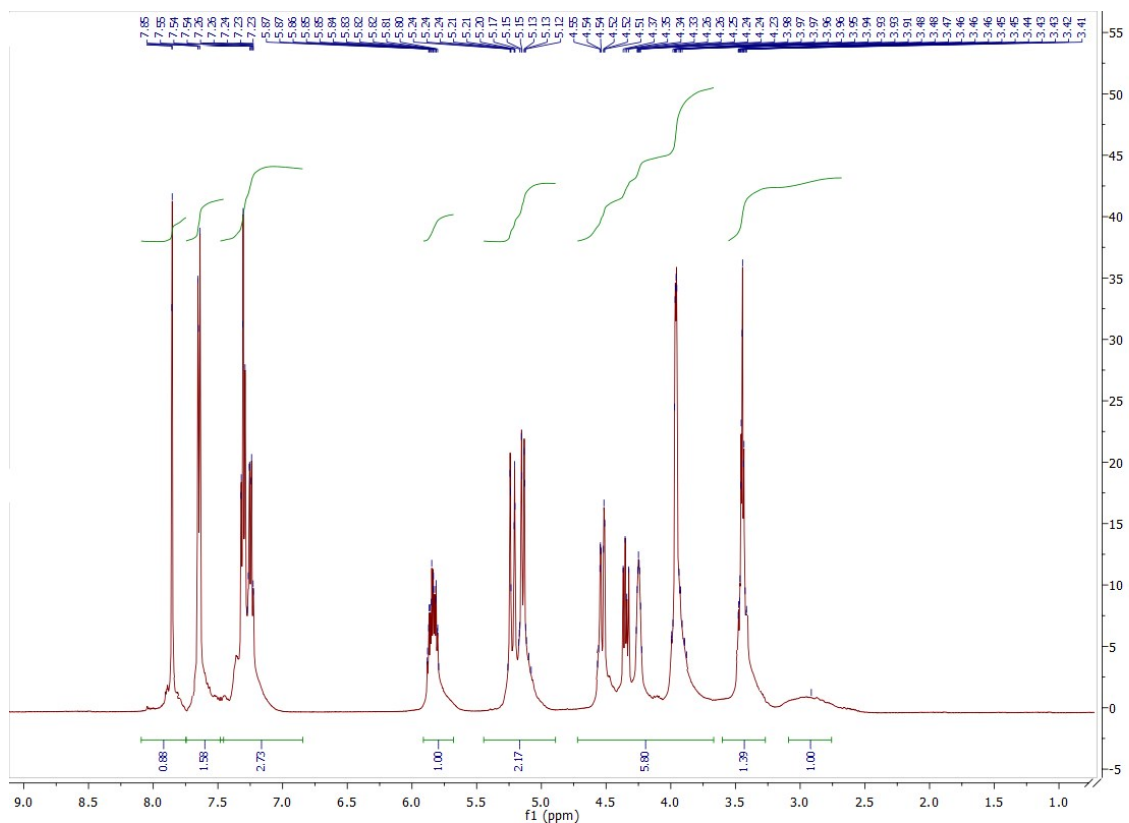


Figure S20. ¹H NMR Spectrum of 1-(allyloxy)-3-(4-phenyl-1*H*-1,2,3-triazol-1-yl)propane-2-thiol (7b)

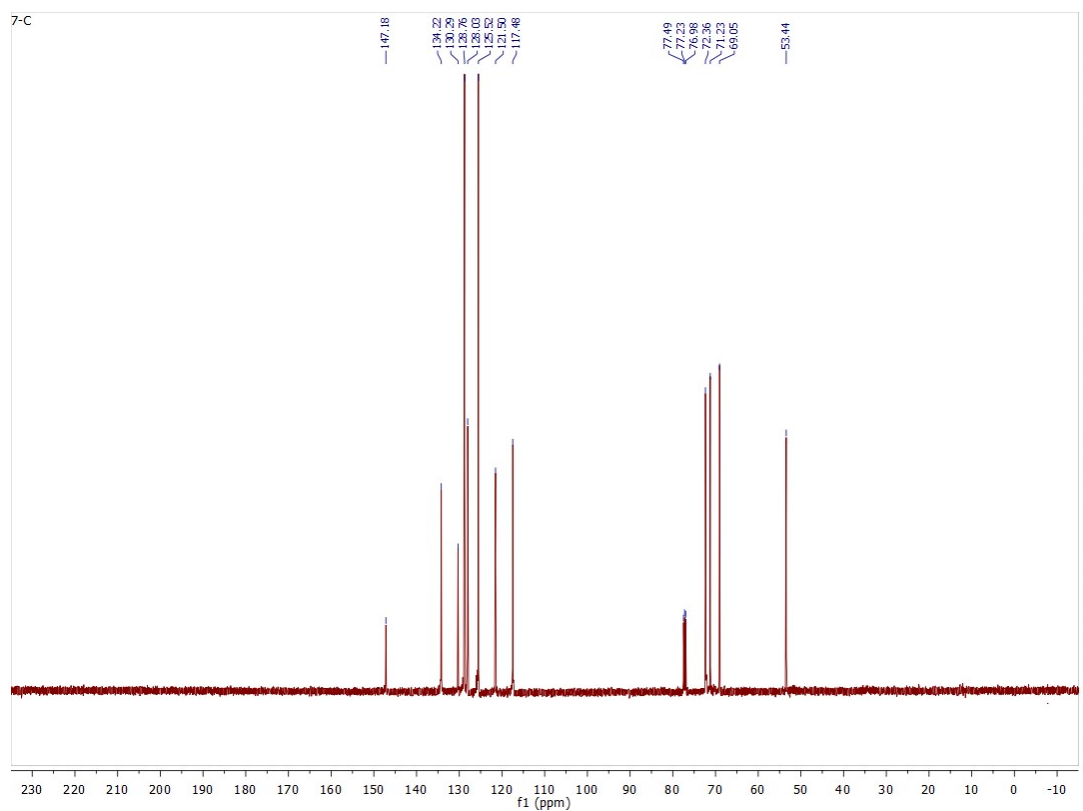


Figure S21. ¹³C NMR Spectrum of 1-(allyloxy)-3-(4-phenyl-1*H*-1,2,3-triazol-1-yl)propane-2-thiol (7b)

2-Mercapto-3-(4-phenyl-1H-1,2,3-triazol-1-yl)propyl methacrylate (8b)

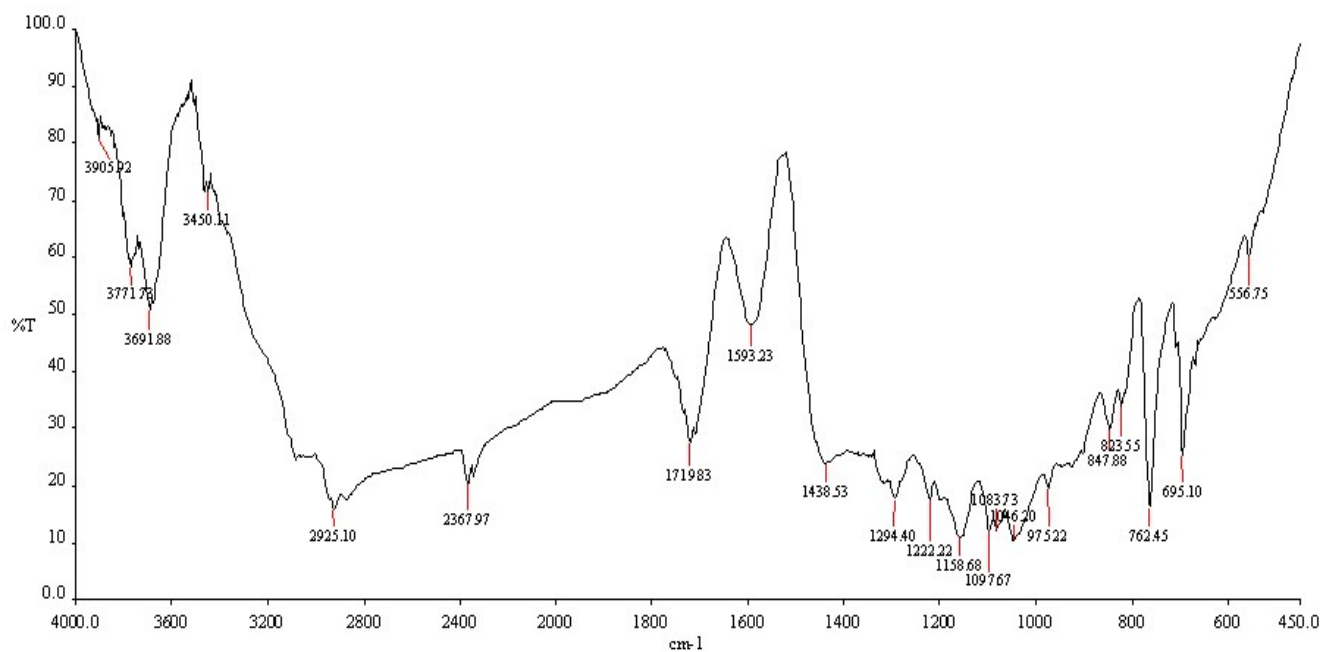
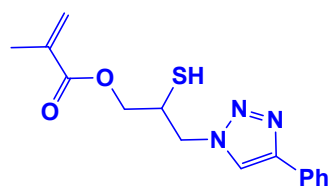


Figure S22. FT-IR Spectrum of 2-mercapto-3-(4-phenyl-1H-1,2,3-triazol-1-yl)propyl methacrylate (8b)

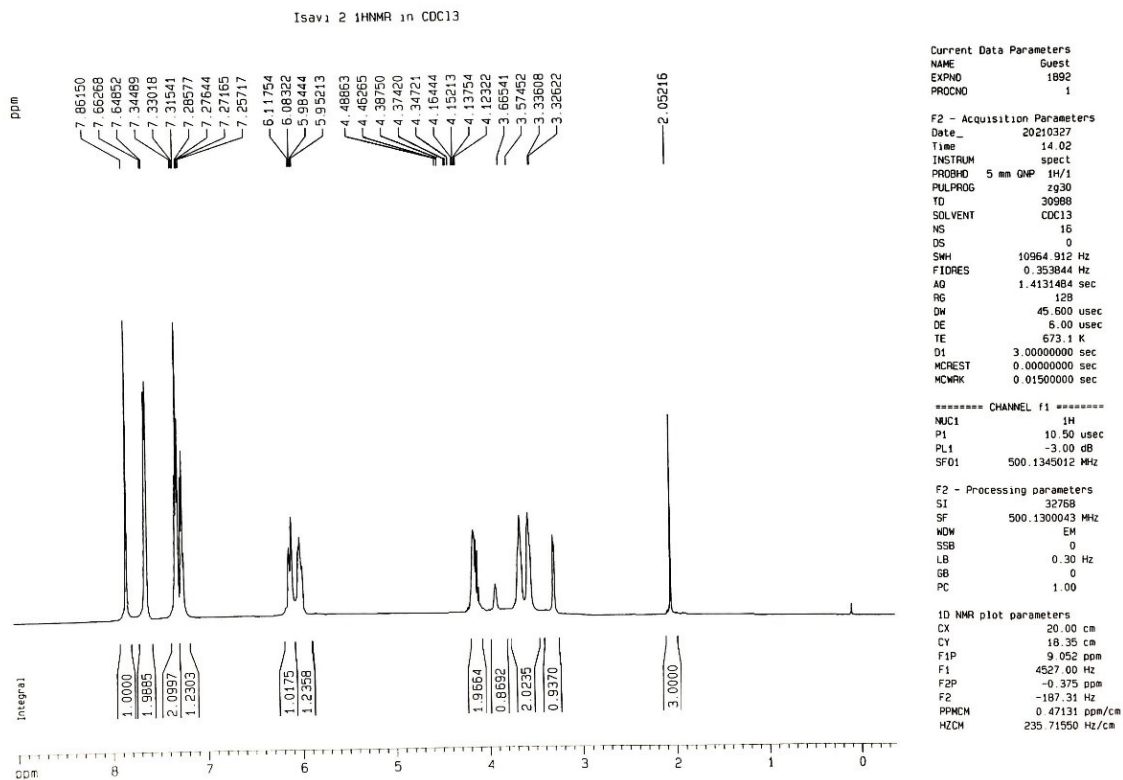


Figure S23. ¹H NMR Spectrum of 2-mercapto-3-(4-phenyl-1H-1,2,3-triazol-1-yl)propyl methacrylate (8b)

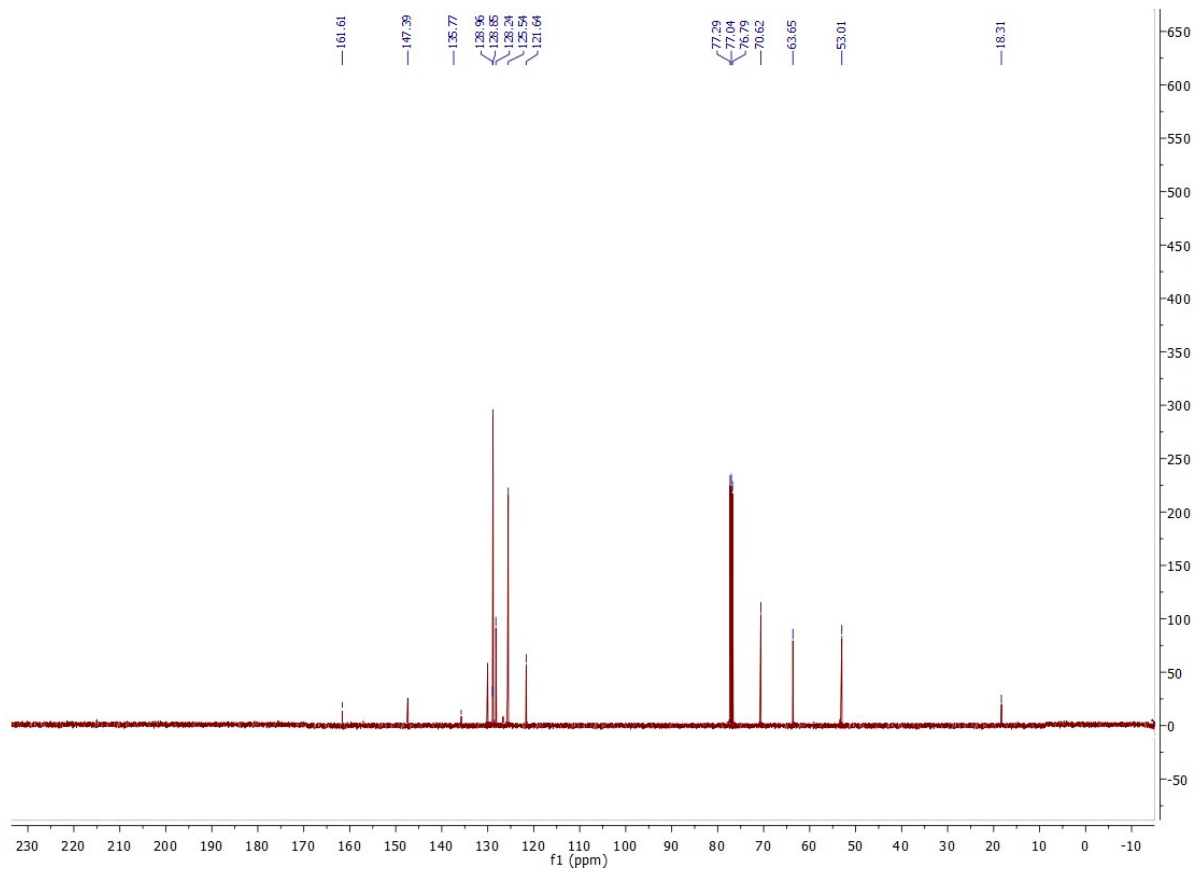
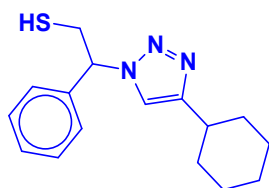


Figure S24. ^{13}C NMR Spectrum of 2-mercapto-3-(4-phenyl-1H-1,2,3-triazol-1-yl)propyl methacrylate (8b)

2-(4-Cyclohexyl-1H-1,2,3-triazol-1-yl)-2-phenylethane-1-thiol (9b)



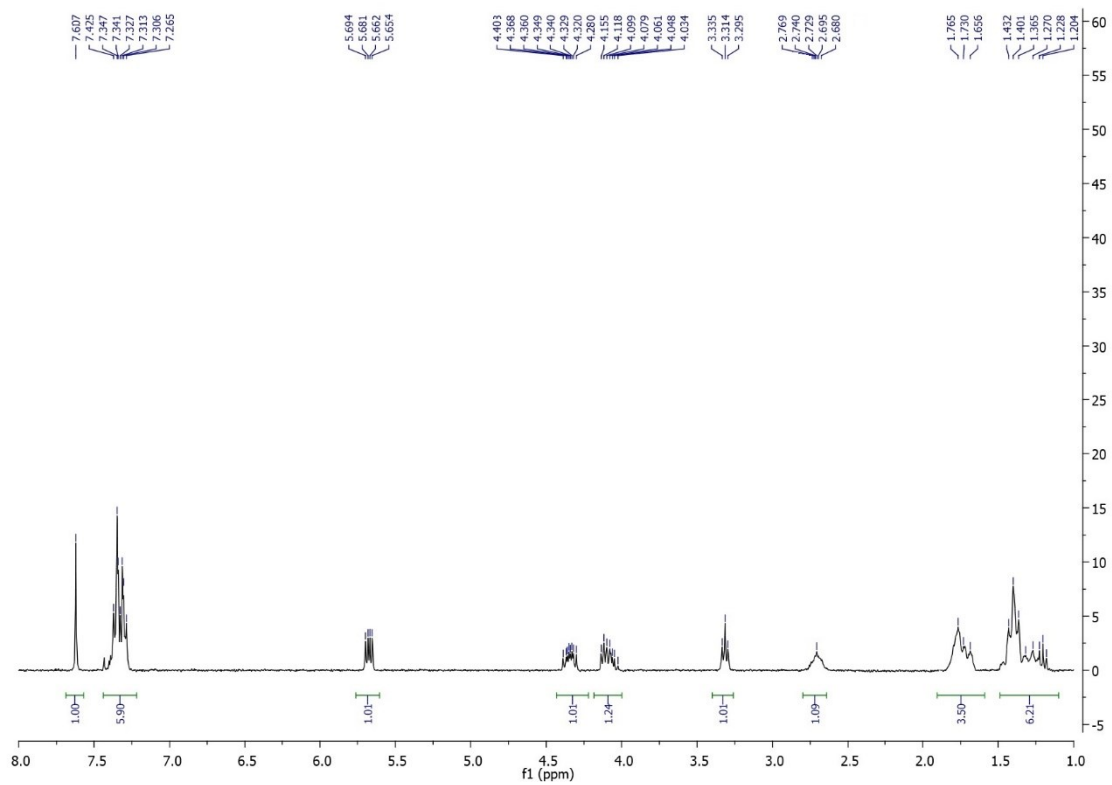


Figure S25. ^1H NMR Spectrum of 2-(4-cyclohexyl-1*H*-1,2,3-triazol-1-yl)-2-phenylethane-1-thiol (**9b**)

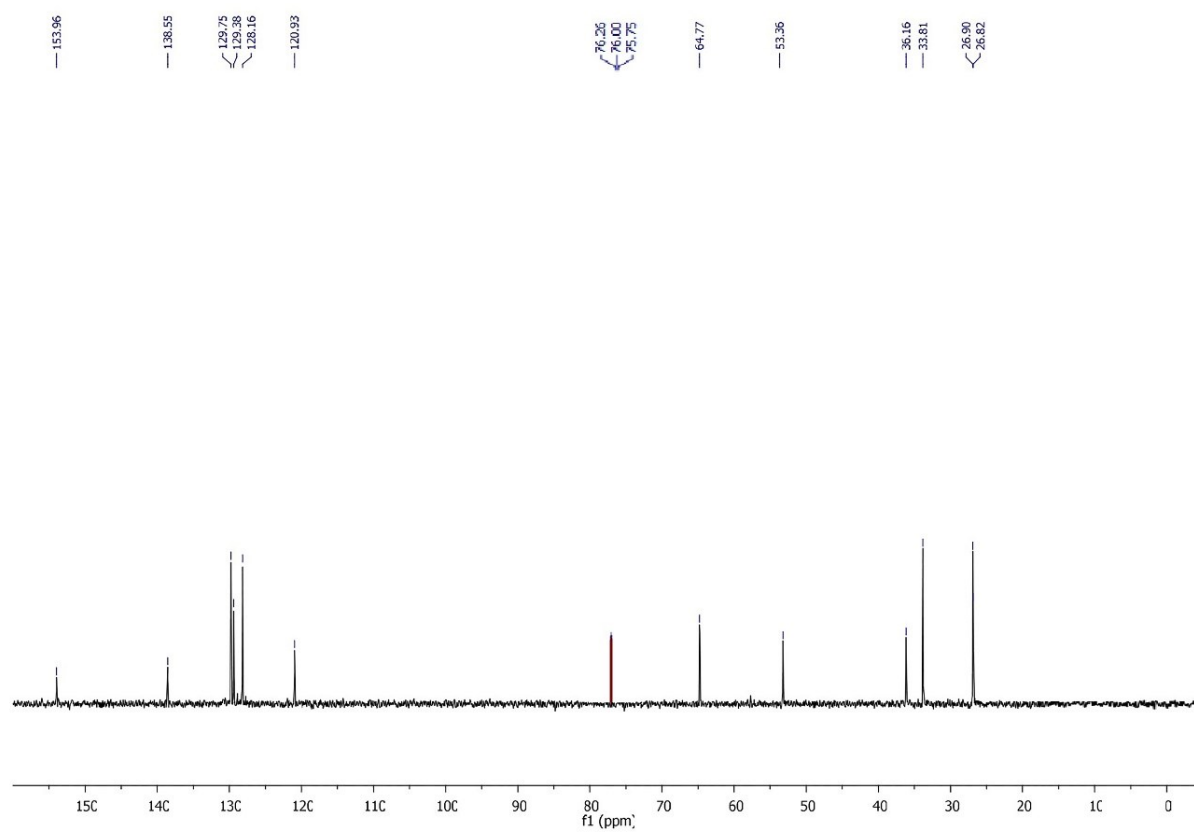
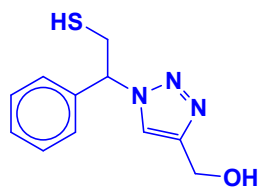


Figure S26. ^{13}C NMR Spectrum of 2-(4-cyclohexyl-1H-1,2,3-triazol-1-yl)-2-phenylethane-1-thiol (9b)

(1-(2-Mercapto-1-phenylethyl)-1H-1,2,3-triazol-4-yl)methanol (10b)



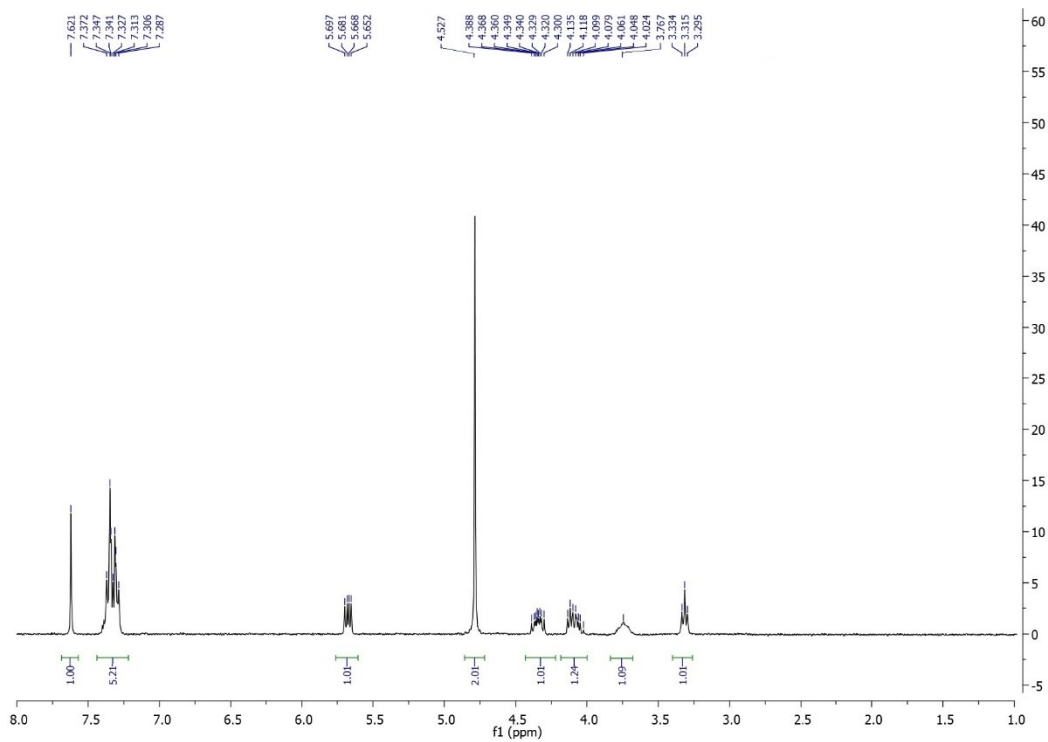


Figure S27. ^1H NMR Spectrum of (1-(2-mercapto-1-phenylethyl)-1*H*-1,2,3-triazol-4-yl)methanol (10b)

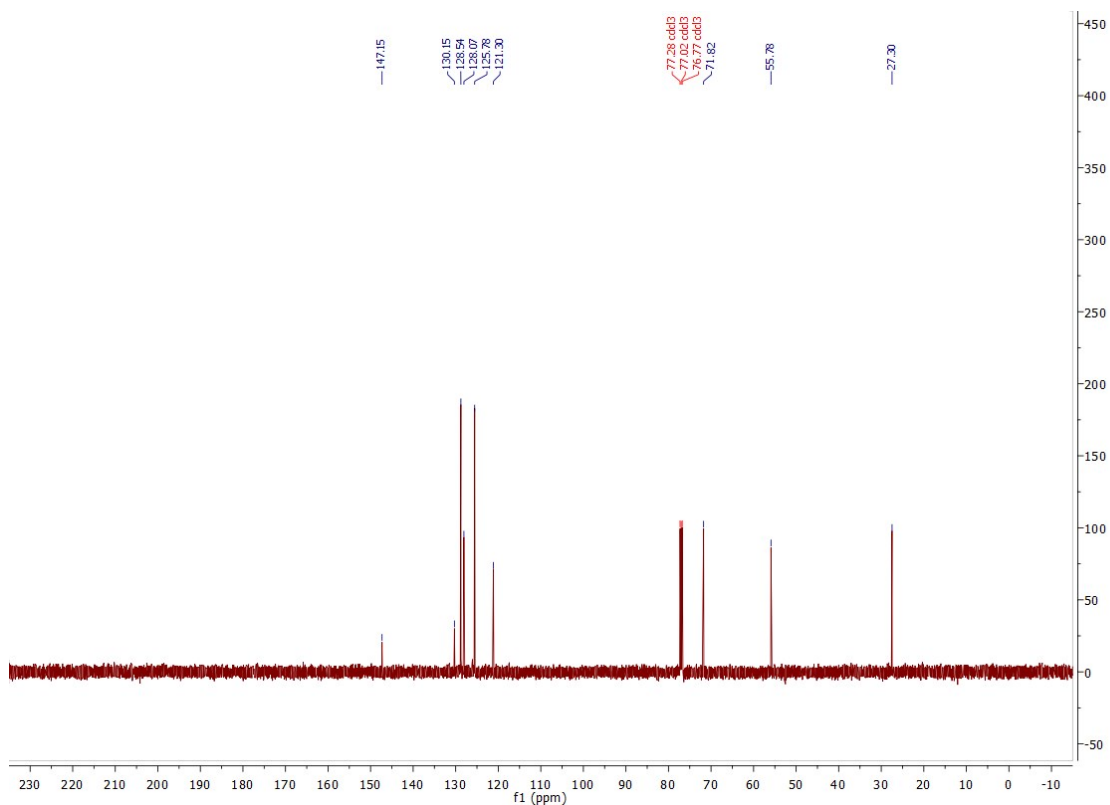


Figure S28. ^{13}C NMR Spectrum of (1-(2-mercapto-1-phenylethyl)-1*H*-1,2,3-triazol-4-yl)methanol (10b)

2-(4-(4-Methoxyphenyl)-1H-1,2,3-triazol-1-yl)-2-phenylethane-1-thiol (11b)

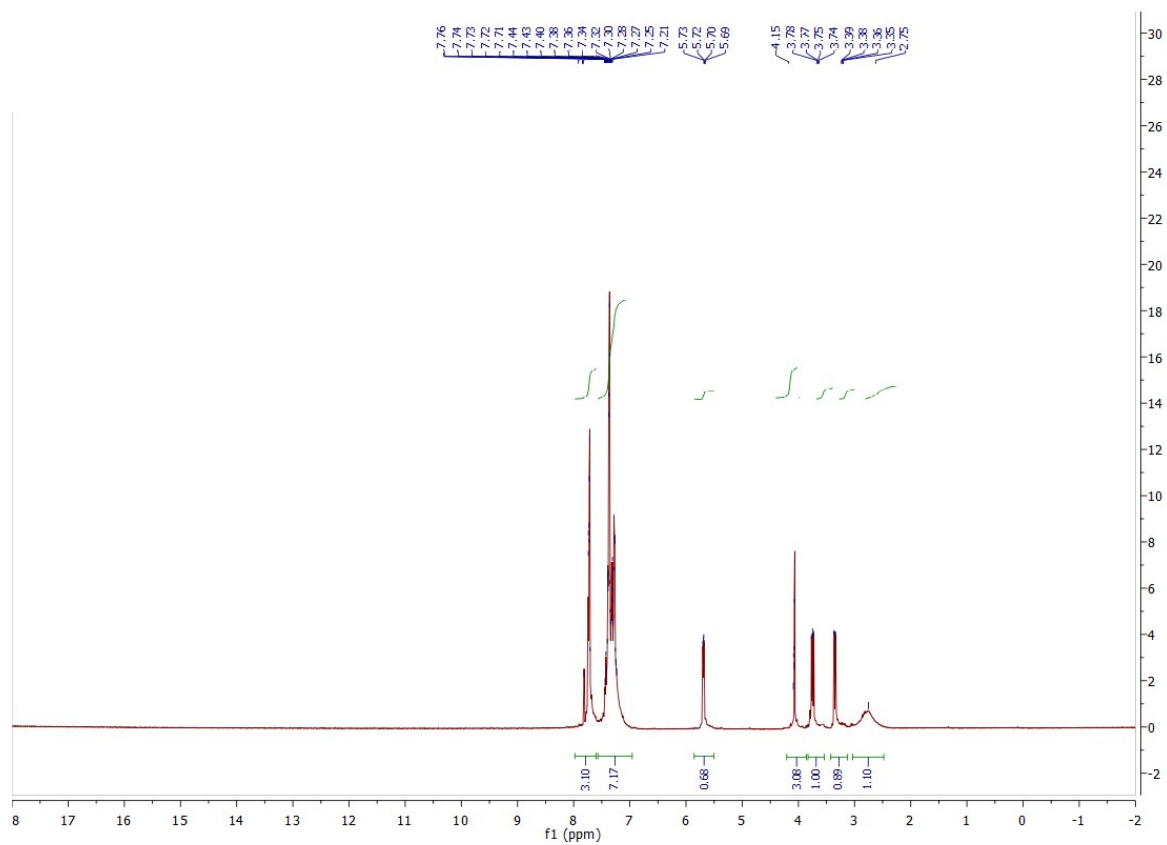
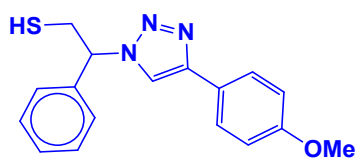


Figure S29. ¹H NMR Spectrum of 2-(4-(4-methoxyphenyl)-1H-1,2,3-triazol-1-yl)-2-phenylethane-1-thiol (11b)

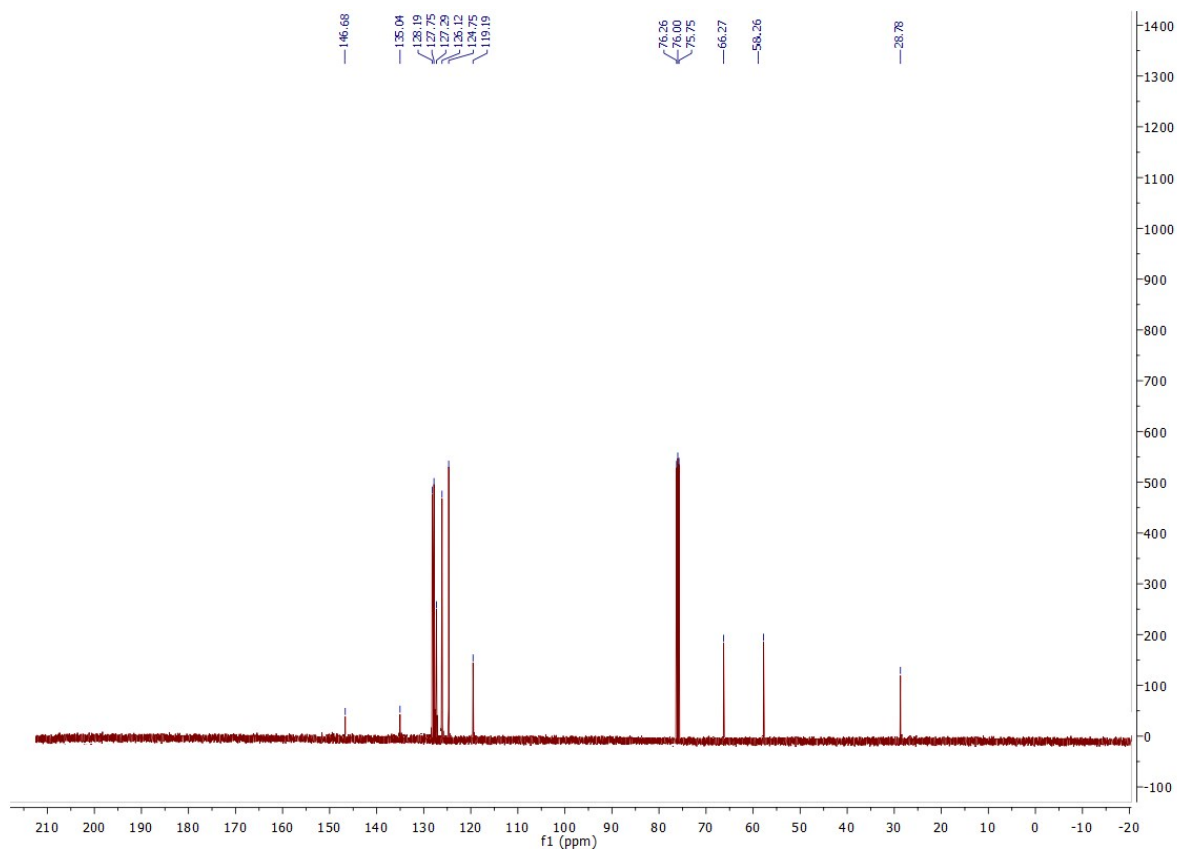


Figure S30. ^{13}C NMR Spectrum of 2-(4-(4-methoxyphenyl)-1H-1,2,3-triazol-1-yl)-2-phenylethane-1-thiol (11b)

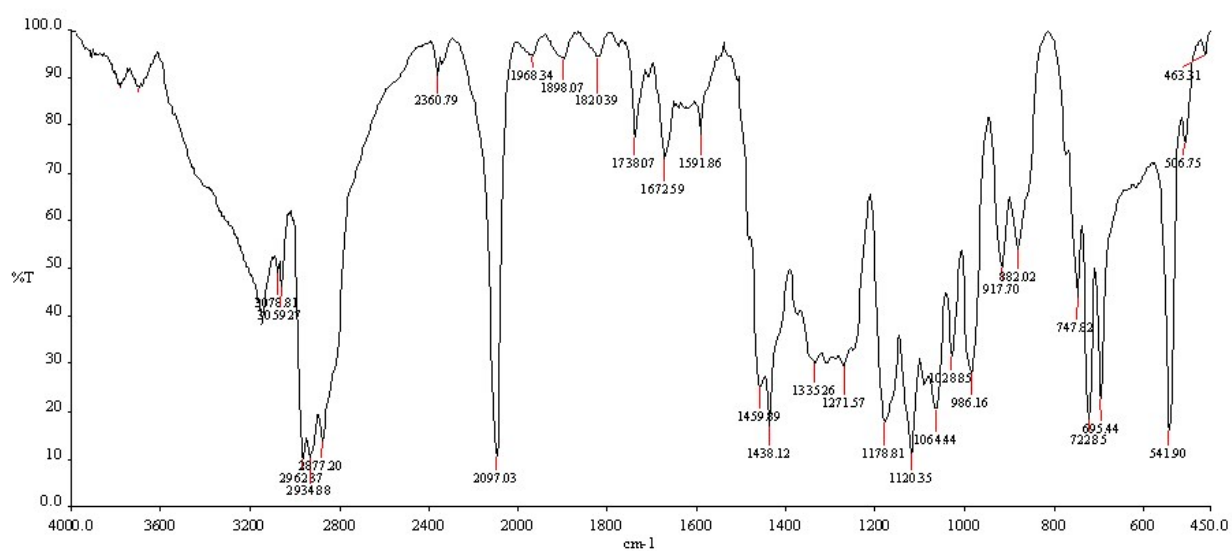


Figure S31. FT-IR Spectrum of 2-azido-2-phenylethanethiol intermediate