



Supporting Information

for

Synthesis of substituted triazole–pyrazole hybrids using triazenylpyrazole precursors

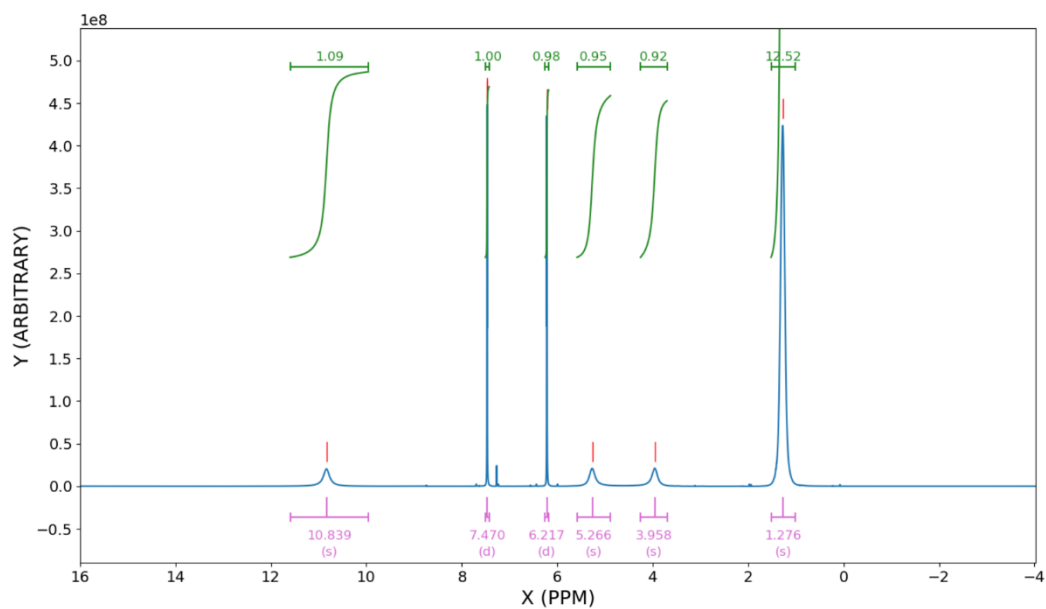
Simone Gräßle, Laura Holzhauer, Nicolai Wippert, Olaf Fuhr, Martin Nieger, Nicole Jung and Stefan Bräse

Beilstein J. Org. Chem. **2024**, *20*, 1396–1404. doi:10.3762/bjoc.20.121

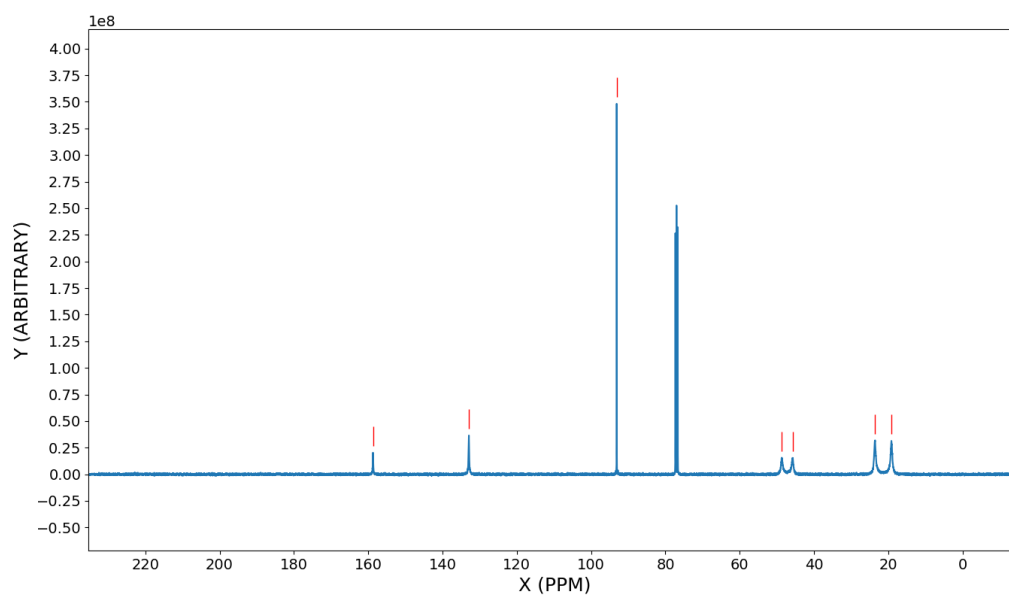
NMR spectra

[15a] (E)-3-(3,3-diisopropyltriaz-1-en-1-yl)-1H-pyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

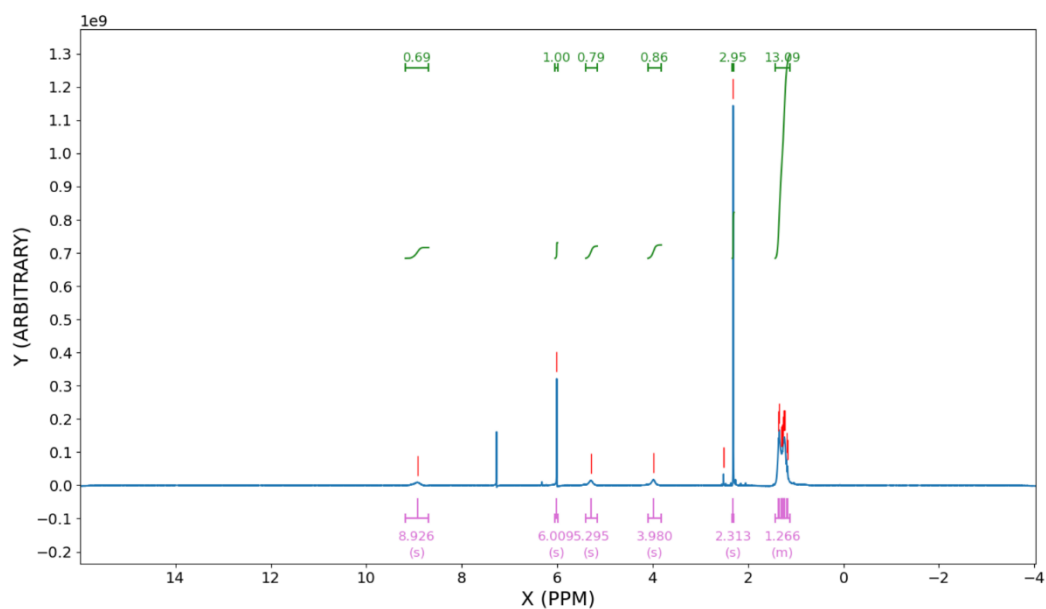


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

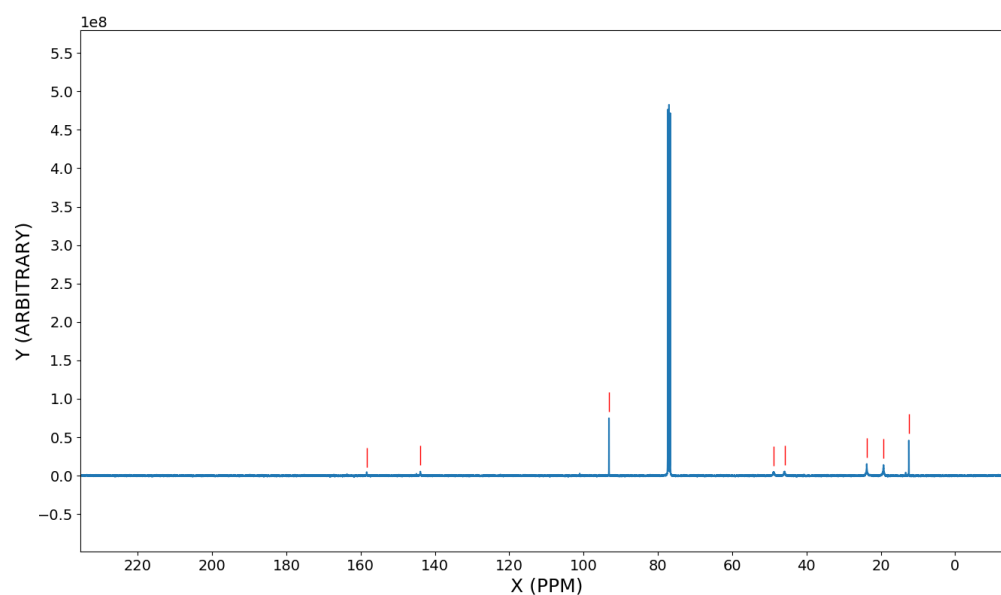


[15b] (E)-3-(3,3-diisopropyltriaz-1-en-1-yl)-5-methyl-1H-pyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

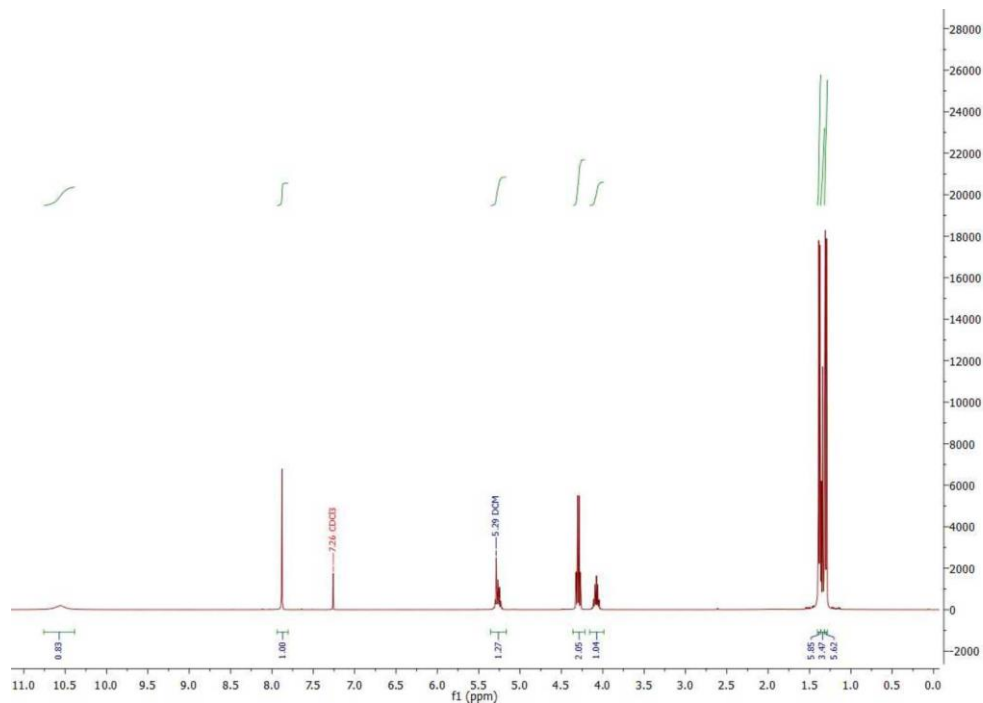


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

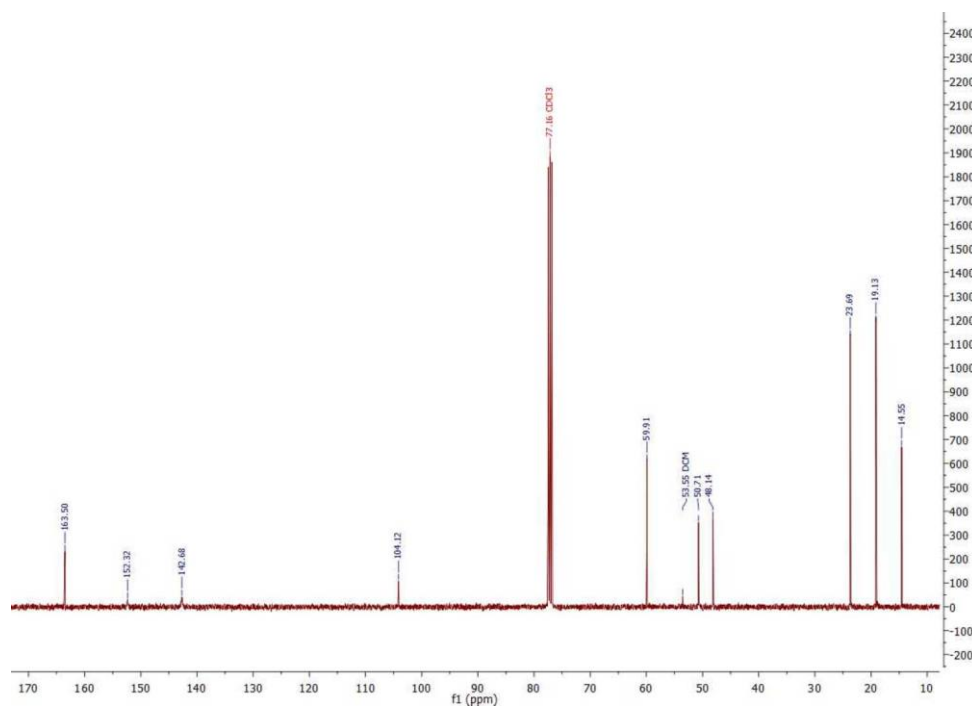


[15c] Ethyl (*E*)-3-(3,3-diisopropyltriaz-1-en-1-yl)-1*H*-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

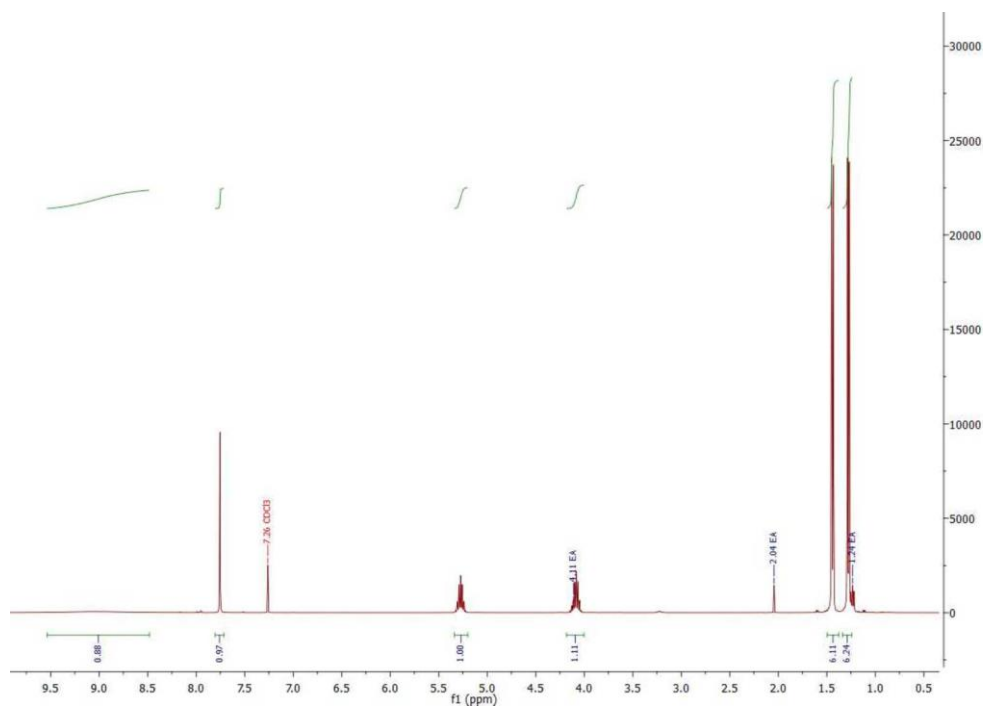


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

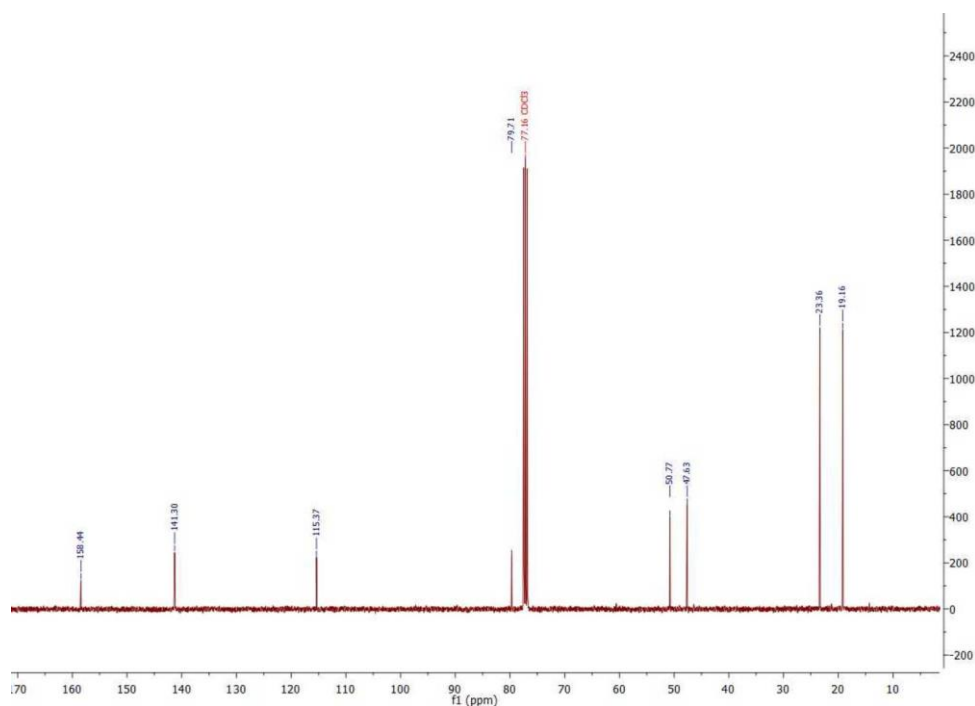


[15d] (E)-3-(3,3-Diisopropyltriaz-1-en-1-yl)-1H-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

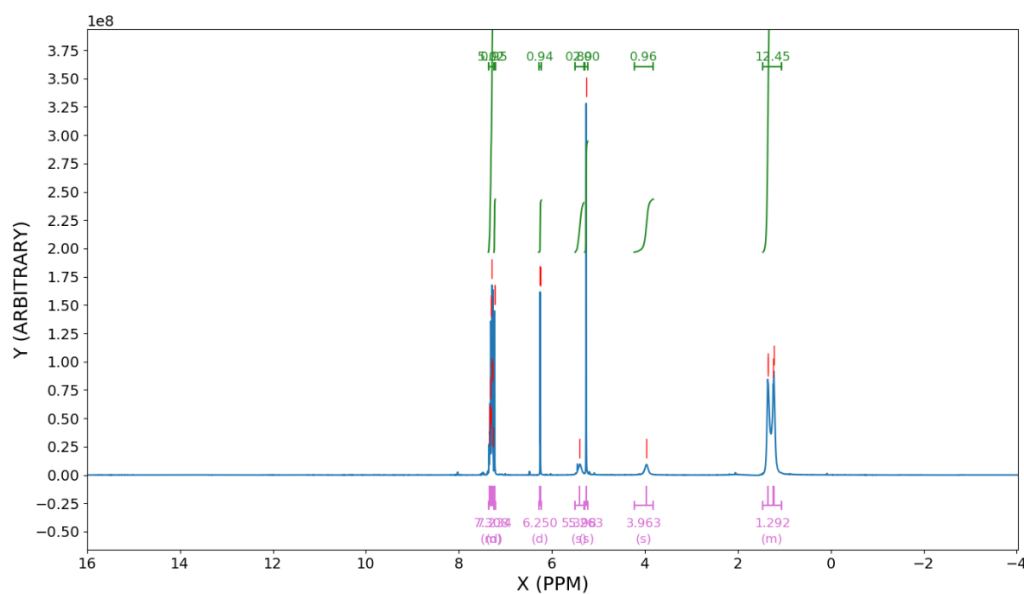


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

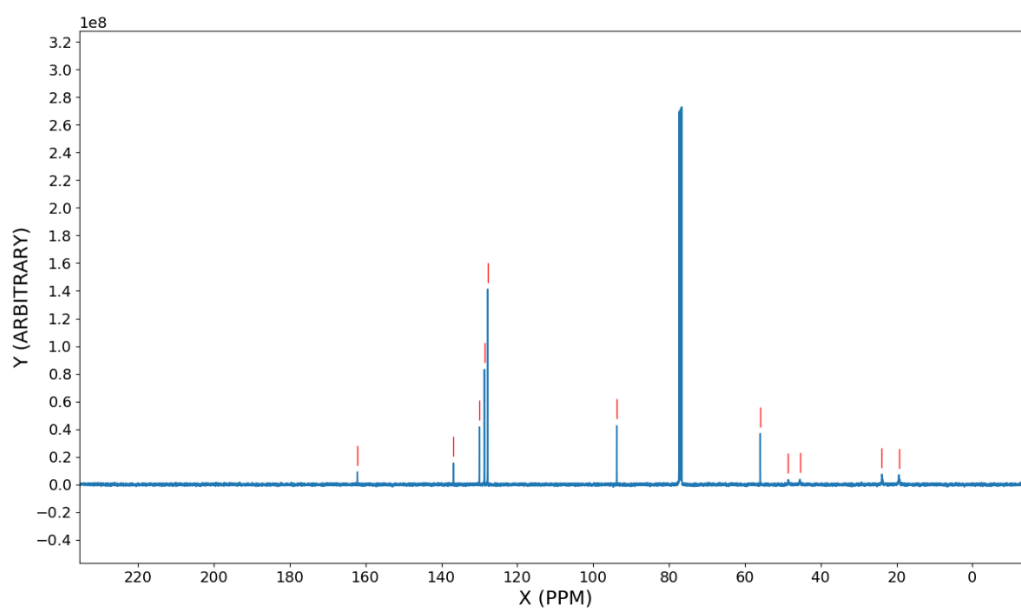


[17a] (E)-1-benzyl-5-(3,3-diisopropyltriaz-1-en-1-yl)-1H-pyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

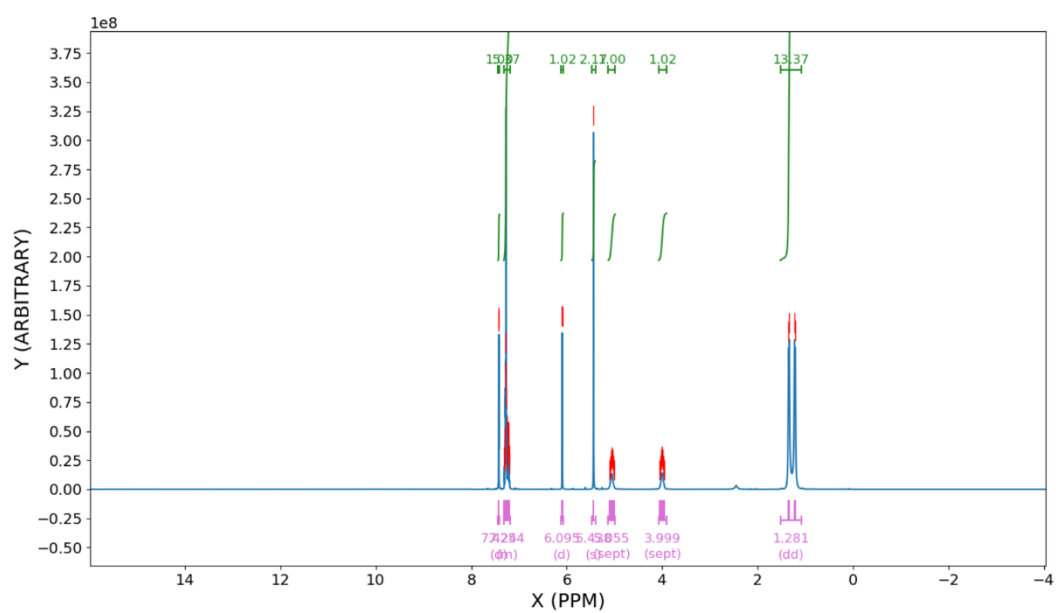


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

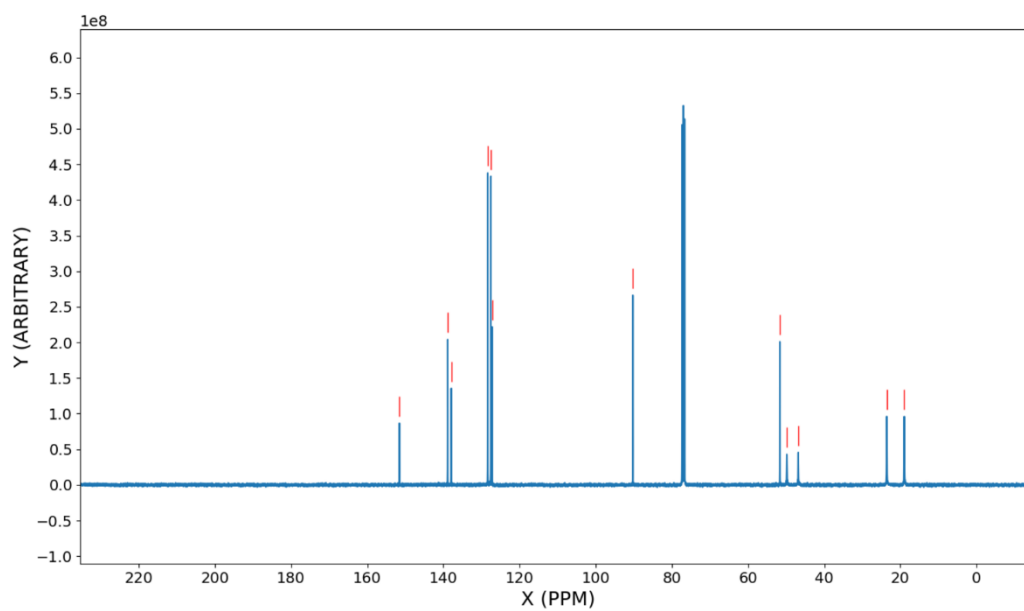


[18a] (*E*)-1-benzyl-5-(3,3-diisopropyltriaz-1-en-1-yl)-1*H*-pyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

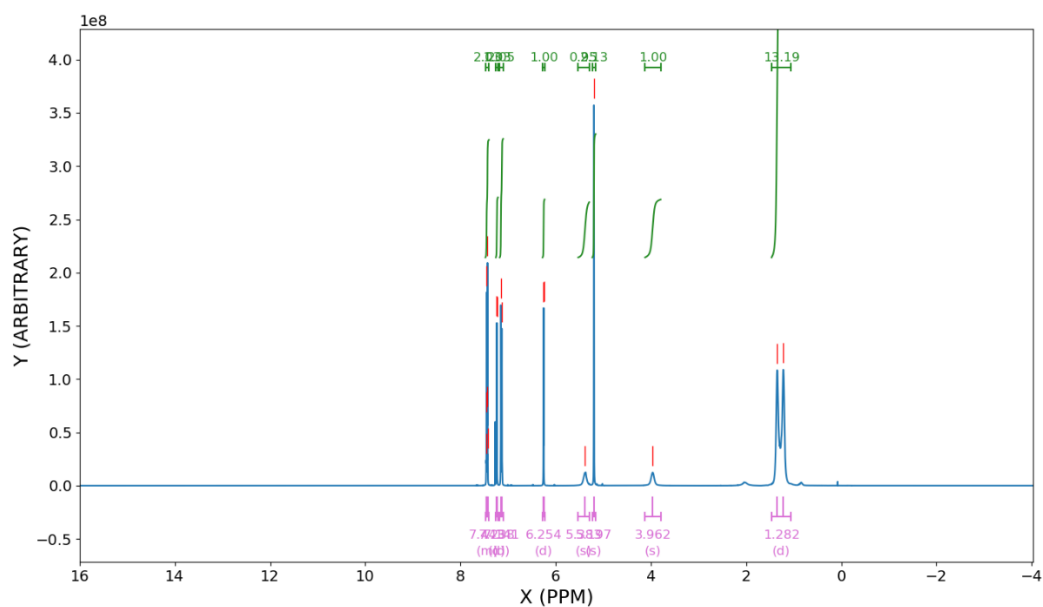


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

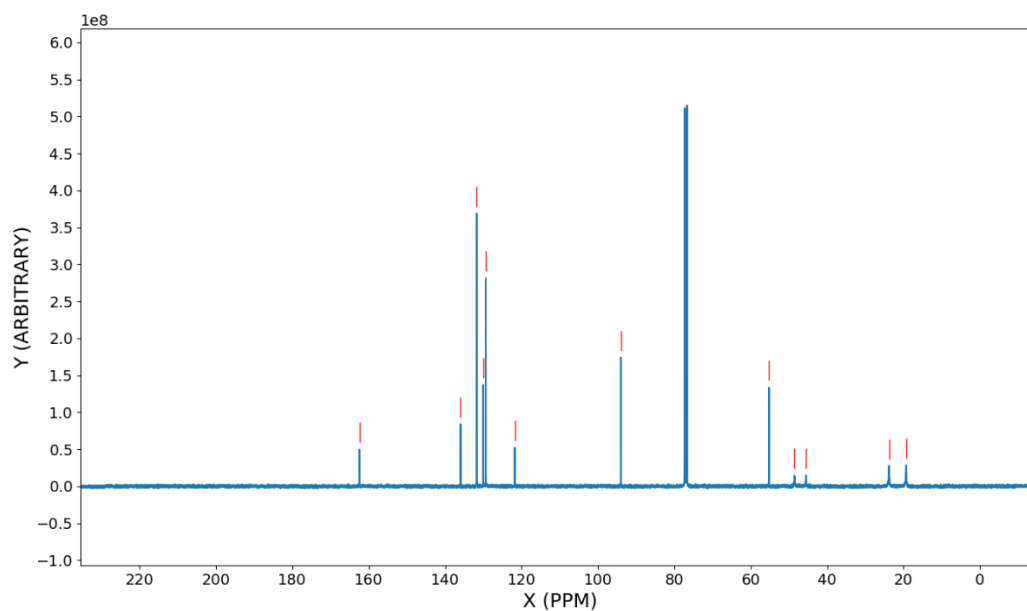


[17b] (E)-1-(4-bromobenzyl)-3-(3,3-diisopropyltriaz-1-en-1-yl)-1H-pyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

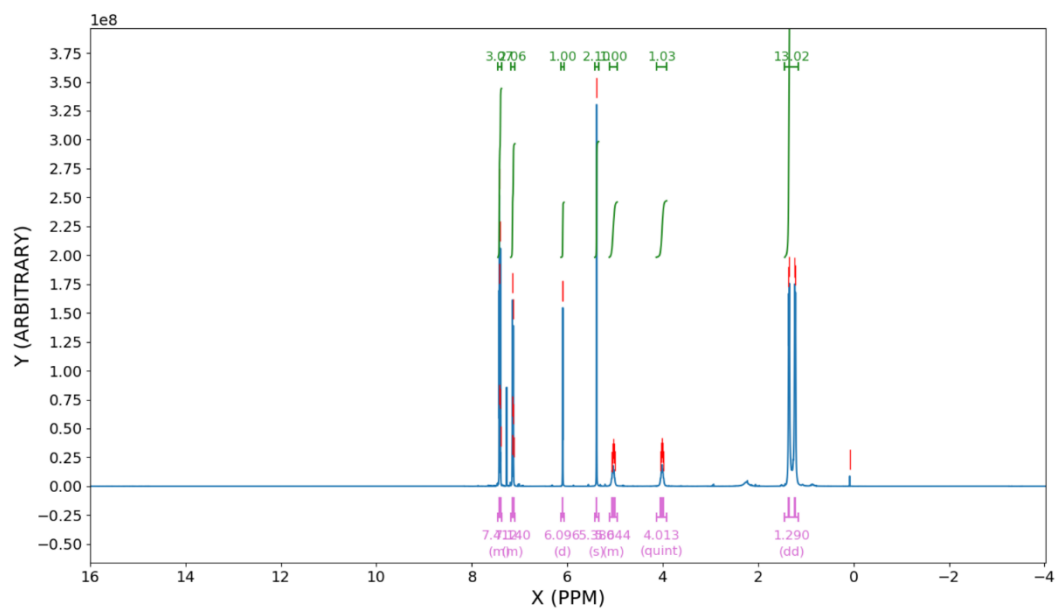


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

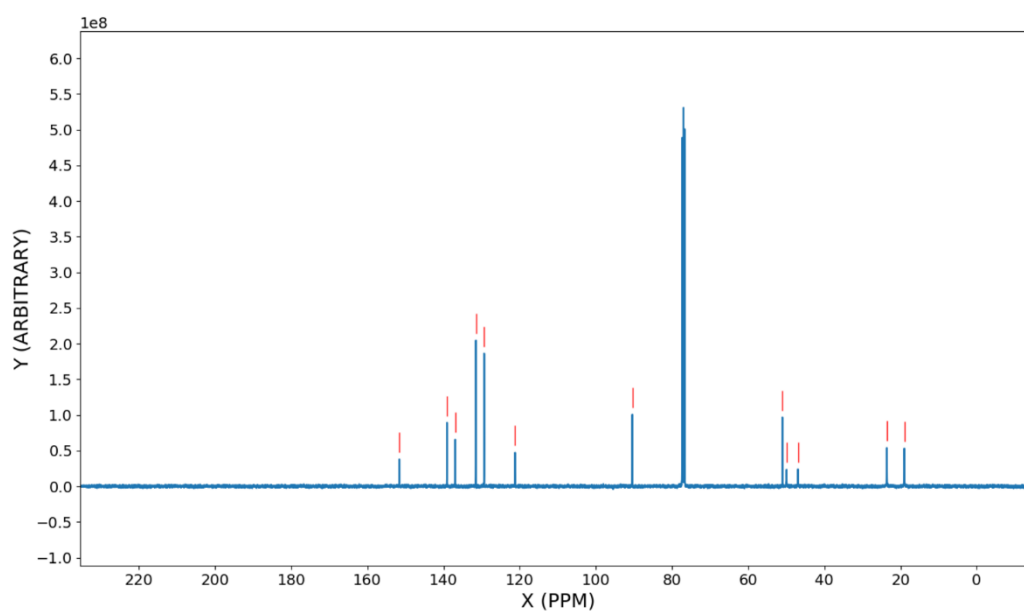


[18b] (*E*)-1-(4-bromobenzyl)-5-(3,3-diisopropyltriaz-1-en-1-yl)-1*H*-pyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

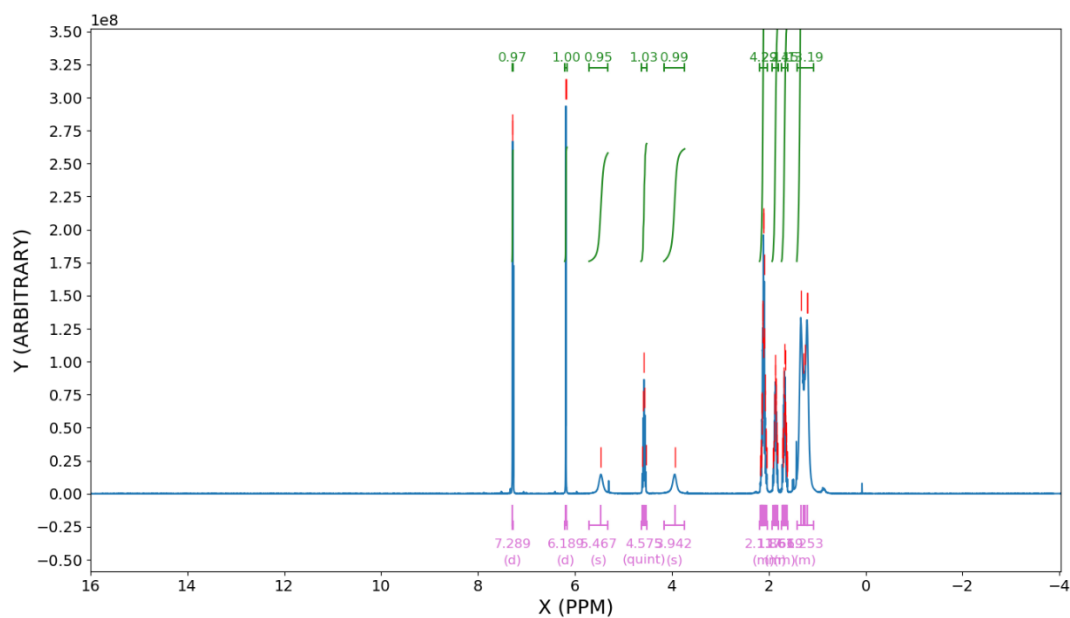


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

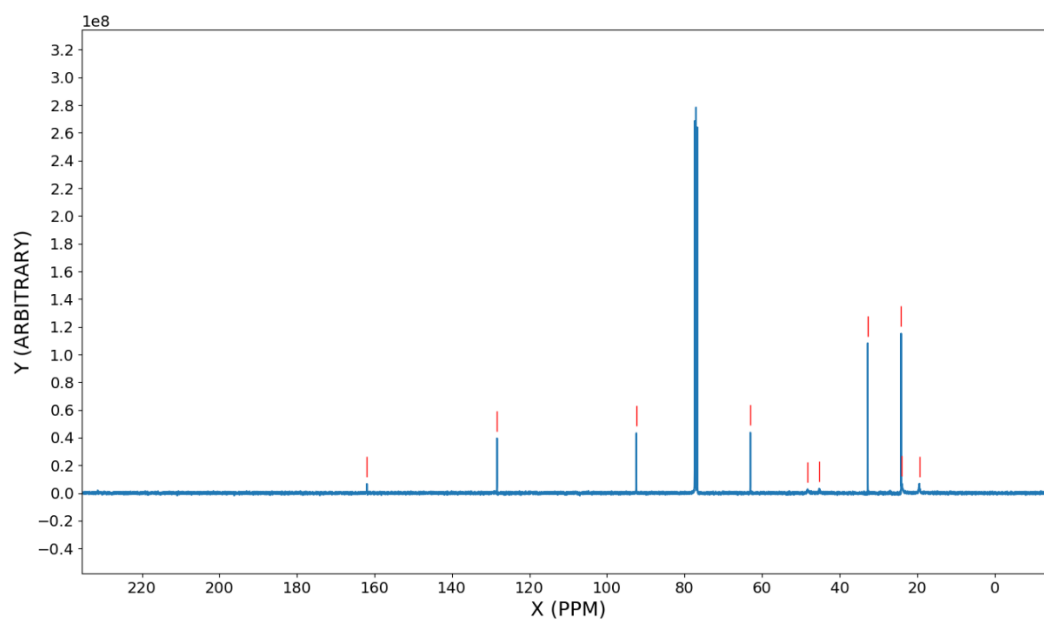


[17c] (*E*)-1-cyclopentyl-5-(3,3-diisopropyltriaz-1-en-1-yl)-1*H*-pyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

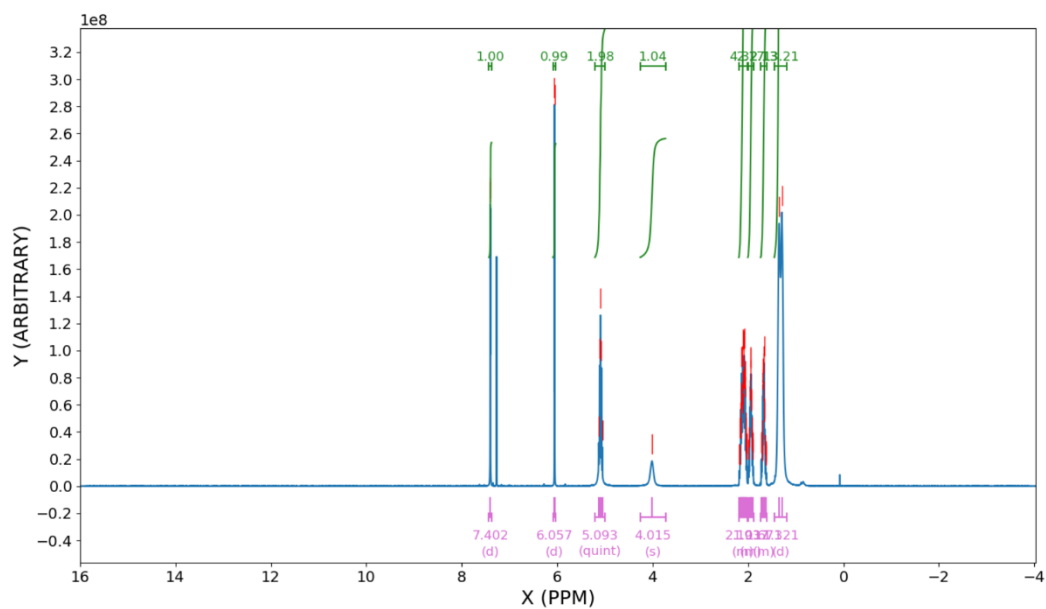


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

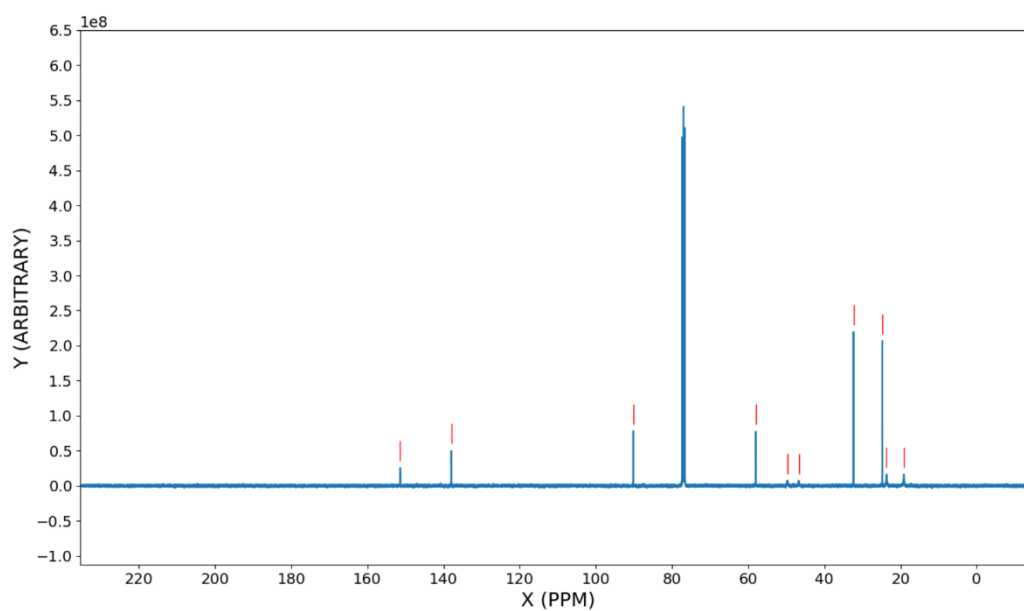


[18c] (E)-1-cyclopentyl-5-(3,3-diisopropyltriaz-1-en-1-yl)-1H-pyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

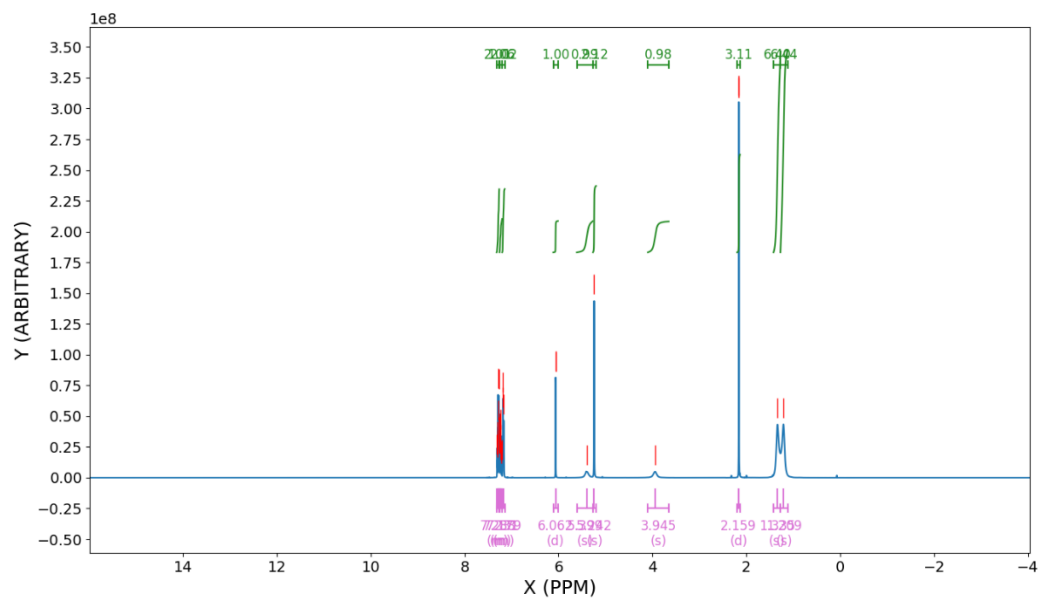


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

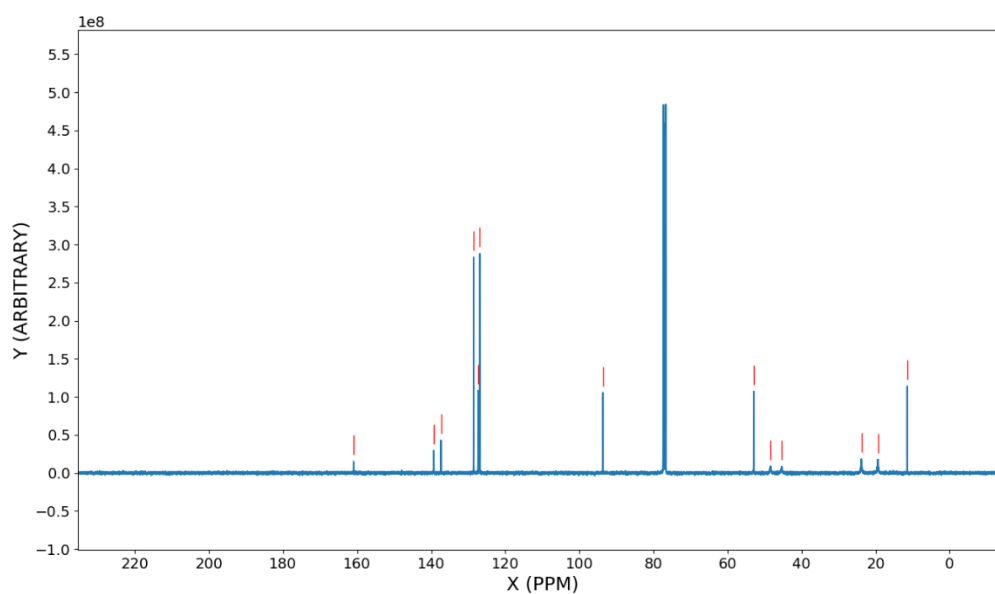


[17d] (E)-1-benzyl-3-(3,3-diisopropyltriaz-1-en-1-yl)-3-methyl-1H-pyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

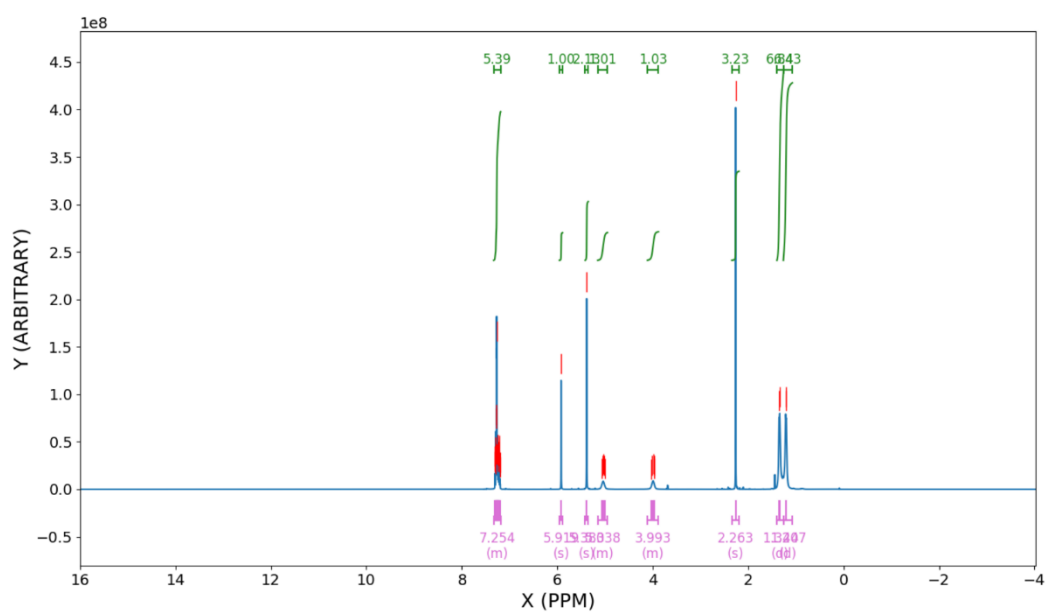


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

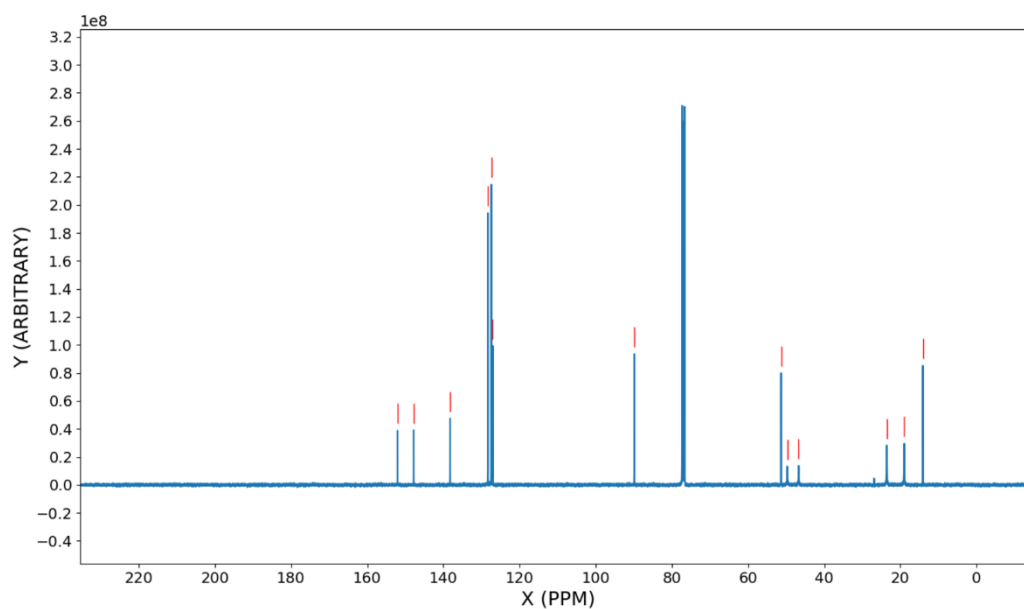


[18d] (*E*)-1-benzyl-5-(3,3-diisopropyltriaz-1-en-1-yl)-3-methyl-1*H*-pyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

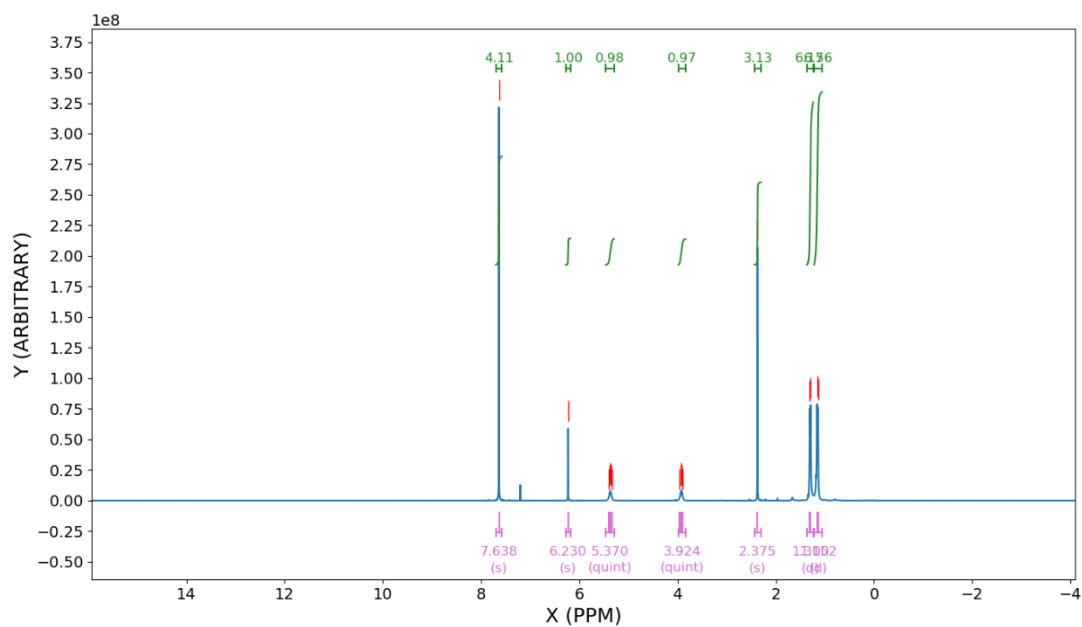


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

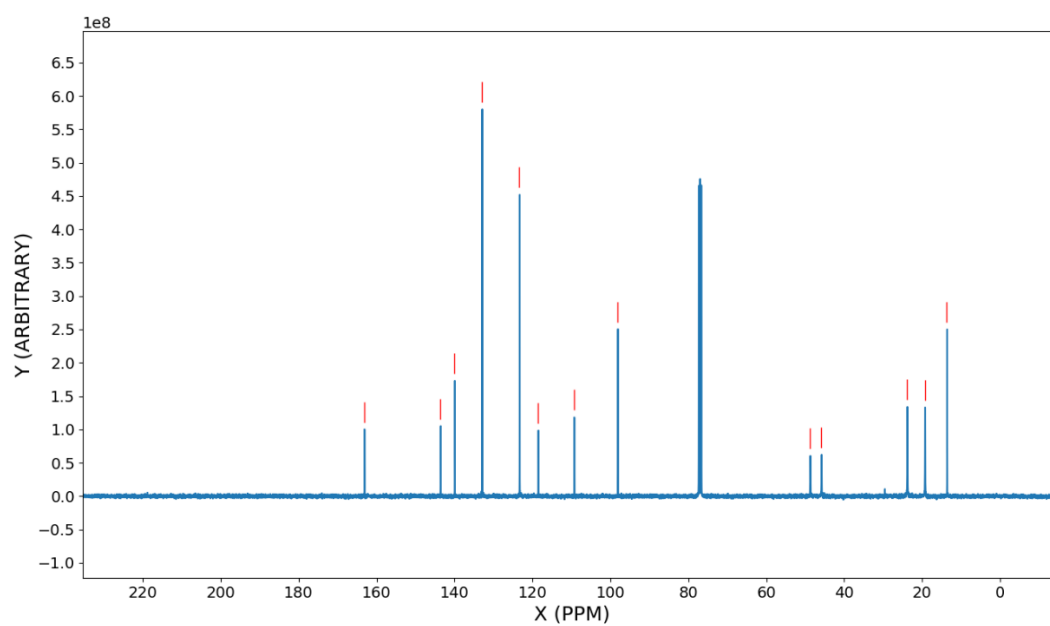


[17e] (E)-4-(3-(3,3-diisopropyltriaz-1-en-1-yl)-3-methyl-1H-pyrazol-1-yl)benzonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

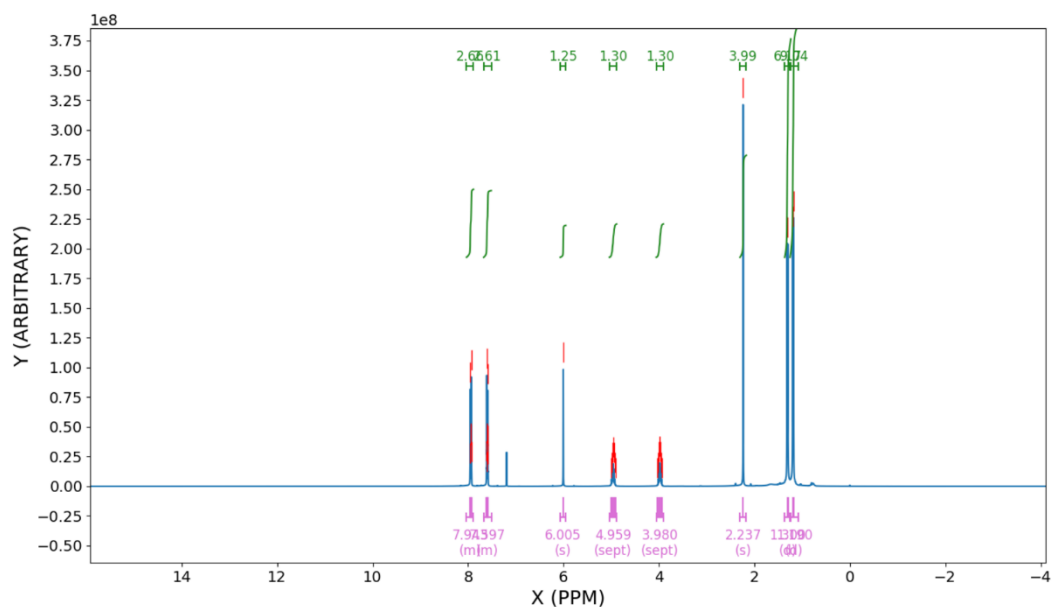


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

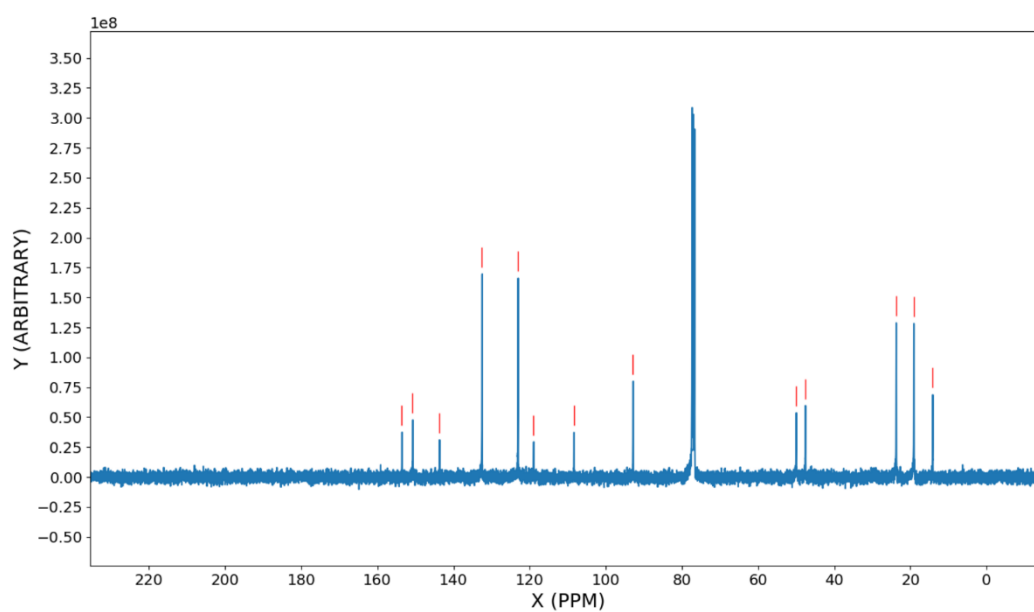


[18e] (E)-4-(5-(3,3-diisopropyltriaz-1-en-1-yl)-3-methyl-1H-pyrazol-1-yl)benzonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

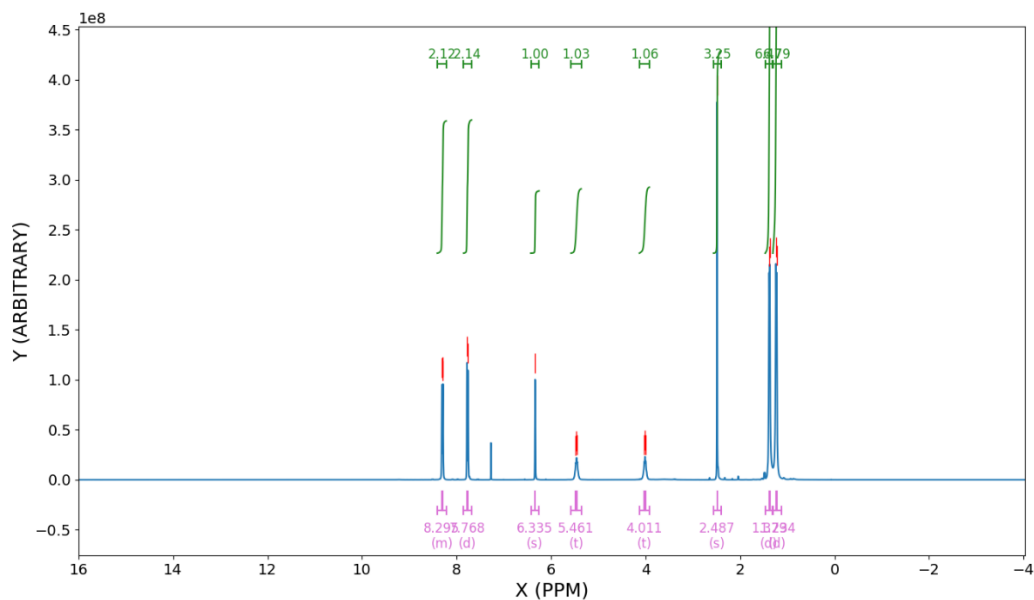


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

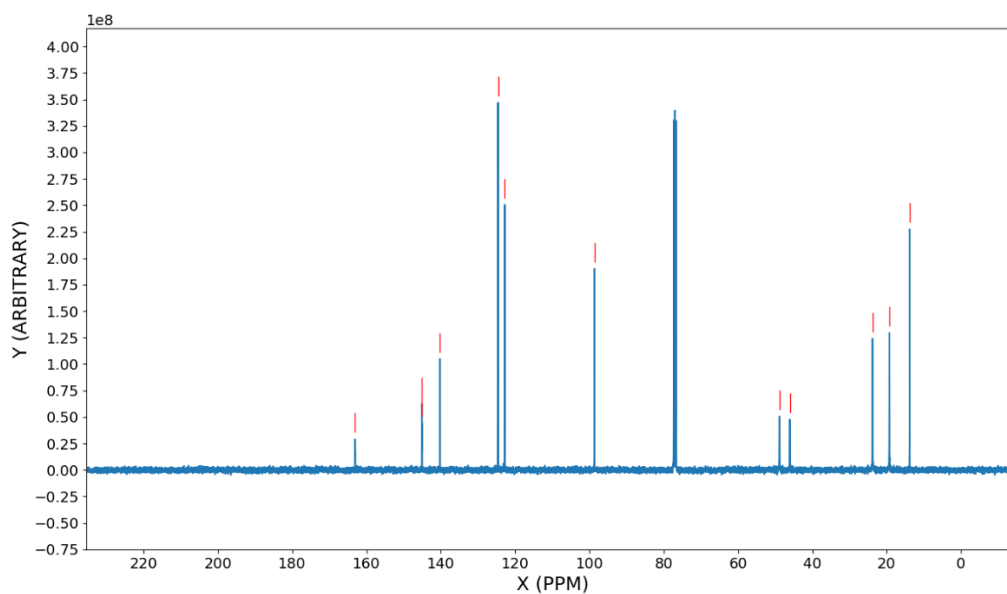


[17f] (*E*)-3-(3,3-diisopropyltriaz-1-en-1-yl)-3-methyl-1-(4-nitrophenyl)-1*H*-pyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

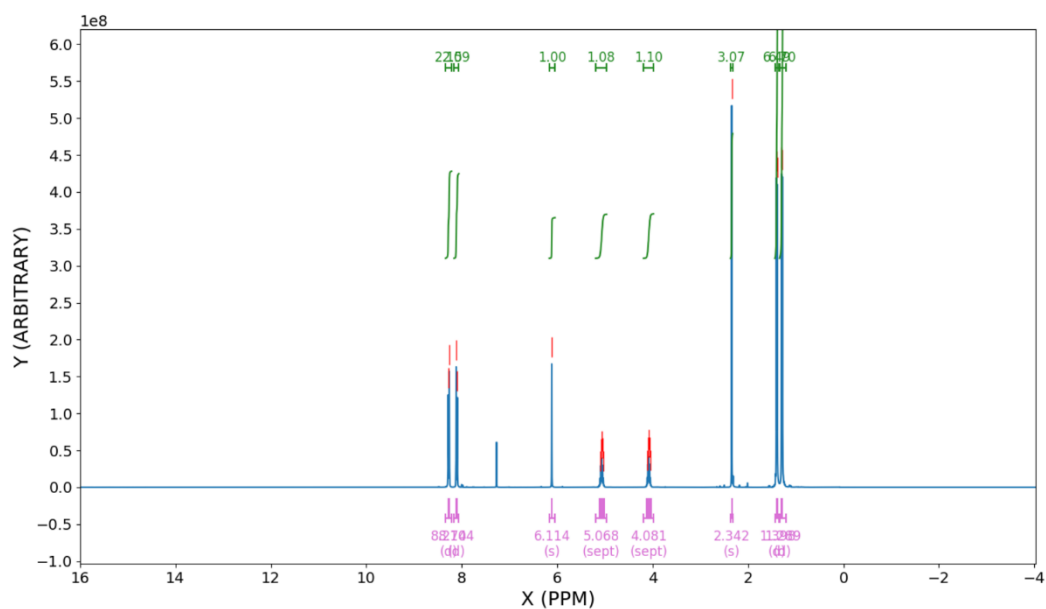


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

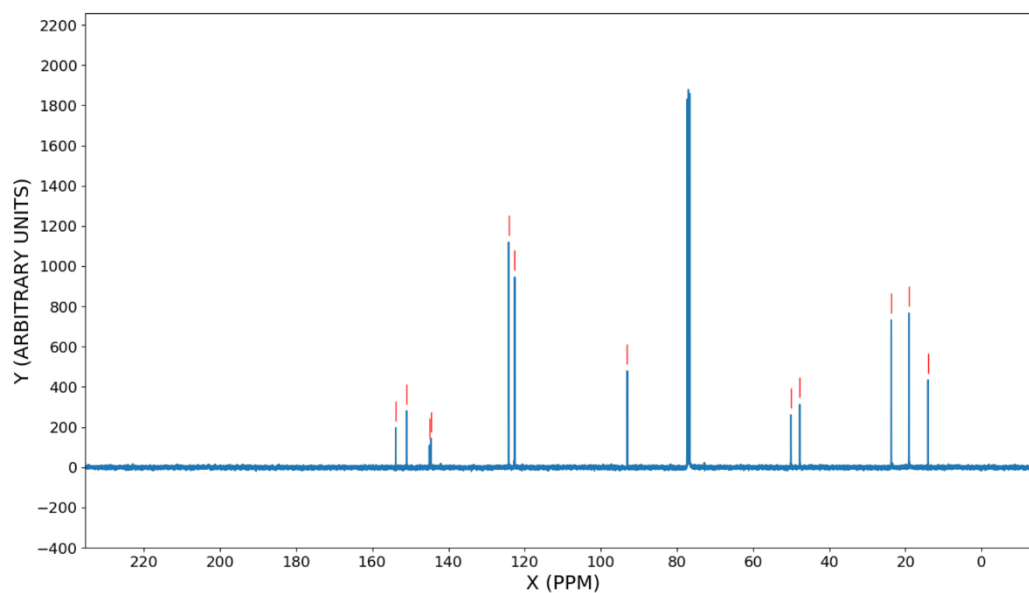


[18f] (*E*)-5-(3,3-diisopropyltriaz-1-en-1-yl)-3-methyl-1-(4-nitrophenyl)-1*H*-pyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

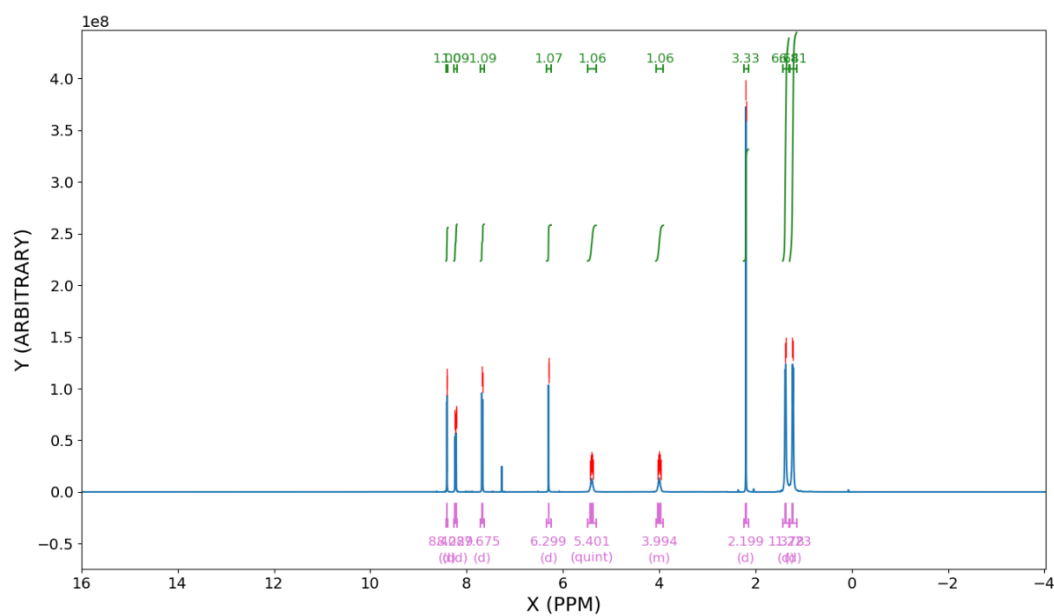


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

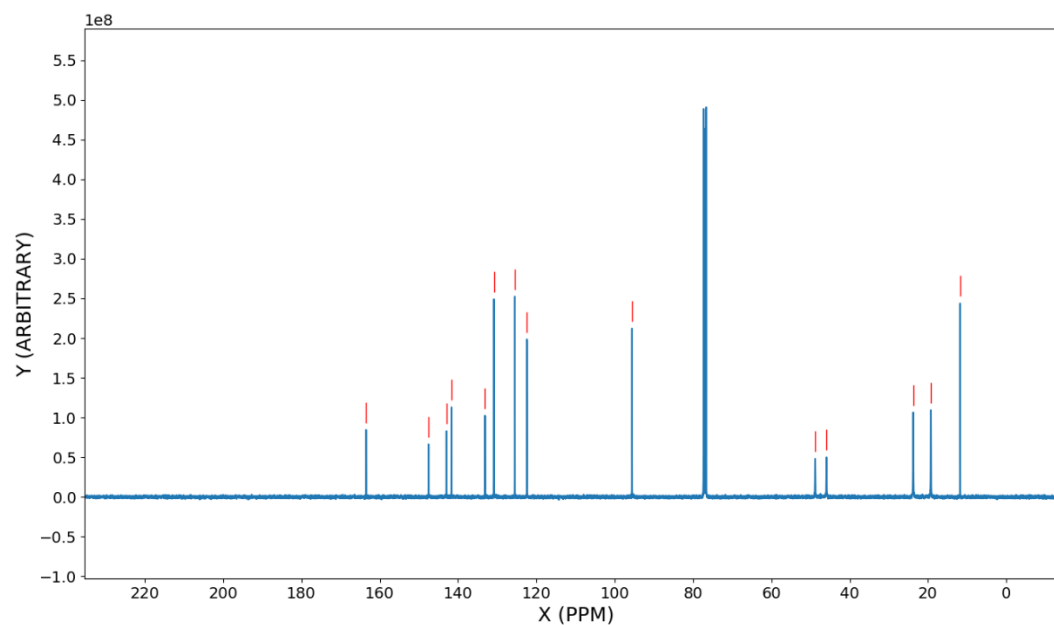


[17g] (E)-1-(2-chloro-4-nitrophenyl)-3-(3,3-diisopropyltriaz-1-en-1-yl)-3-methyl-1H-pyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

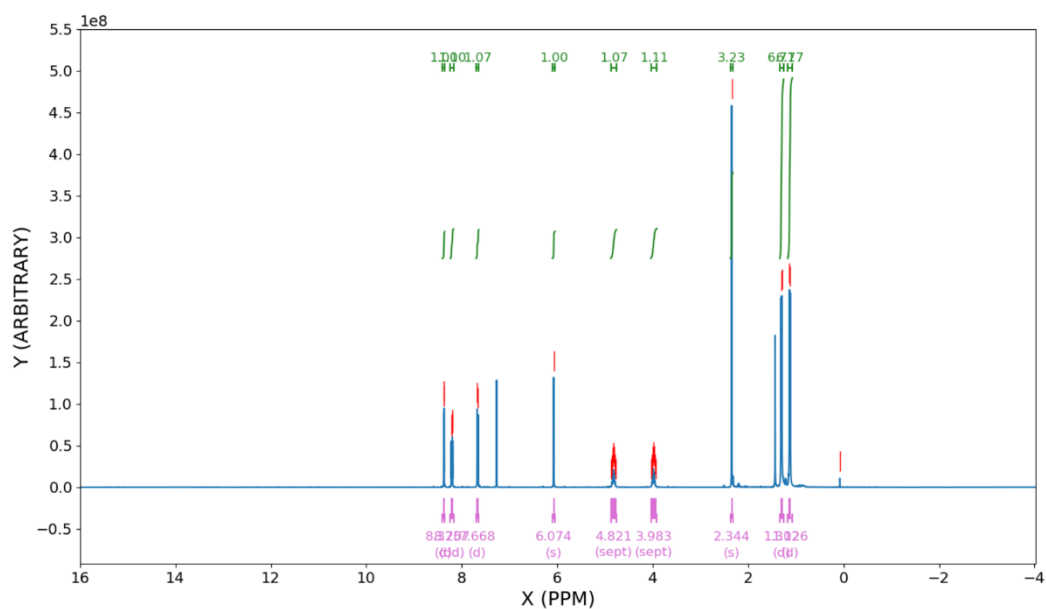


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

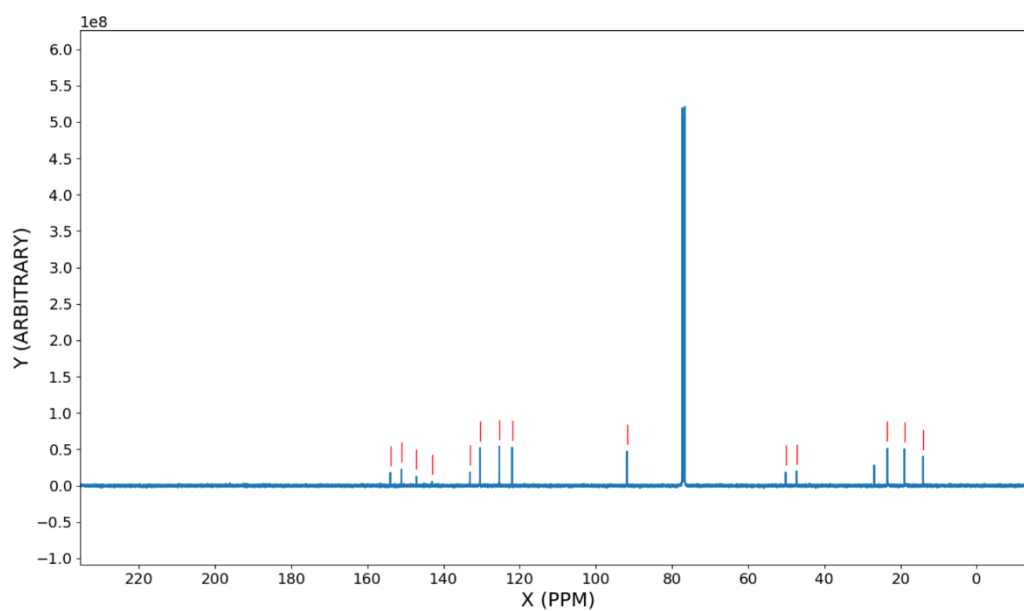


[18g] (E)-1-(2-chloro-4-nitrophenyl)-5-(3,3-diisopropyltriaz-1-en-1-yl)-3-methyl-1*H*-pyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

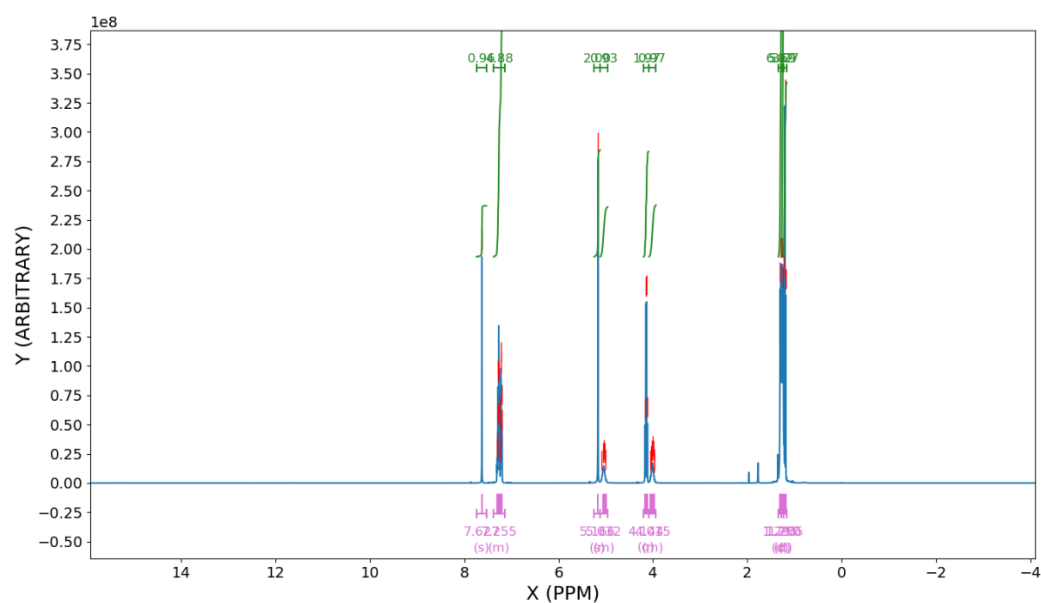


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

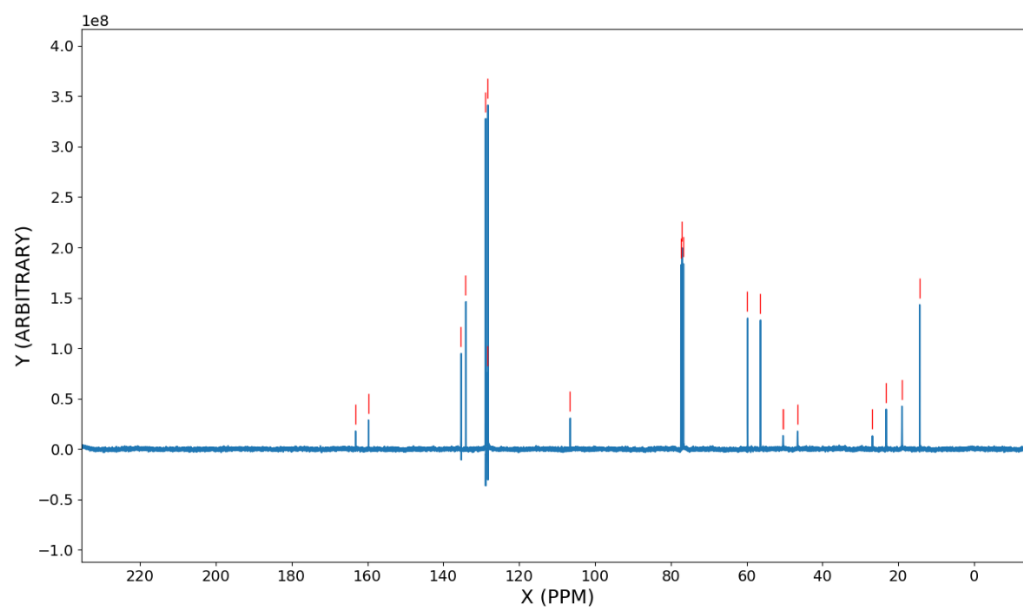


[17h] ethyl (*E*)-1-benzyl-3-(3,3-diisopropyltriaz-1-en-1-yl)-1*H*-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

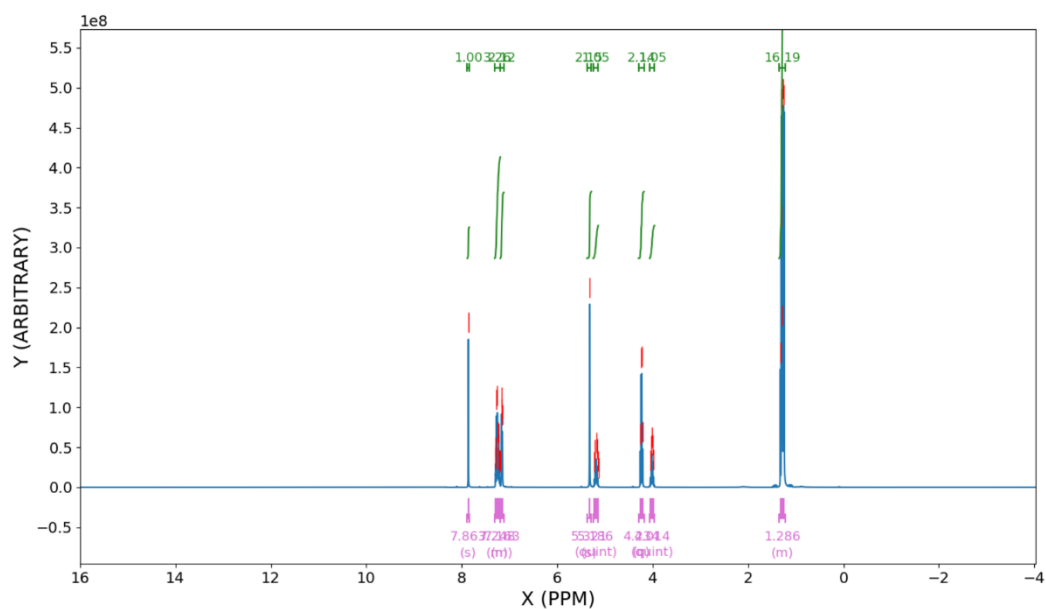


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

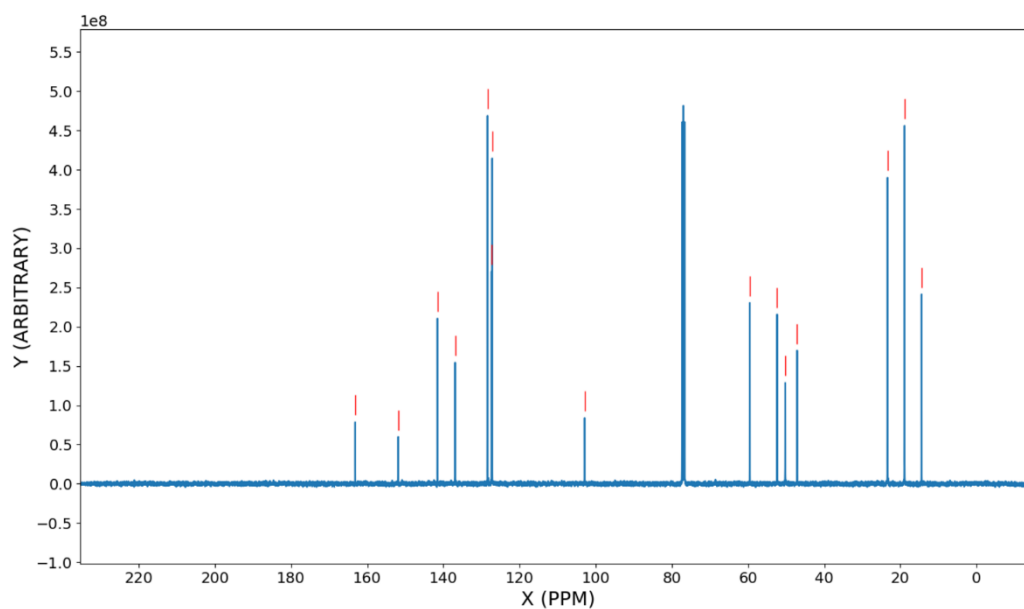


[18h] ethyl (*E*)-1-benzyl-5-(3,3-diisopropyltriaz-1-en-1-yl)-1*H*-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

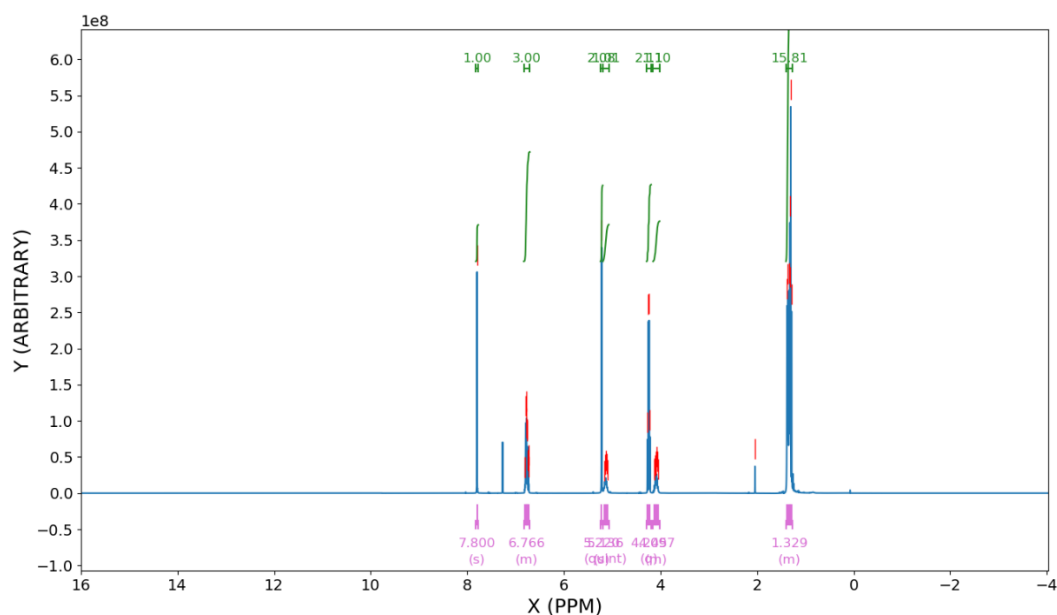


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

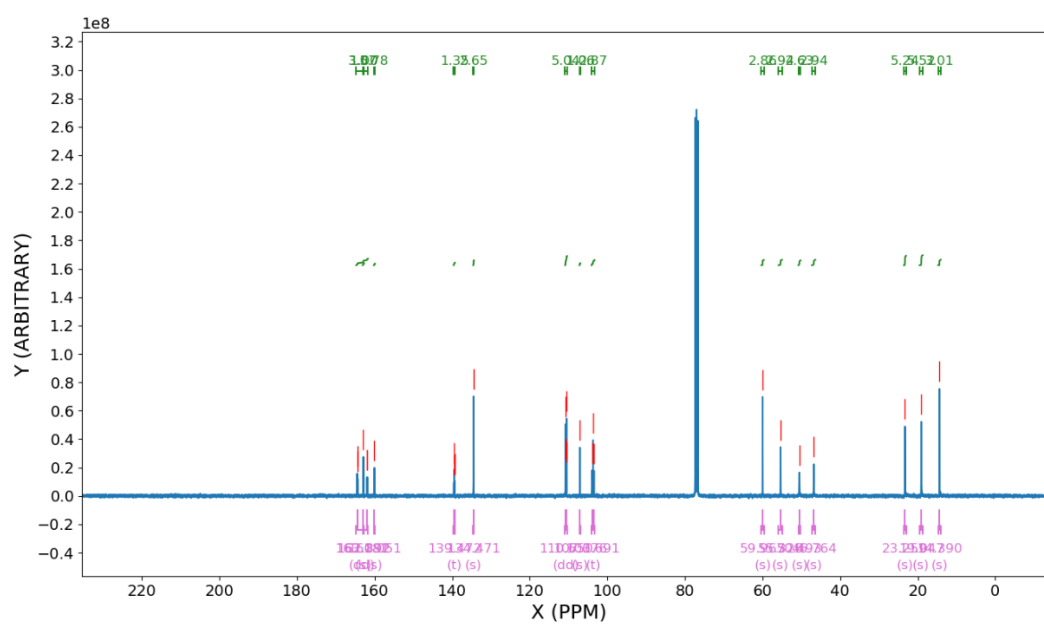


[17i] ethyl (*E*)-1-(3,5-difluorobenzyl)-3-(3,3-diisopropyltriaz-1-en-1-yl)-1*H*-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

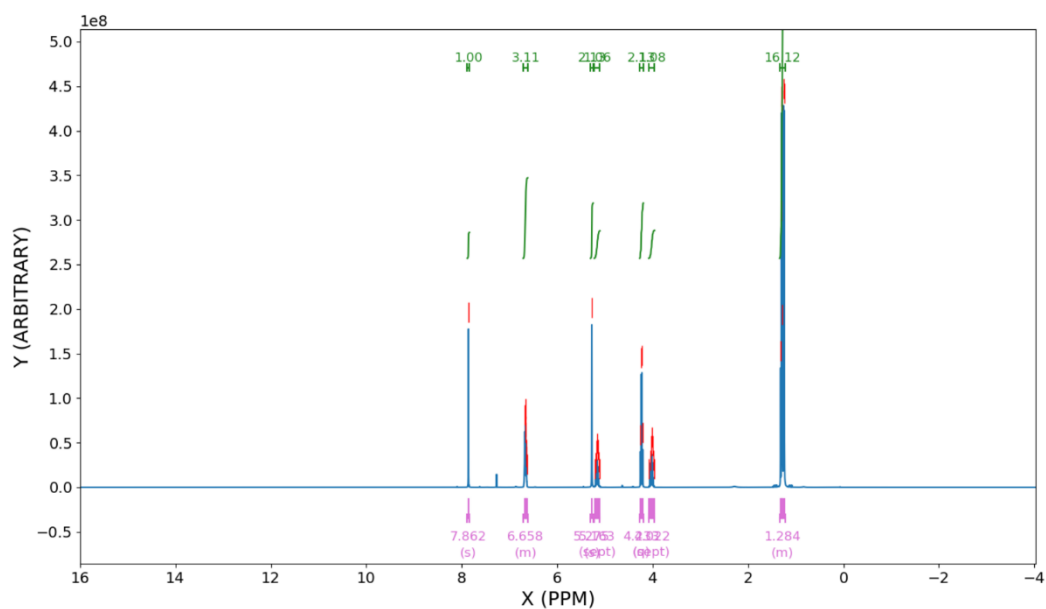


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

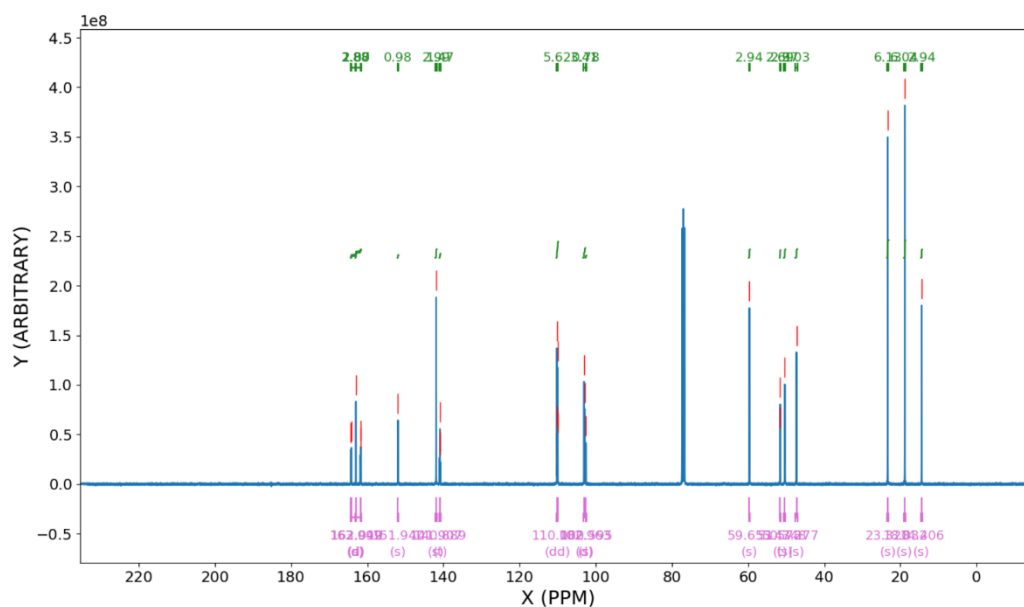


[18i] ethyl (*E*)-1-(3,5-difluorobenzyl)-5-(3,3-diisopropyltriaz-1-en-1-yl)-1*H*-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

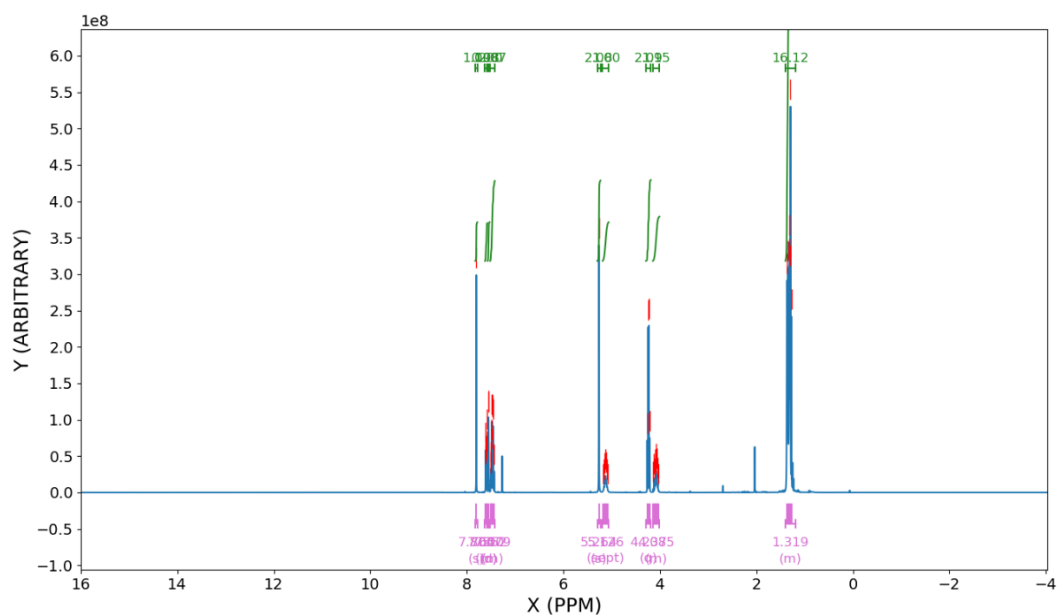


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

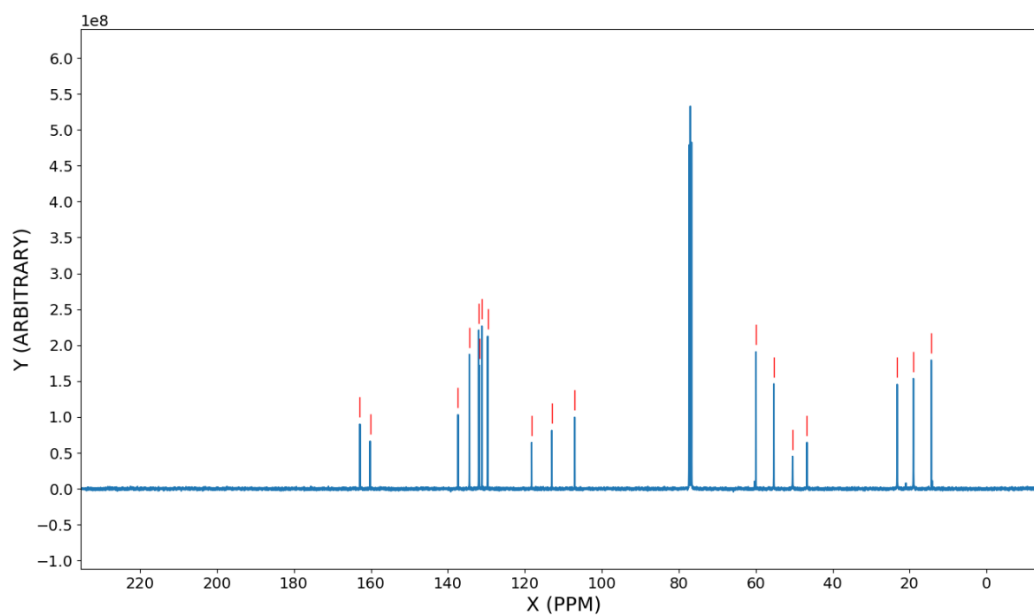


[17j] ethyl (*E*)-1-(3-cyanobenzyl)-3-(3,3-diisopropyltriaz-1-en-1-yl)-1*H*-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

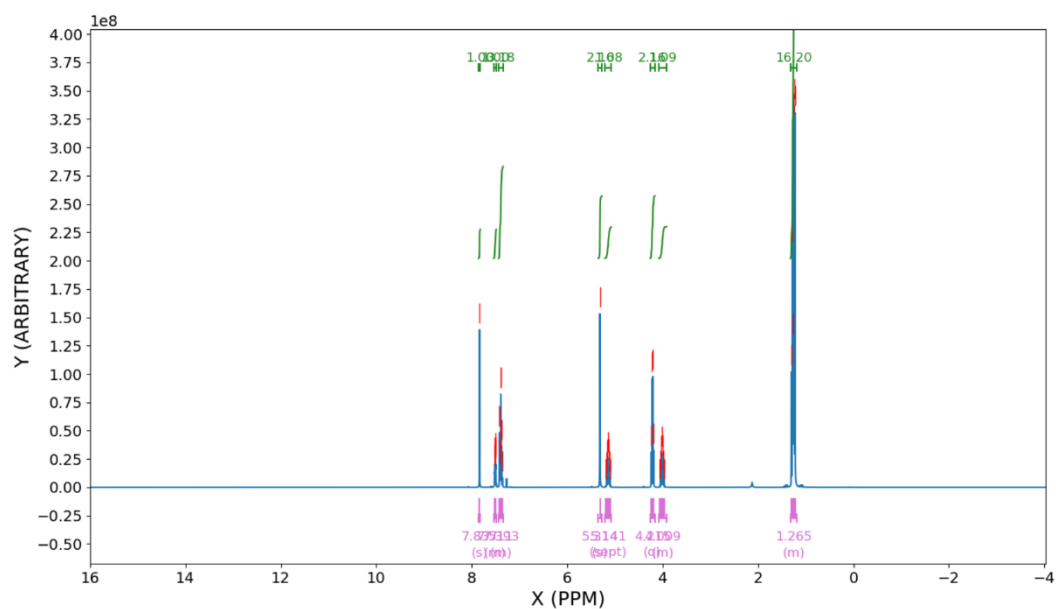


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

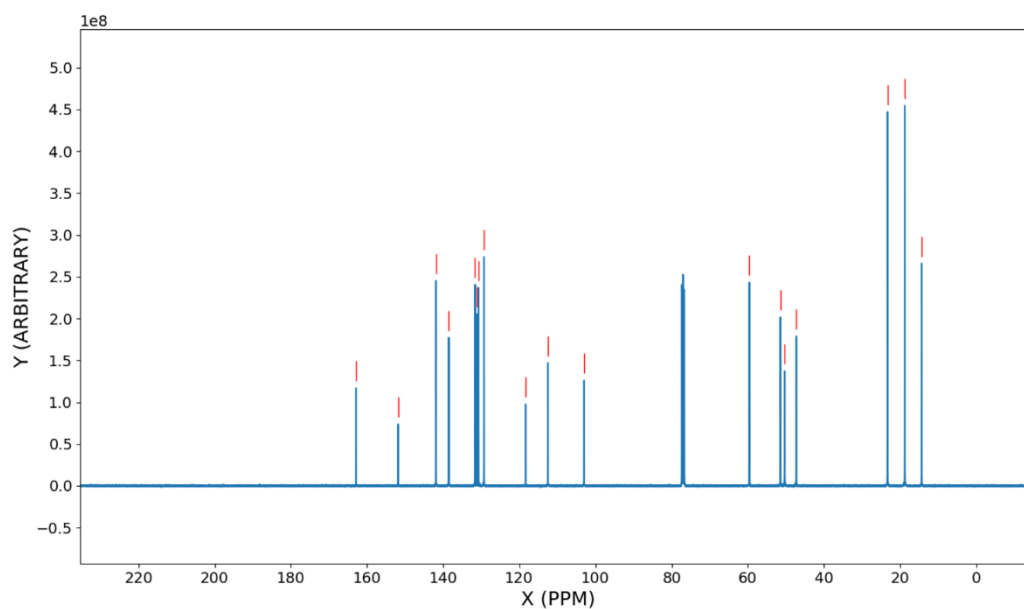


[18j] ethyl (*E*)-1-(3-cyanobenzyl)-5-(3,3-diisopropyltriaz-1-en-1-yl)-1*H*-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

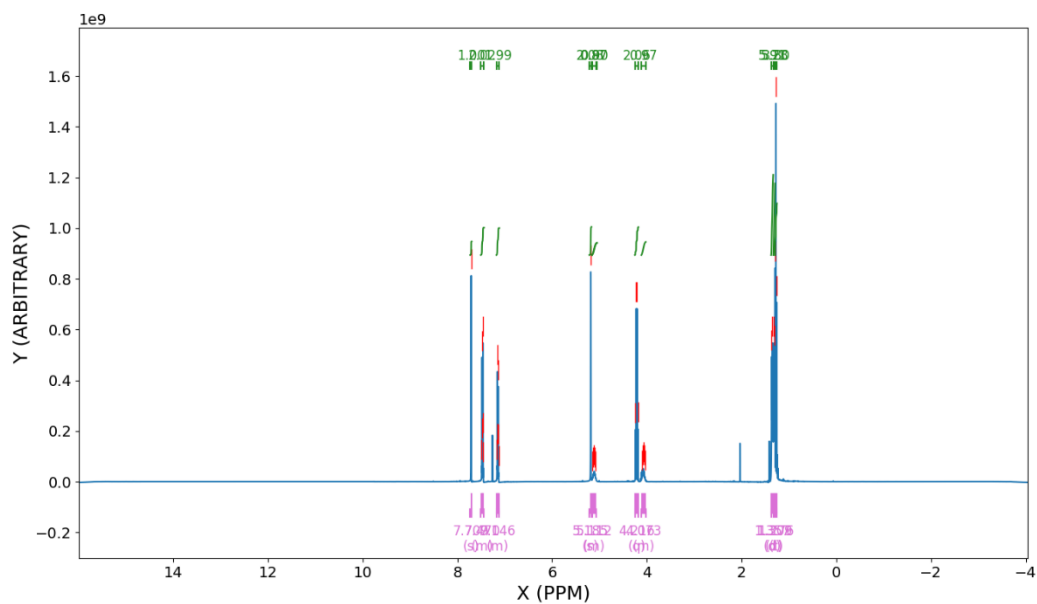


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

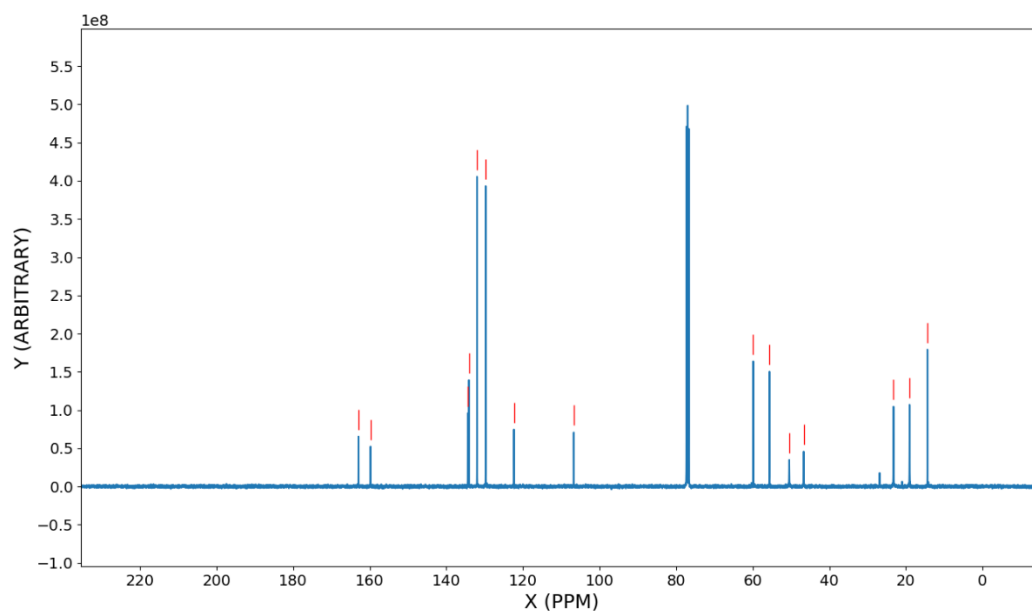


[17k] ethyl (*E*)-1-(4-bromobenzyl)-5-(3,3-diisopropyltriaz-1-en-1-yl)-1*H*-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

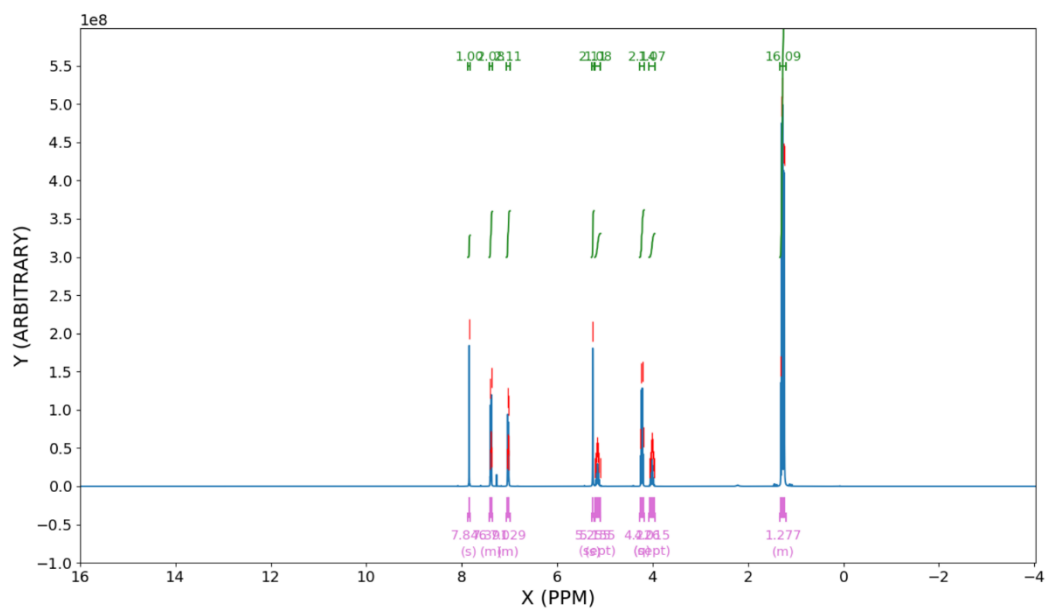


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

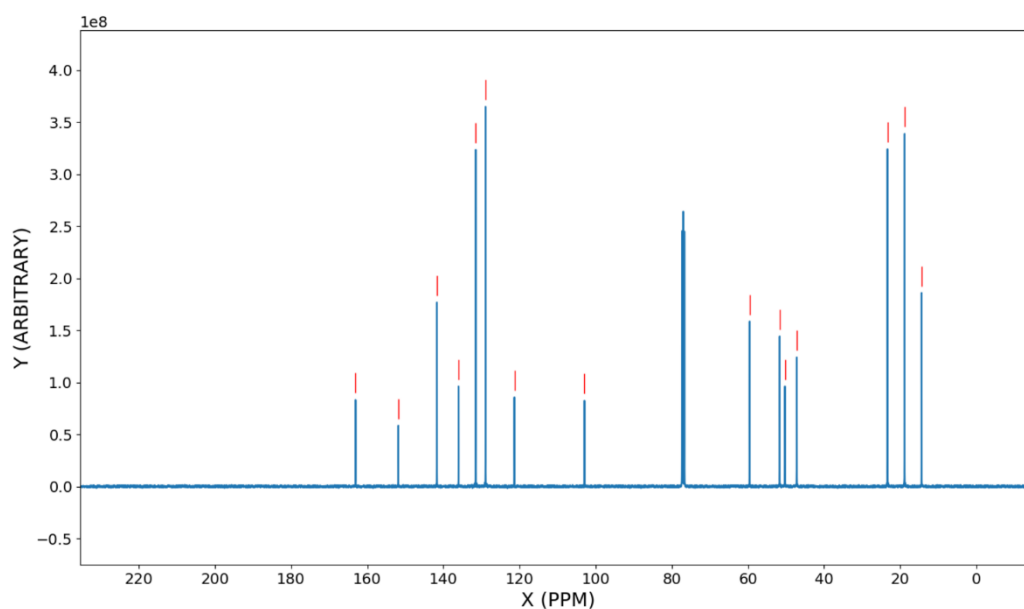


[18k] ethyl (*E*)-1-(4-bromobenzyl)-5-(3,3-diisopropyltriaz-1-en-1-yl)-1*H*-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

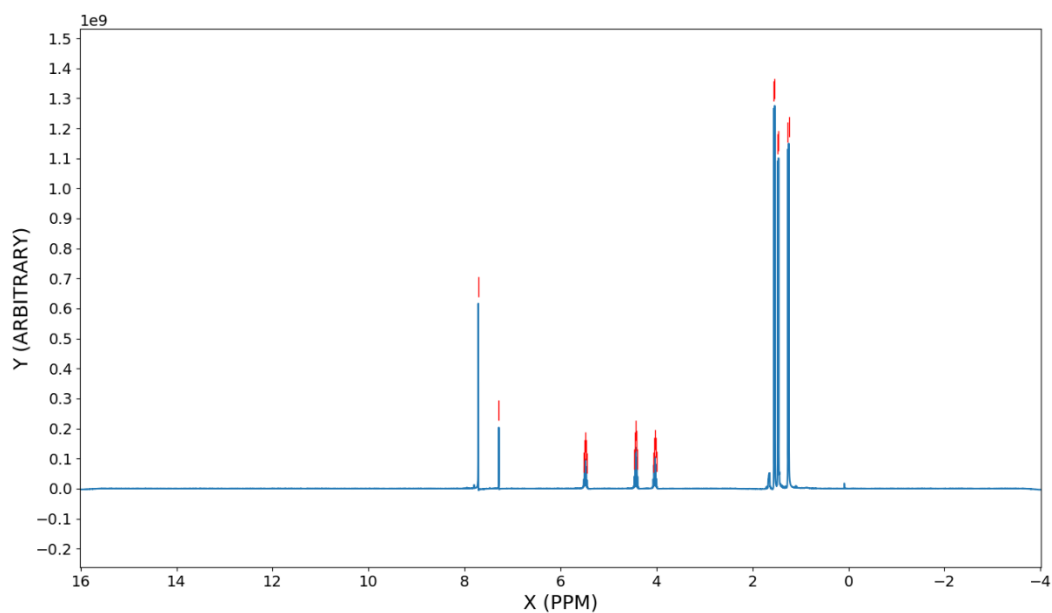


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

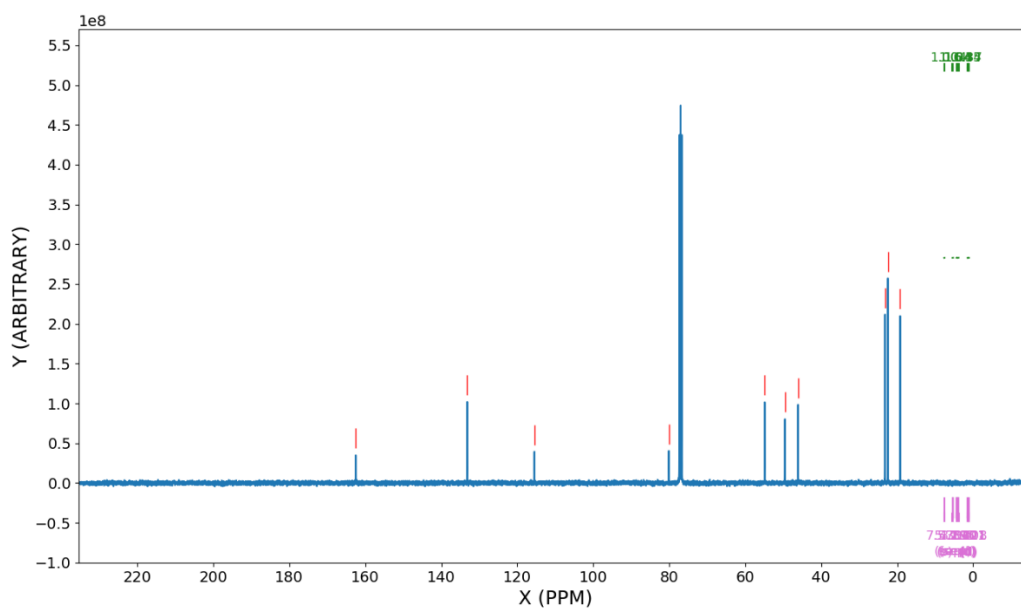


[171] (*E*)-3-(3,3-diisopropyltriaz-1-en-1-yl)-1-isopropyl-1*H*-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

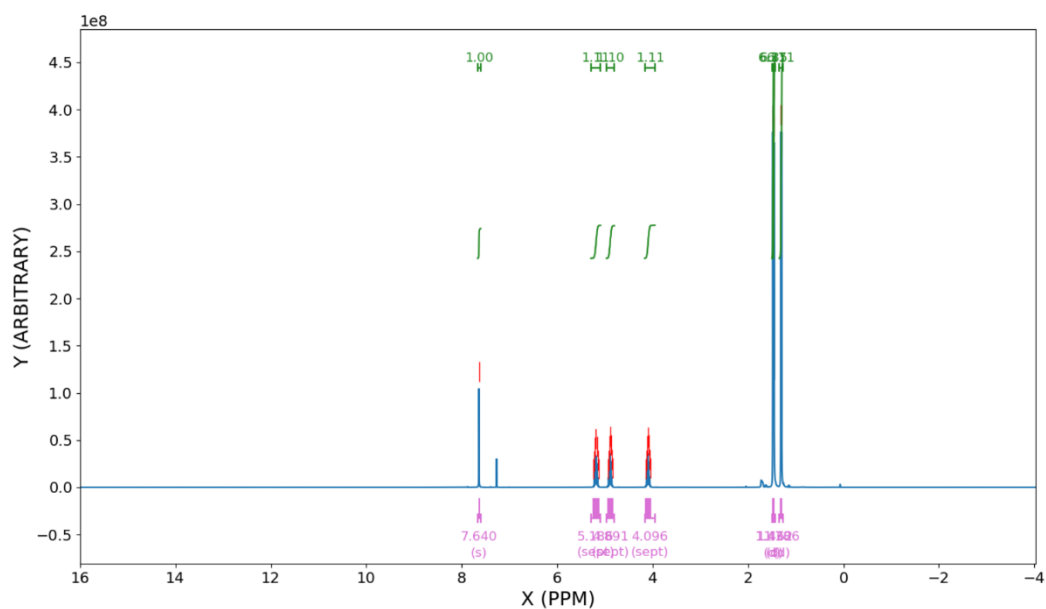


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

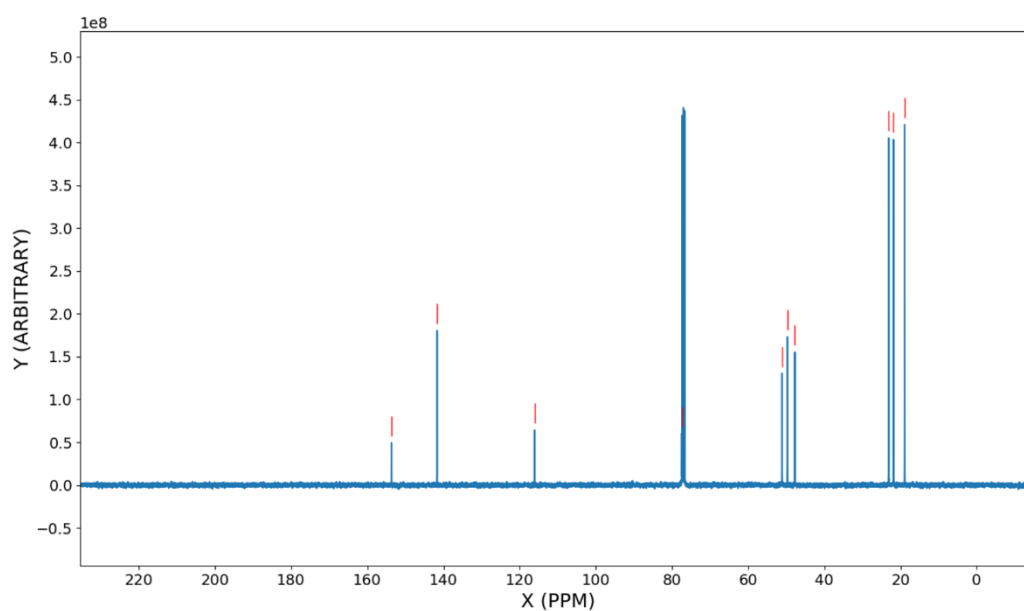


[181] (*E*)-5-(3,3-diisopropyltriaz-1-en-1-yl)-1-isopropyl-1*H*-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

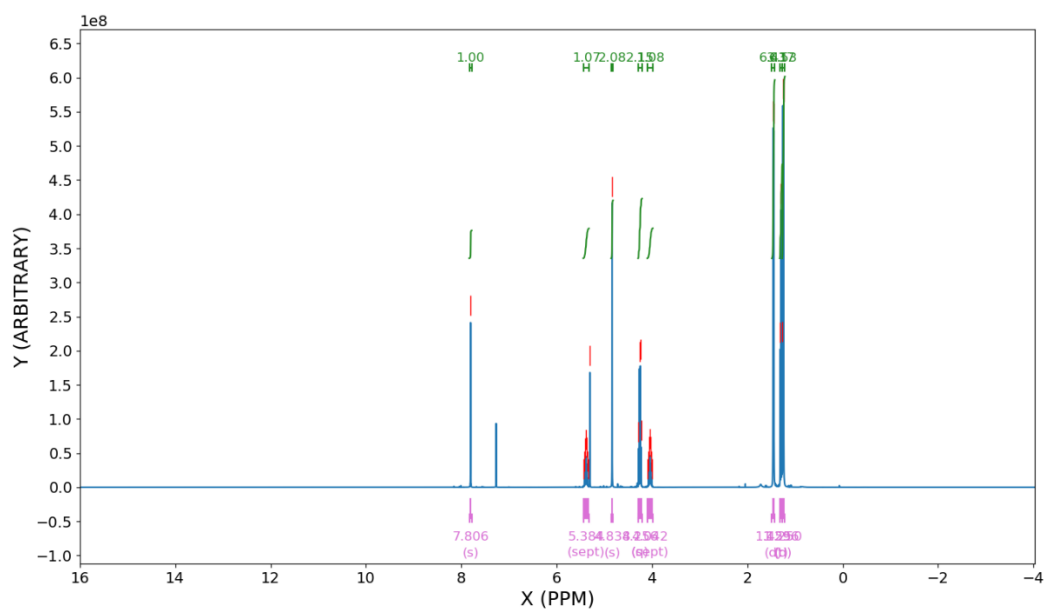


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

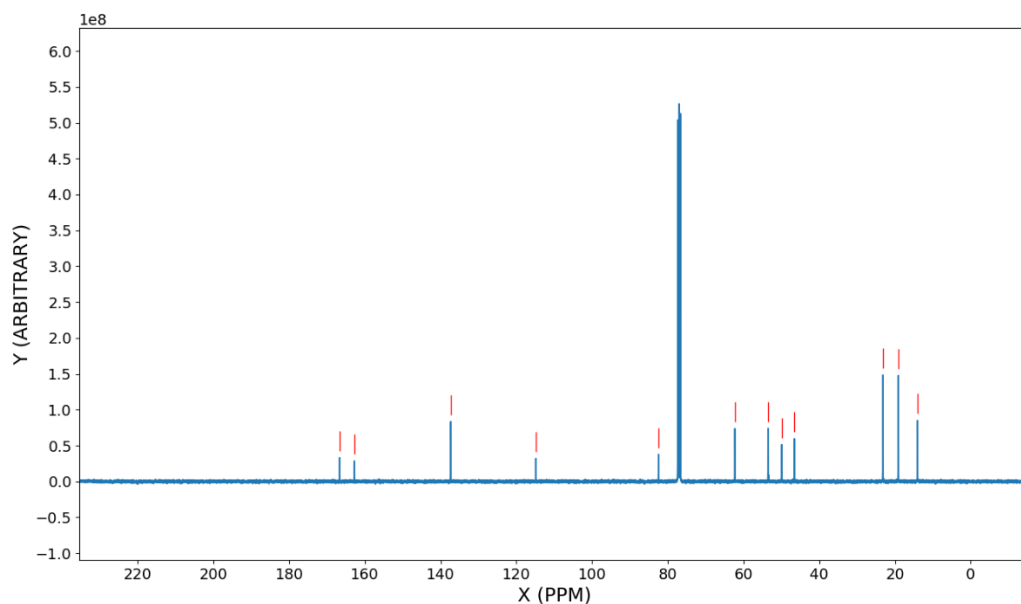


[**17m**] ethyl (*E*)-2-(4-cyano-3-(3,3-diisopropyltriaz-1-en-1-yl)-1*H*-pyrazol-1-yl)acetate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

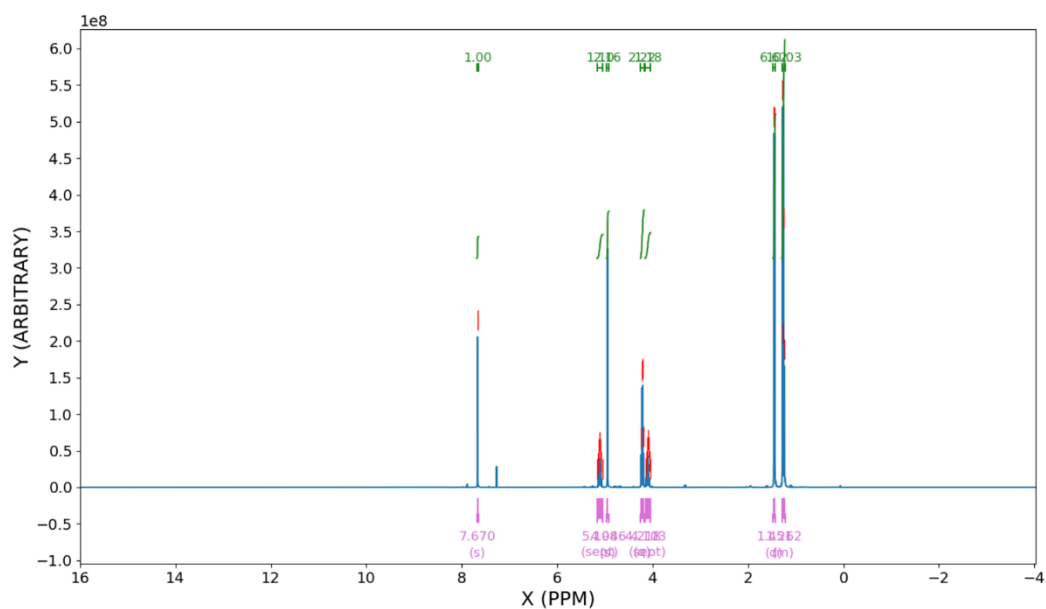


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

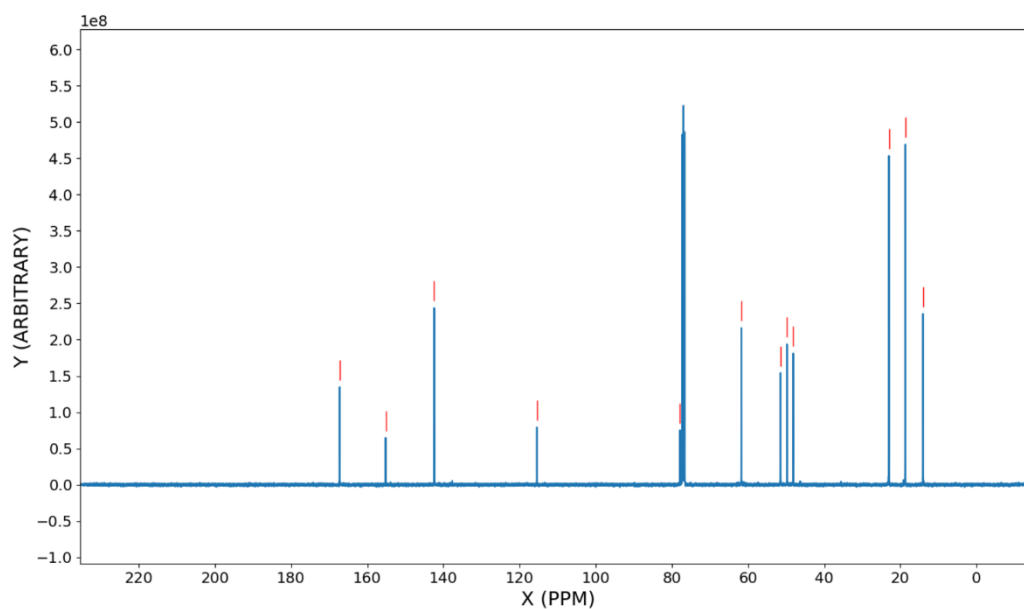


[**18m**] ethyl (*E*)-2-(4-cyano-5-(3,3-diisopropyltriaz-1-en-1-yl)-1*H*-pyrazol-1-yl)acetate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

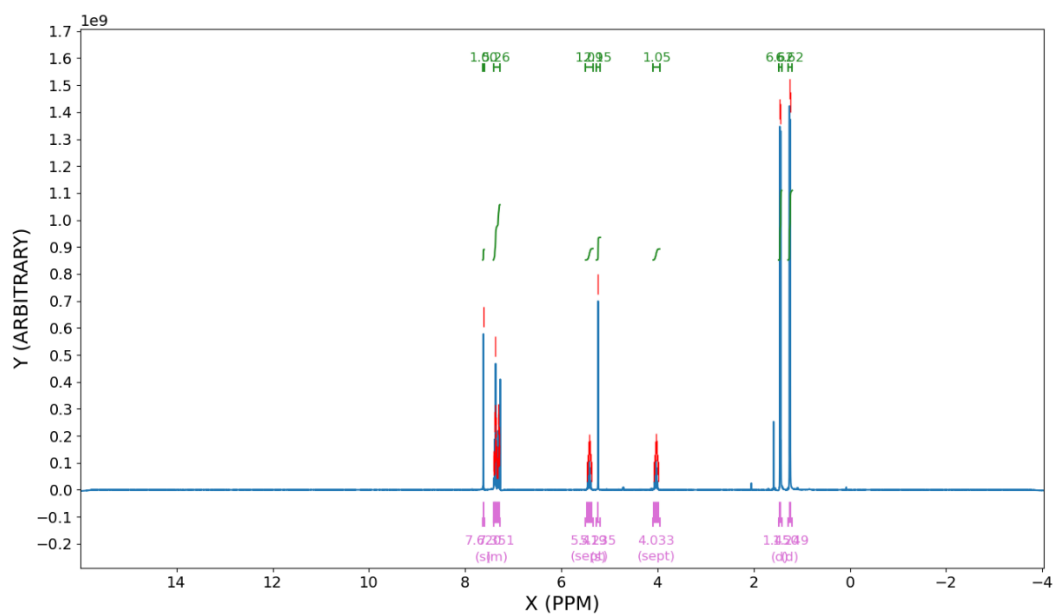


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

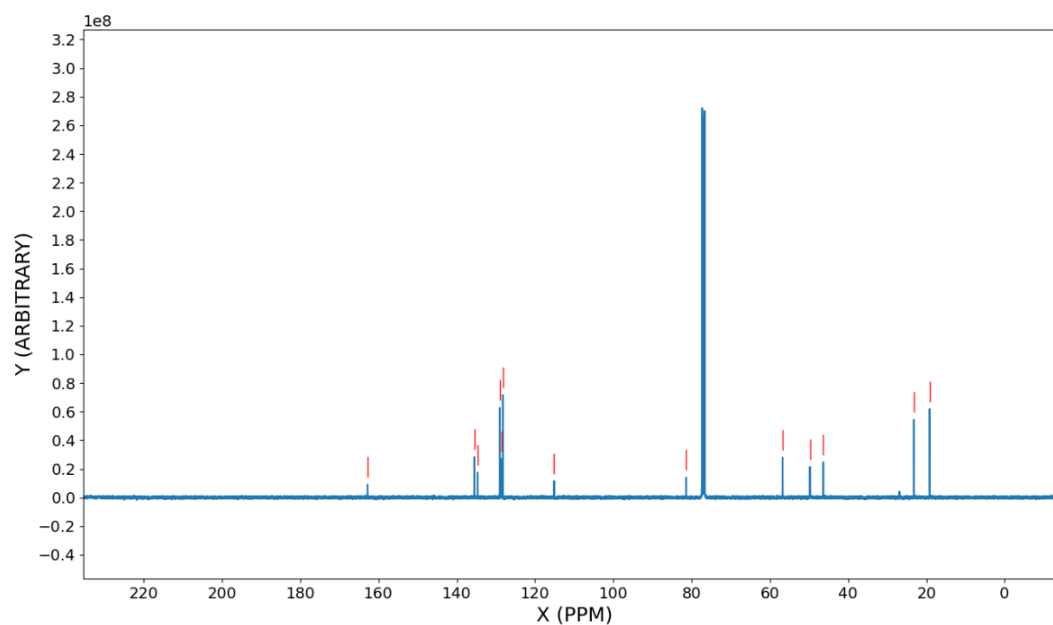


[17n] (*E*)-1-benzyl-3-(3,3-diisopropyltriaz-1-en-1-yl)-1*H*-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

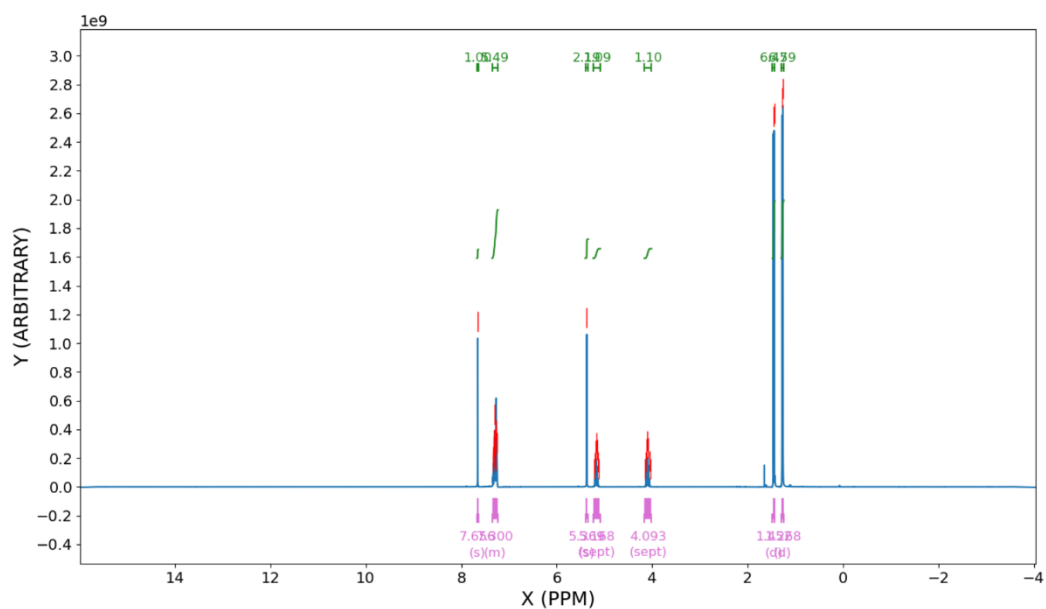


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

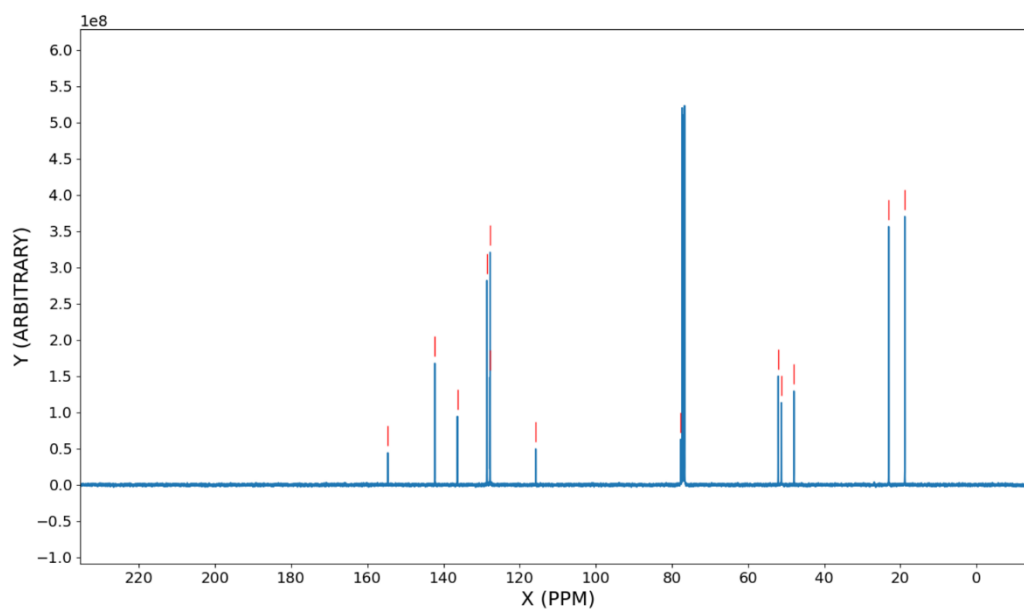


[18n] (*E*)-1-benzyl-5-(3,3-diisopropyltriaz-1-en-1-yl)-1*H*-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

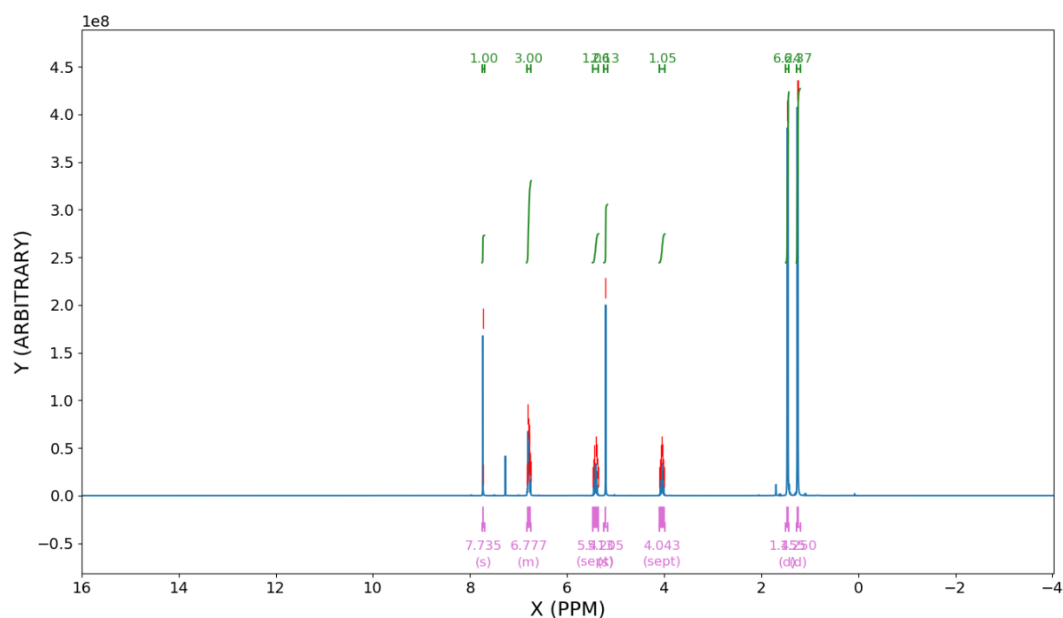


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

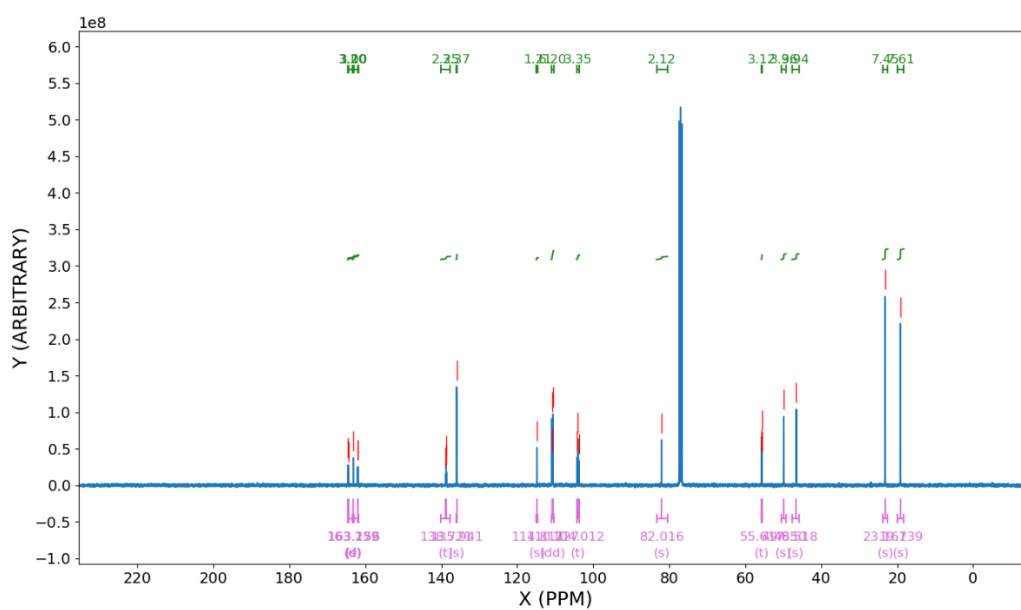


[170] (*E*)-1-(3,5-difluorobenzyl)-3-(3,3-diisopropyltriaz-1-en-1-yl)-1*H*-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

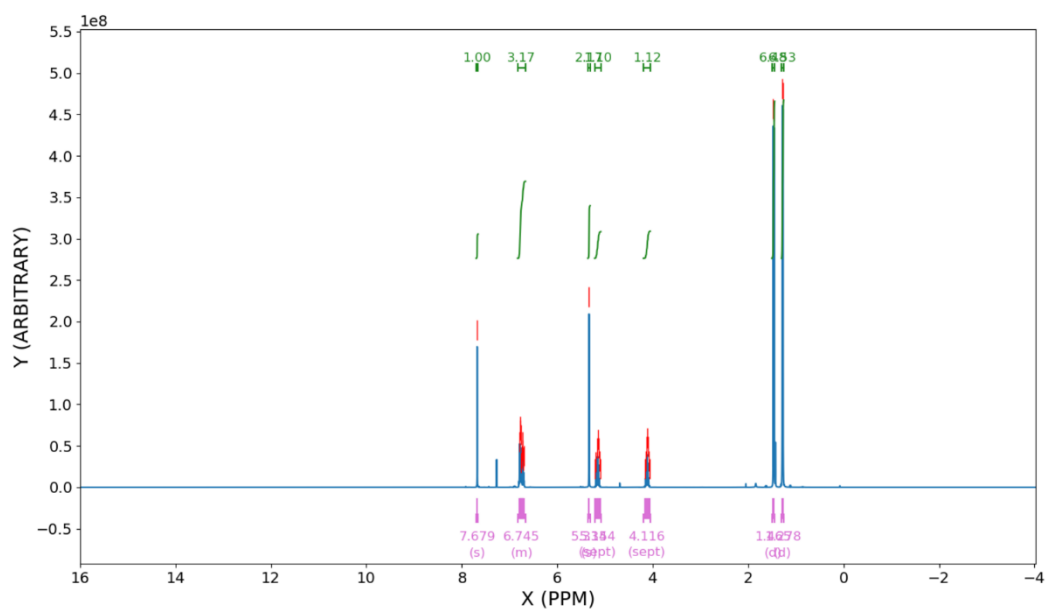


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

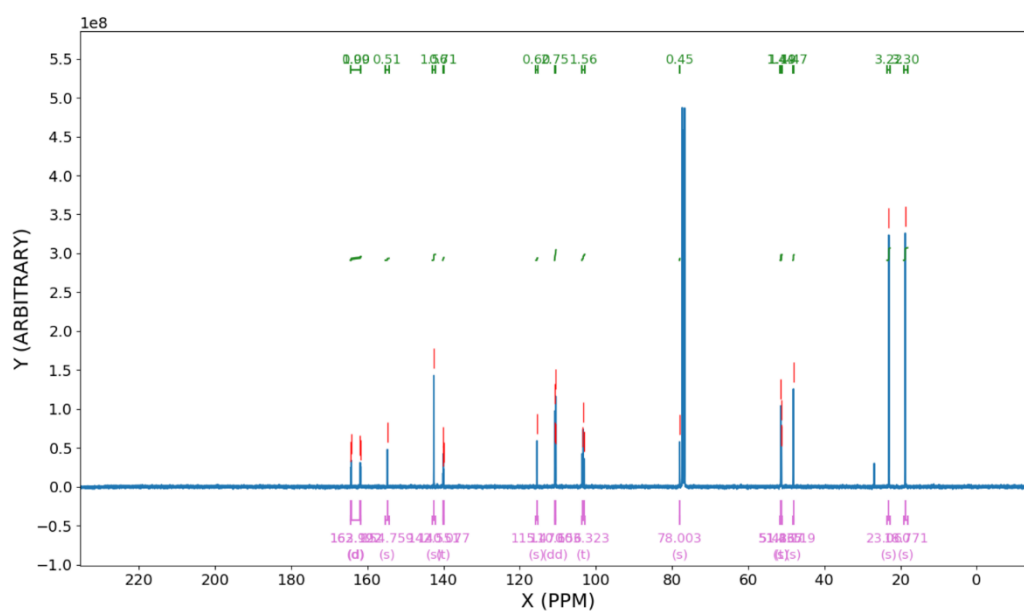


[180] (E)-1-(3,5-difluorobenzyl)-5-(3,3-diisopropyltriaz-1-en-1-yl)-1H-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

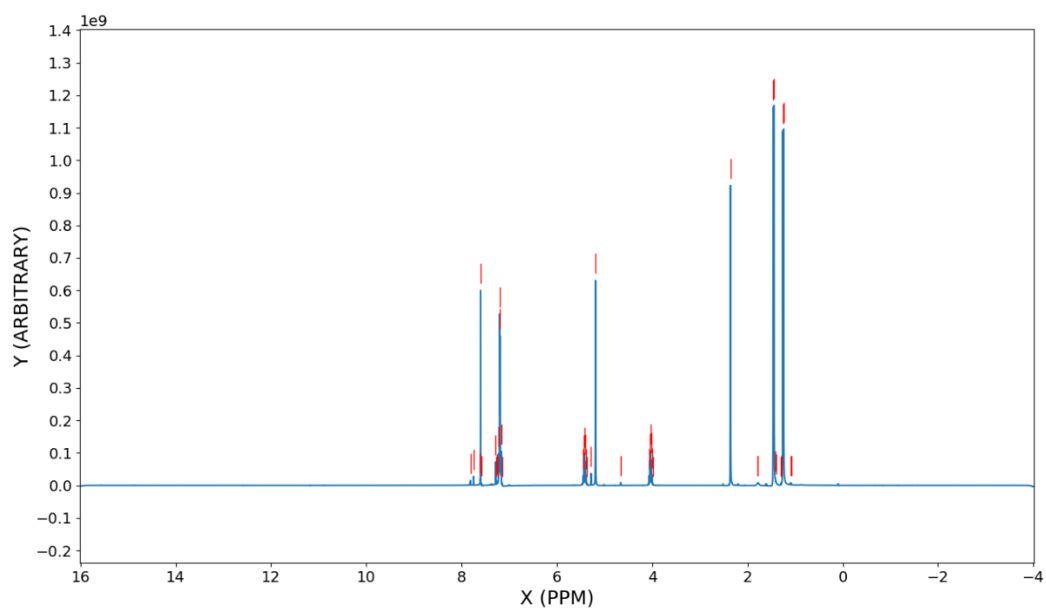


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

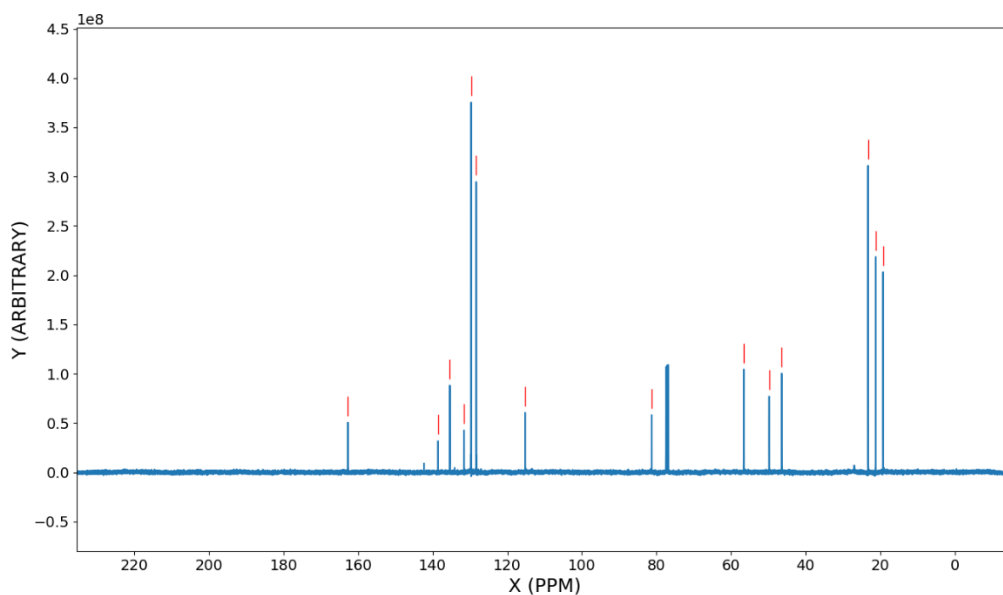


[17p] (*E*)-3-(3,3-diisopropyltriaz-1-en-1-yl)-1-(4-methylbenzyl)-1*H*-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

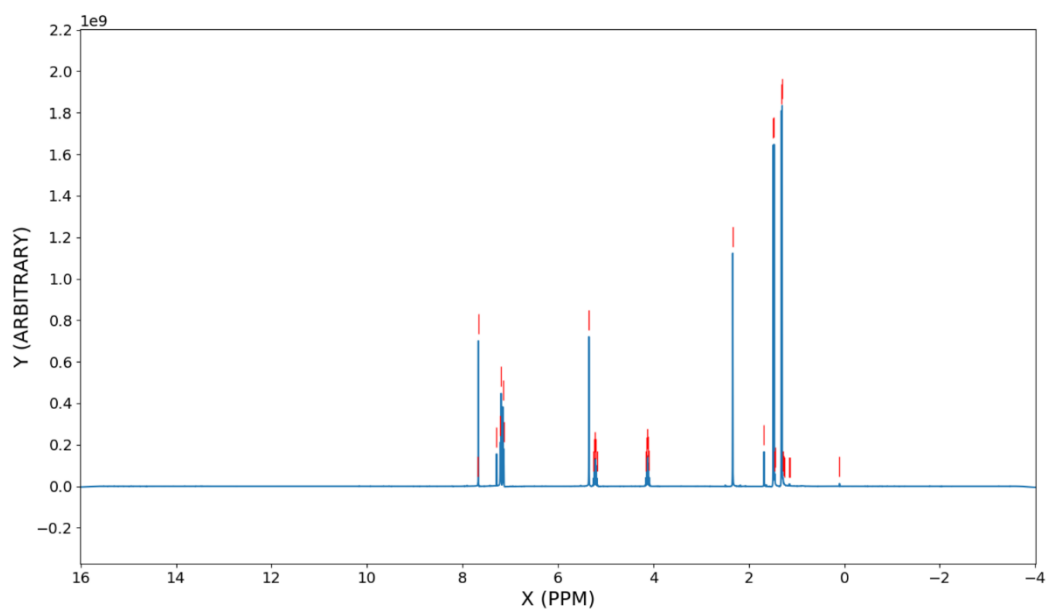


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

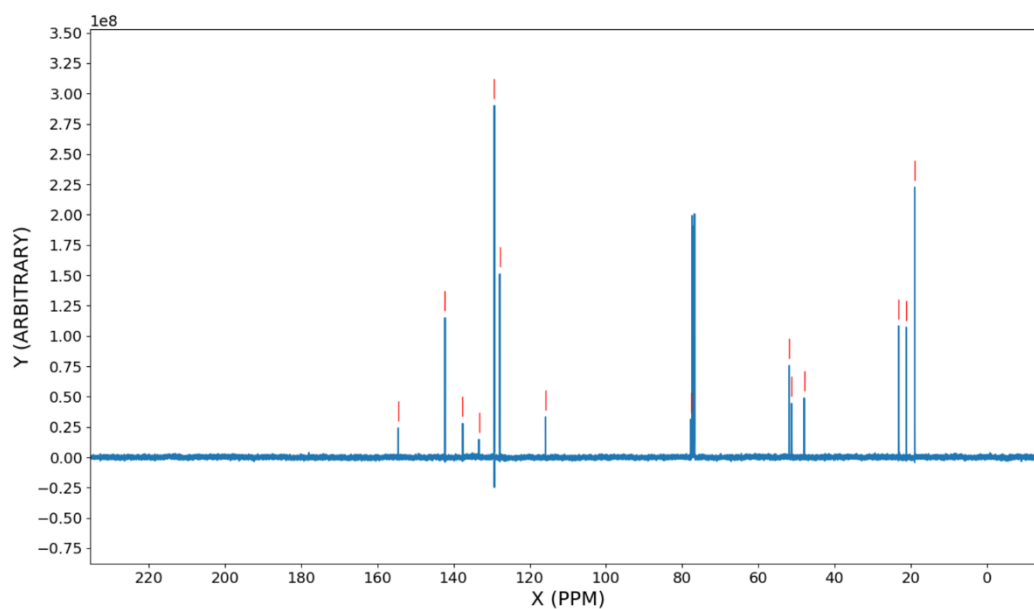


[18p] (*E*)-5-(3,3-diisopropyltriaz-1-en-1-yl)-1-(4-methylbenzyl)-1*H*-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

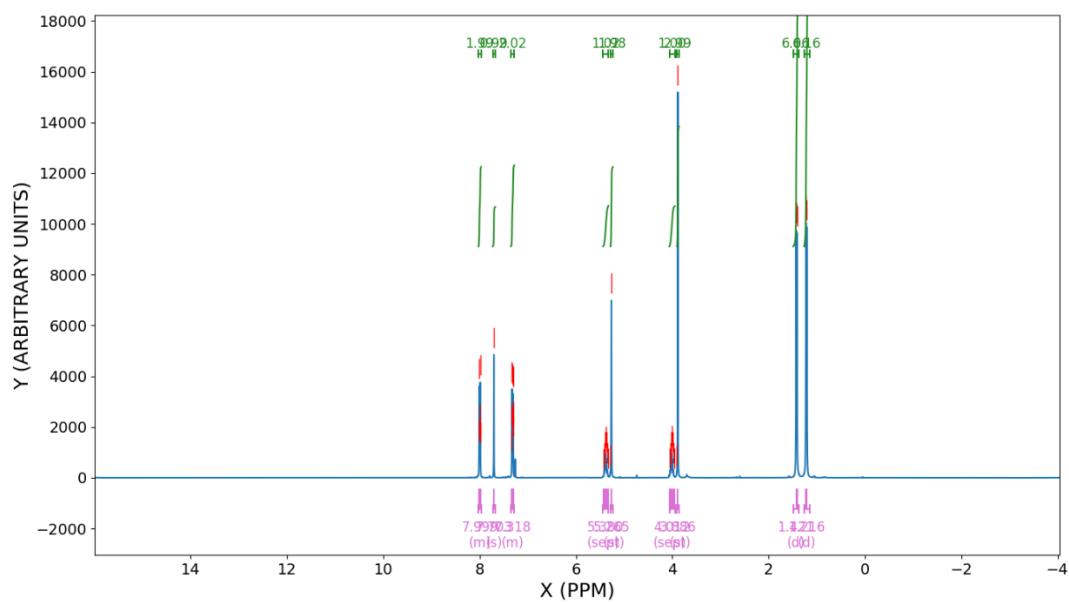


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

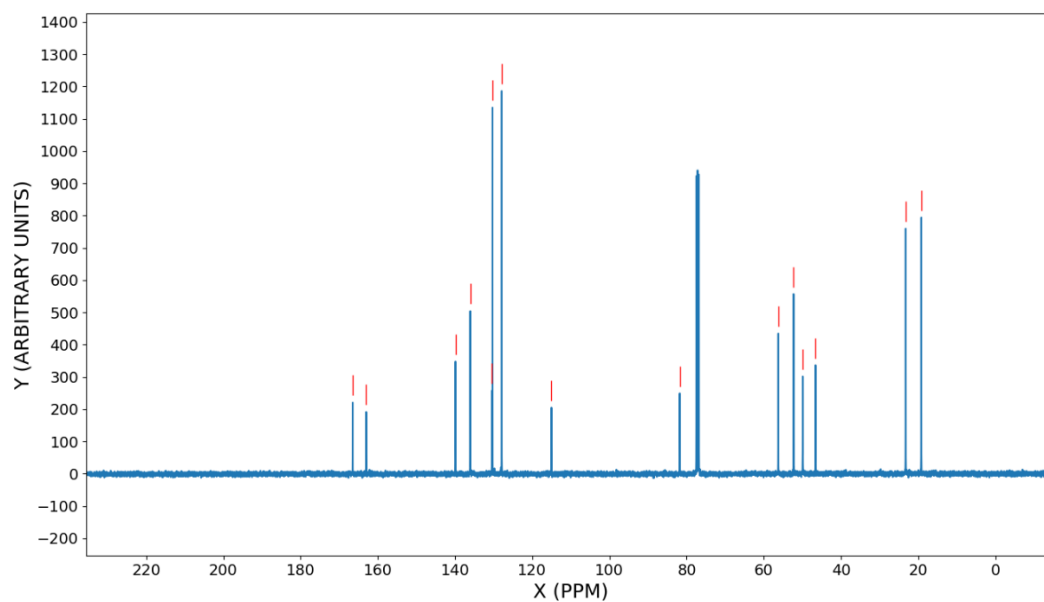


[**17q**] methyl (*E*)-4-((4-cyano-3-(3,3-diisopropyltriaz-1-en-1-yl)-1*H*-pyrazol-1-yl)methyl)benzoate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

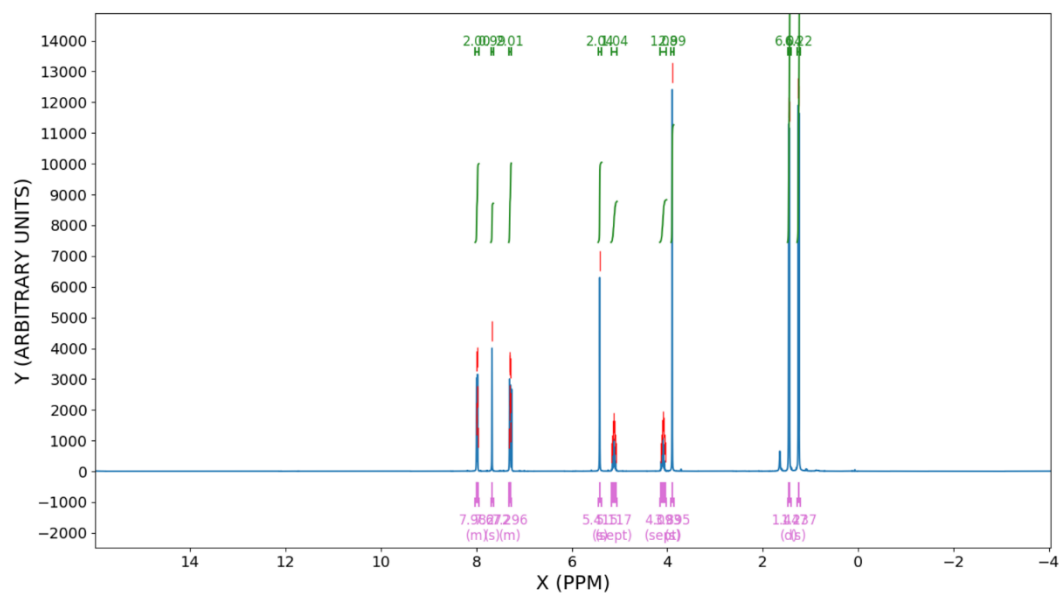


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

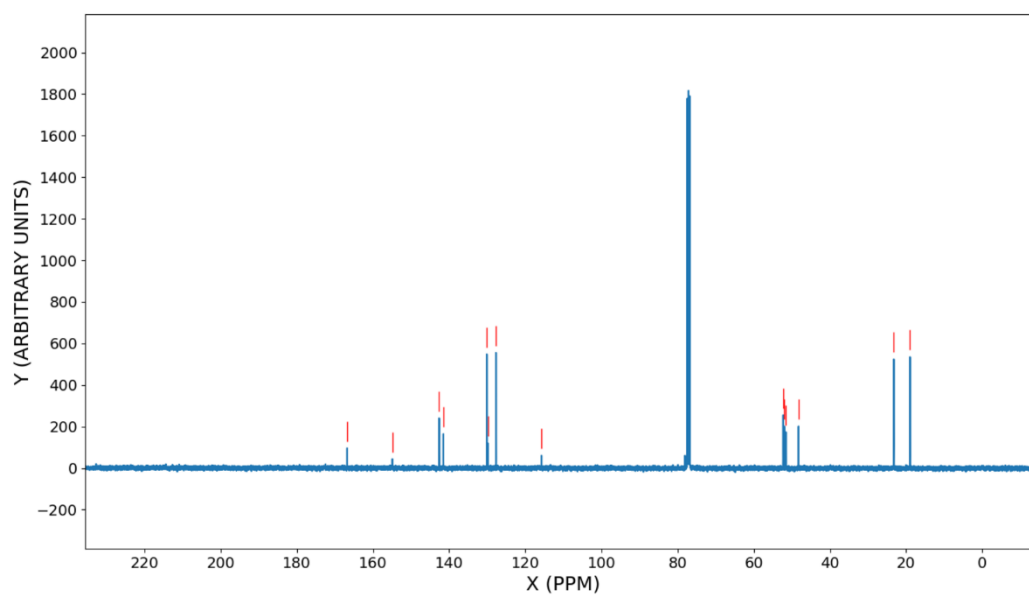


[**18q**] methyl (*E*)-4-((4-cyano-5-(3,3-diisopropyltriaz-1-en-1-yl)-1*H*-pyrazol-1-yl)methyl)benzoate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

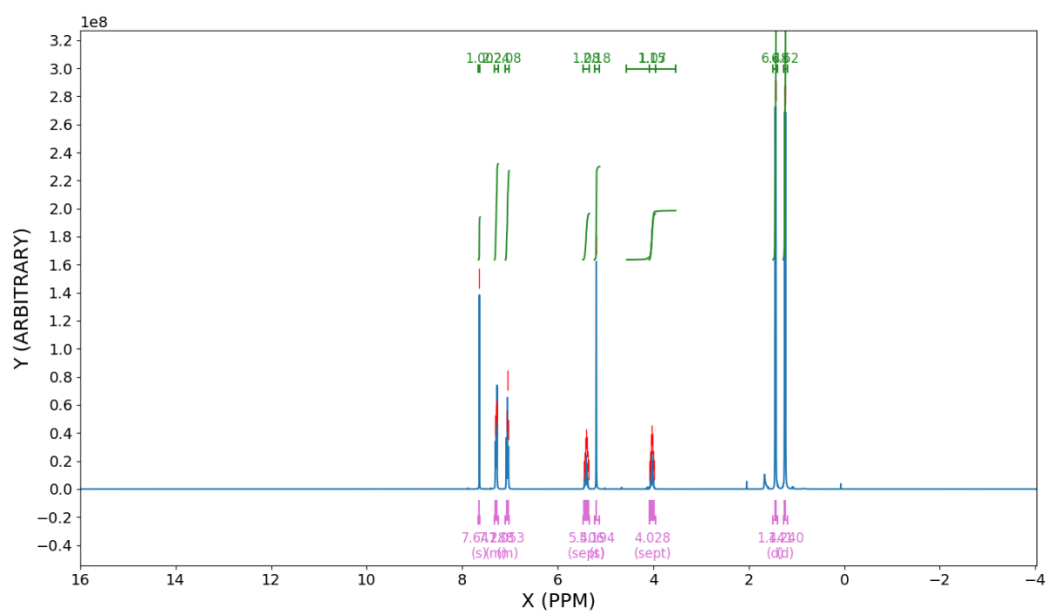


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

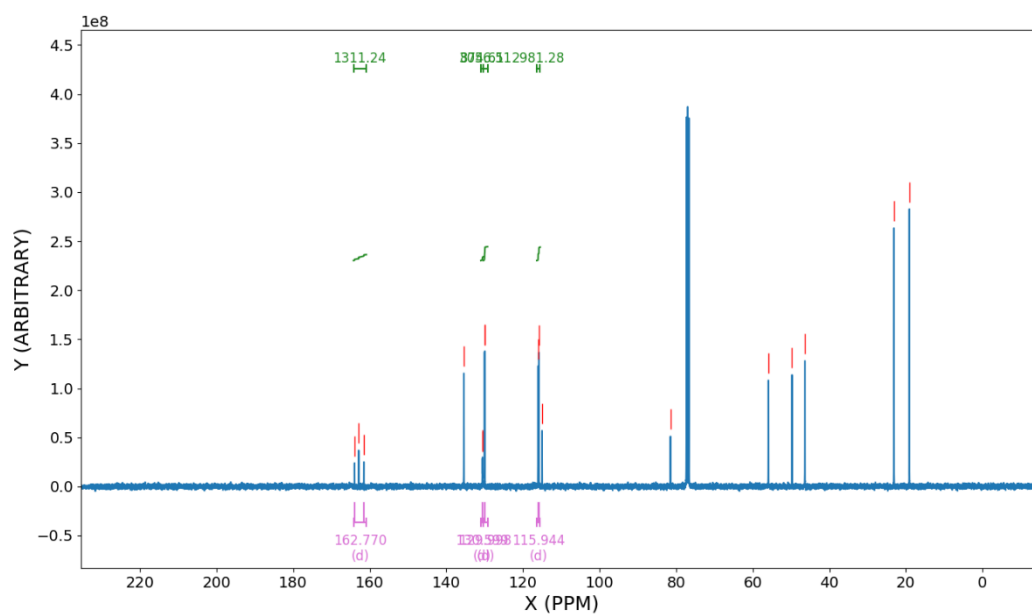


[17r] (*E*)-3-(3,3-diisopropyltriaz-1-en-1-yl)-1-(4-fluorobenzyl)-1*H*-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

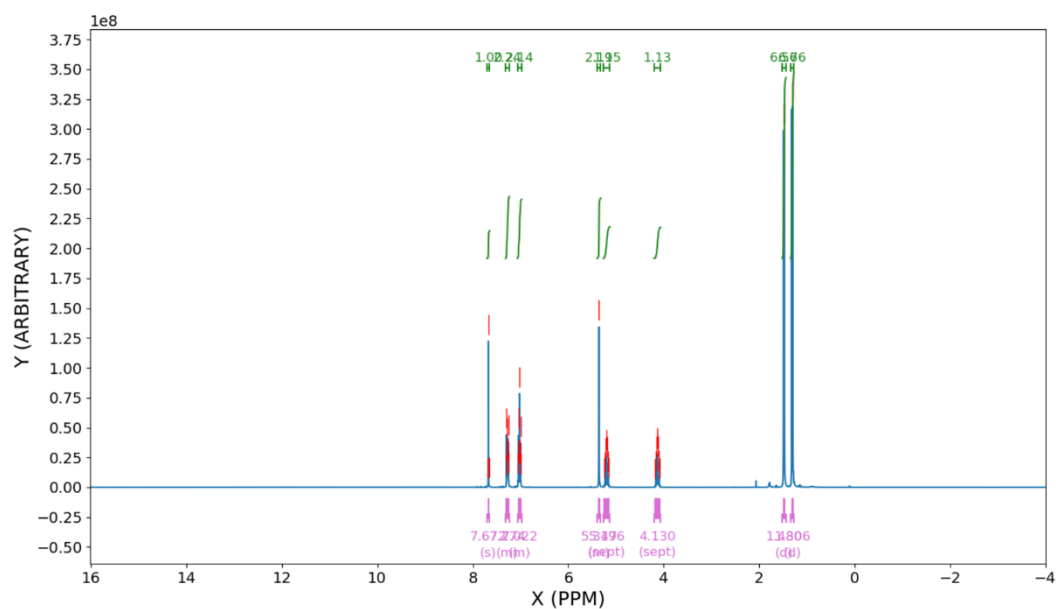


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

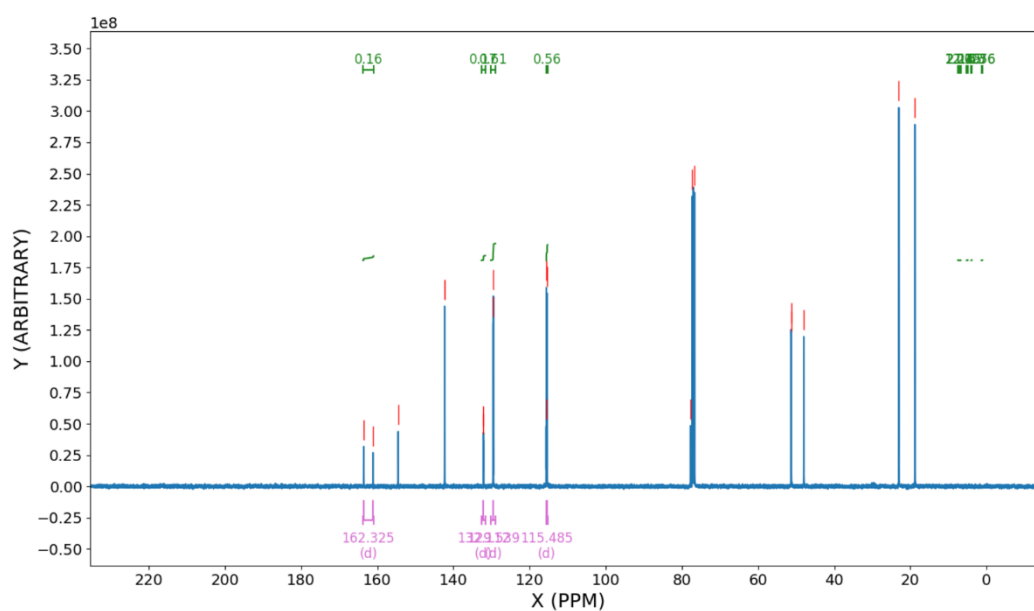


[18r] (*E*)-5-(3,3-diisopropyltriaz-1-en-1-yl)-1-(4-fluorobenzyl)-1*H*-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

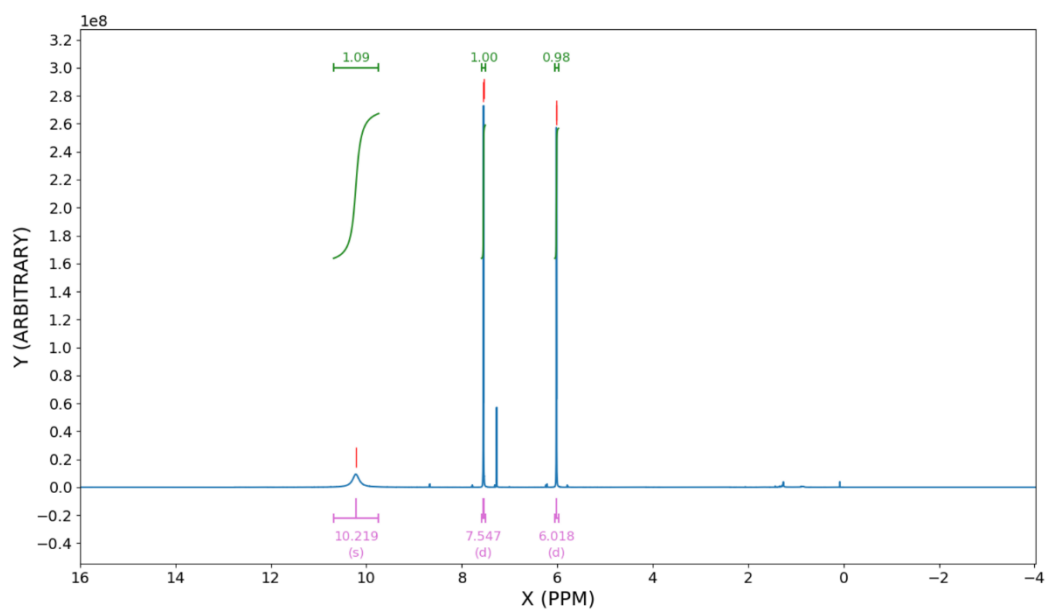


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

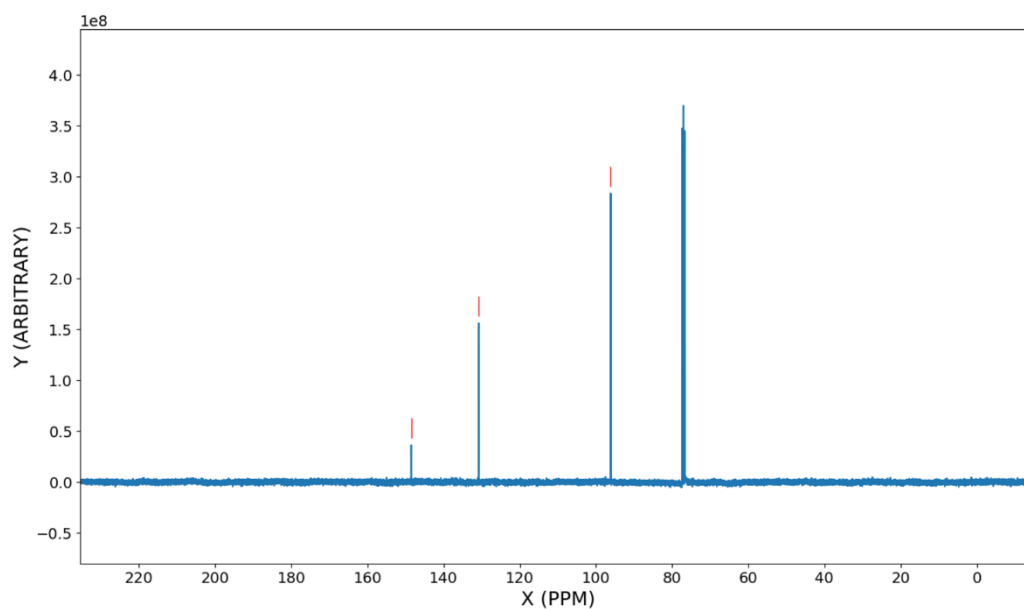


[19a] 5-azido-1*H*-pyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

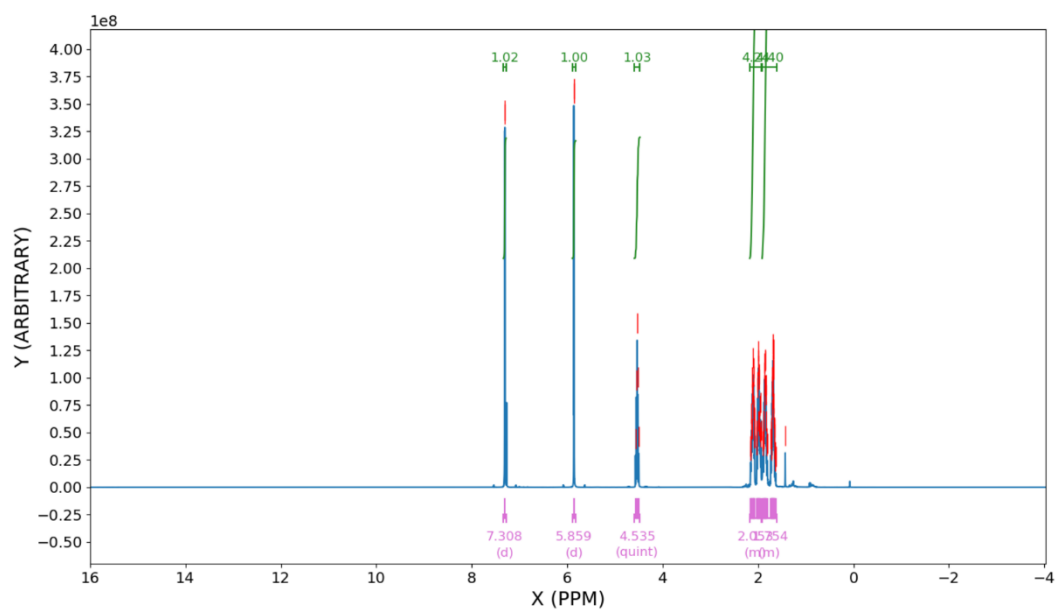


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

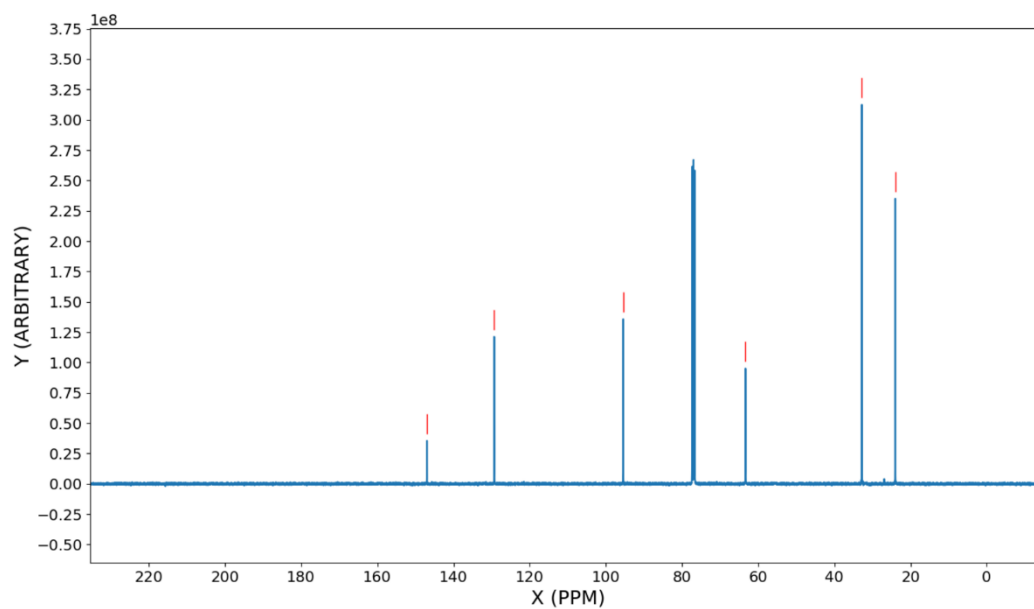


[19b] 3-azido-1-cyclopentylpyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

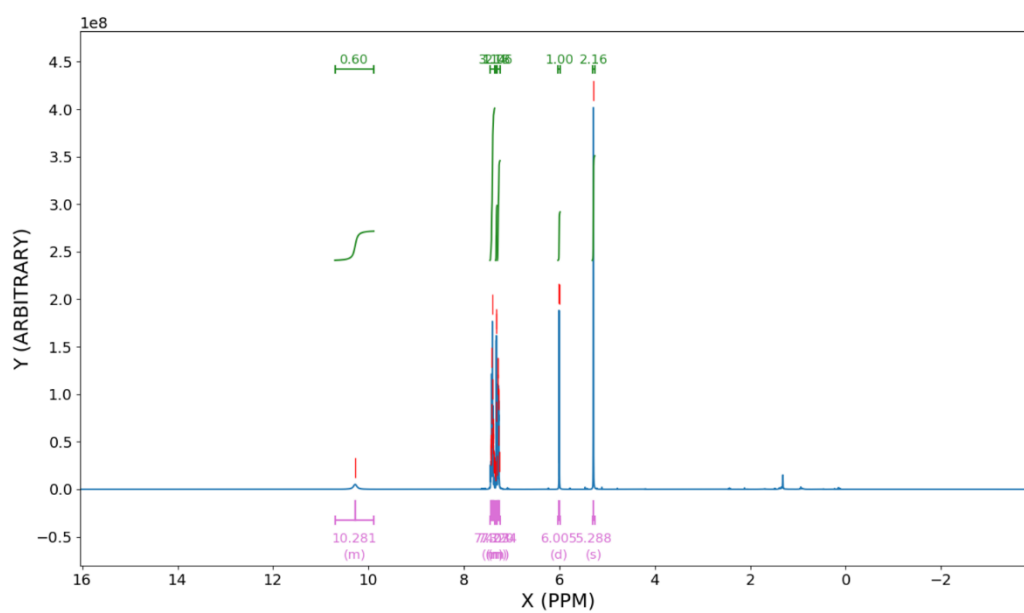


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

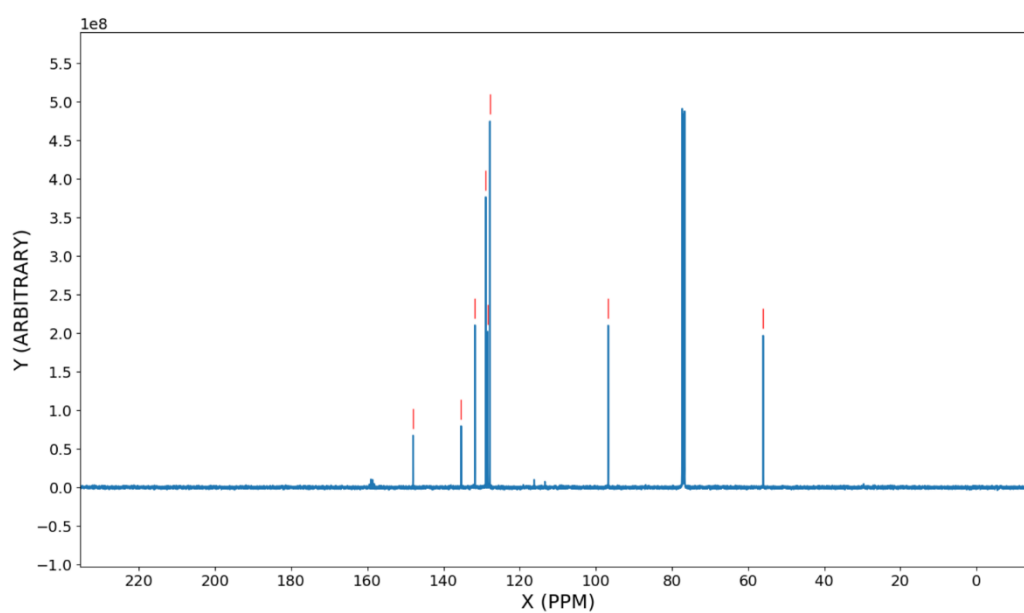


[19c] 3-azido-1-benzyl-pyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

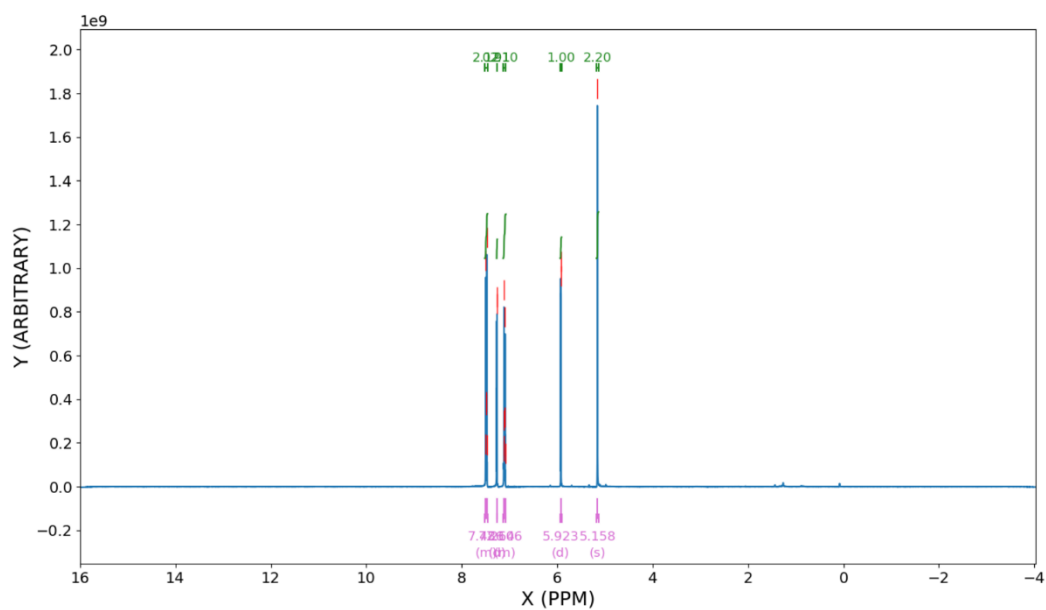


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

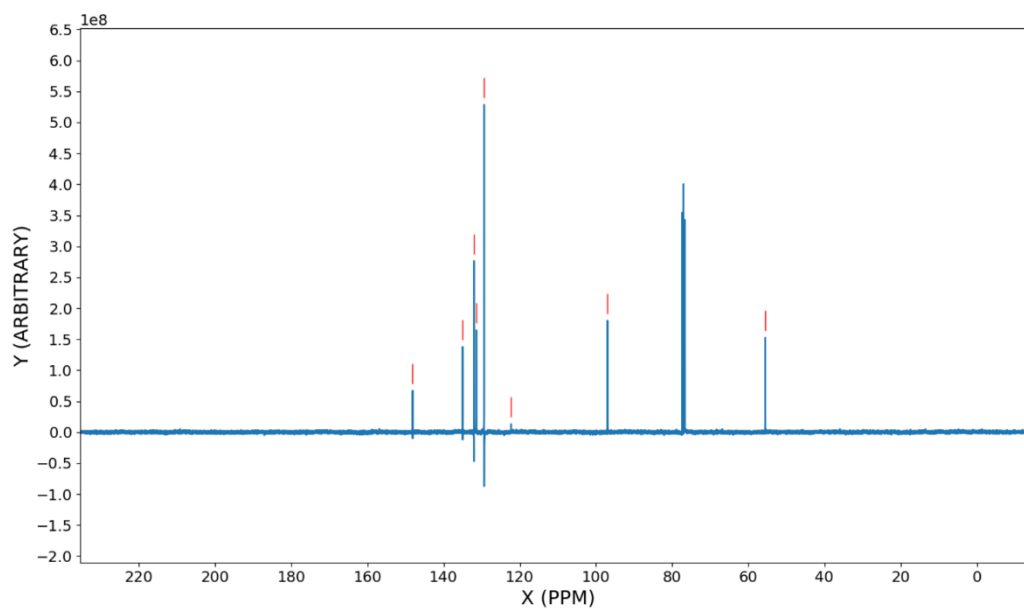


[19d] 3-azido-1-(4-bromobenzyl)pyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

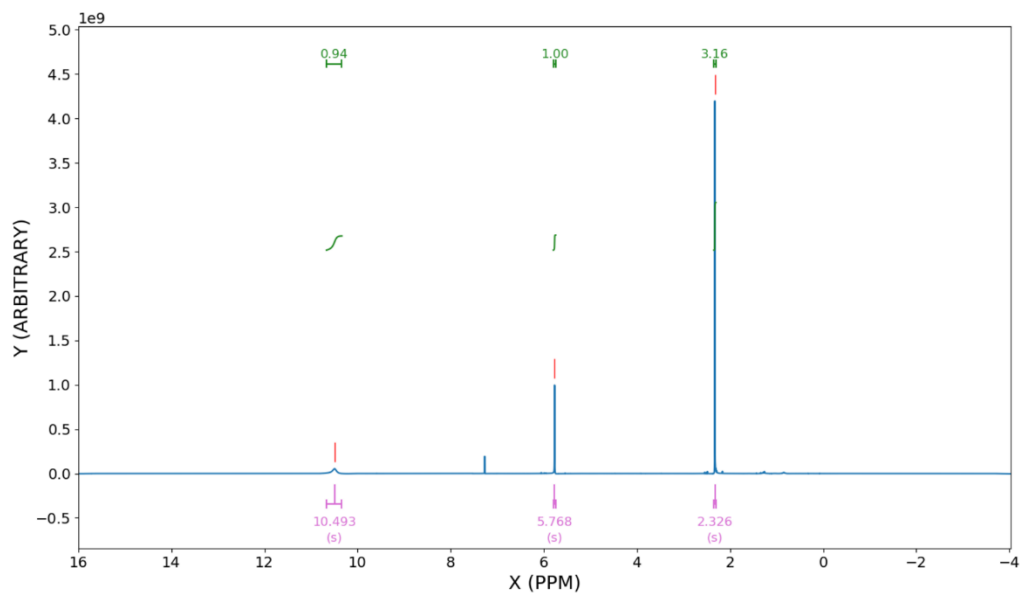


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

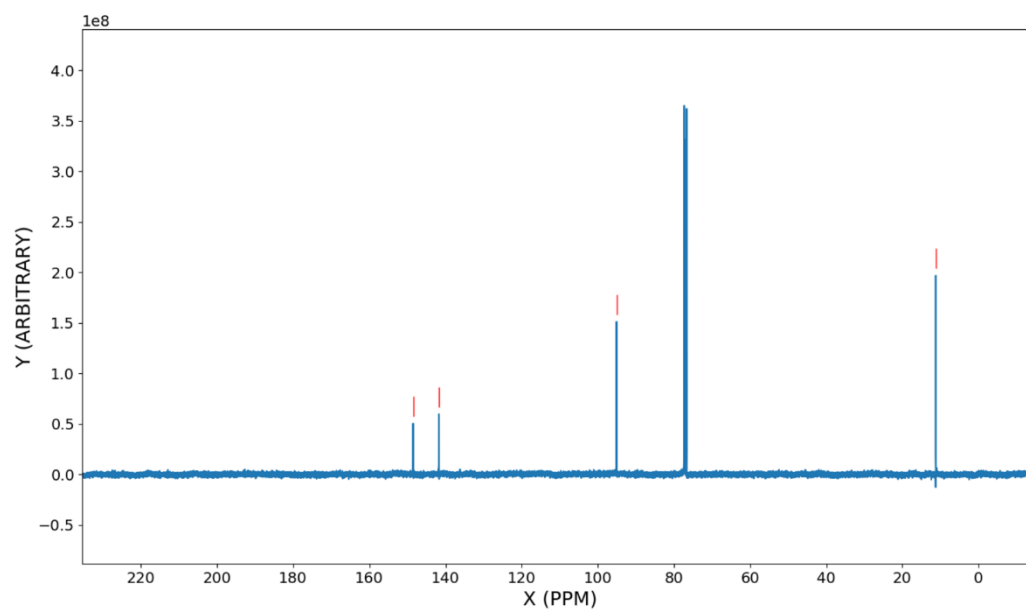


[19e] 3-azido-5-methyl-1*H*-pyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

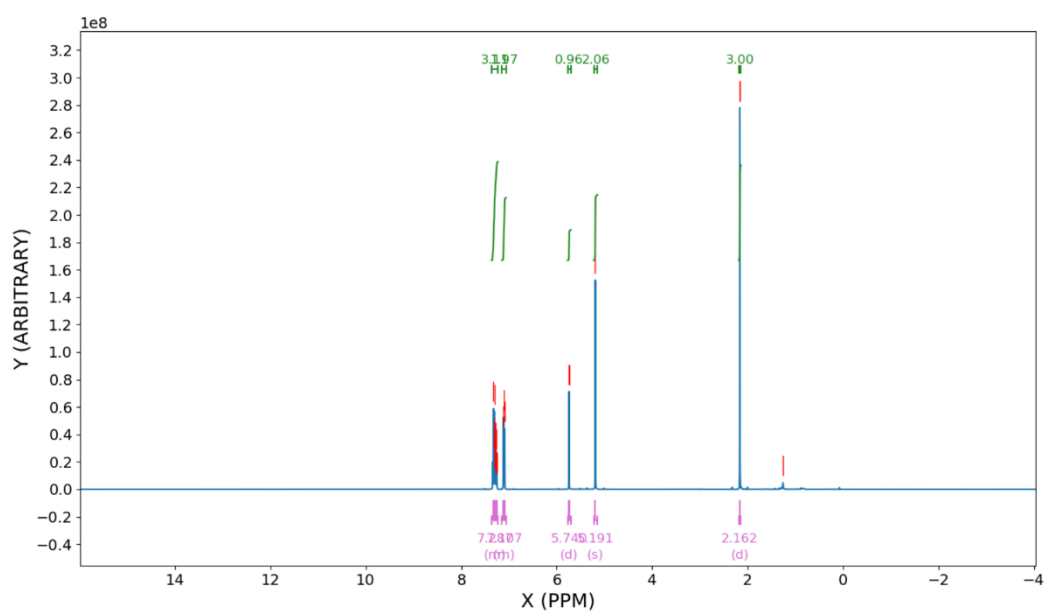


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

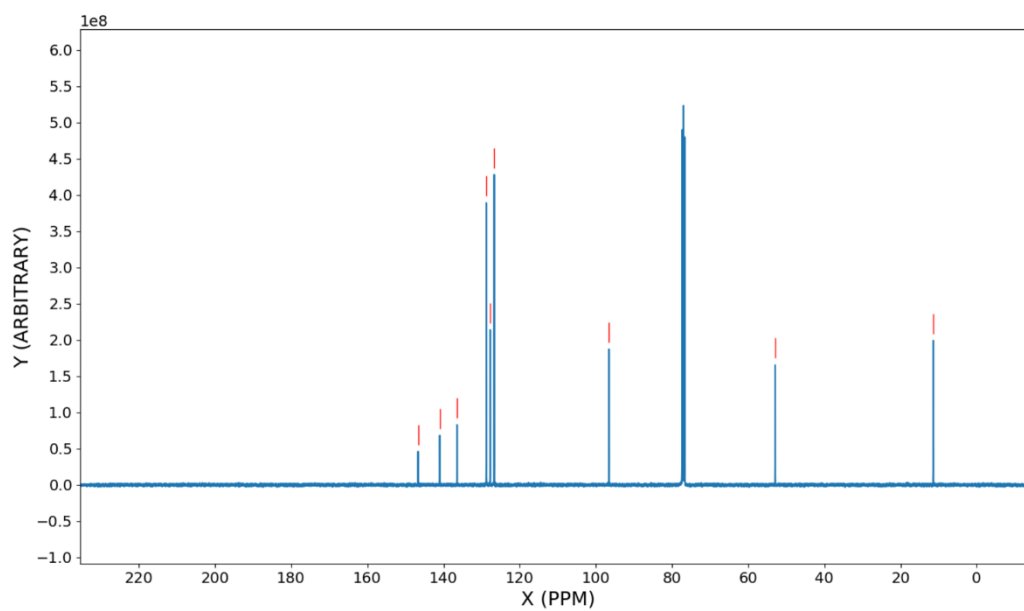


[19f] 3-azido-1-benzyl-5-methyl-pyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

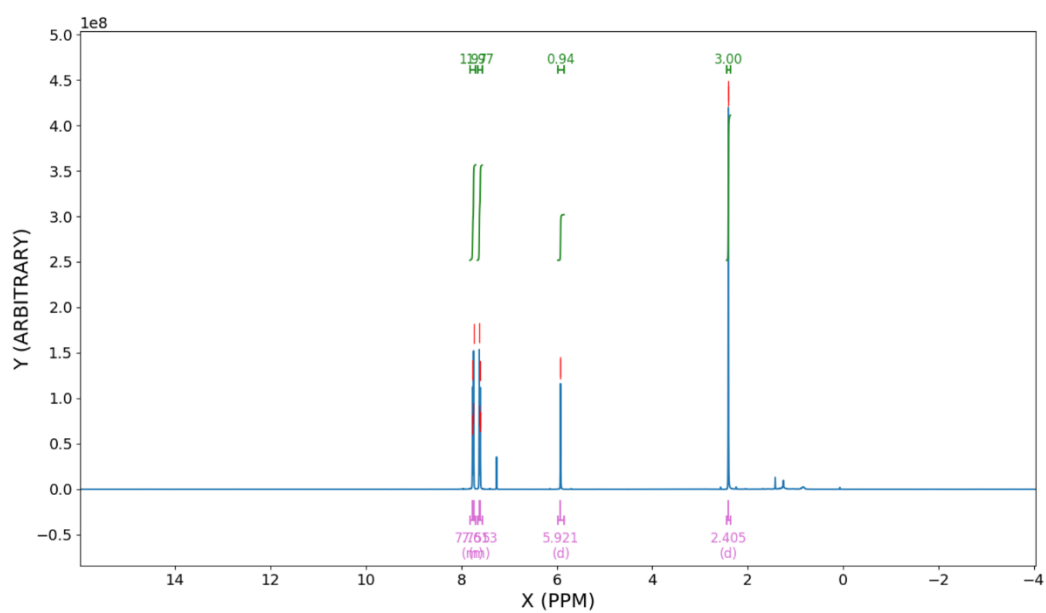


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

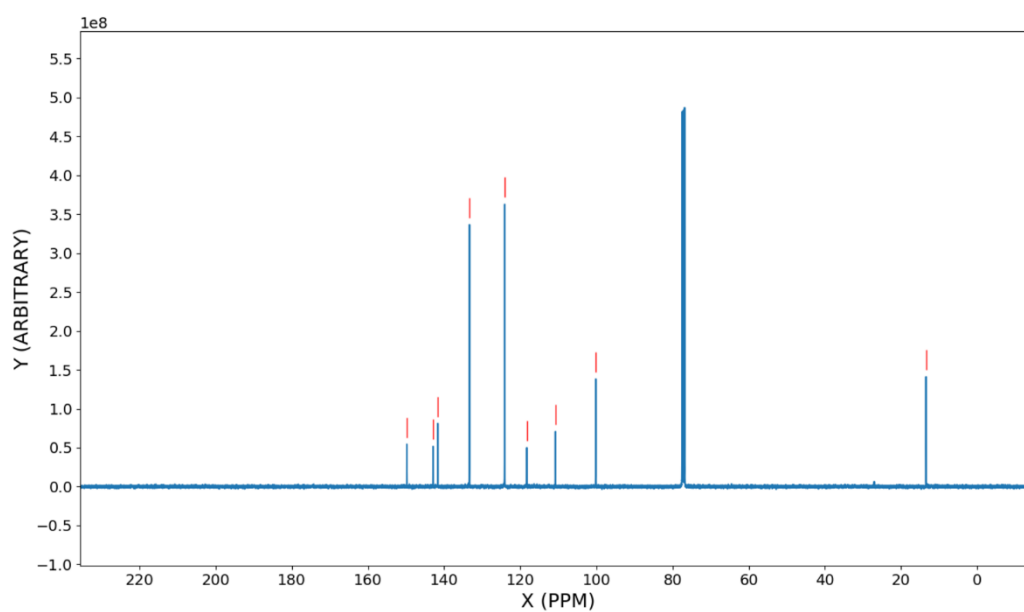


[19g] 4-(3-azido-5-methyl-1*H*-pyrazol-1-yl)benzonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

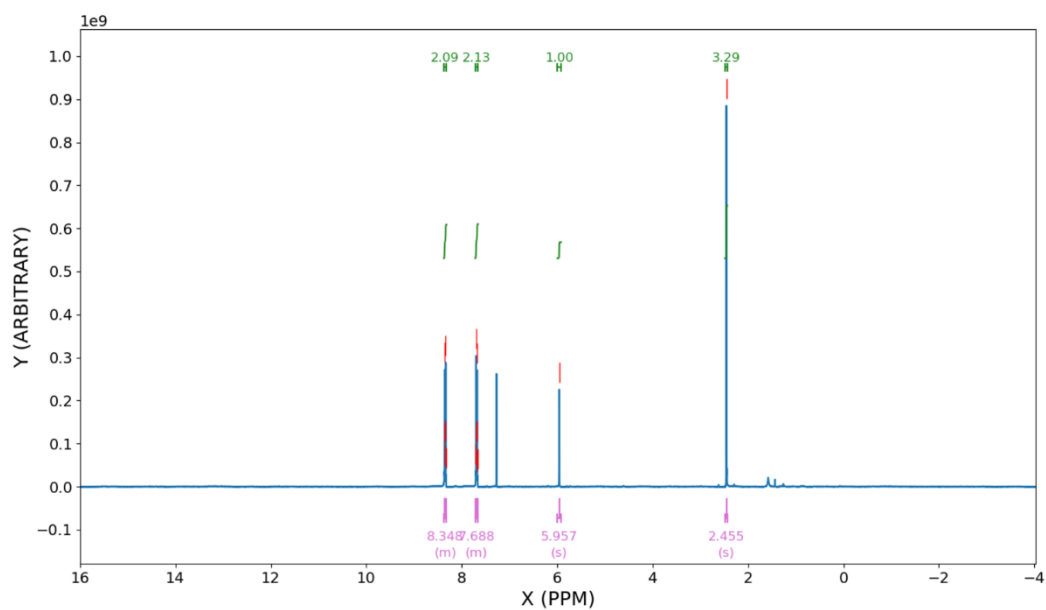


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

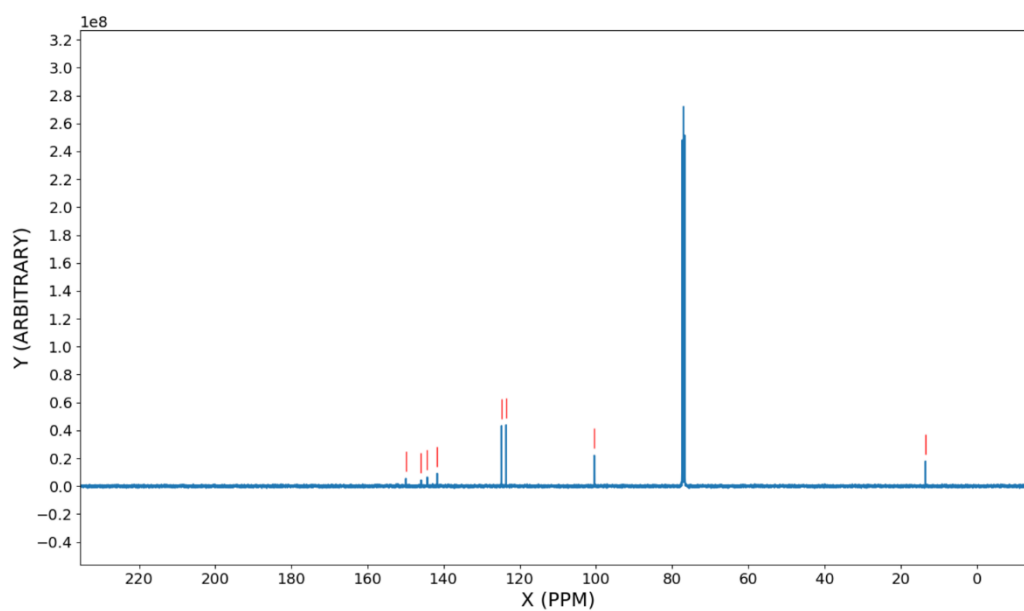


[19h] 3-azido-5-methyl-1-(4-nitrophenyl)-1*H*-pyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

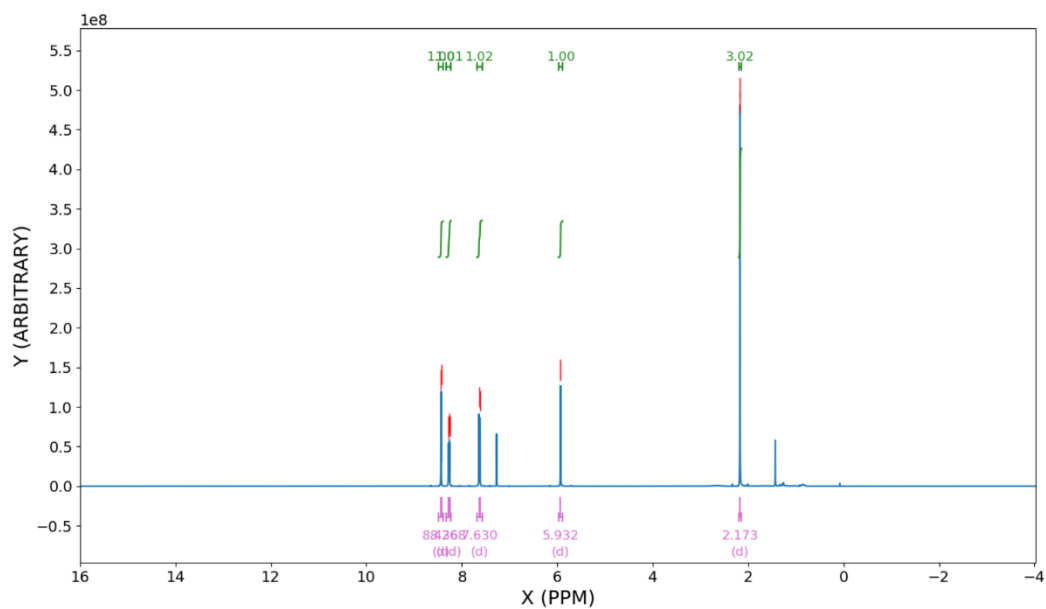


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

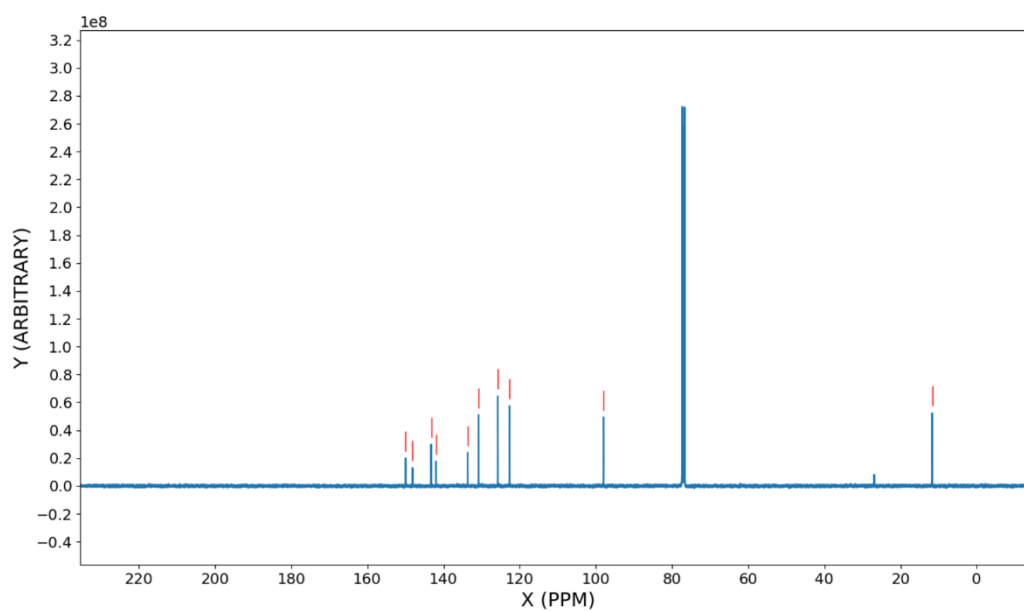


[19i] 3-azido-1-(2-chloro-4-nitrophenyl)-5-methyl-1*H*-pyrazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

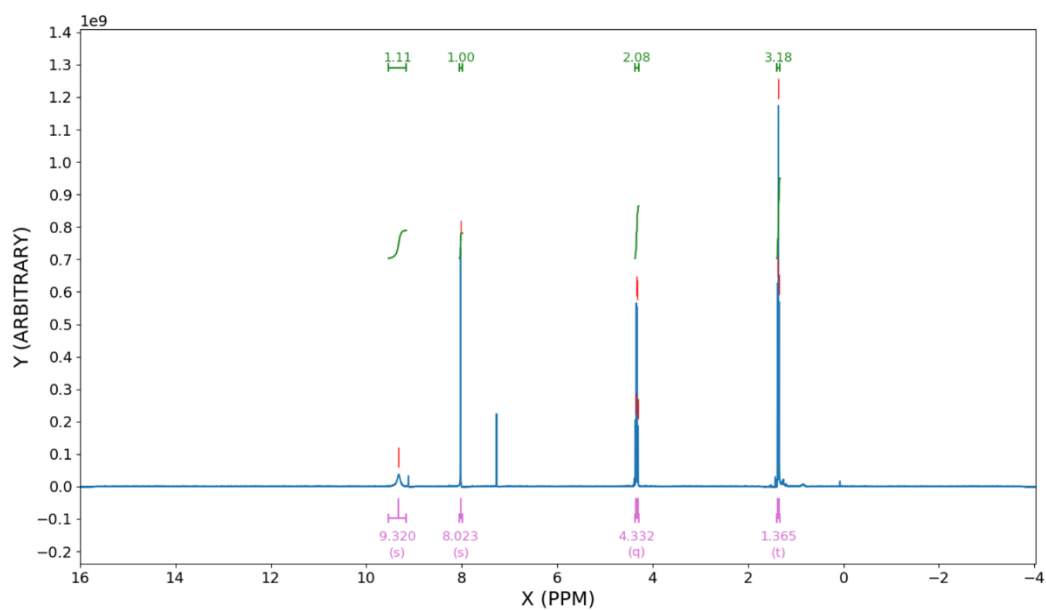


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

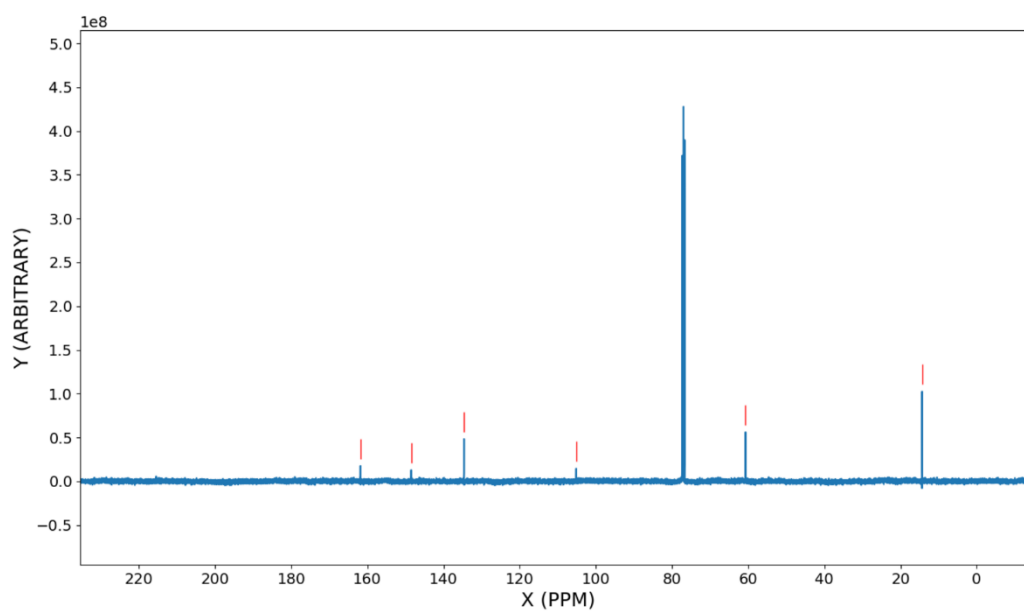


[19j] ethyl 5-azido-1*H*-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

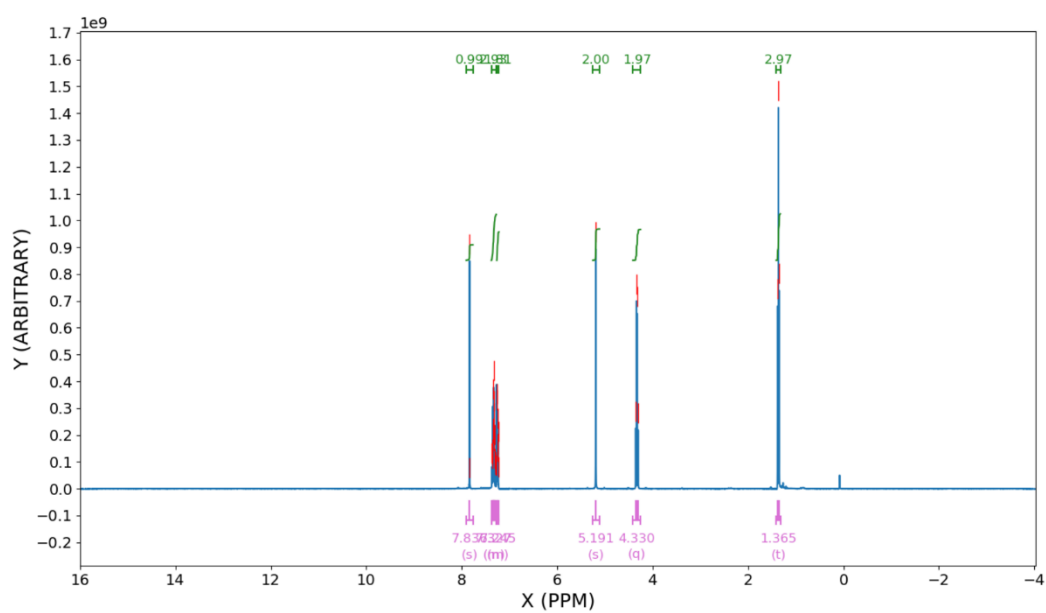


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

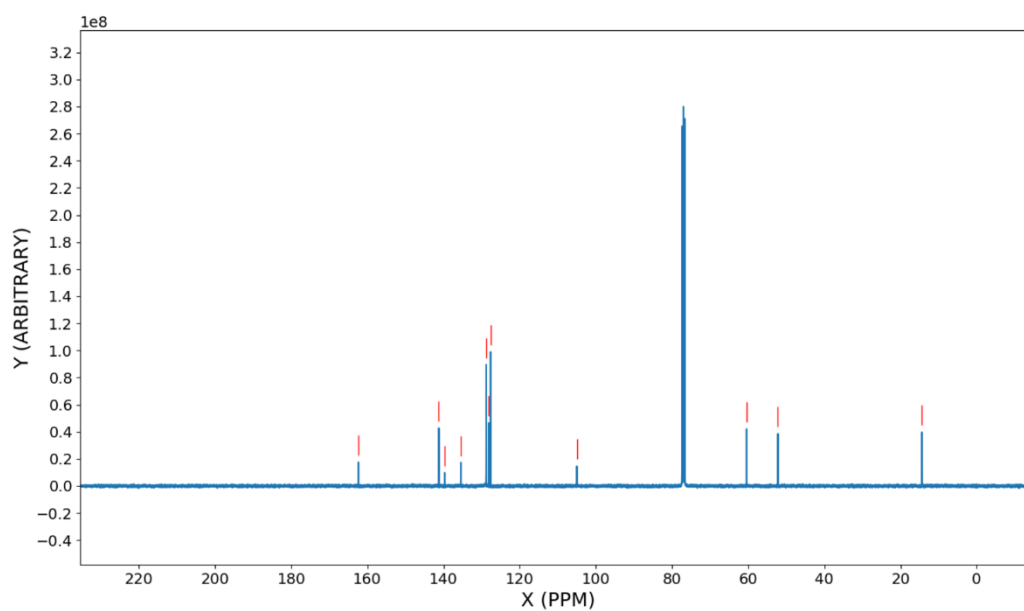


[19k] 3-azido-1-benzyl-pyrazole-4-carboxylic acid ethyl ester

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

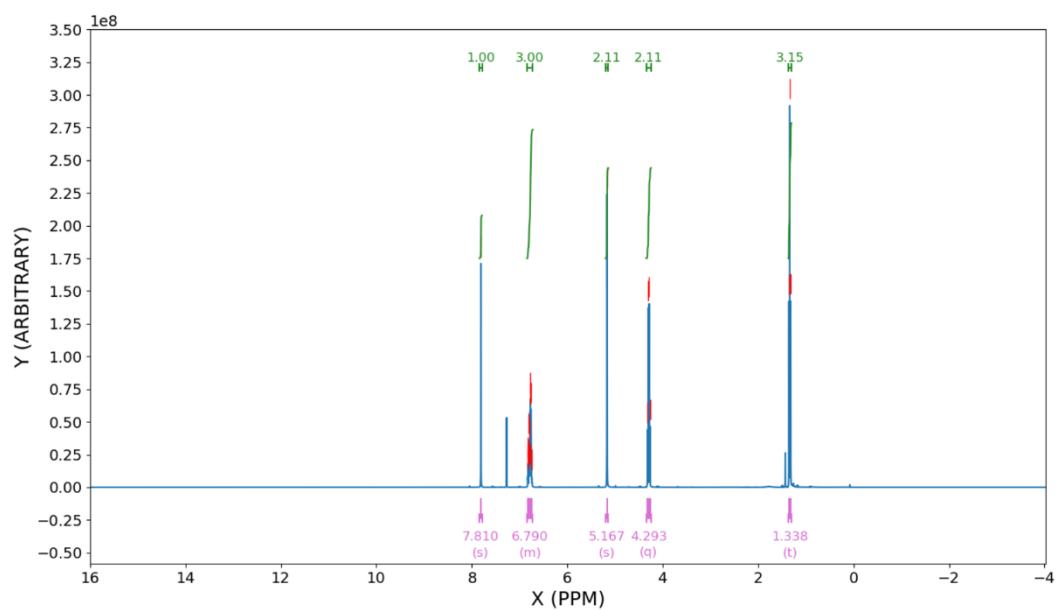


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

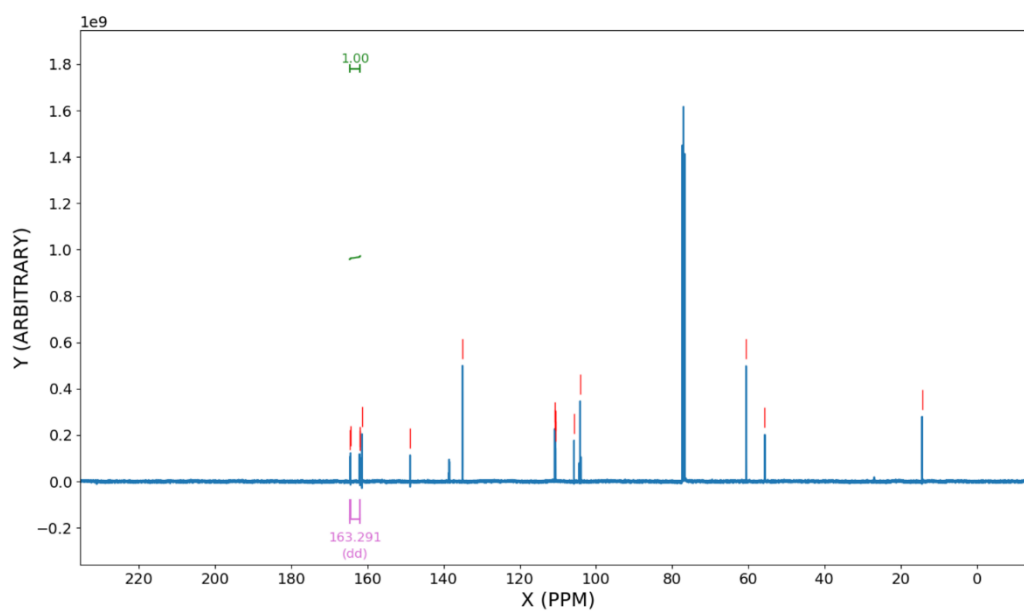


[19l] ethyl 3-azido-1-(3,5-difluorobenzyl)-1H-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

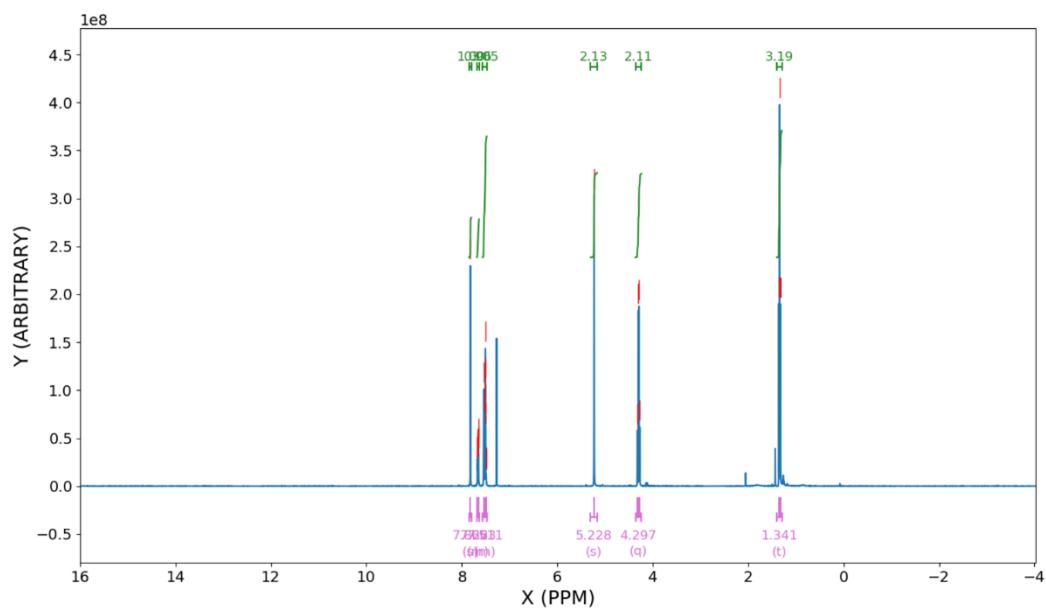


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

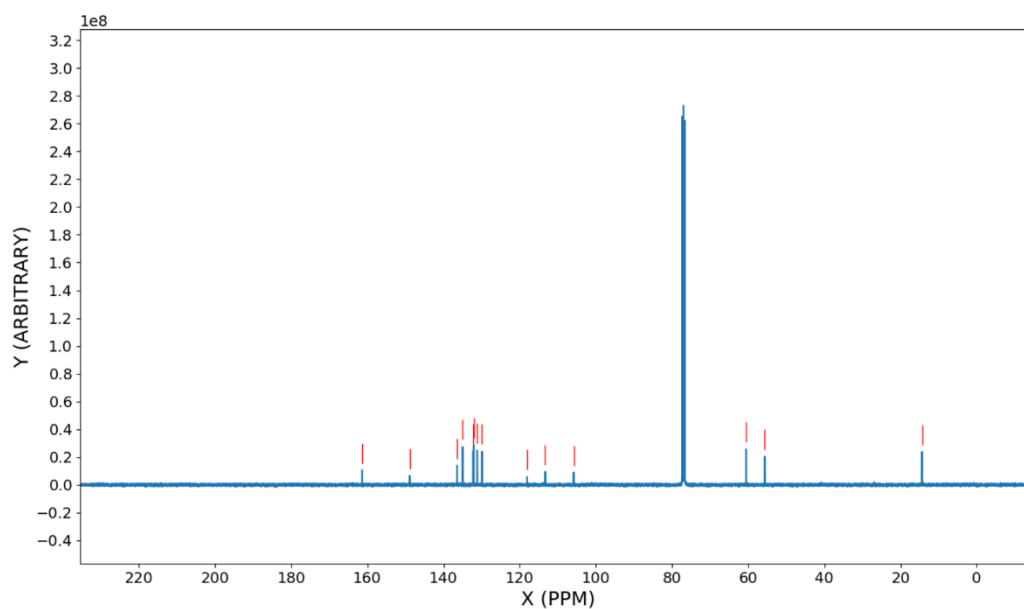


[19m] ethyl 3-azido-1-(3-cyanobenzyl)-1H-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

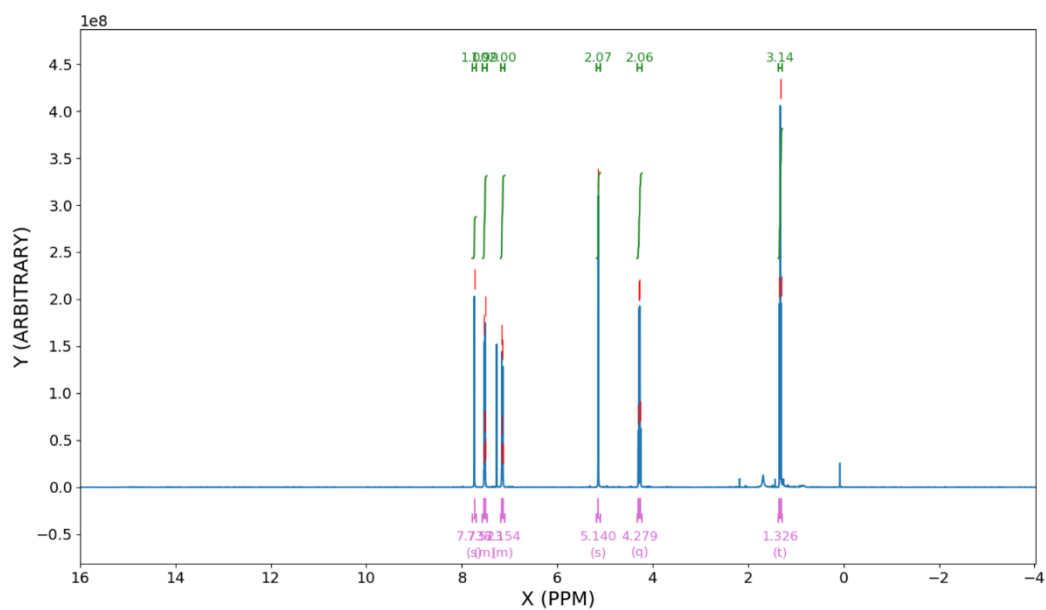


CHMO:0000593 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

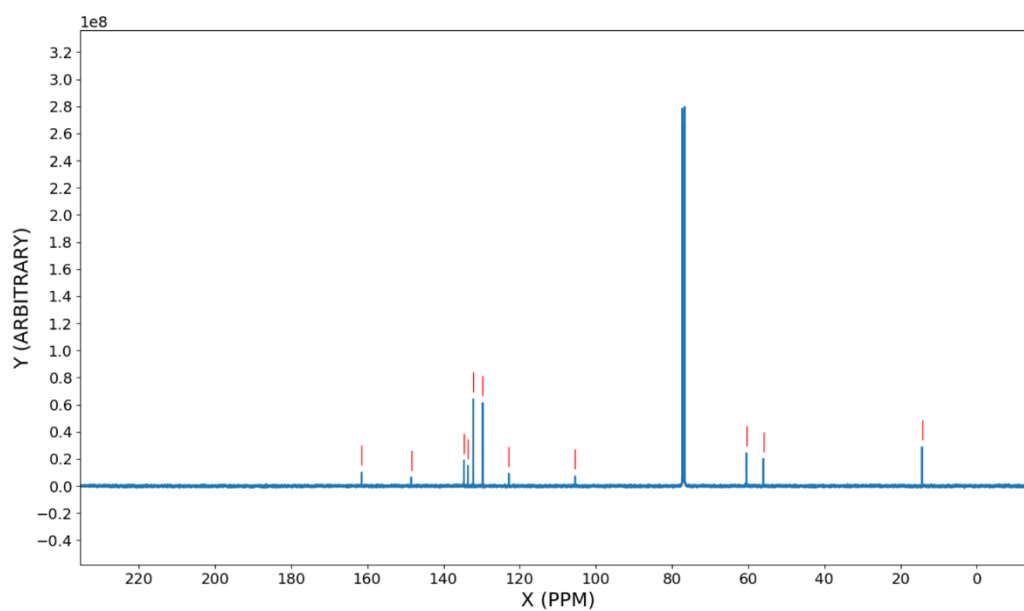


[19n] ethyl 3-azido-1-(4-bromobenzyl)-1H-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

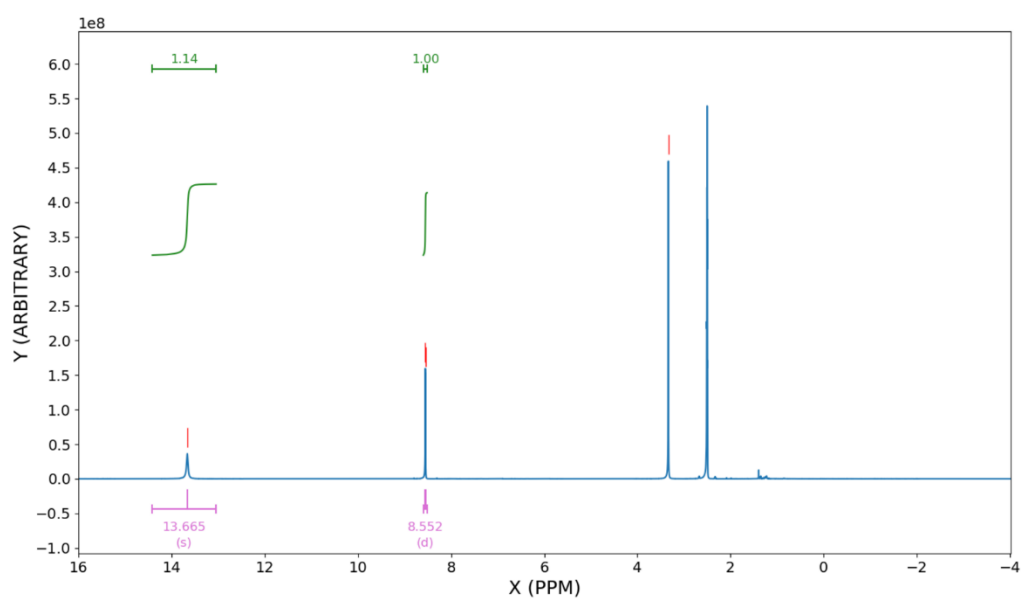


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

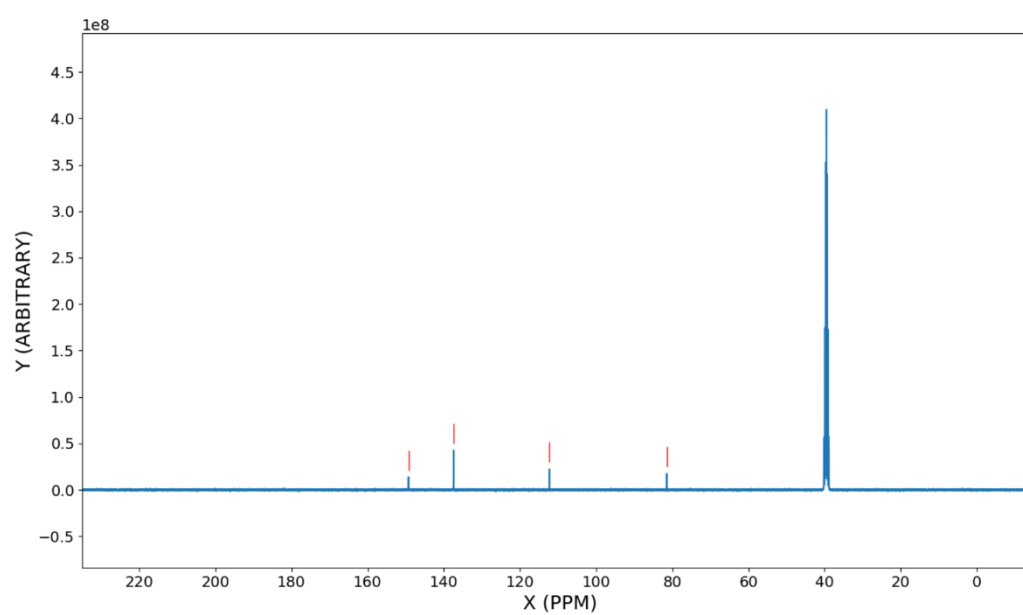


[19o] 5-azido-1*H*-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

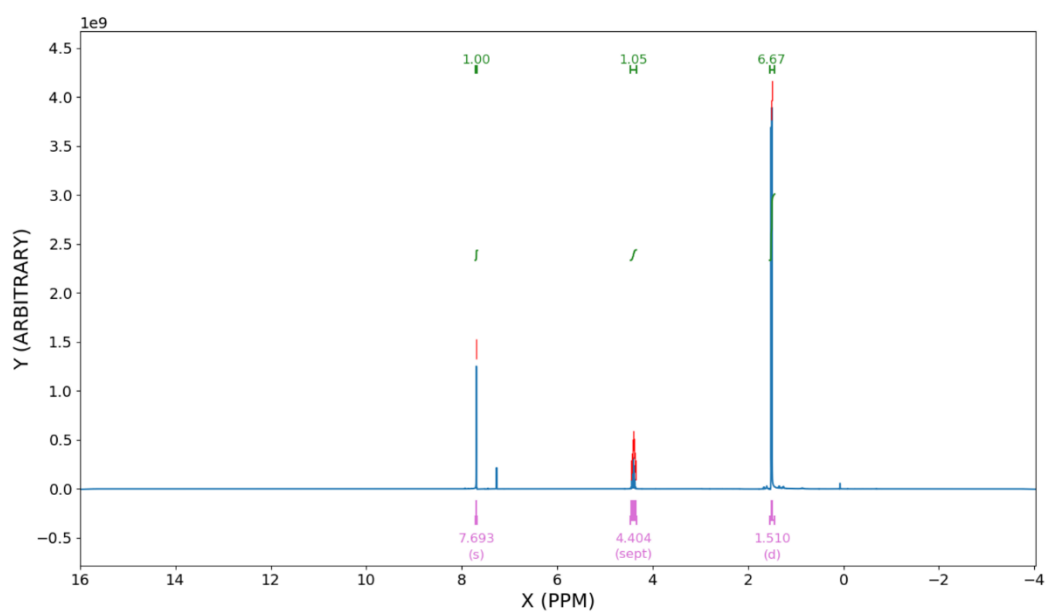


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

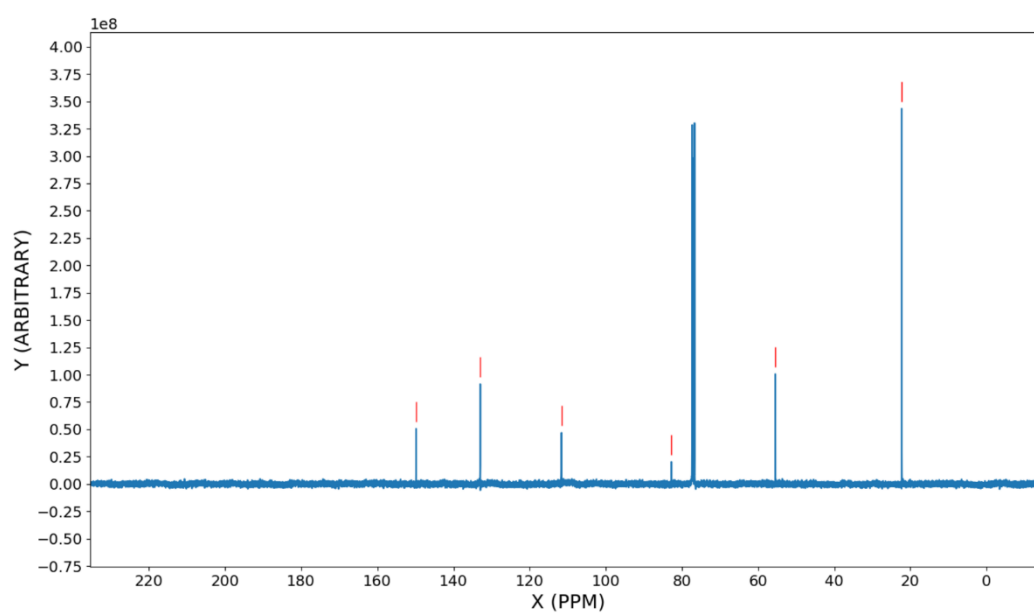


[19p] 3-azido-1-propan-2-yl-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

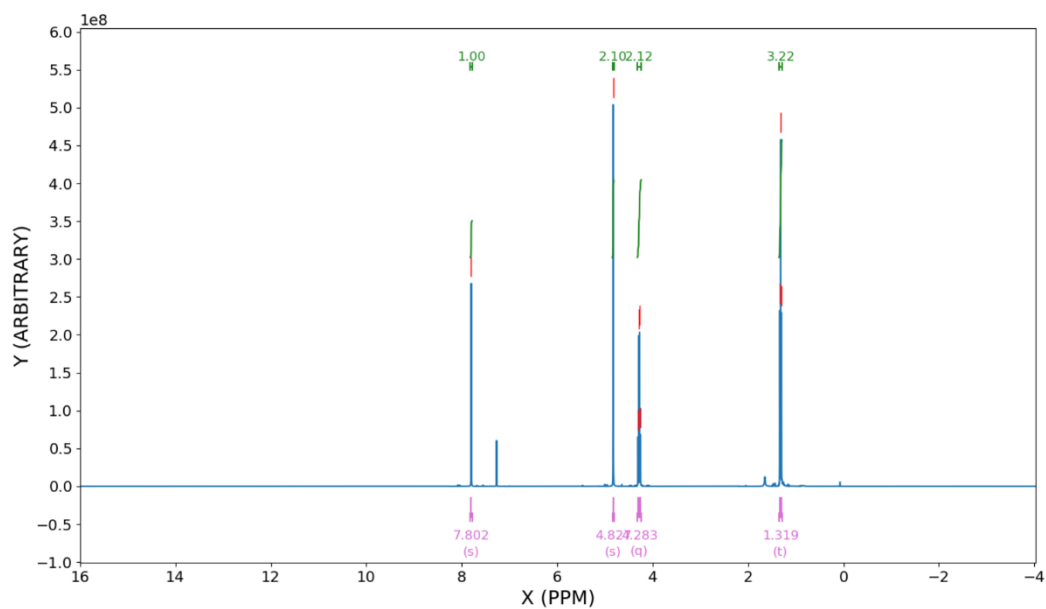


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

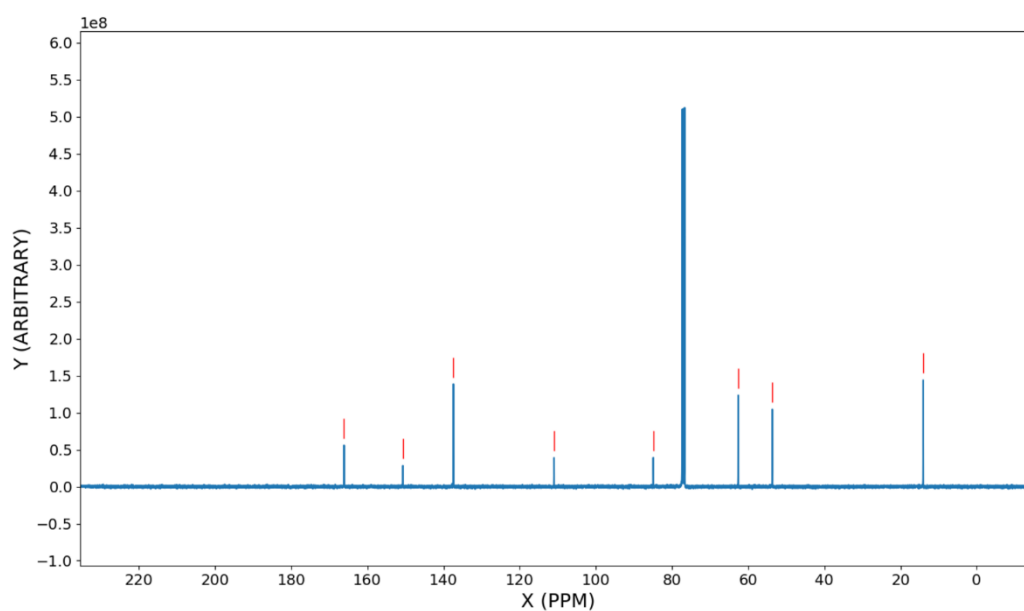


[19q] ethyl 2-(3-azido-4-cyano-1*H*-pyrazol-1-yl)acetate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

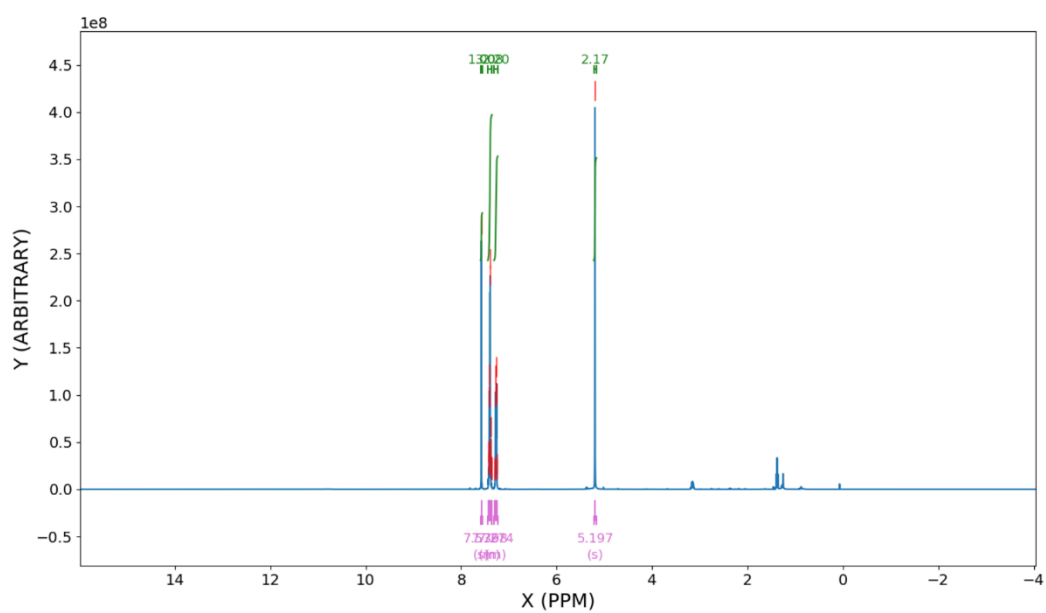


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

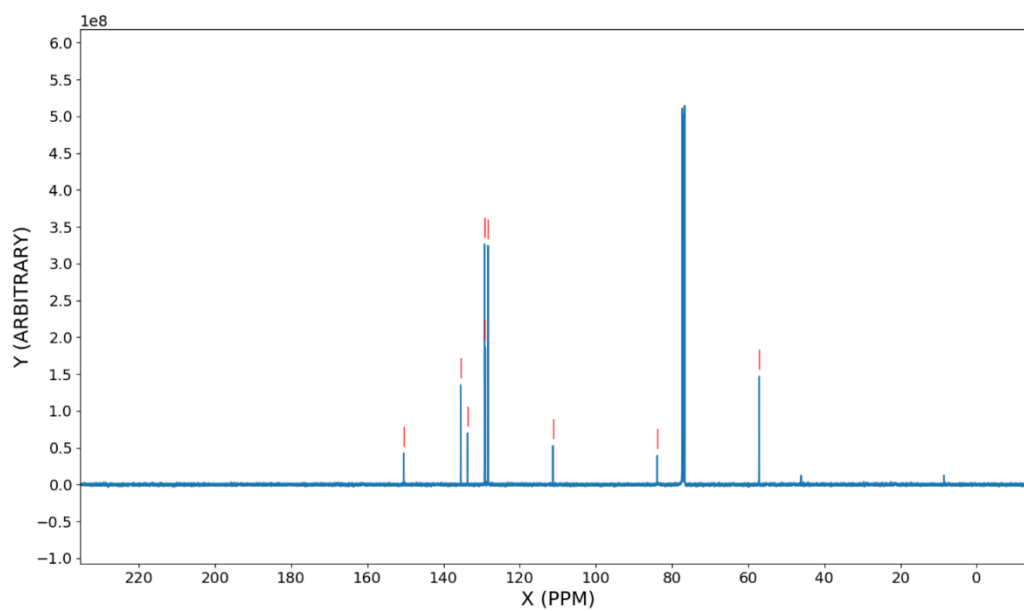


[19r] 3-azido-1-benzyl-1*H*-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

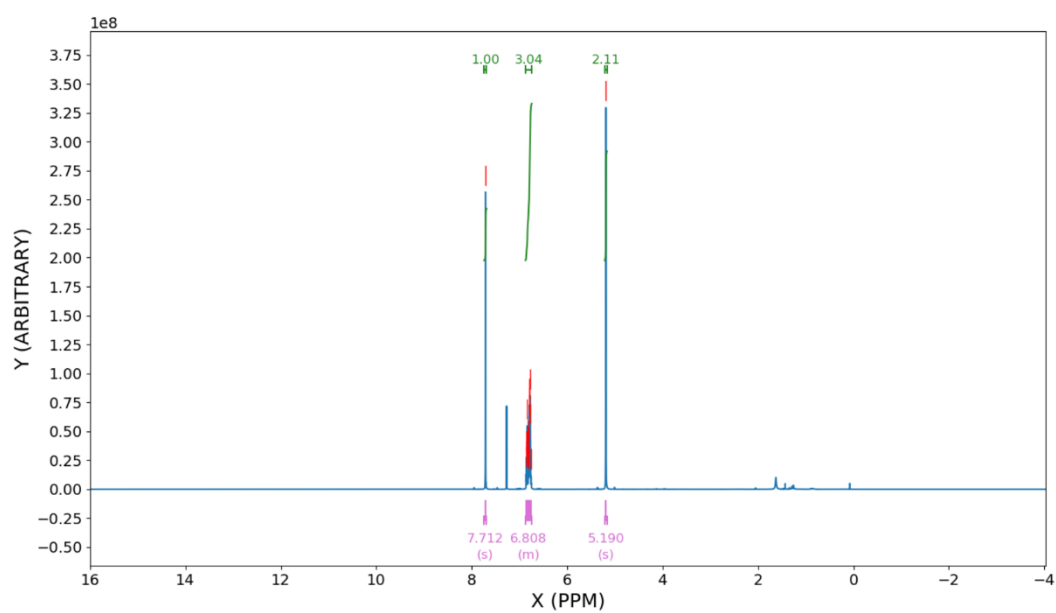


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

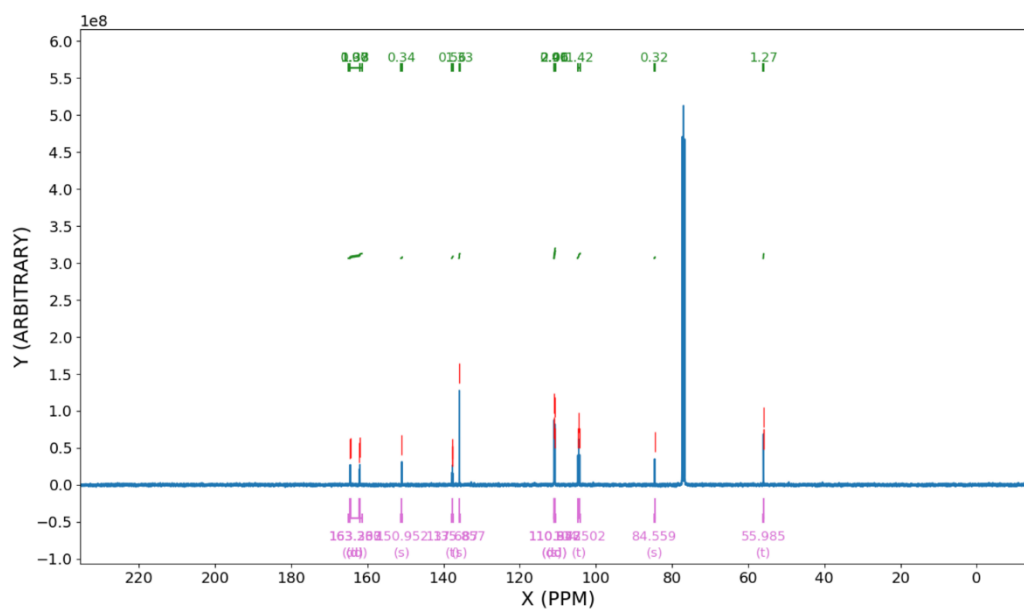


[19s] 3-azido-1-(3,5-difluorobenzyl)-1*H*-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

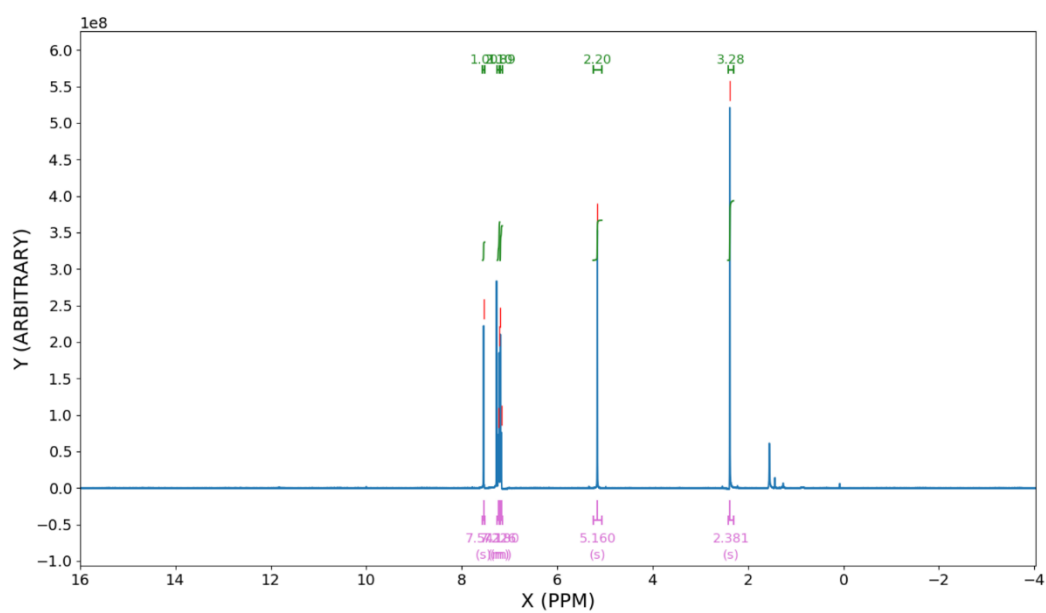


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

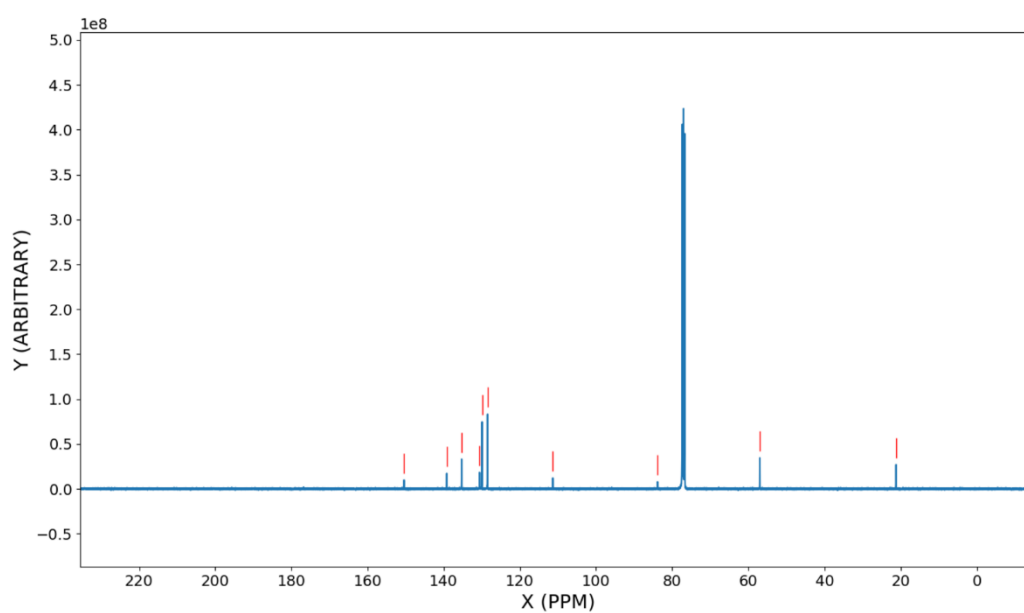


[19t] 3-azido-1-(4-methylbenzyl)-1H-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)



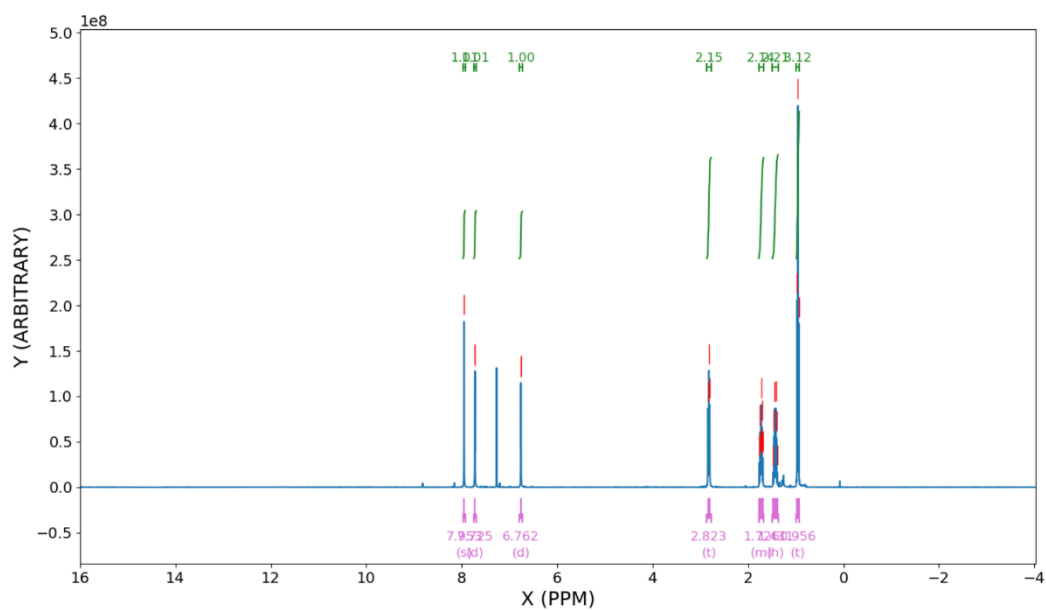
CHMO:0000593 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)



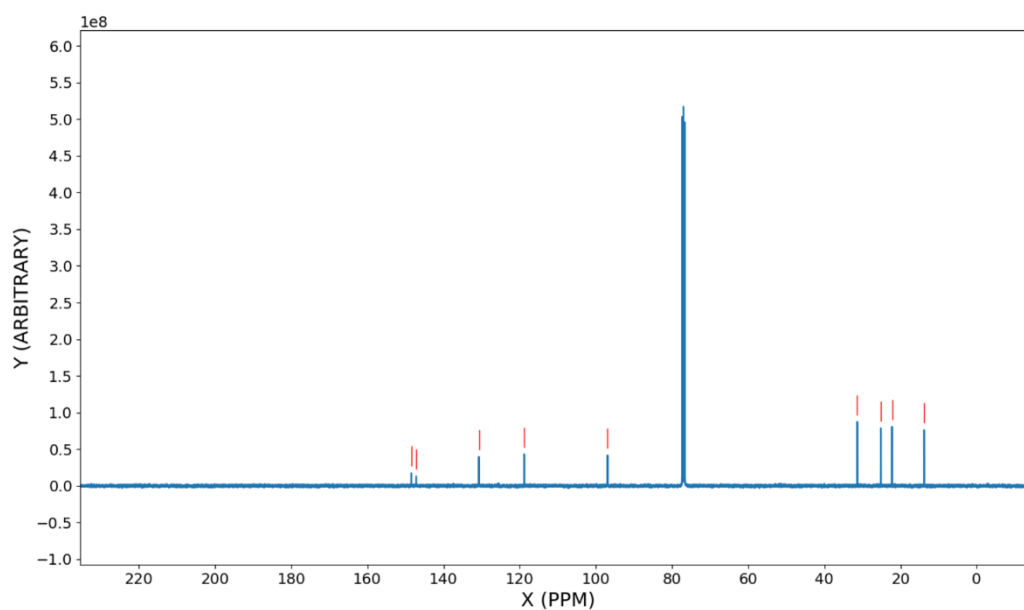
CHMO:0000593 | ¹H nuclear magnetic resonance spectroscopy (¹H NMR)

[21aa] 4-butyl-1-(1*H*-pyrazol-3-yl)-1*H*-1,2,3-triazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

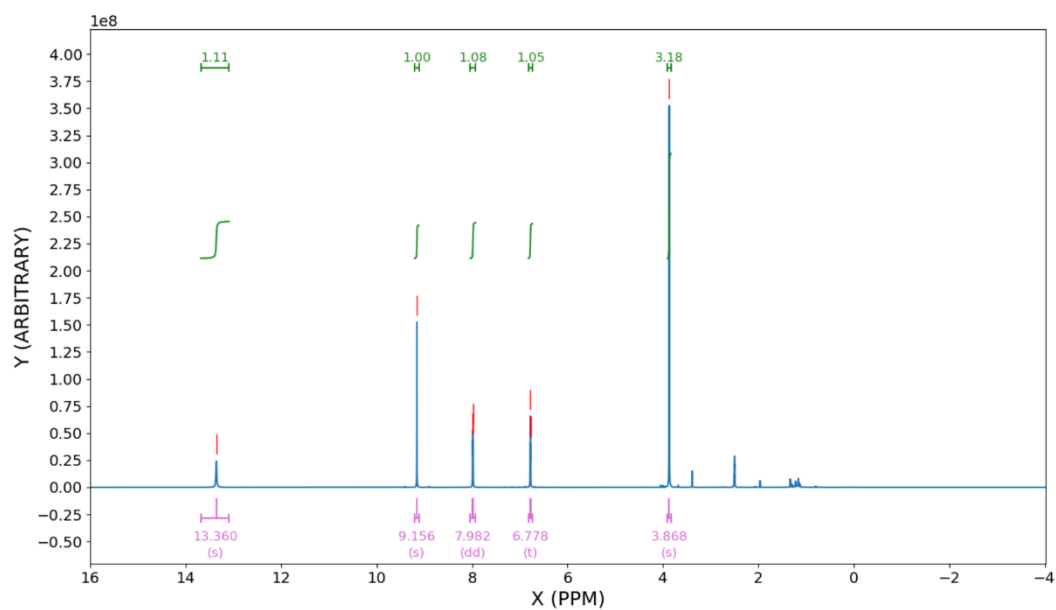


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

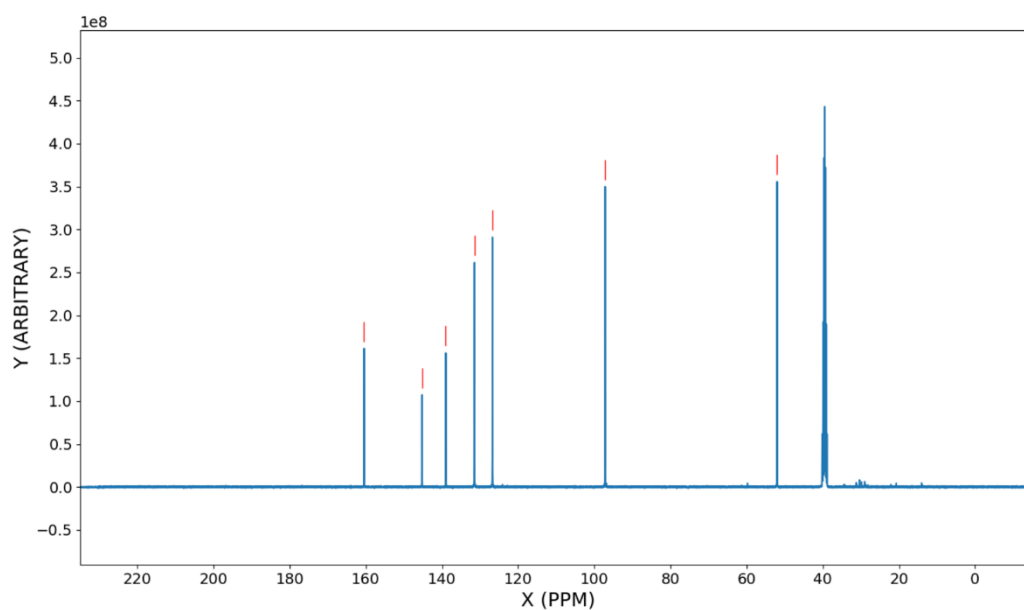


[21ab] methyl 1-(1*H*-pyrazol-5-yl)triazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

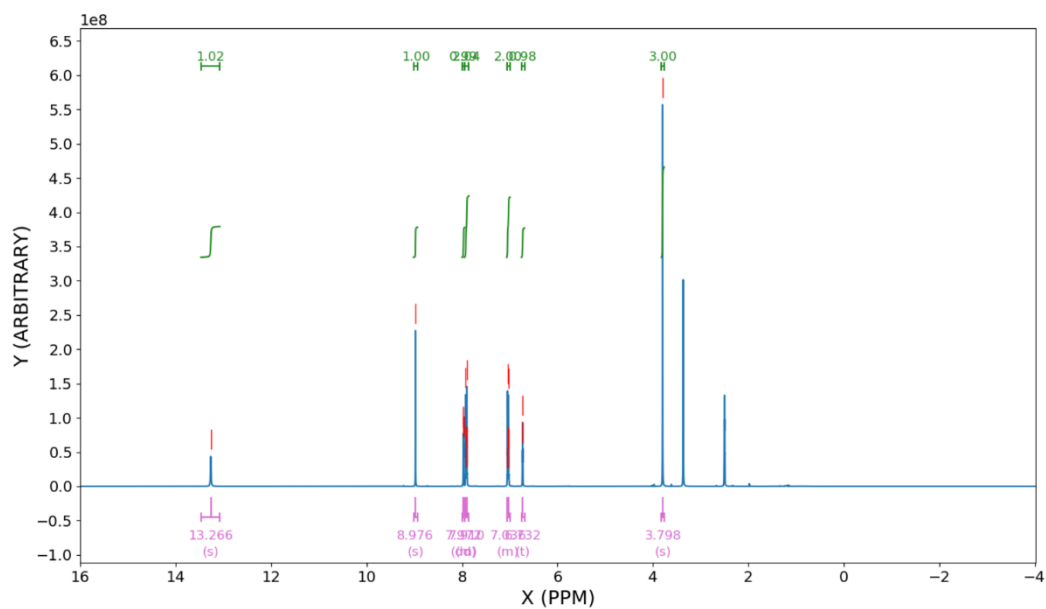


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

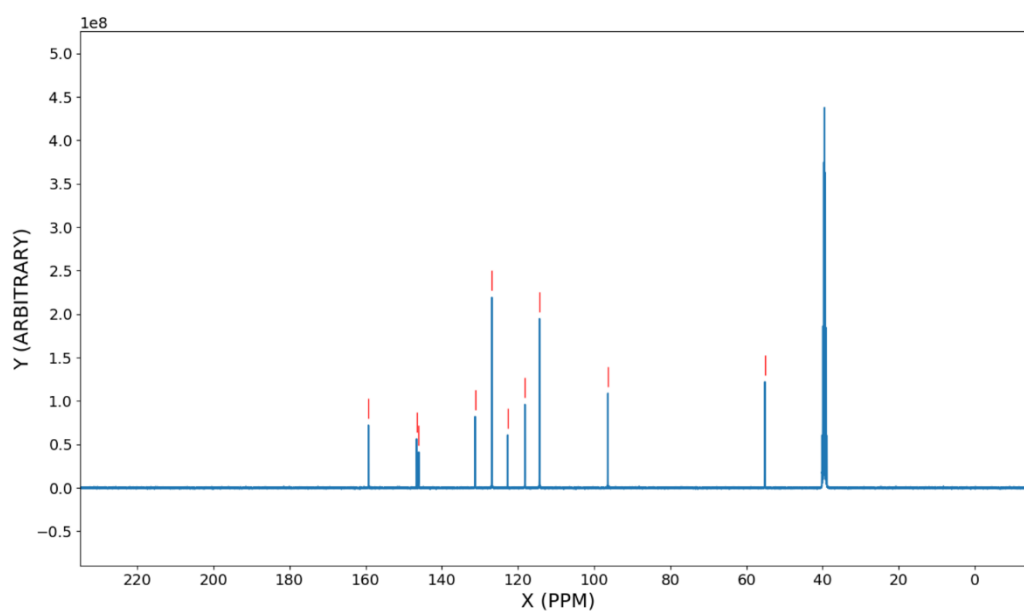


[21ae] 4-(4-methoxyphenyl)-1-(1*H*-pyrazol-3-yl)-1*H*-1,2,3-triazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

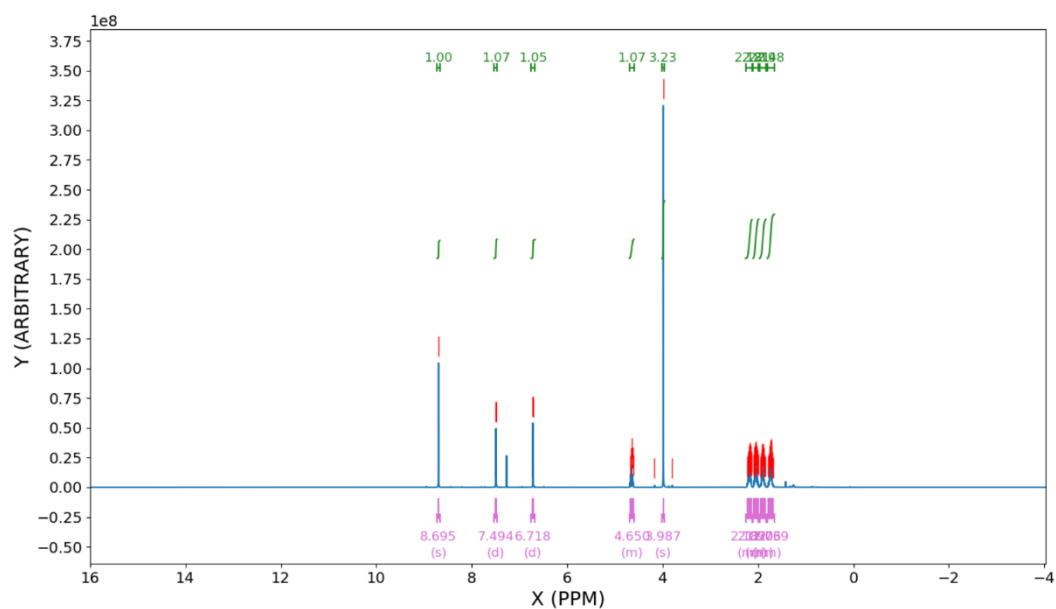


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

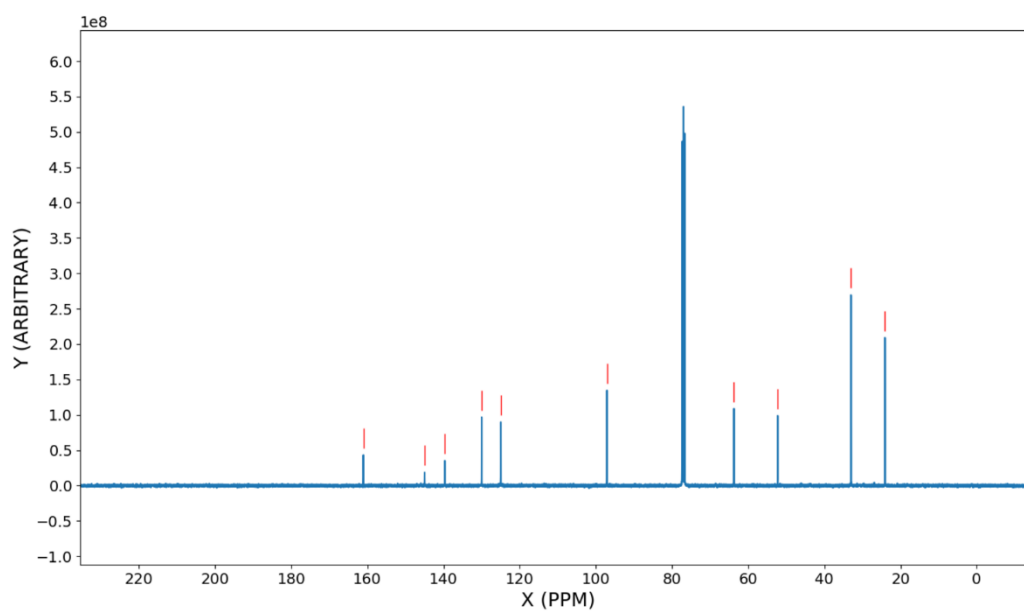


[21bb] methyl 1-(1-cyclopentyl-1*H*-pyrazol-3-yl)-1*H*-1,2,3-triazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

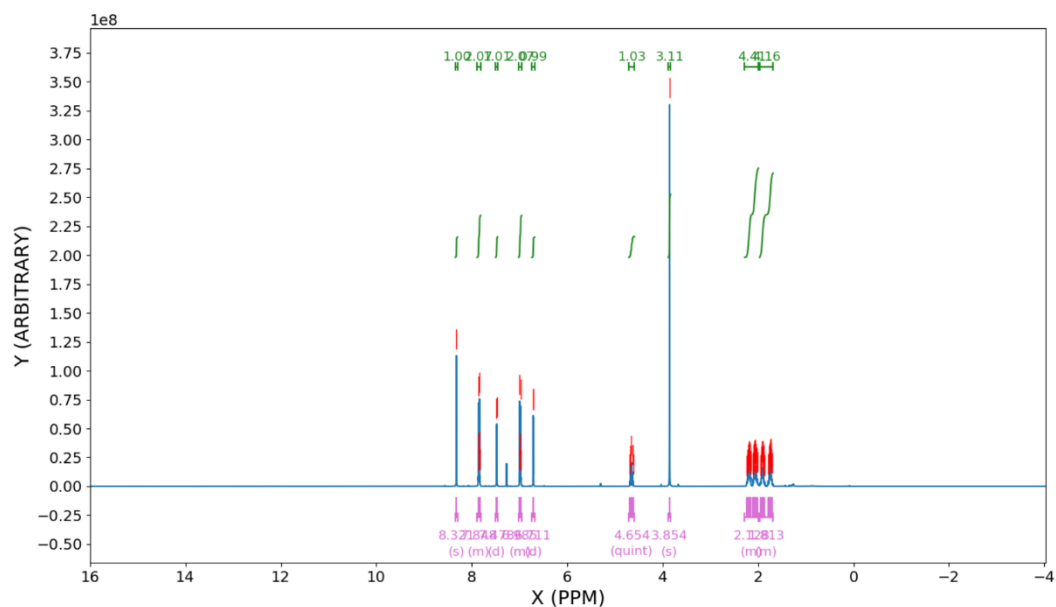


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

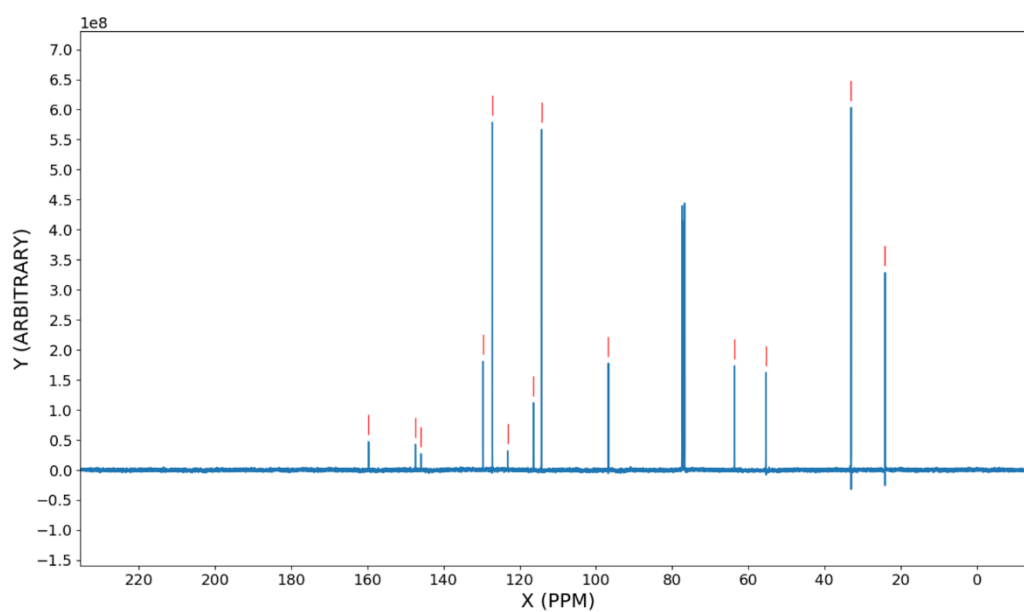


[21be] 1-(1-cyclopentyl-1*H*-pyrazol-3-yl)-4-(4-methoxyphenyl)-1*H*-1,2,3-triazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

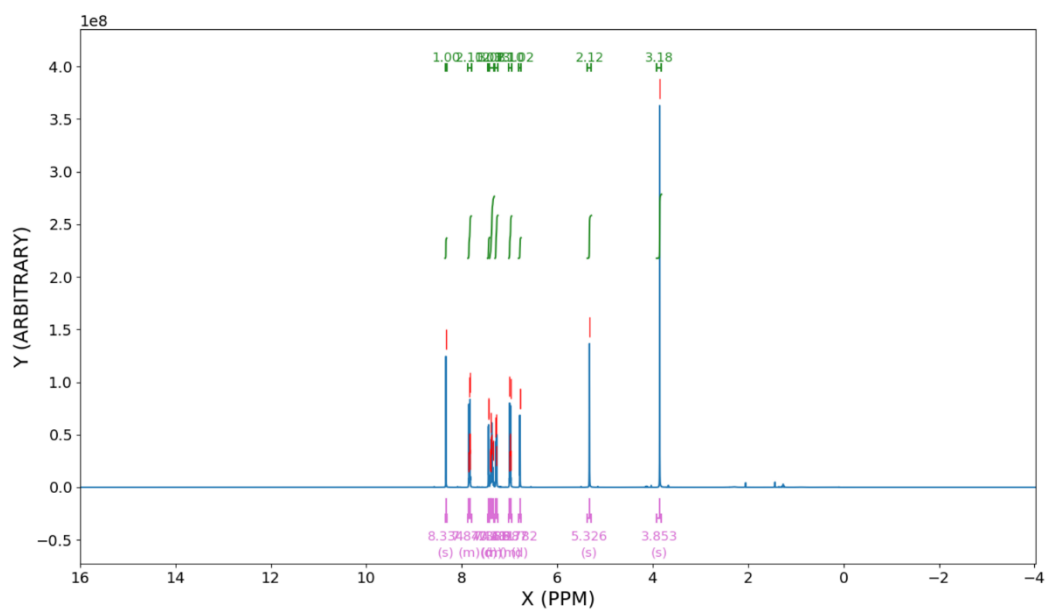


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

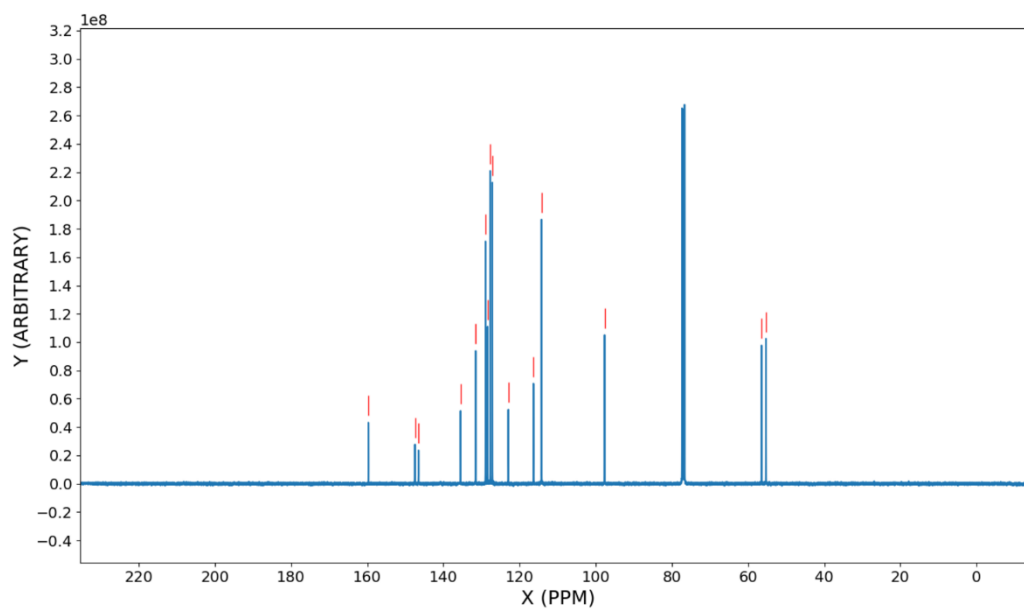


[21ce] 1-(1-benzyl-1*H*-pyrazol-3-yl)-4-(4-methoxyphenyl)-1*H*-1,2,3-triazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

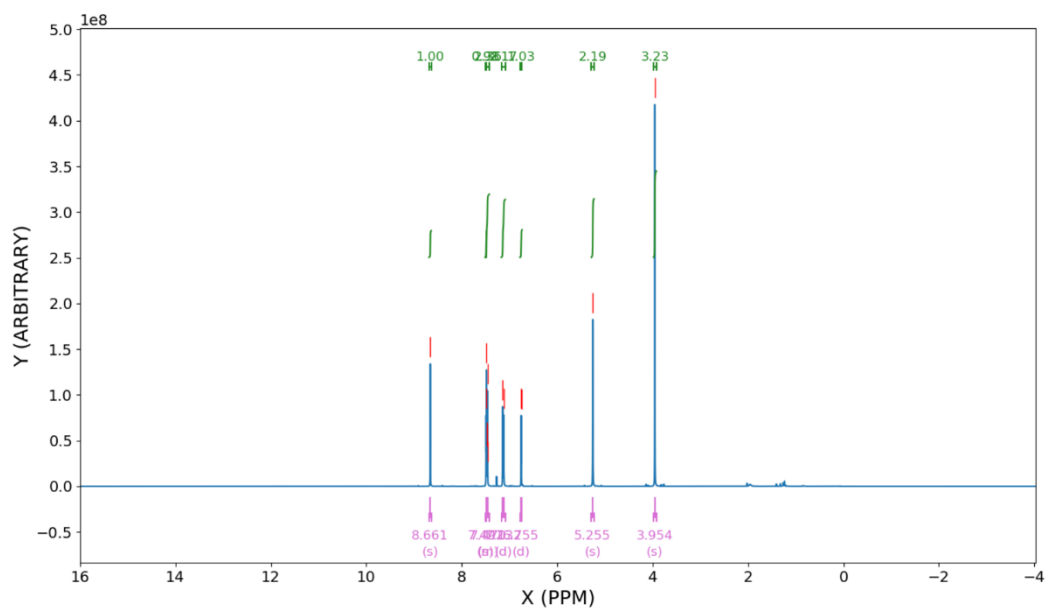


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

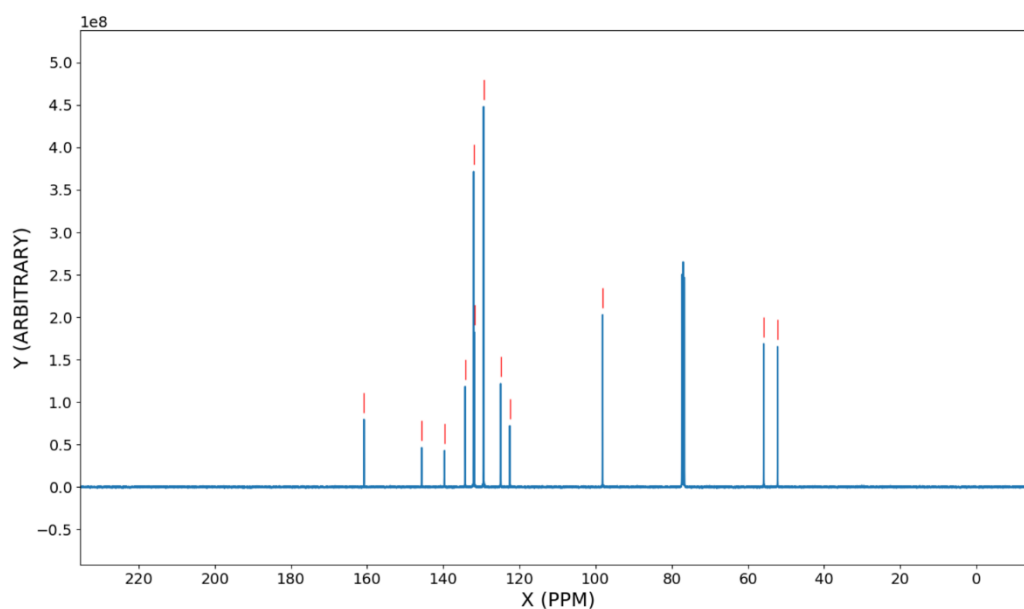


[21db] methyl 1-(1-(4-bromobenzyl)-1*H*-pyrazol-3-yl)-1*H*-1,2,3-triazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

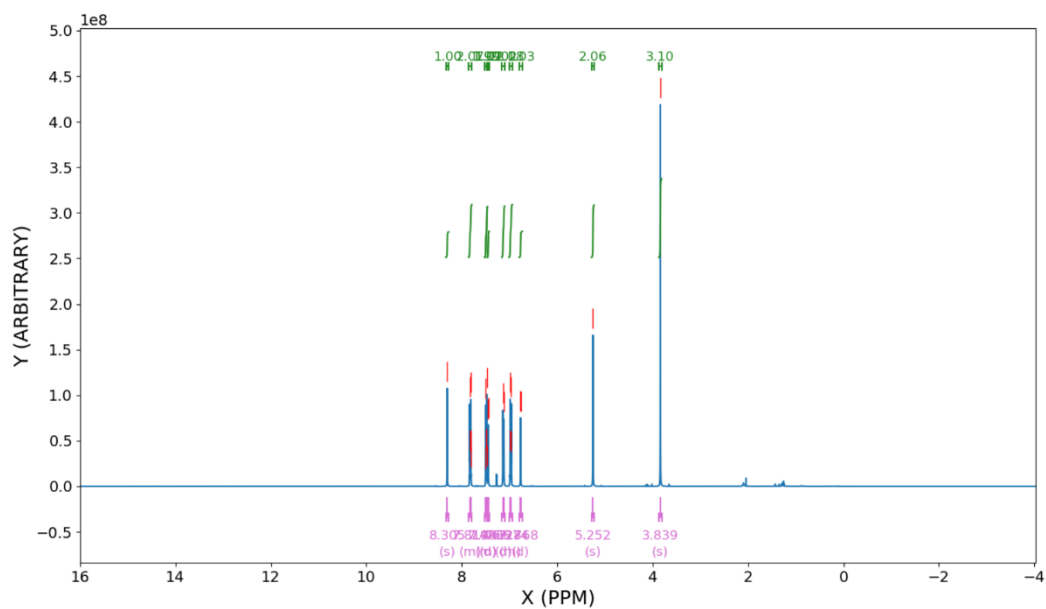


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

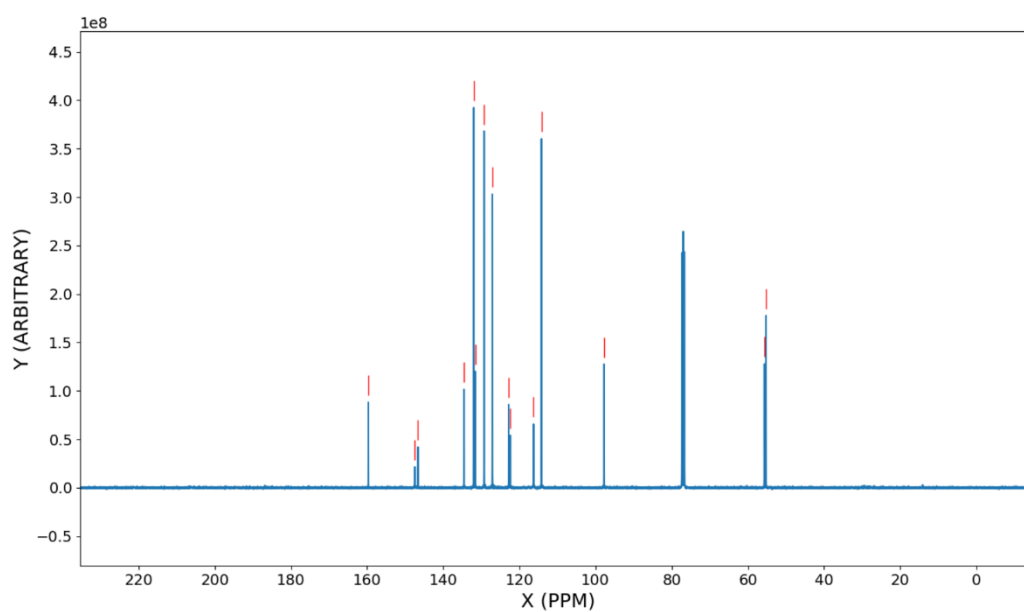


[21de] 1-(1-(4-bromobenzyl)-1*H*-pyrazol-3-yl)-4-(4-methoxyphenyl)-1*H*-1,2,3-triazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

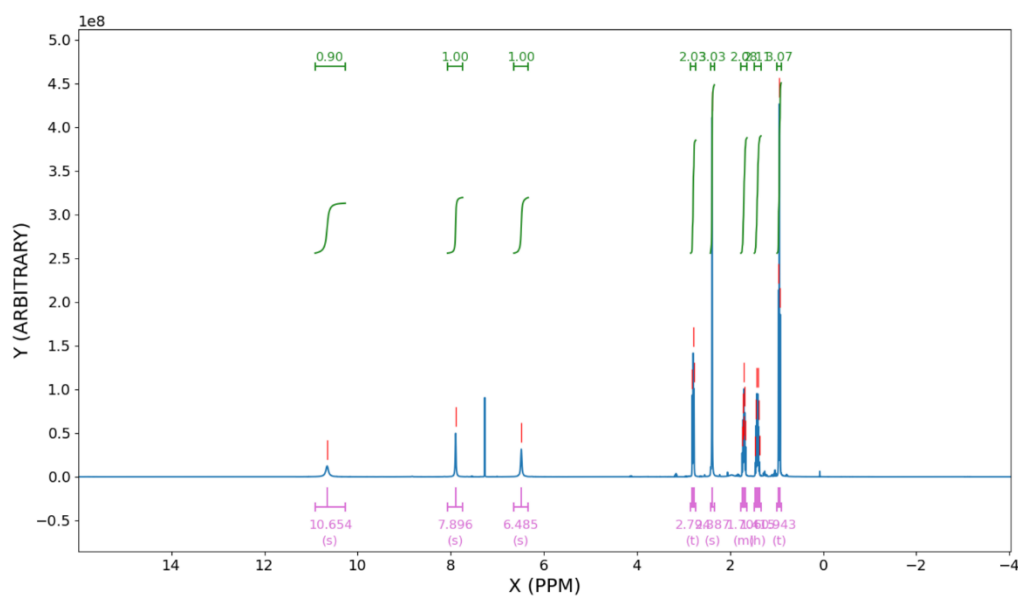


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

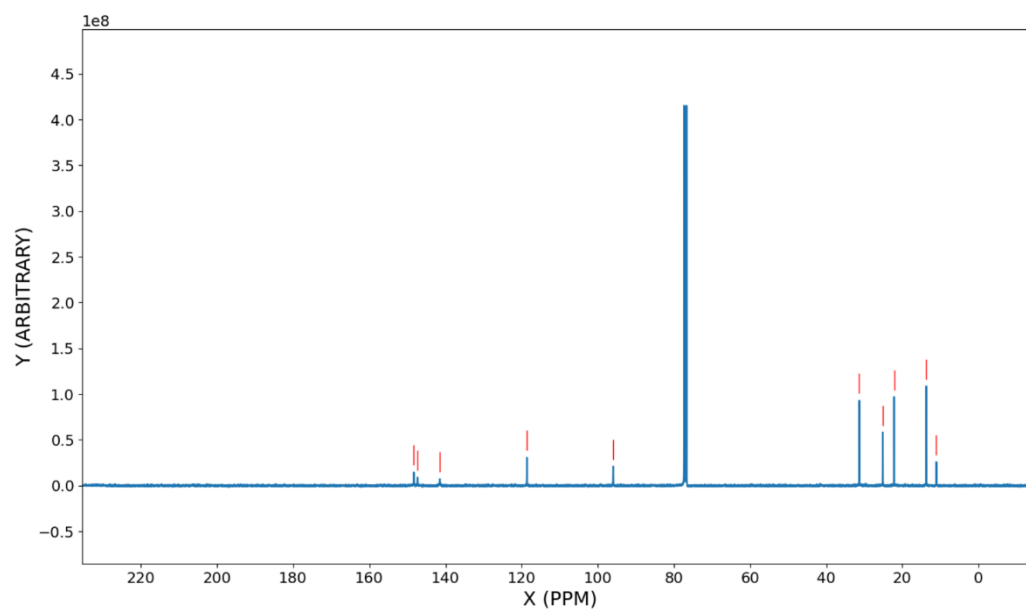


[21ea] 4-butyl-1-(5-methyl-1*H*-pyrazol-3-yl)-1*H*-1,2,3-triazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

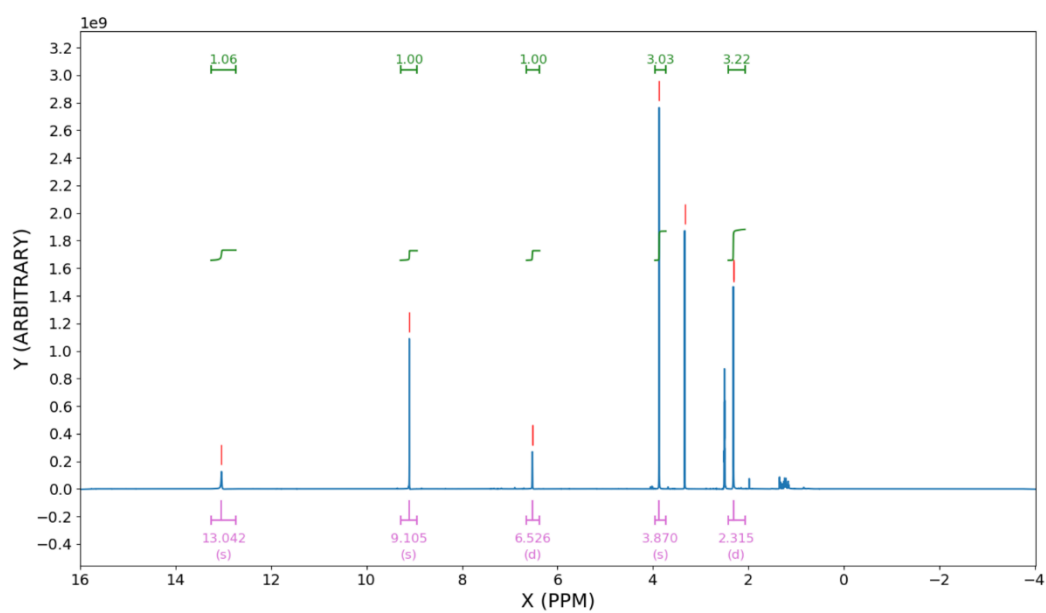


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

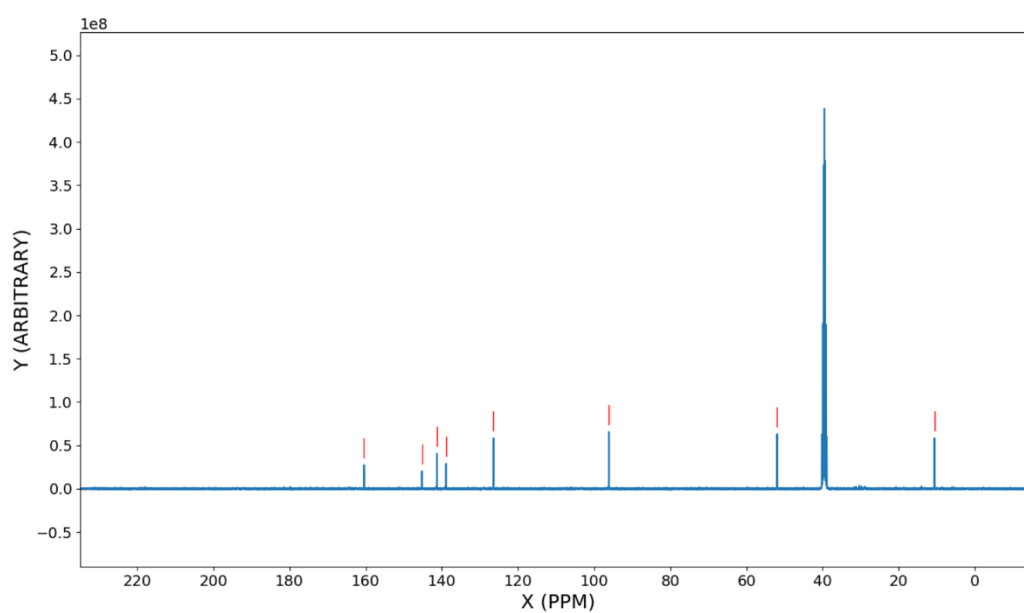


[21eb] methyl 1-(5-methyl-1*H*-pyrazol-3-yl)triazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

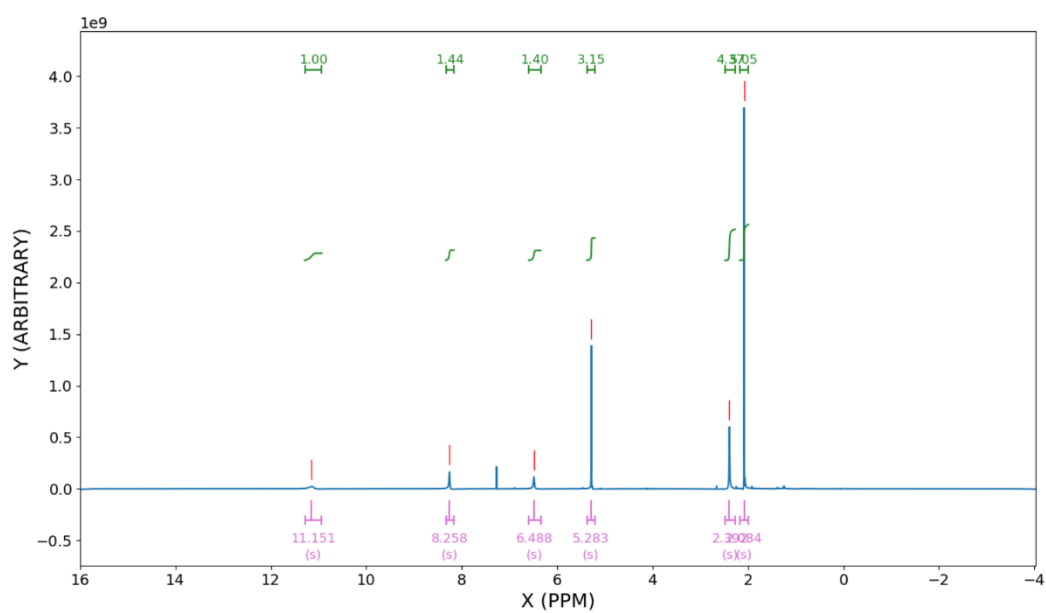


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

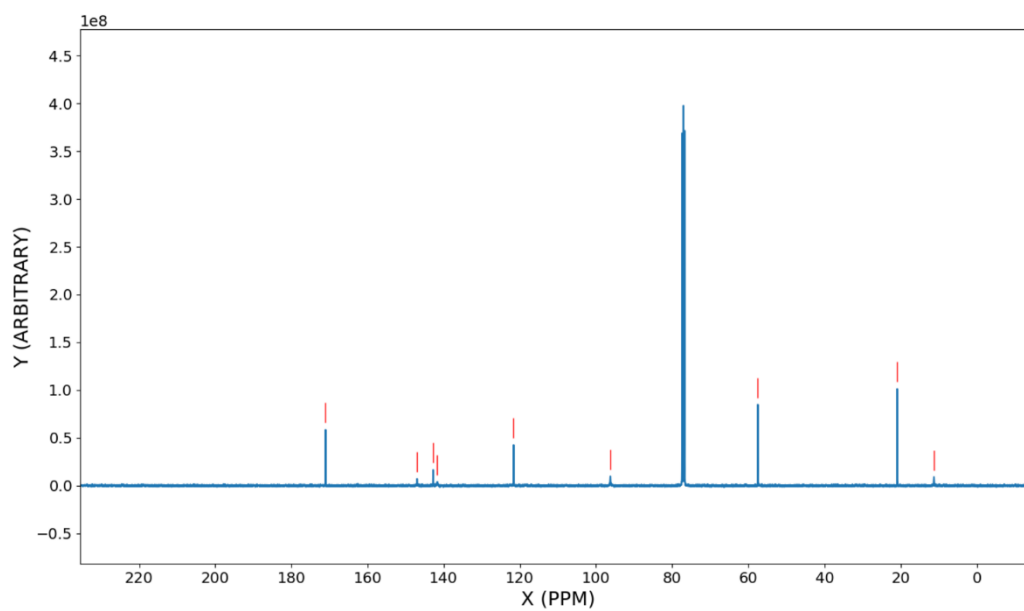


[21ec] (1-(5-methyl-1*H*-pyrazol-3-yl)-1*H*-1,2,3-triazol-4-yl)methyl acetate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

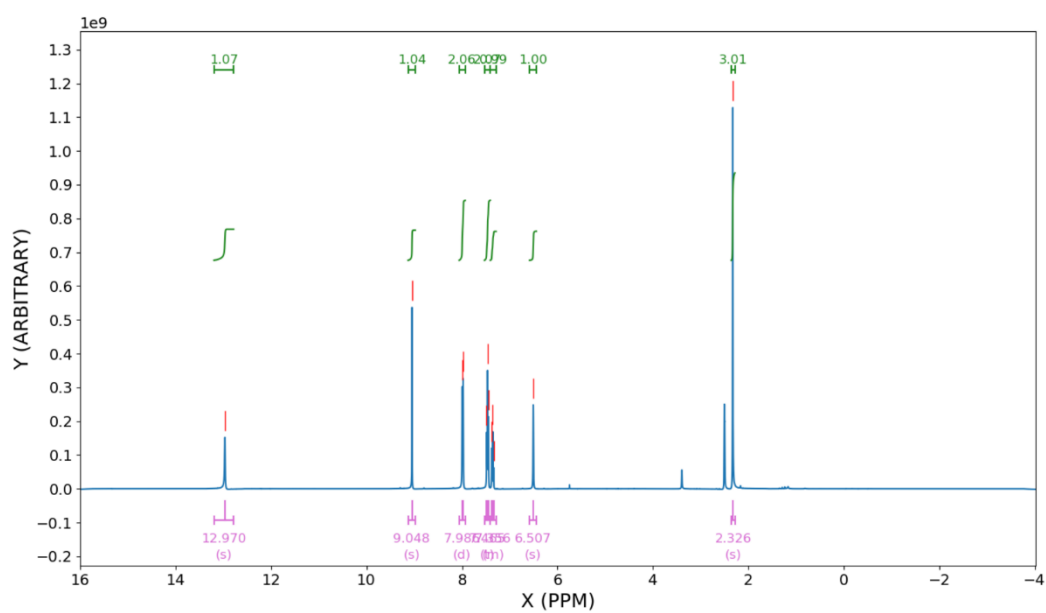


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

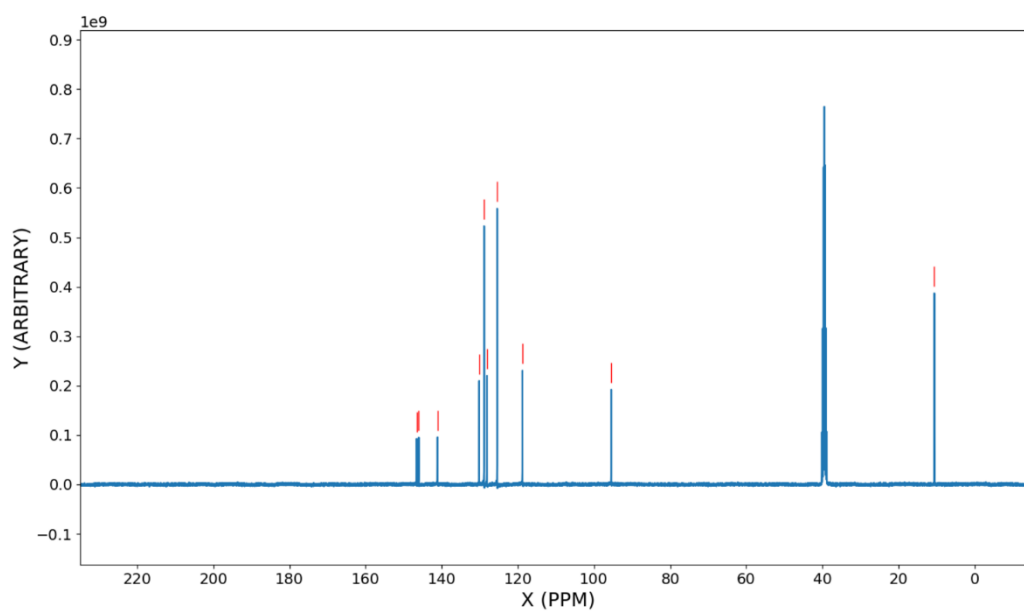


[21ed] 1-(5-methyl-1*H*-pyrazol-3-yl)-4-phenyl-1*H*-1,2,3-triazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

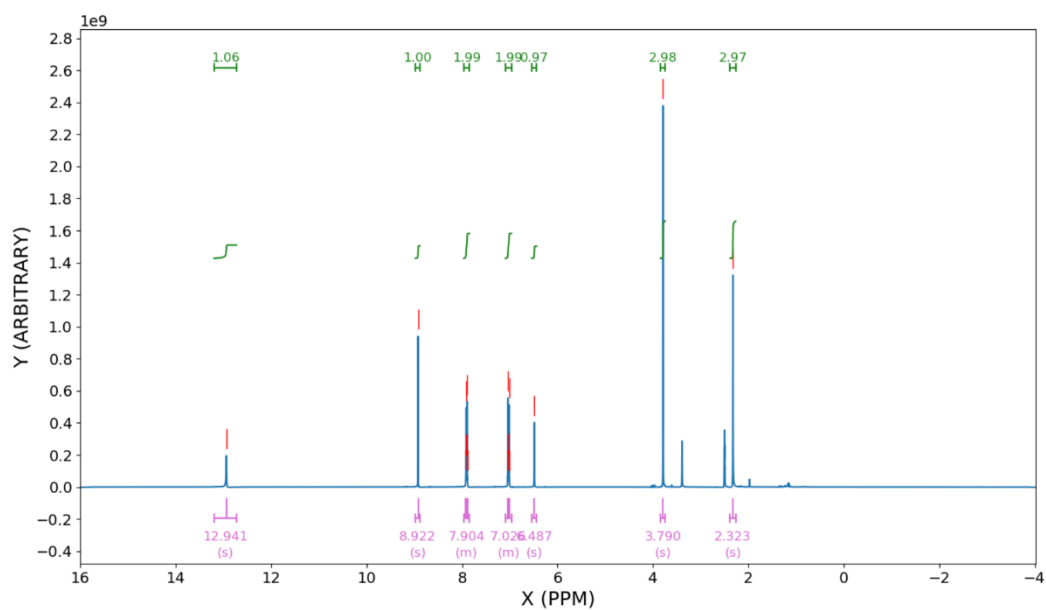


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

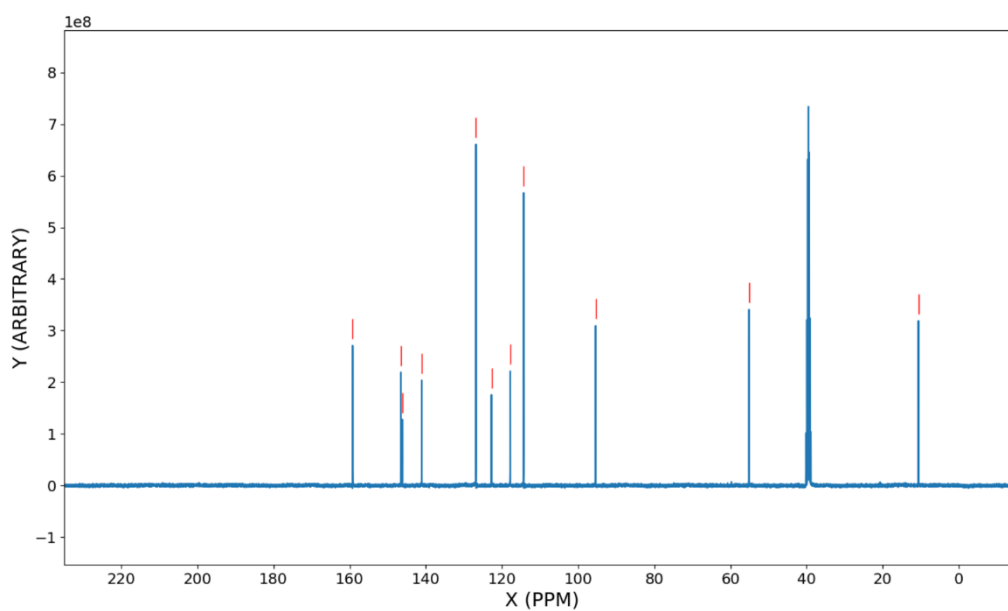


[21ee] 4-(4-Methoxyphenyl)-1-(5-methyl-1*H*-pyrazol-3-yl)-1*H*-1,2,3-triazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

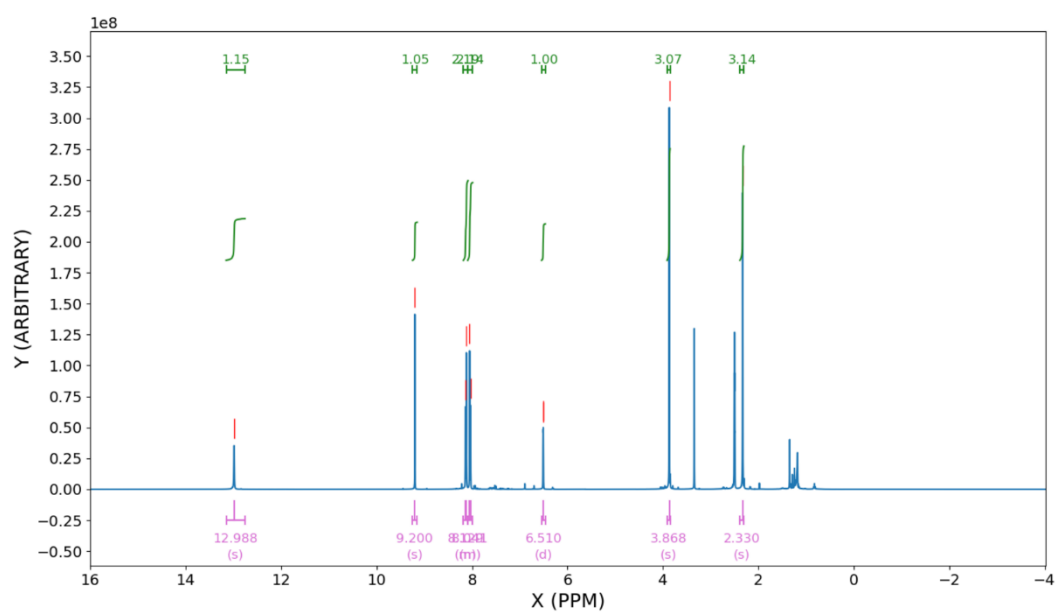


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

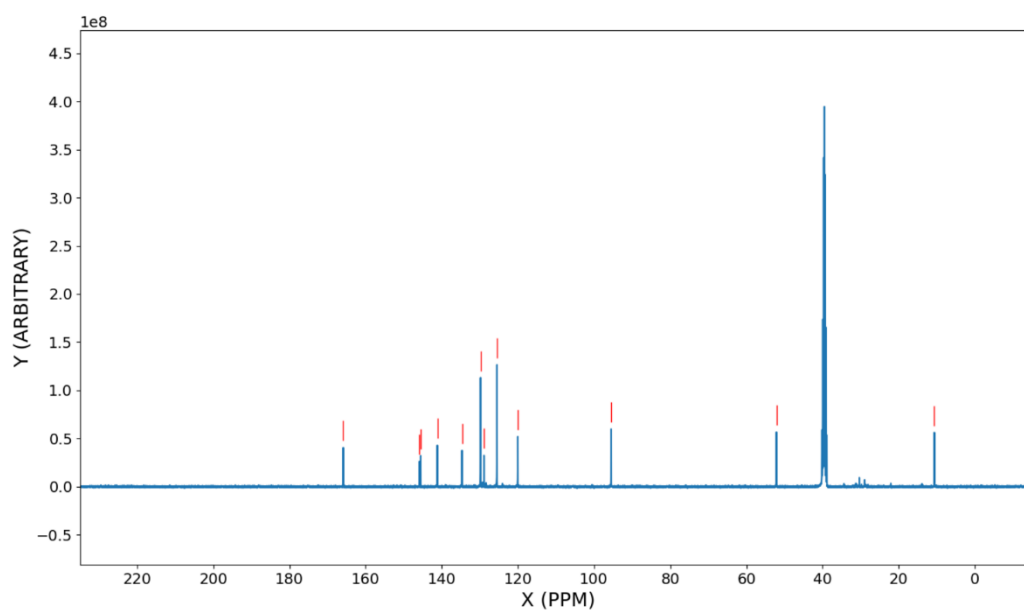


[21ef] methyl 4-(1-(5-methyl-1H-pyrazol-3-yl)-1H-1,2,3-triazol-4-yl)benzoate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

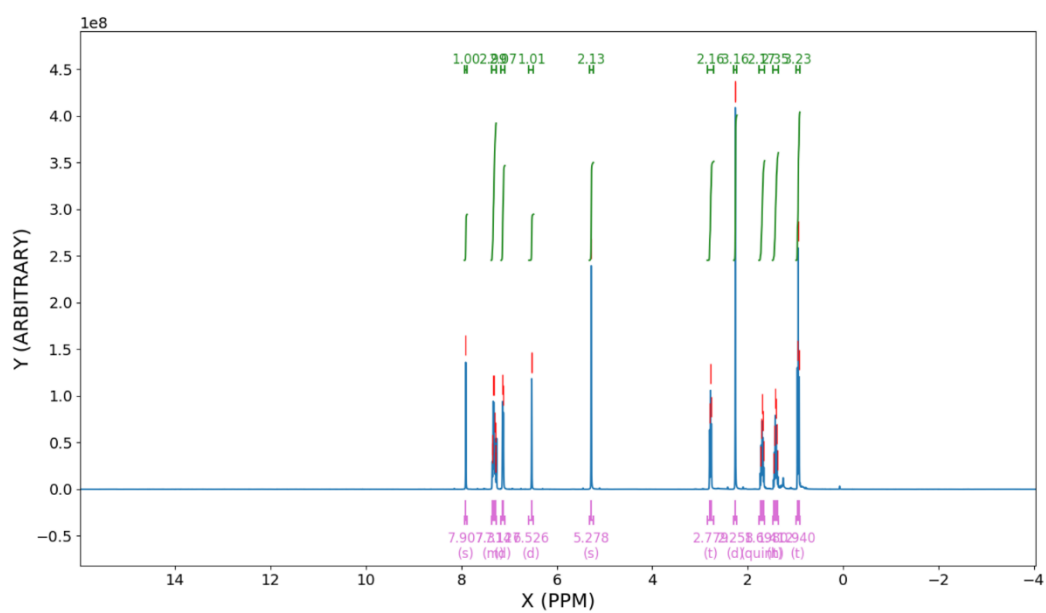


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

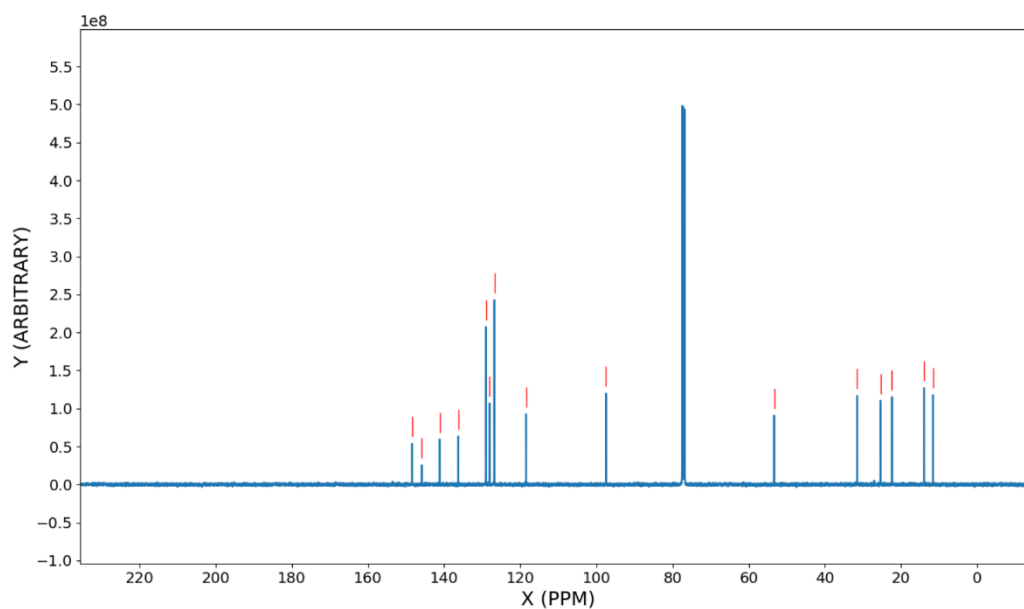


[21fa] 1-(1-benzyl-5-methyl-1*H*-pyrazol-3-yl)-4-butyl-1*H*-1,2,3-triazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)



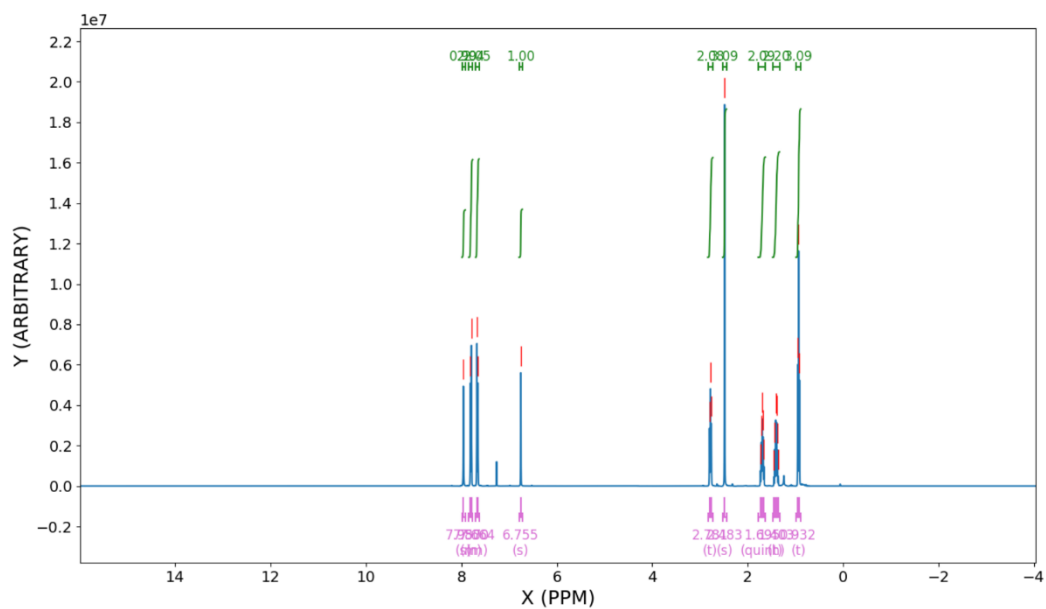
CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)



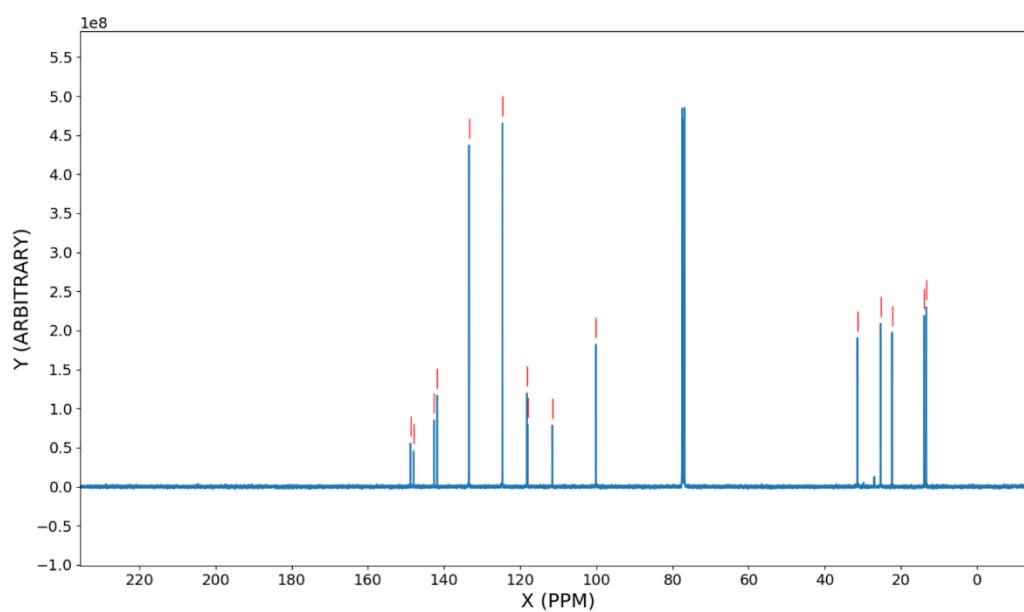
CHMO:0000593 | ¹H nuclear magnetic resonance spectroscopy (¹H NMR)

[21ga] 4-(3-(4-butyl-1*H*-1,2,3-triazol-1-yl)-5-methyl-1*H*-pyrazol-1-yl)benzonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)



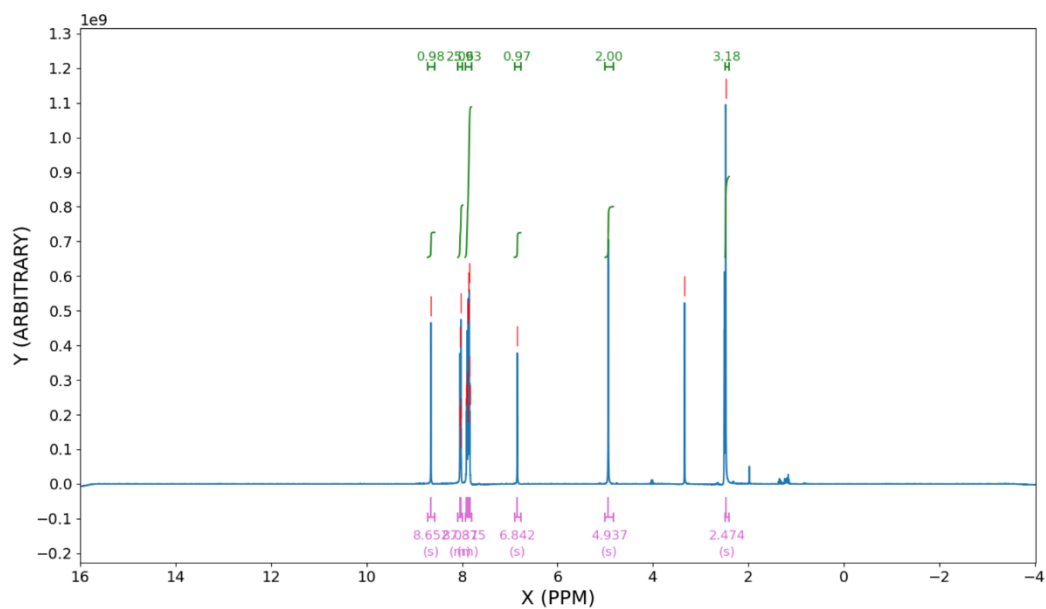
CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)



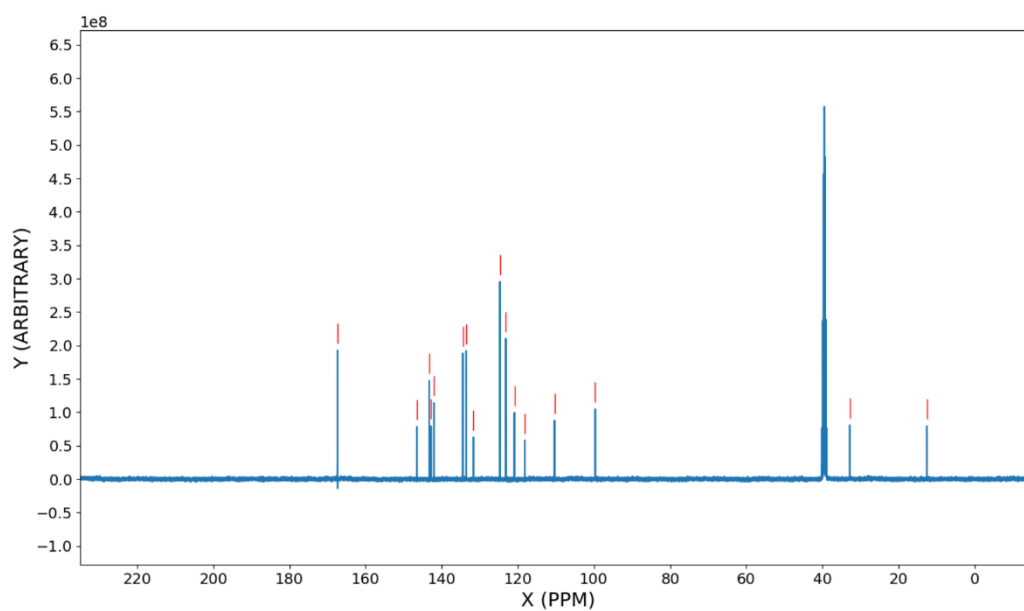
CHMO:0000593 | ¹H nuclear magnetic resonance spectroscopy (¹H NMR)

[21gh] 4-(3-(4-((1,3-dioxoisindolin-2-yl)methyl)-1*H*-1,2,3-triazol-1-yl)-5-methyl-1*H*-pyrazol-1-yl)benzonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

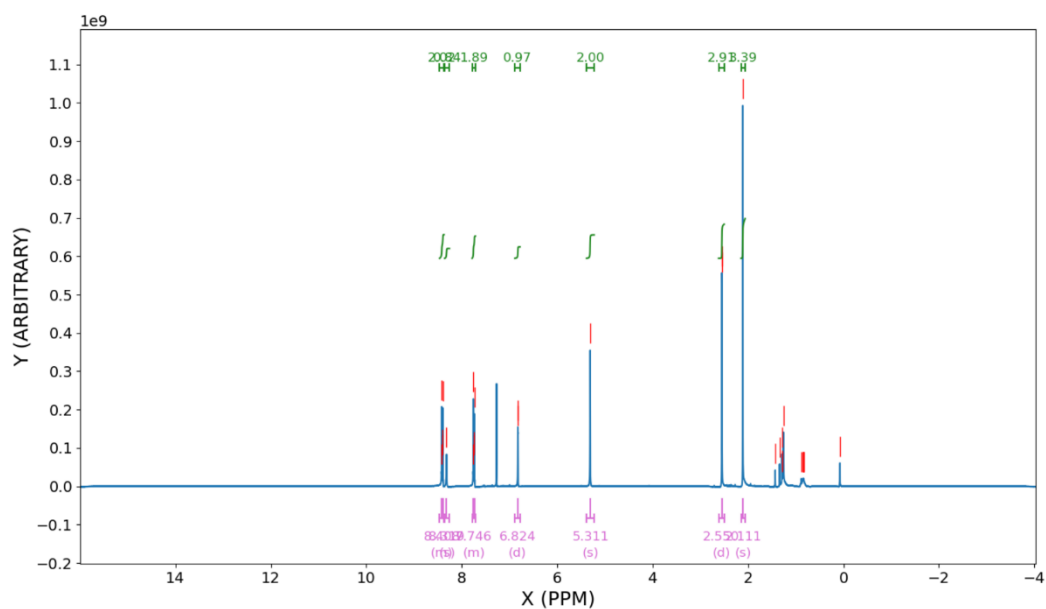


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

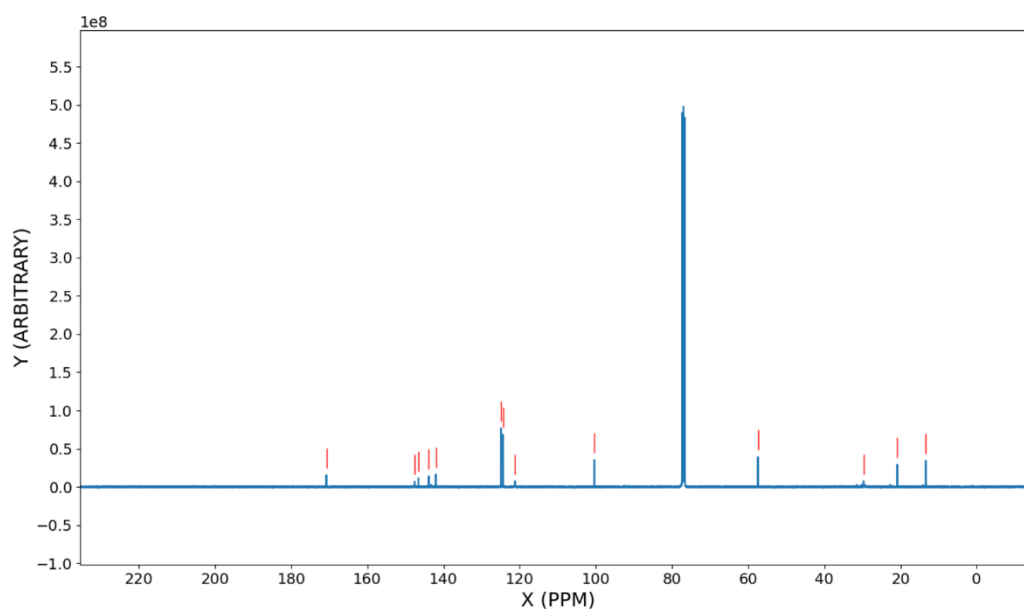


[21hc] (1-(5-methyl-1-(4-nitrophenyl)-1*H*-pyrazol-3-yl)-1*H*-1,2,3-triazol-4-yl)methyl acetate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

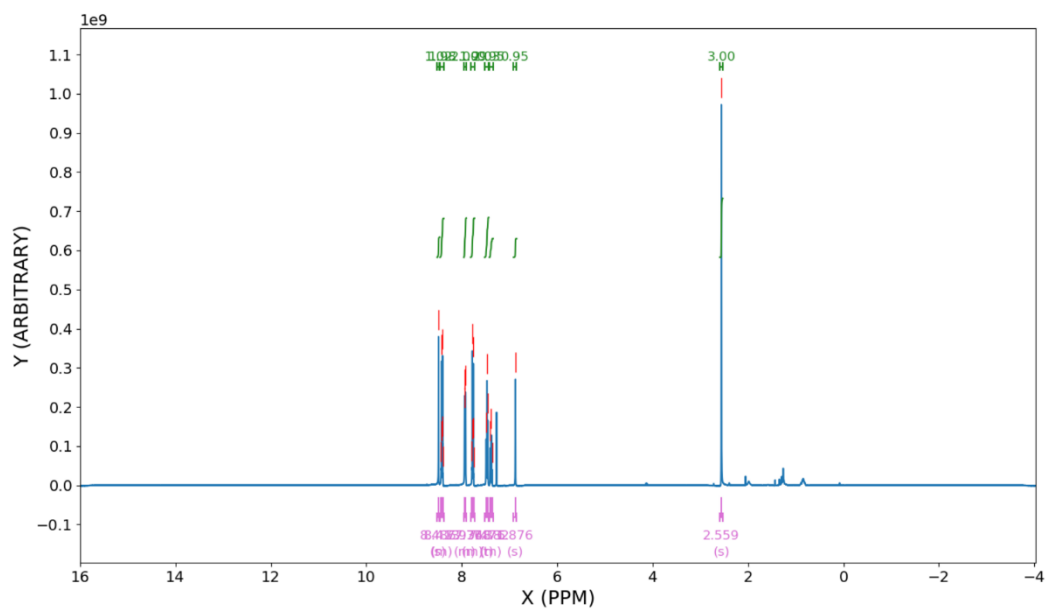


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

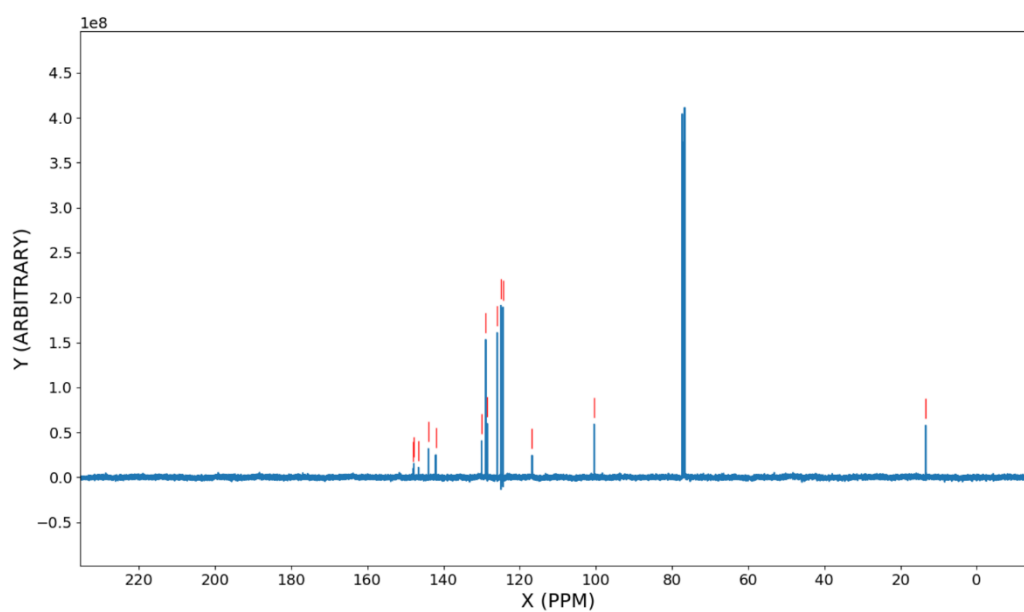


[21hd] 1-(5-methyl-1-(4-nitrophenyl)-1*H*-pyrazol-3-yl)-4-phenyl-1*H*-1,2,3-triazole

CHMO:0000593 | ¹H nuclear magnetic resonance spectroscopy (¹H NMR)

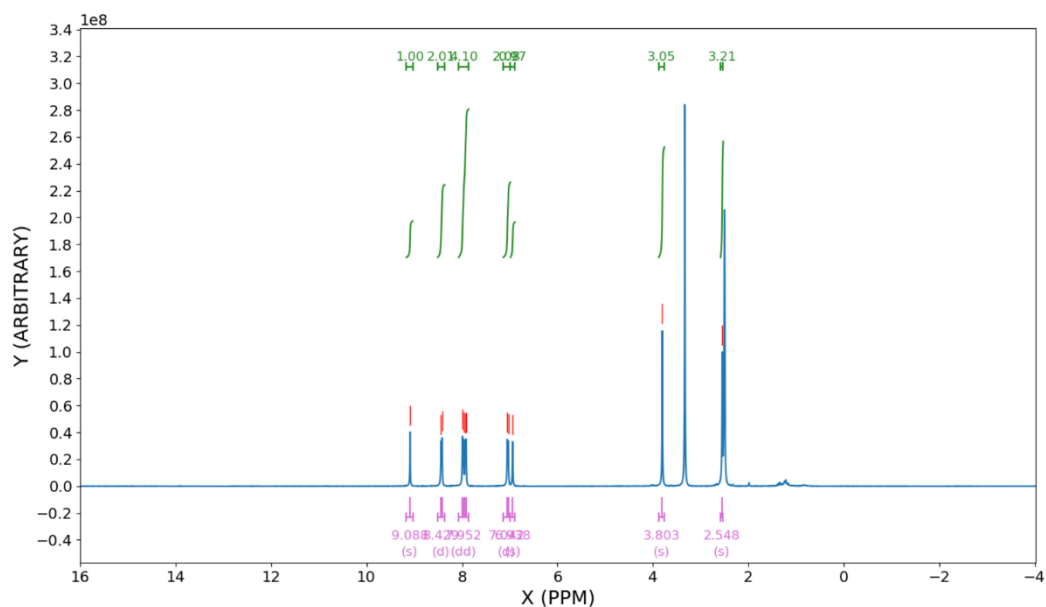


CHMO:0000595 | ¹³C nuclear magnetic resonance spectroscopy (¹³C NMR)

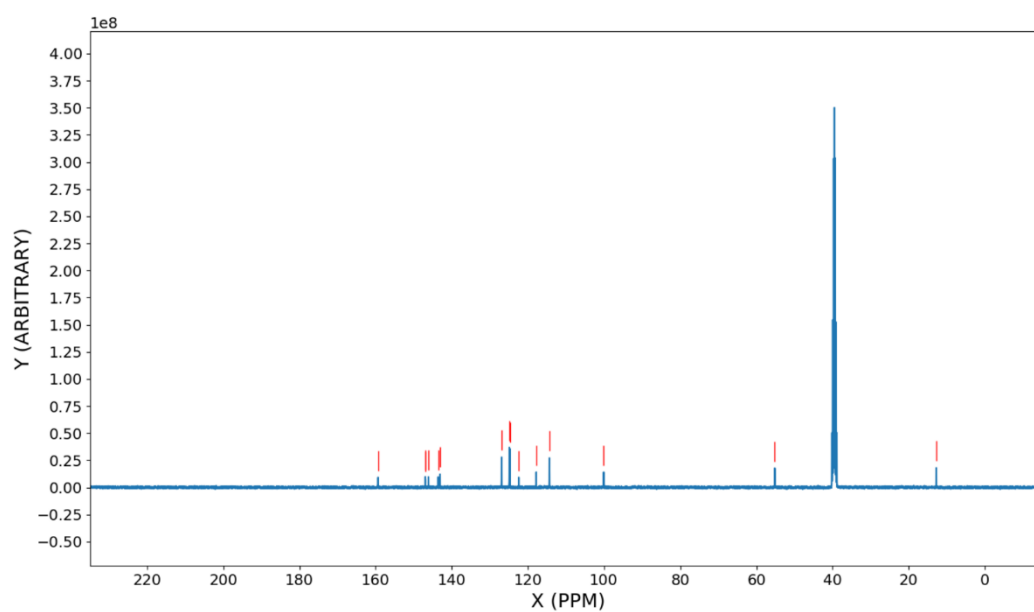


[21he] 4-(4-methoxyphenyl)-1-(5-methyl-1-(4-nitrophenyl)-1*H*-pyrazol-3-yl)-1*H*-1,2,3-triazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

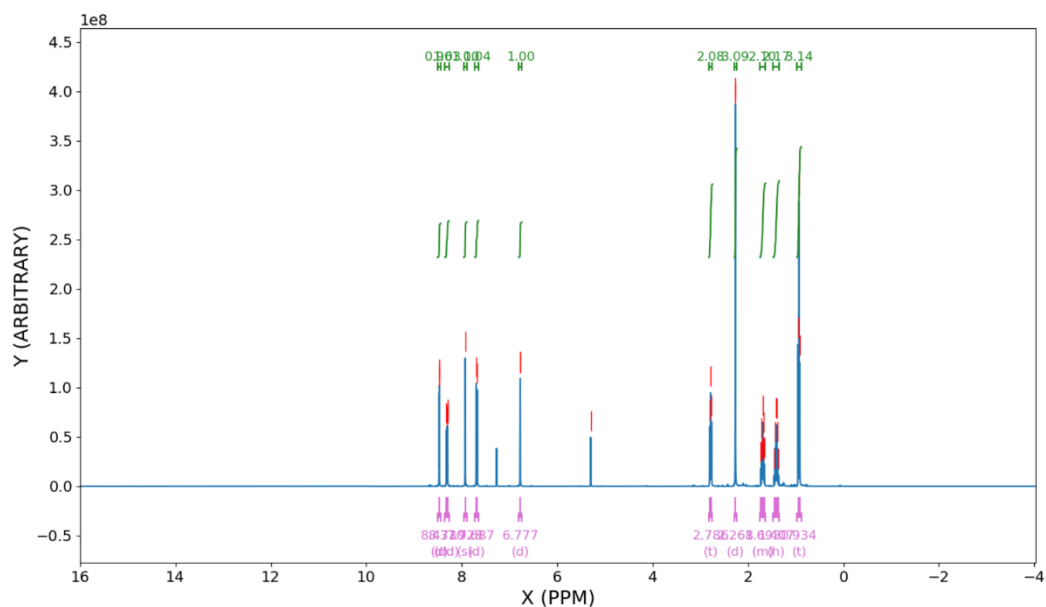


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

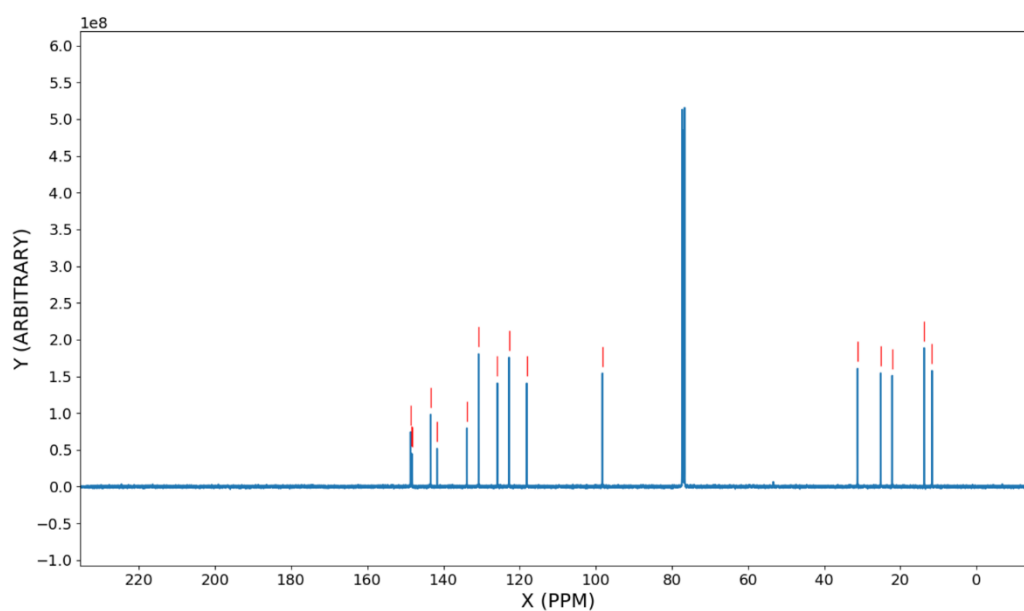


[21ia] 4-butyl-1-(1-(2-chloro-4-nitrophenyl)-5-methyl-1*H*-pyrazol-3-yl)-1*H*-1,2,3-triazole

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

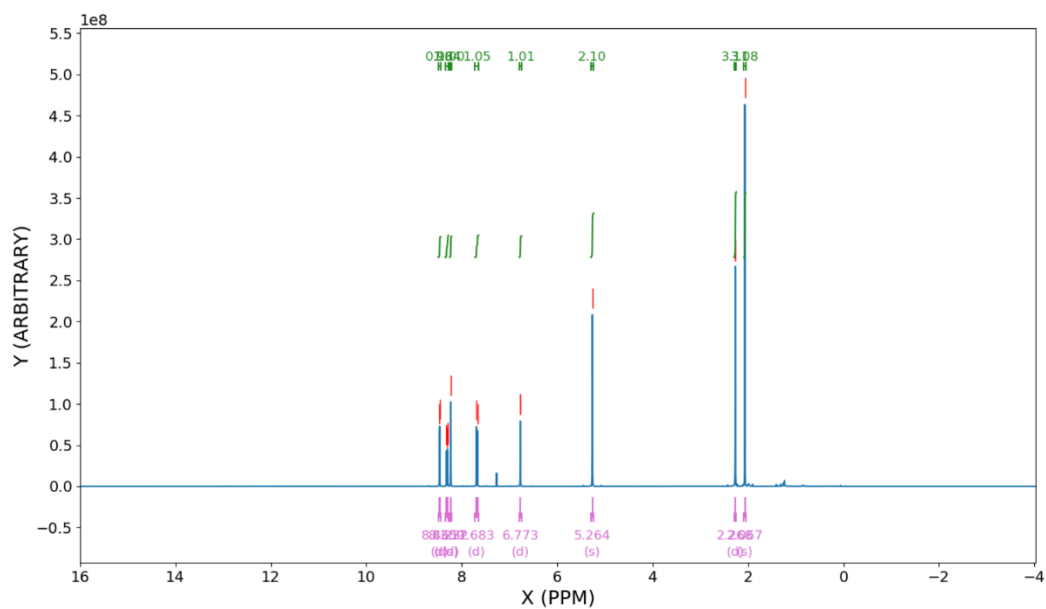


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

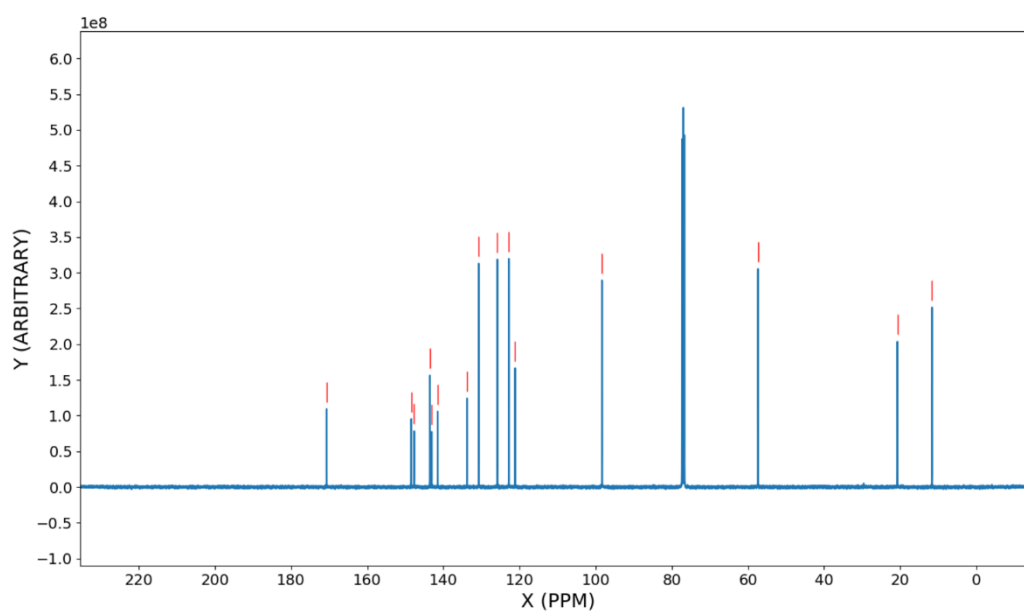


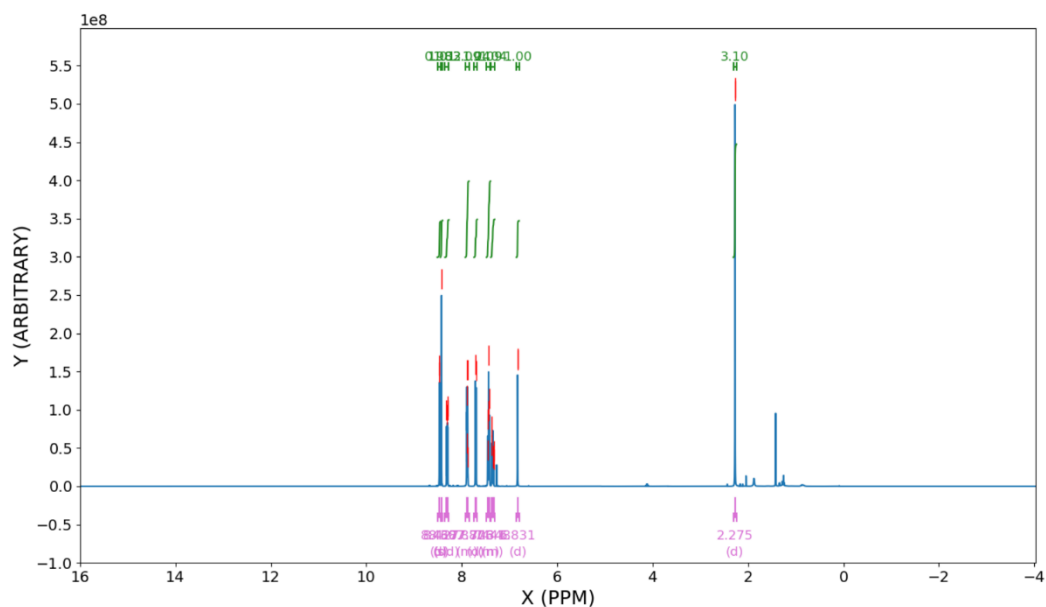
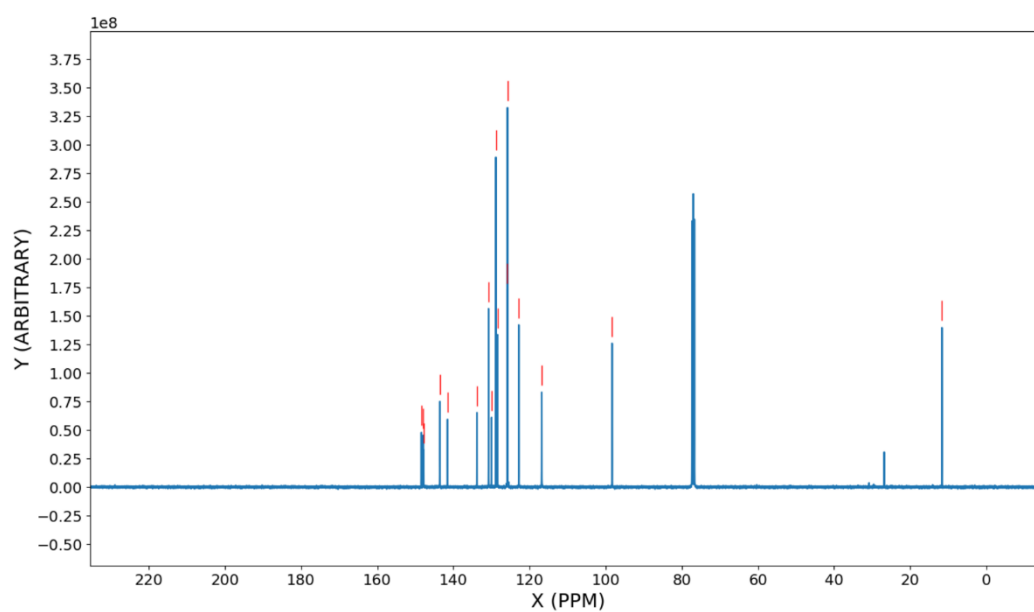
[21ic] (1-(1-(2-chloro-4-nitrophenyl)-5-methyl-1*H*-pyrazol-3-yl)-1*H*-1,2,3-triazol-4-yl)methyl acetate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)



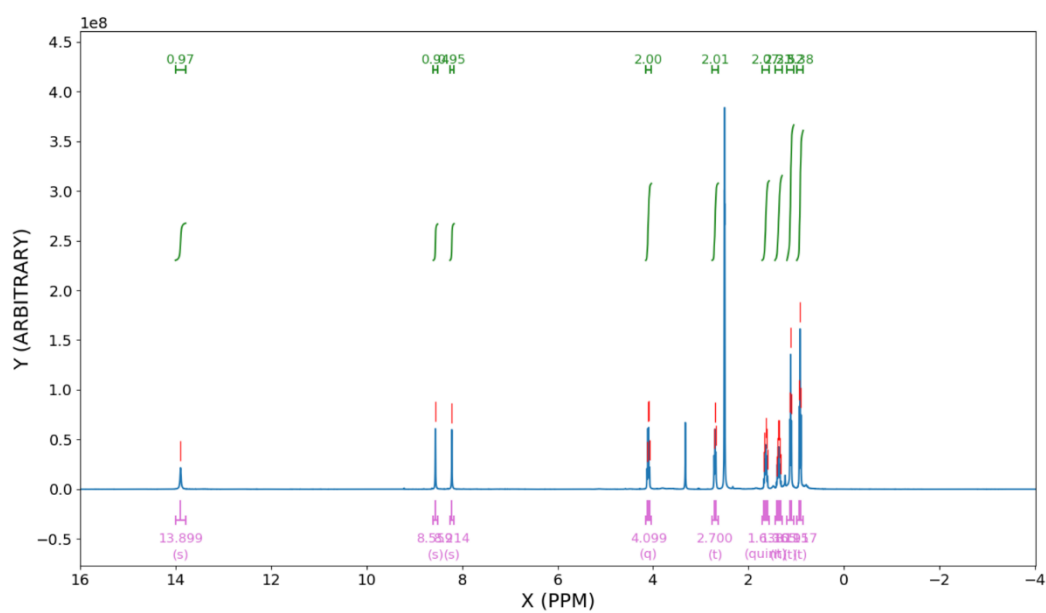
CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)



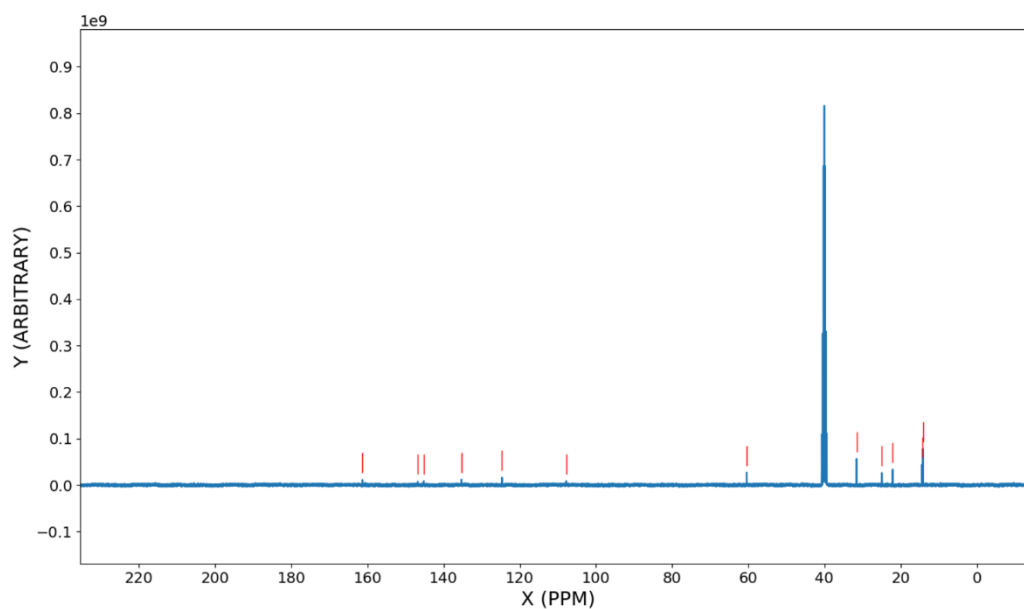
CHMO:0000593 | ¹H nuclear magnetic resonance spectroscopy (¹H NMR)CHMO:0000595 | ¹³C nuclear magnetic resonance spectroscopy (¹³C NMR)

[21ja] ethyl 3-(4-butyl-1*H*-1,2,3-triazol-1-yl)-1*H*-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

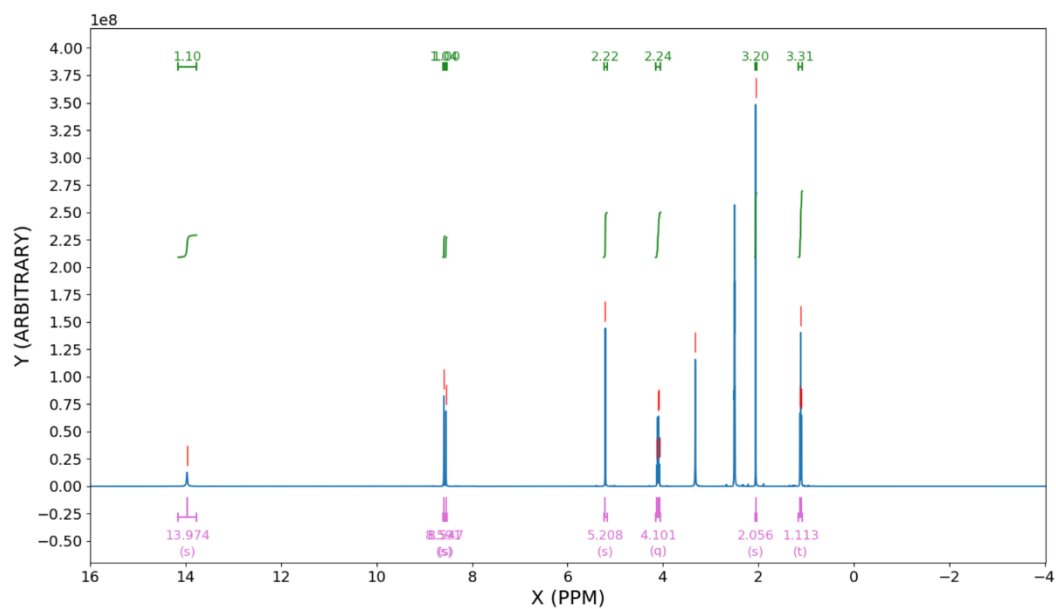


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

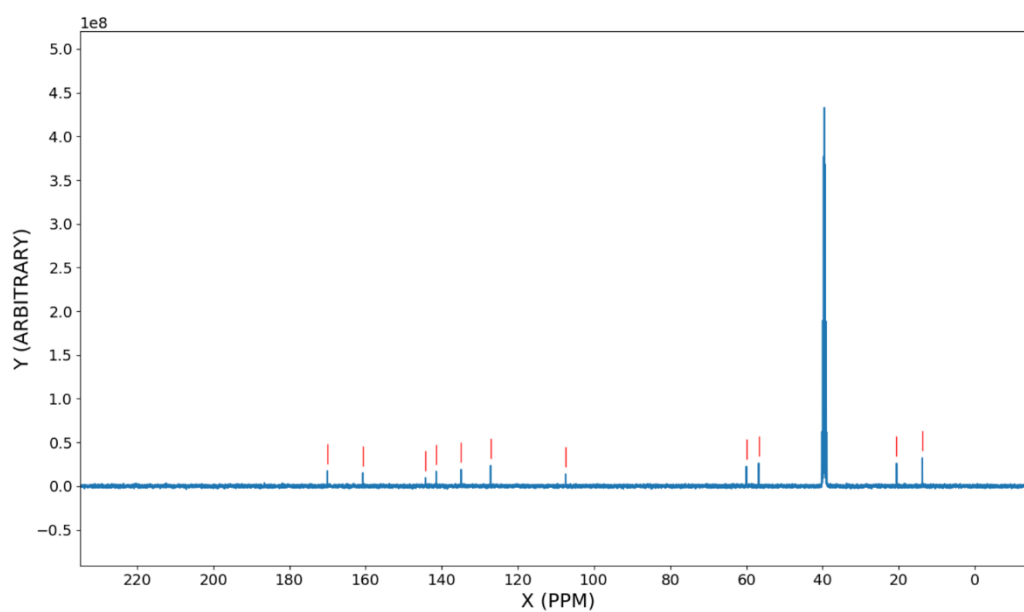


[21jc] ethyl 3-(4-(acetoxymethyl)-1*H*-1,2,3-triazol-1-yl)-1*H*-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

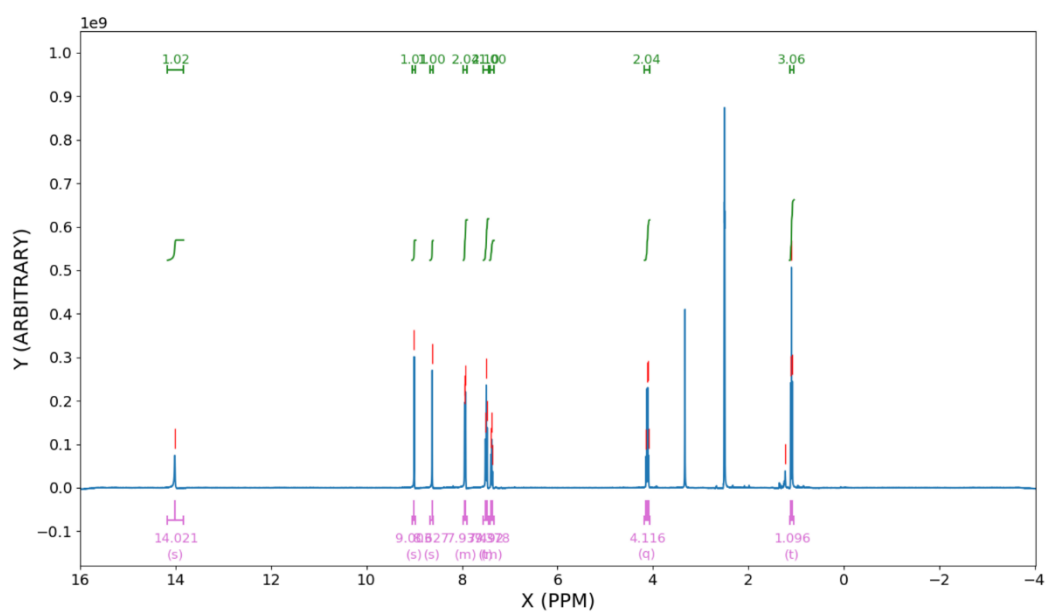


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

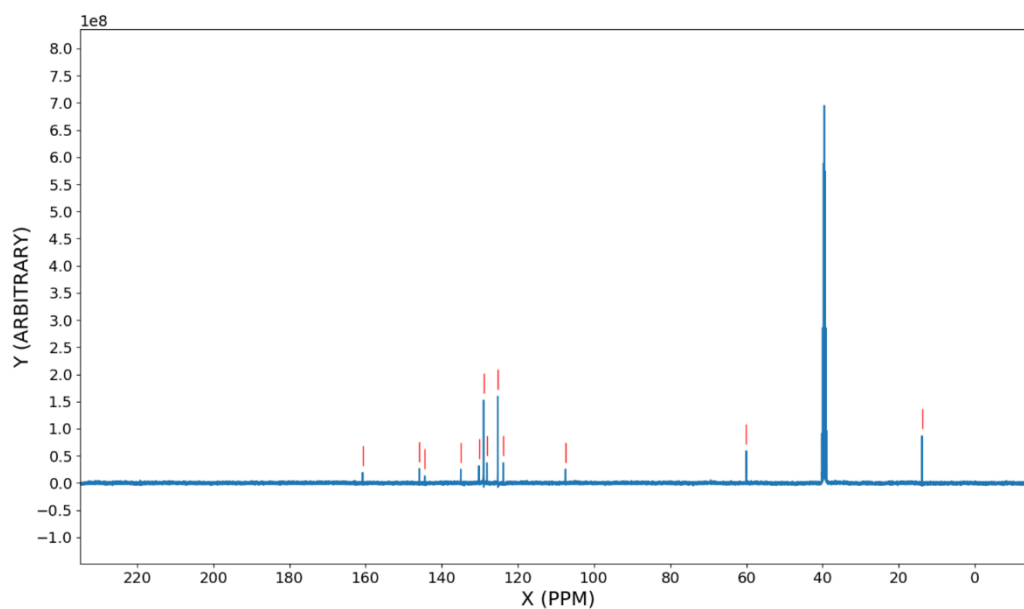


[21jd] ethyl 3-(4-phenyl-1*H*-1,2,3-triazol-1-yl)-1*H*-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

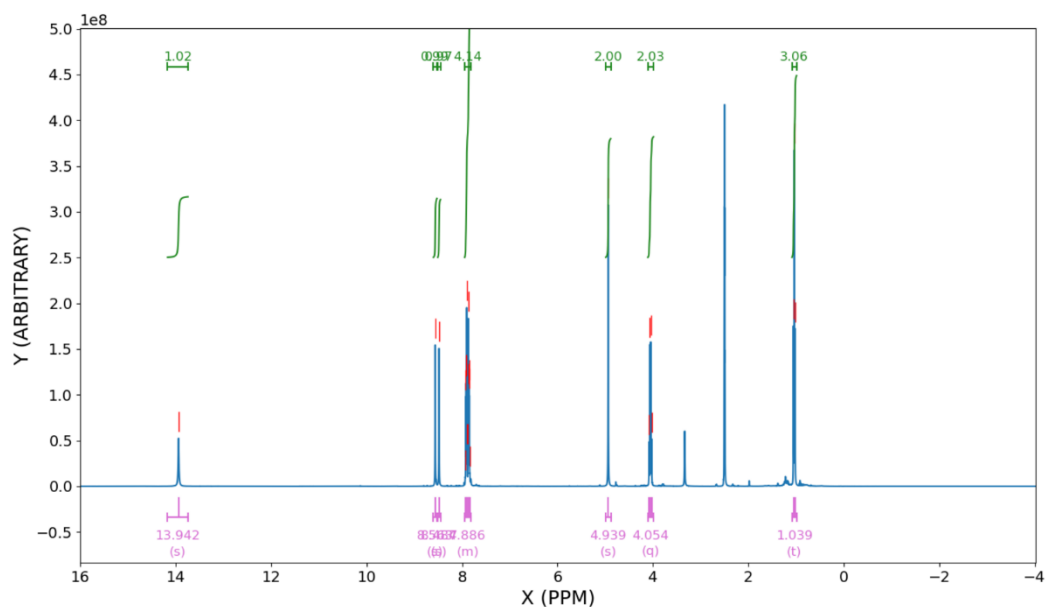


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

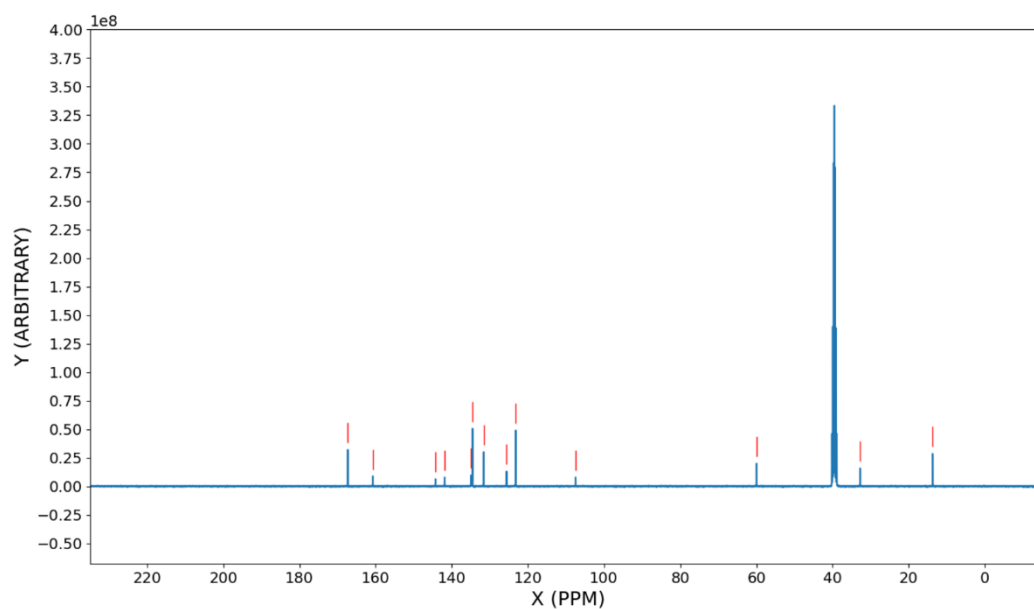


[21jh] ethyl 3-(4-((1,3-dioxoisindolin-2-yl)methyl)-1H-1,2,3-triazol-1-yl)-1H-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)



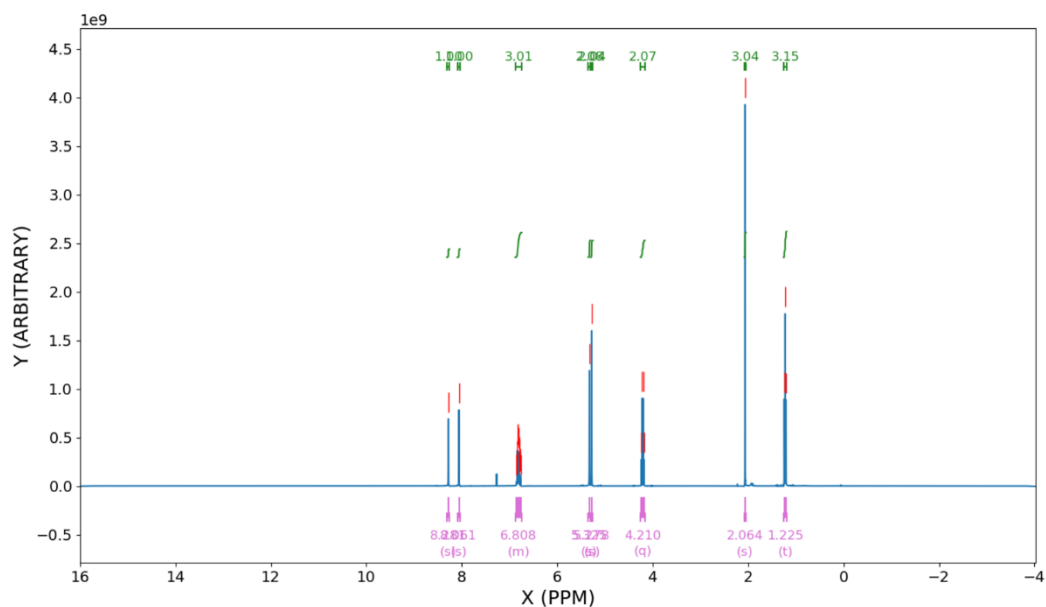
CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)



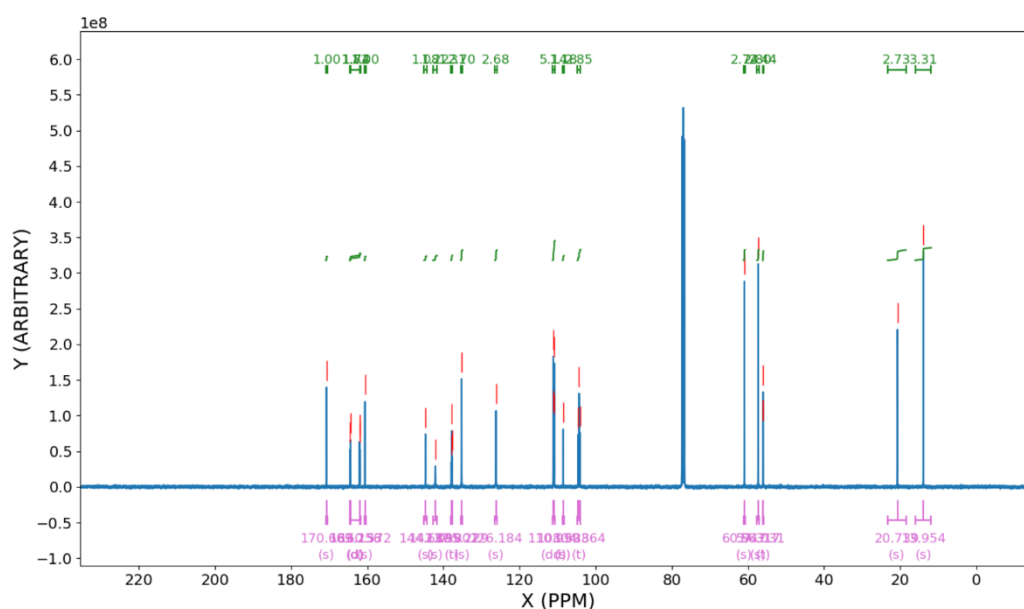
CHMO:0000593 | ¹H nuclear magnetic resonance spectroscopy (¹H NMR)

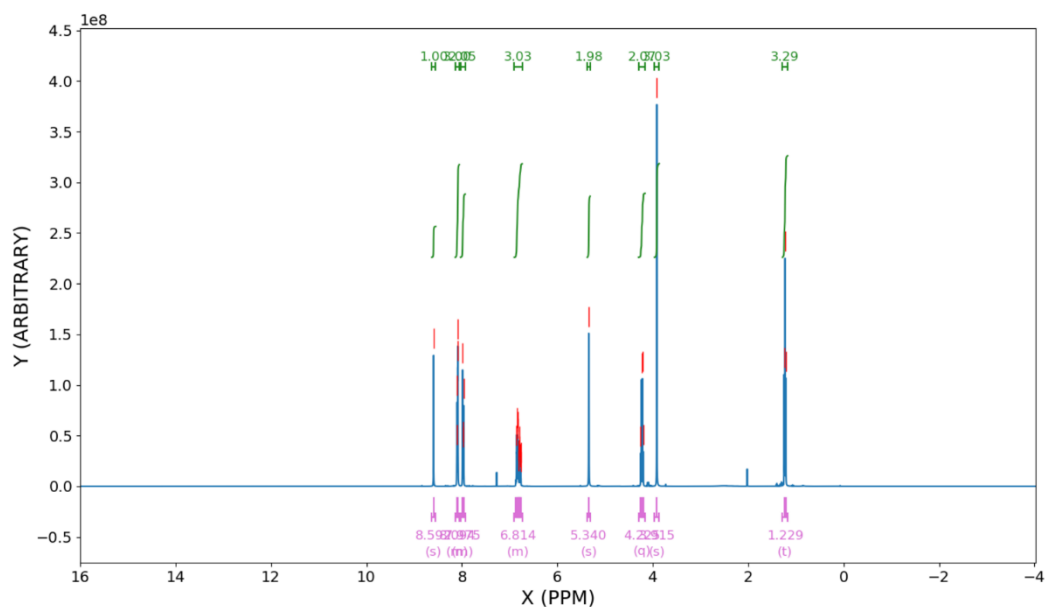
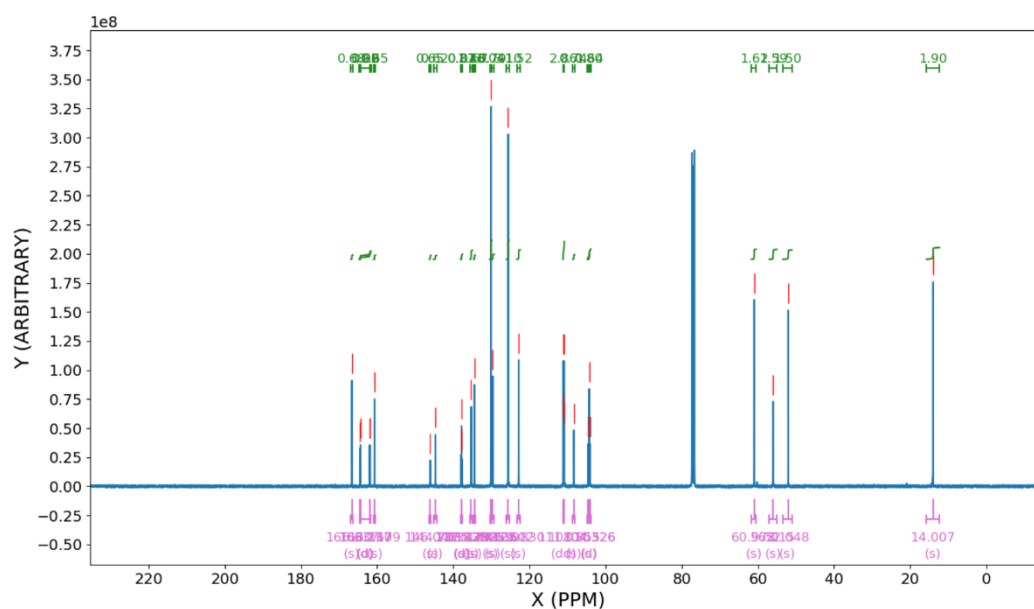
[211c] ethyl 3-(4-(acetoxymethyl)-1*H*-1,2,3-triazol-1-yl)-1-(3,5-difluorobenzyl)-1*H*-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)



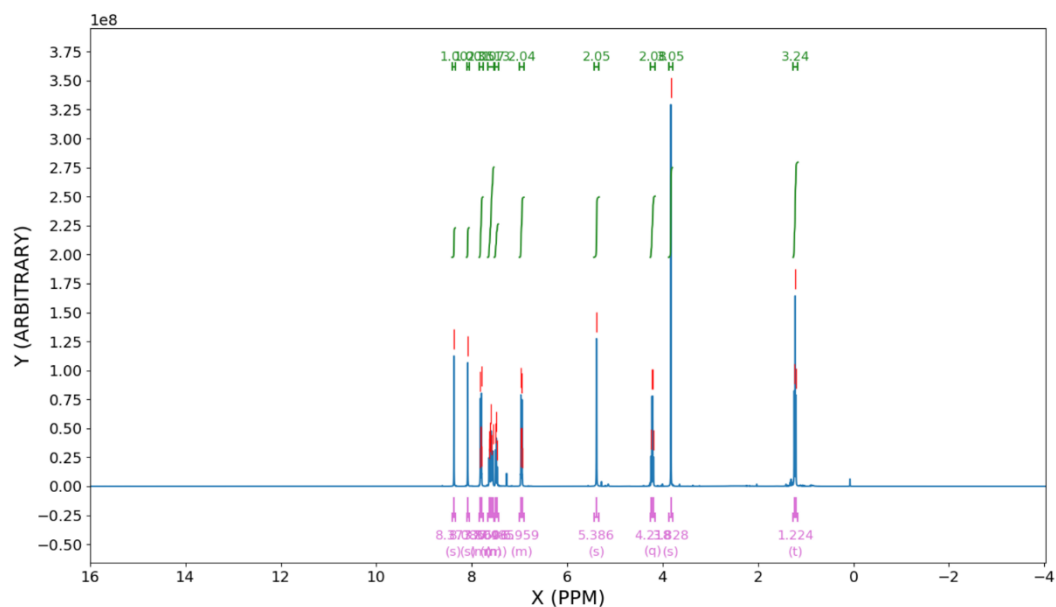
CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)



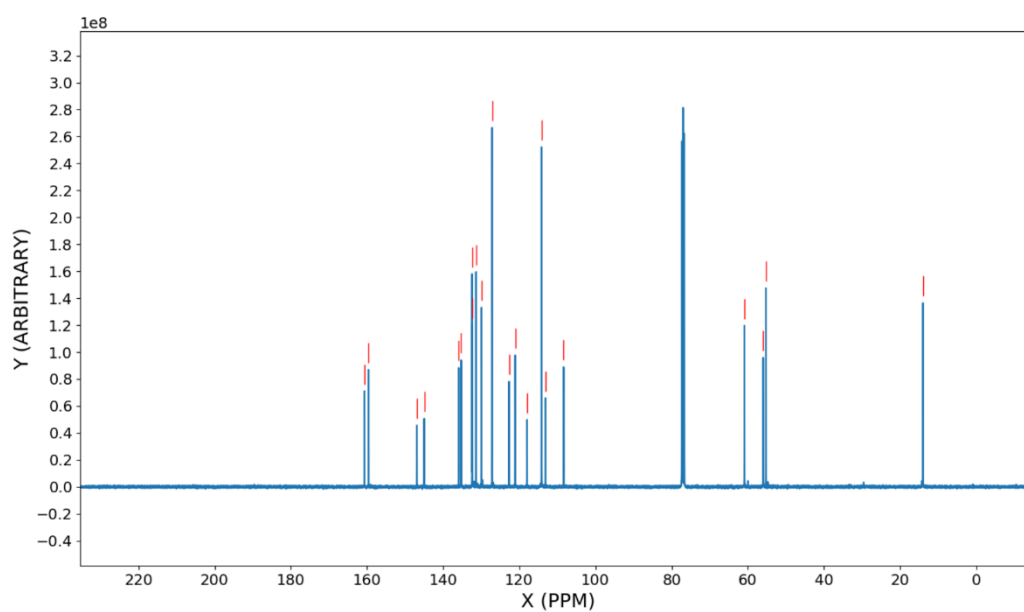
CHMO:0000593 | ¹H nuclear magnetic resonance spectroscopy (¹H NMR)CHMO:0000595 | ¹³C nuclear magnetic resonance spectroscopy (¹³C NMR)

[21me] ethyl 1-(3-cyanobenzyl)-3-(4-(4-methoxyphenyl)-1*H*-1,2,3-triazol-1-yl)-1*H*-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

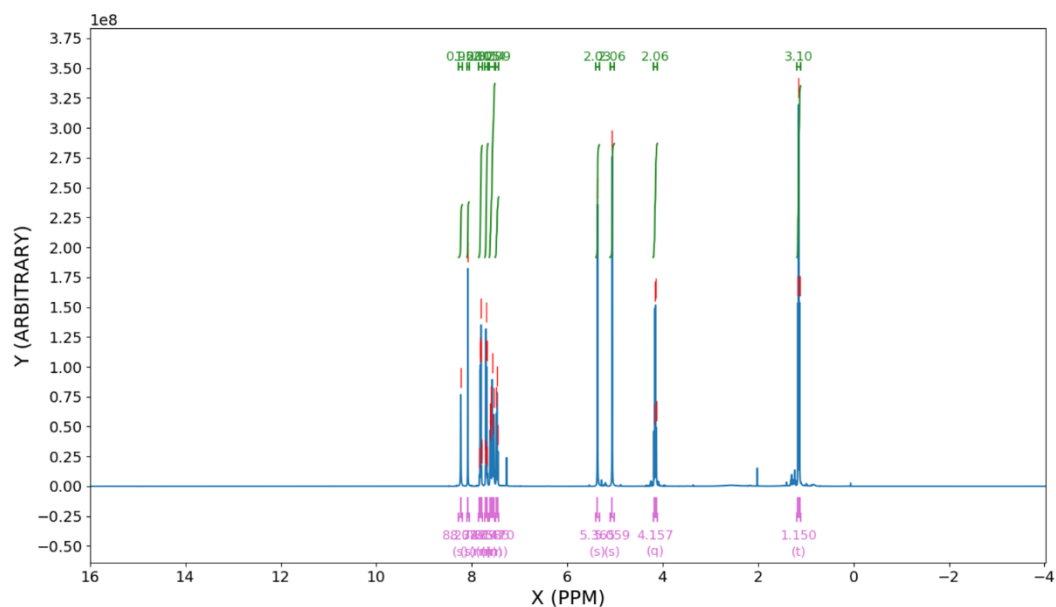


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

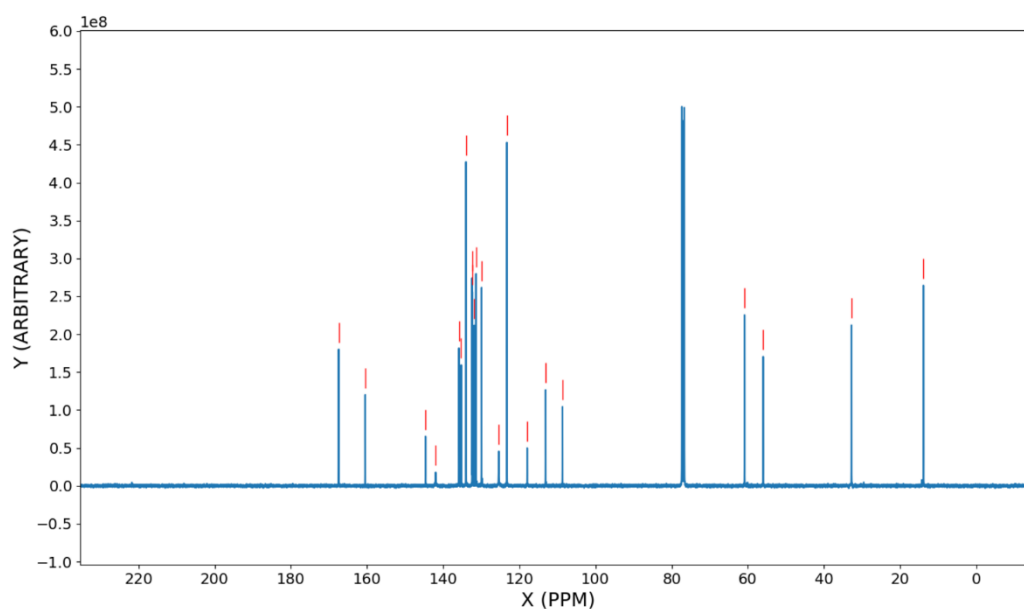


[21mh] ethyl 1-(3-cyanobenzyl)-3-(4-((1,3-dioxoisindolin-2-yl)methyl)-1*H*-1,2,3-triazol-1-yl)-1*H*-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

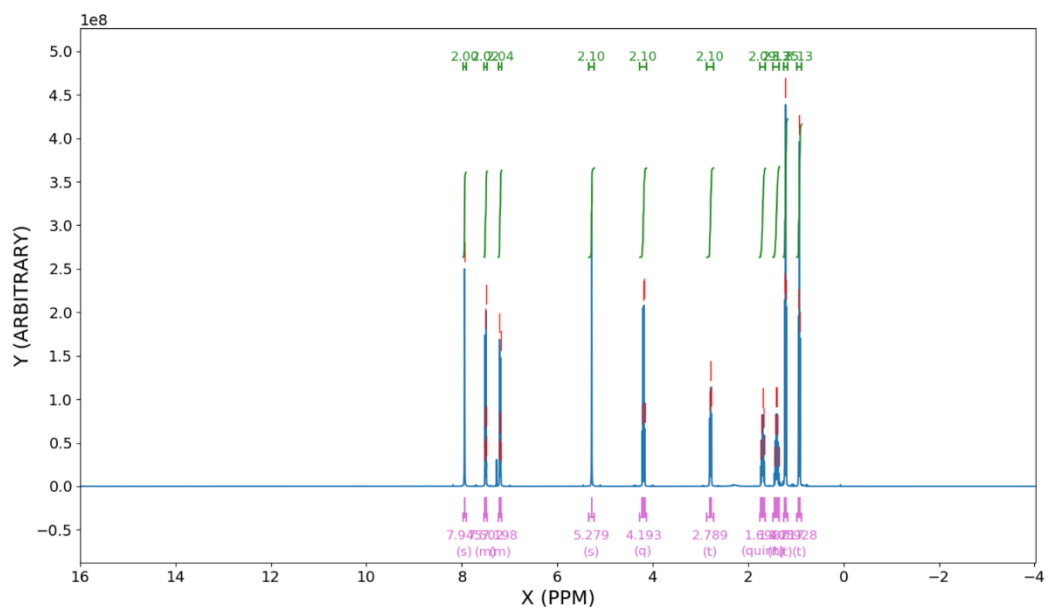


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

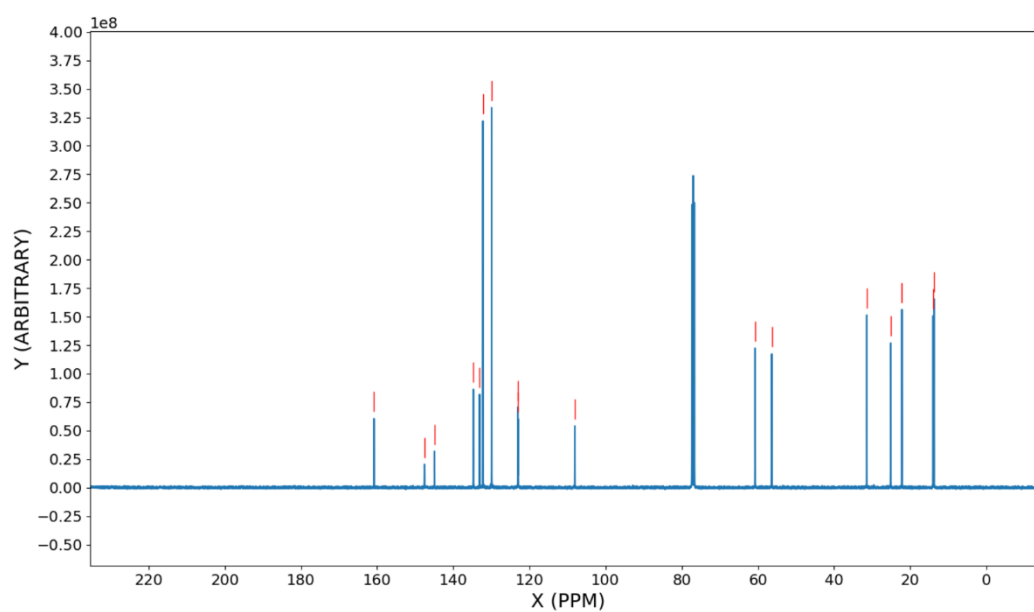


[21na] ethyl 1-(4-bromobenzyl)-3-(4-butyl-1*H*-1,2,3-triazol-1-yl)-1*H*-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

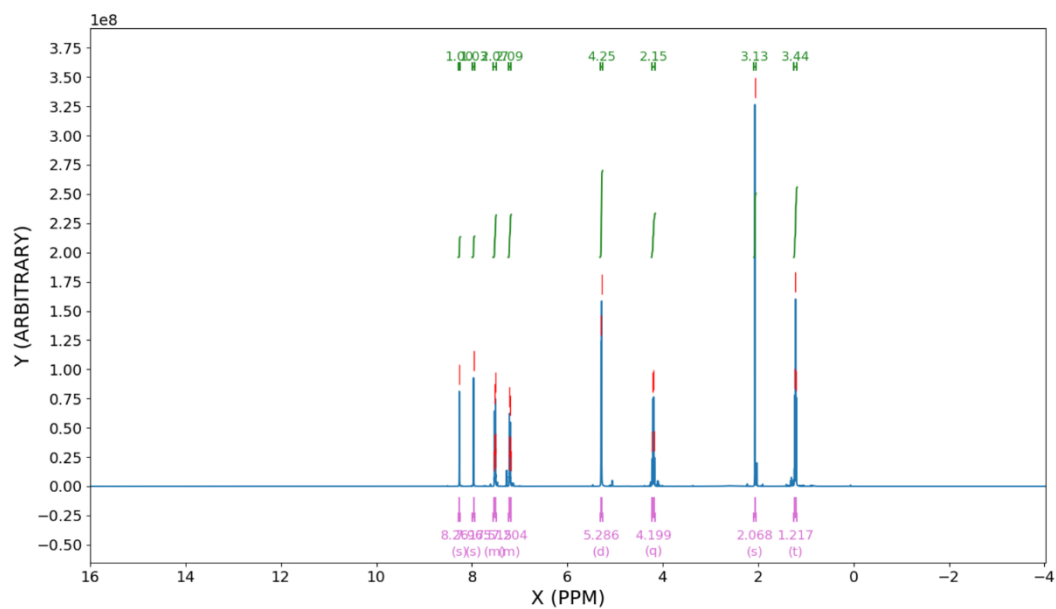


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

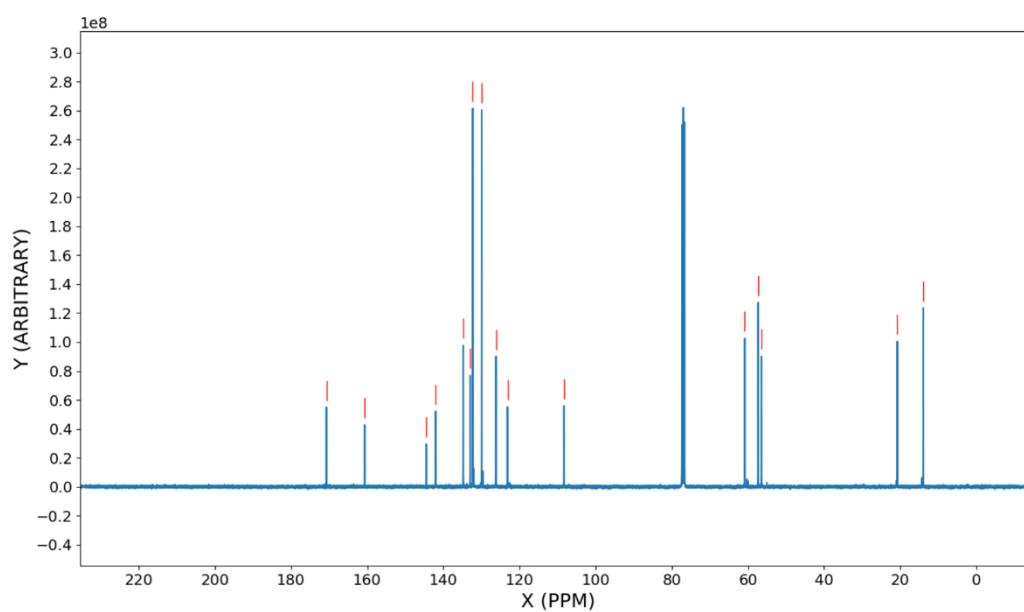


[21nc] ethyl 3-(4-(acetoxymethyl)-1*H*-1,2,3-triazol-1-yl)-1-(4-bromobenzyl)-1*H*-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

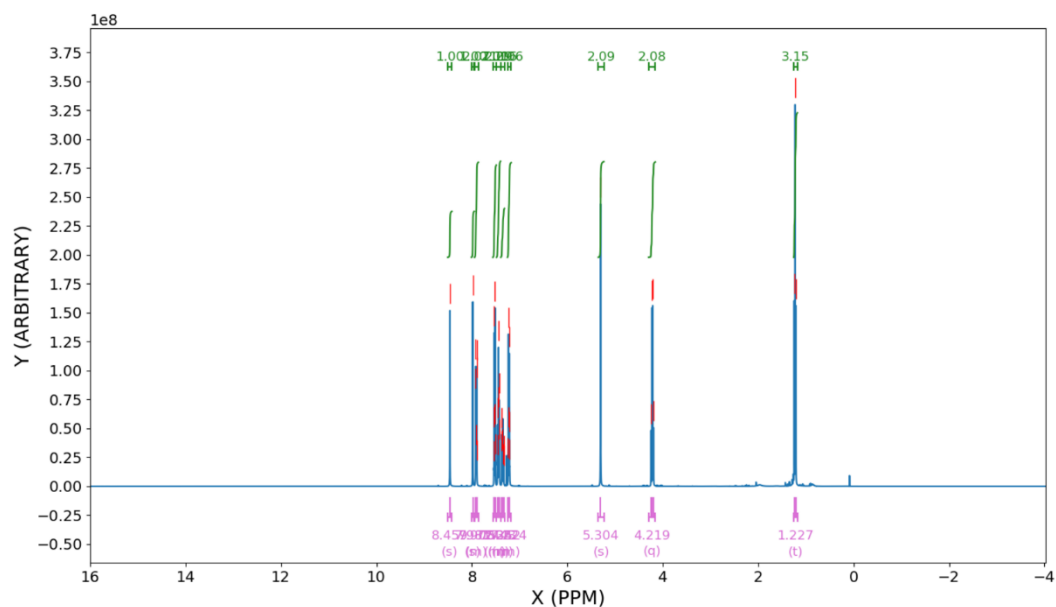


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

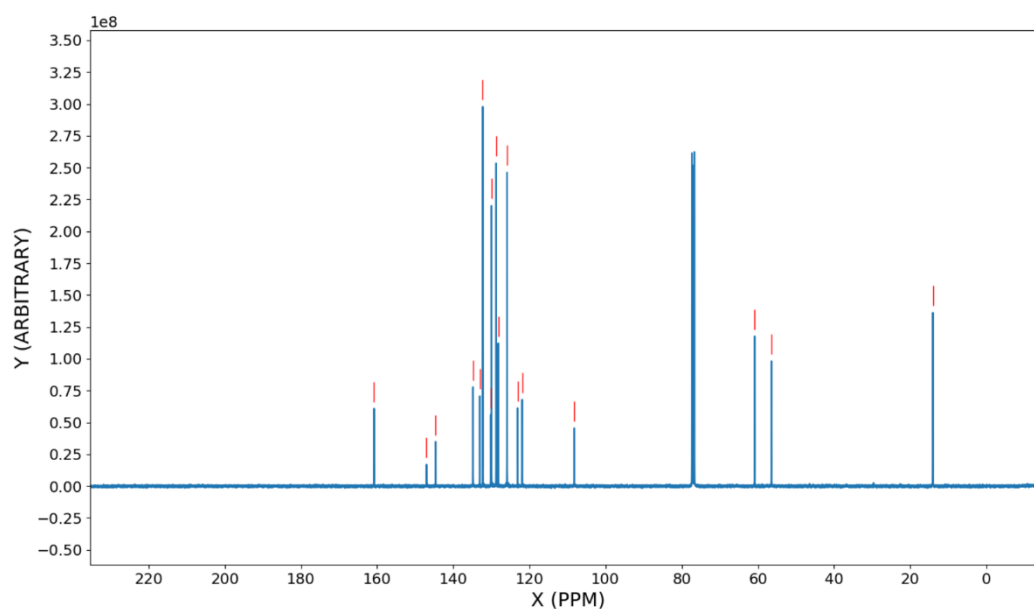


[21nd] ethyl 1-(4-bromobenzyl)-3-(4-phenyl-1*H*-1,2,3-triazol-1-yl)-1*H*-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

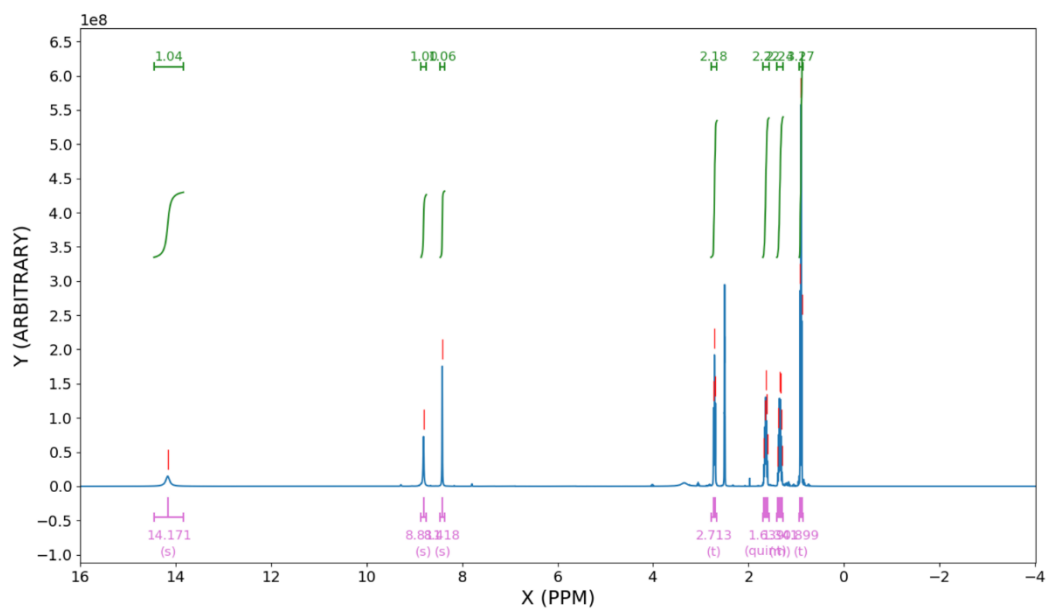


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

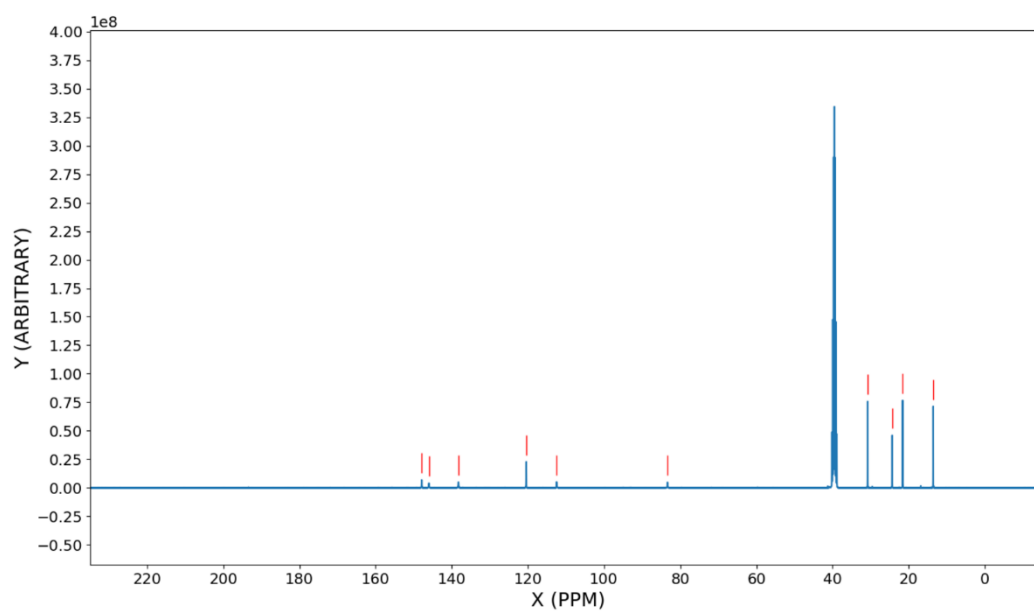


[210a] 3-(4-butyl-1*H*-1,2,3-triazol-1-yl)-1*H*-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

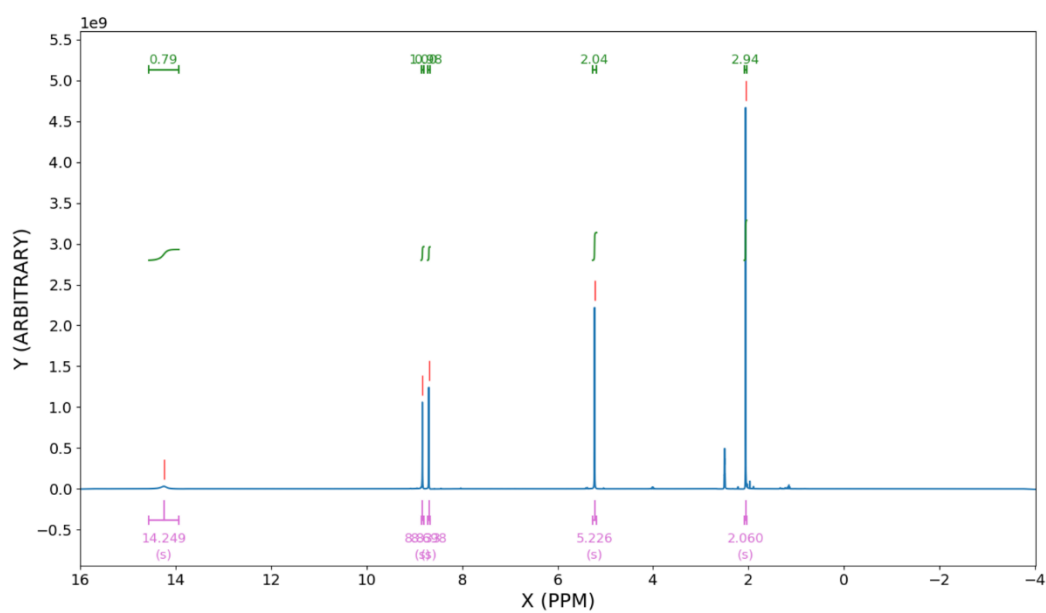


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

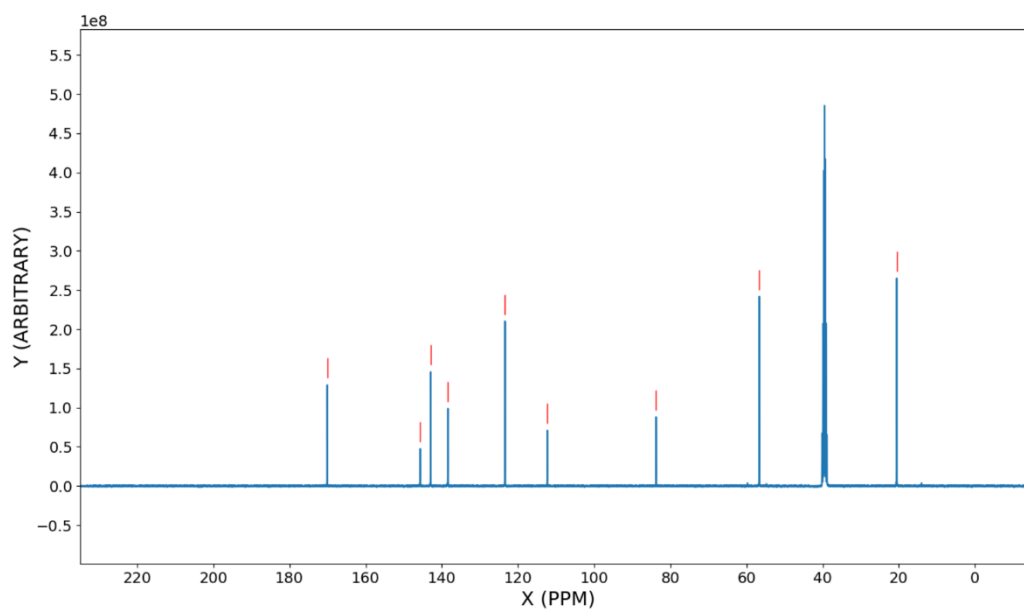


[210c] (1-(4-cyano-1*H*-pyrazol-3-yl)-1*H*-1,2,3-triazol-4-yl)methyl acetate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

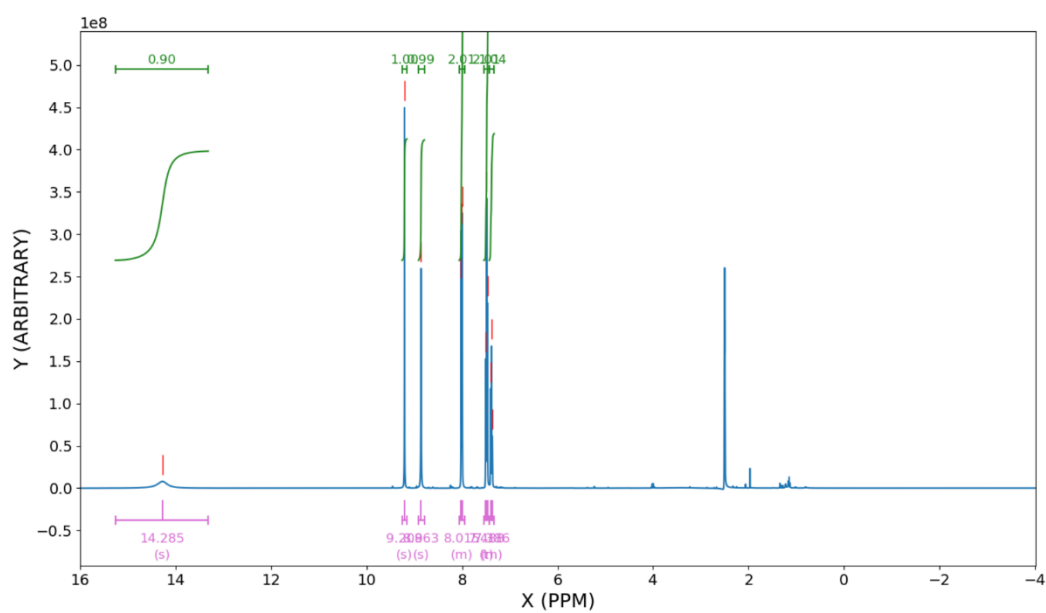


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

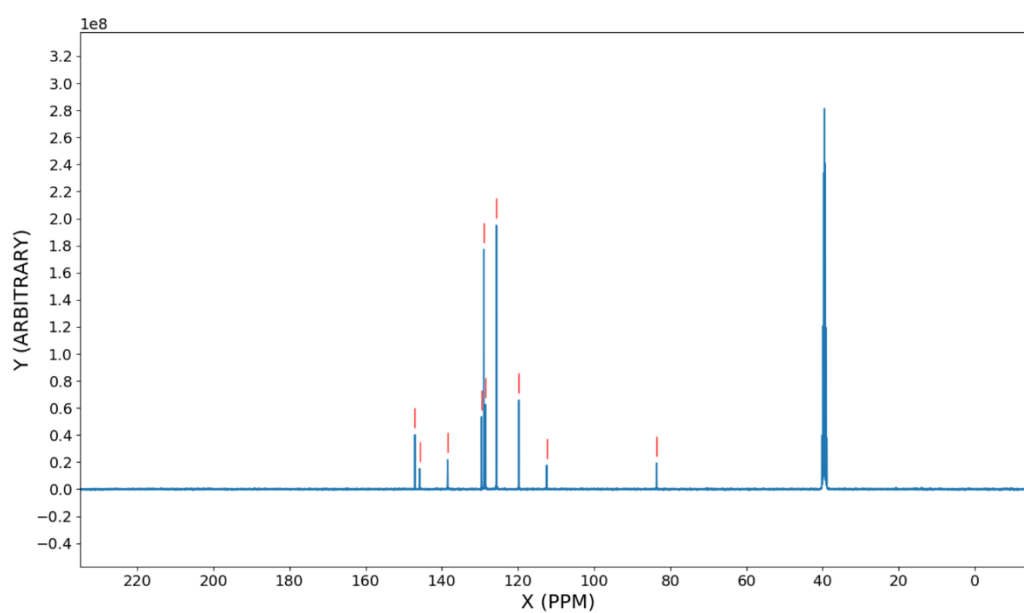


[21od] 3-(4-phenyl-1*H*-1,2,3-triazol-1-yl)-1*H*-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

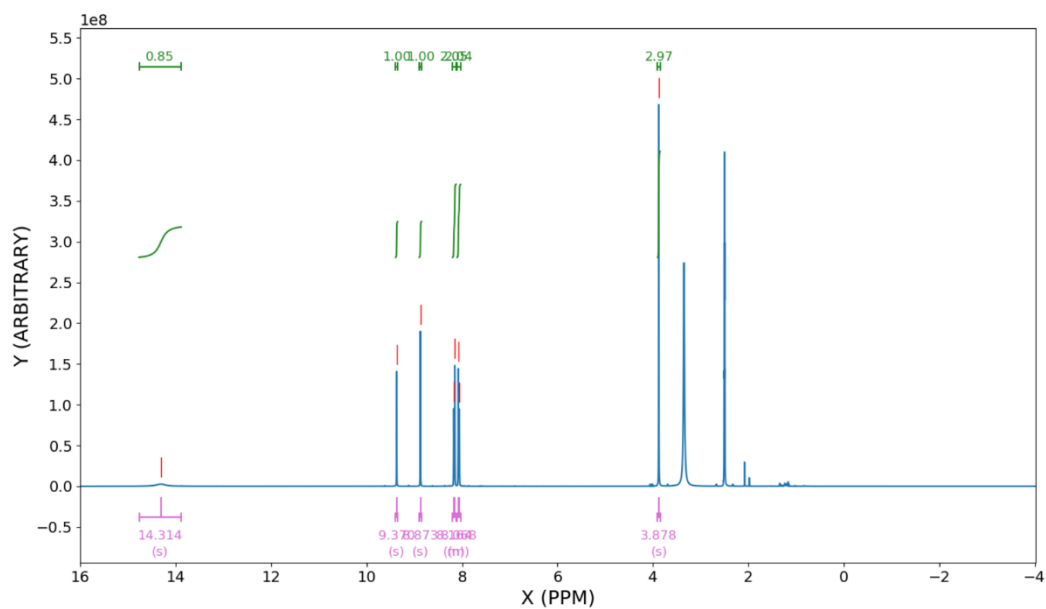


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

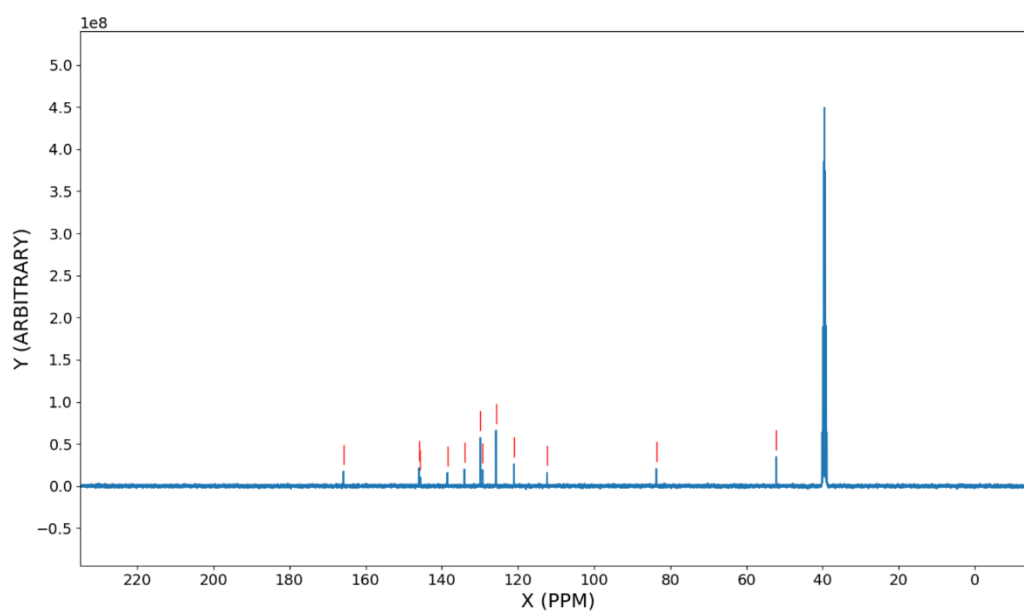


[21of] methyl 4-(1-(4-cyano-1*H*-pyrazol-3-yl)-1*H*-1,2,3-triazol-4-yl)benzoate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

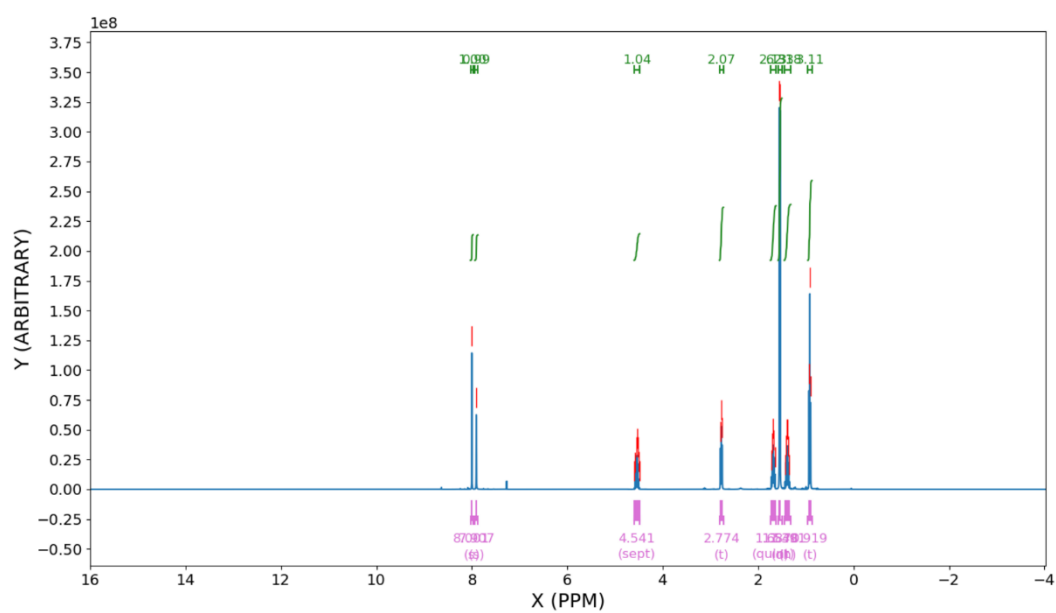


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

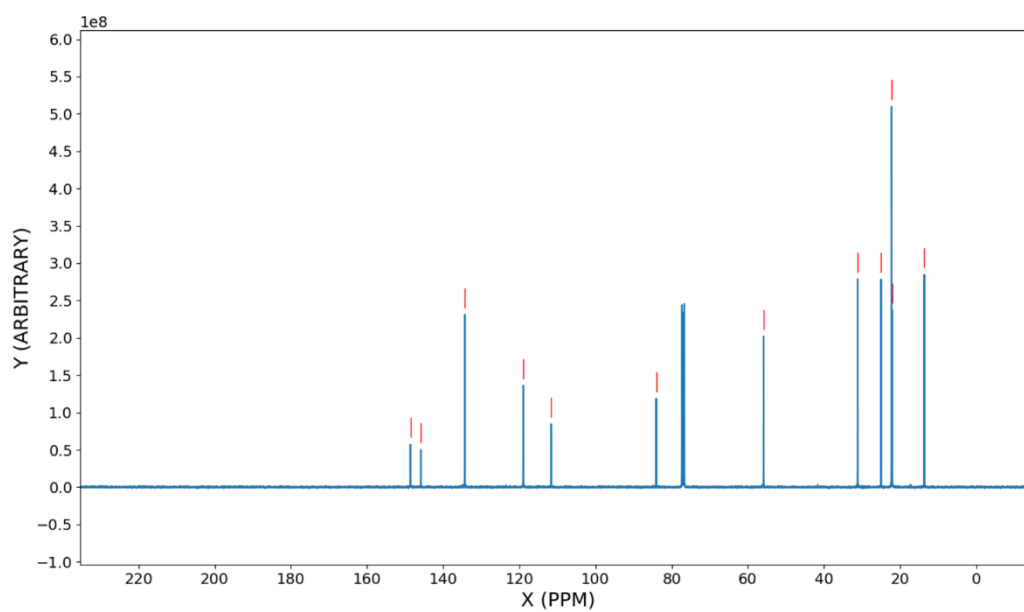


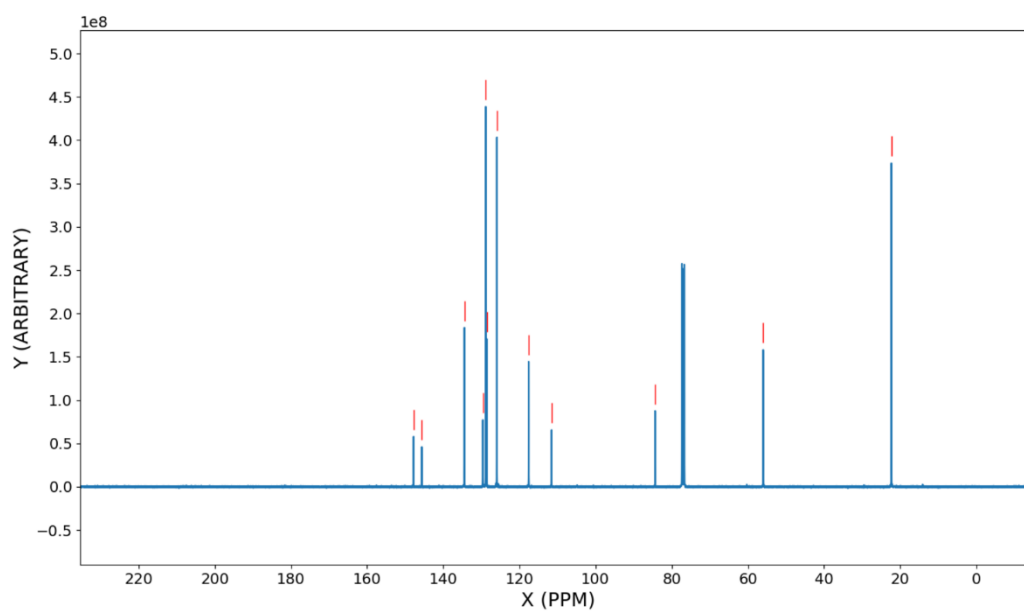
[21pa] 3-(4-butyl-1*H*-1,2,3-triazol-1-yl)-1-isopropyl-1*H*-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)



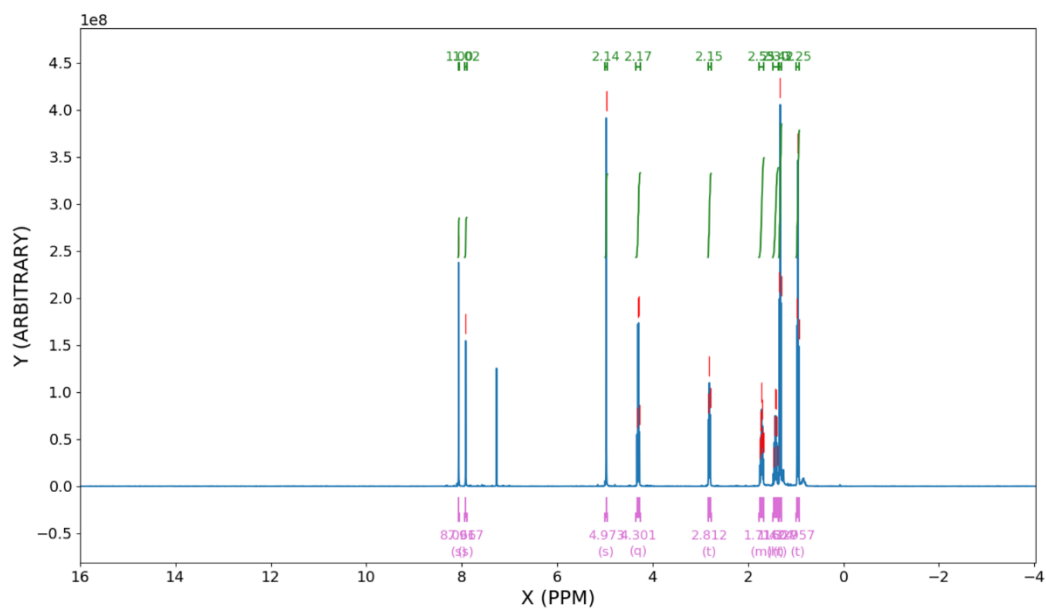
CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)



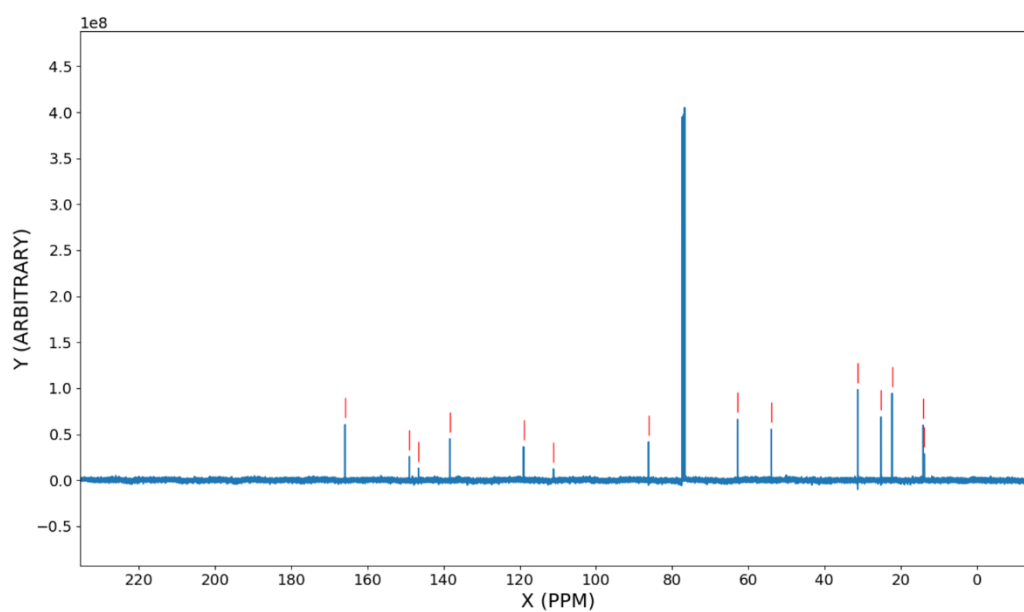
CHMO:0000593 | ¹H nuclear magnetic resonance spectroscopy (¹H NMR)

[21qa] ethyl 2-(3-(4-butyl-1*H*-1,2,3-triazol-1-yl)-4-cyano-1*H*-pyrazol-1-yl)acetate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)



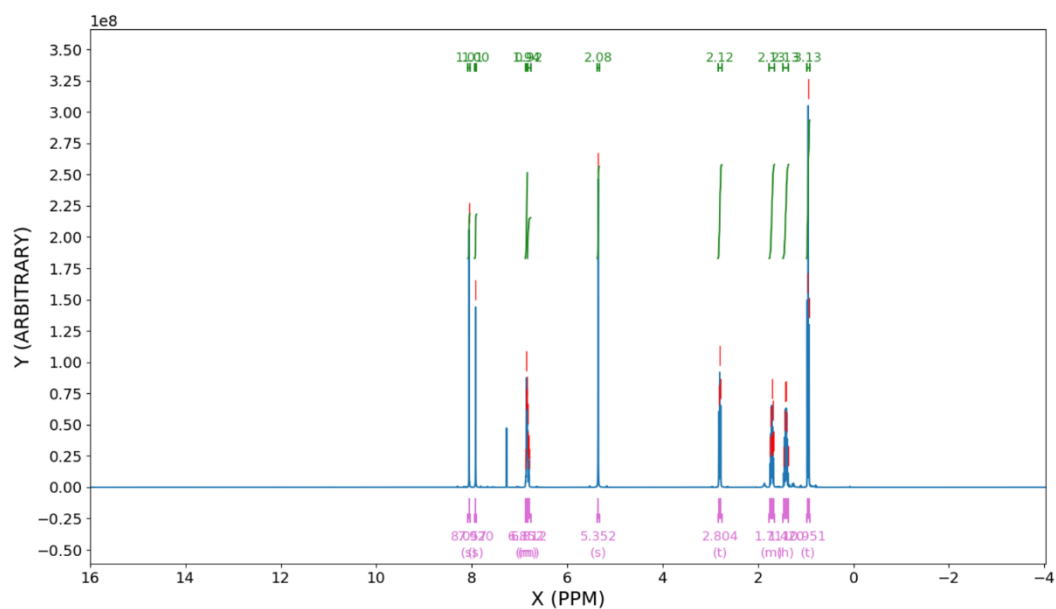
CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)



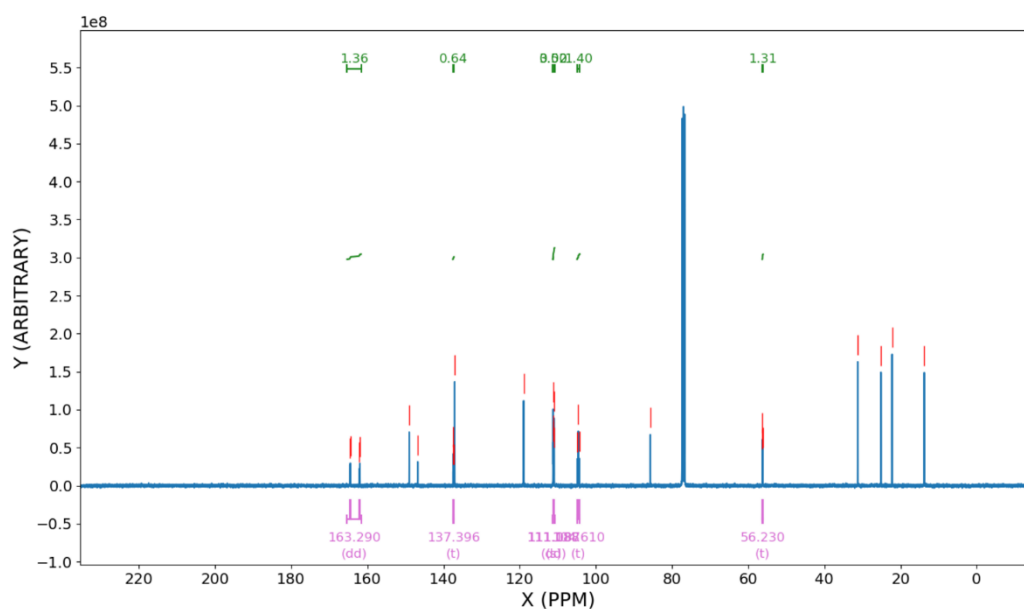
CHMO:0000593 | ¹H nuclear magnetic resonance spectroscopy (¹H NMR)

[21sa] 3-(4-butyl-1*H*-1,2,3-triazol-1-yl)-1-(3,5-difluorobenzyl)-1*H*-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

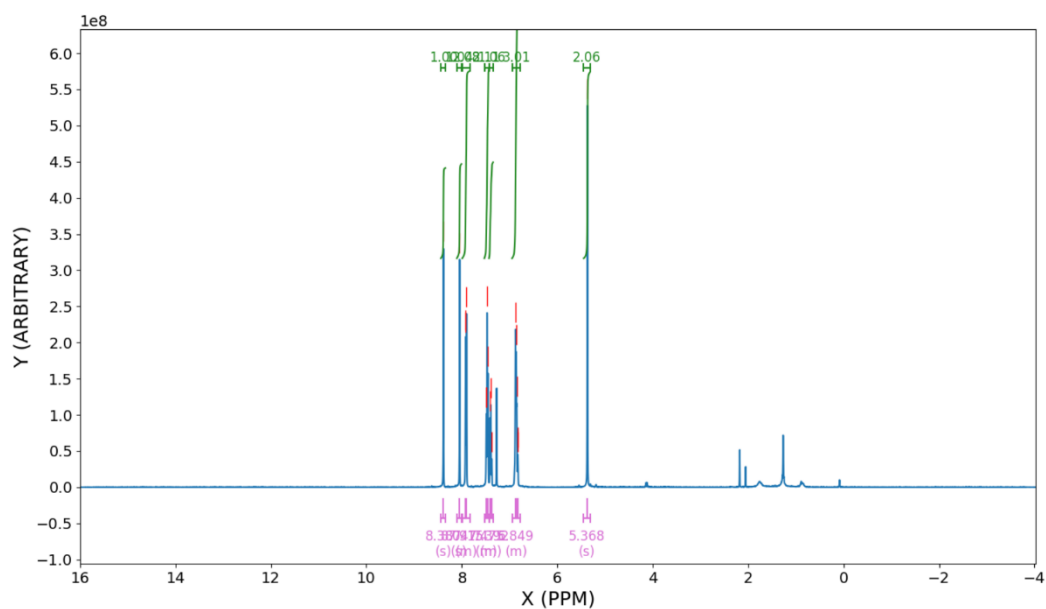


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

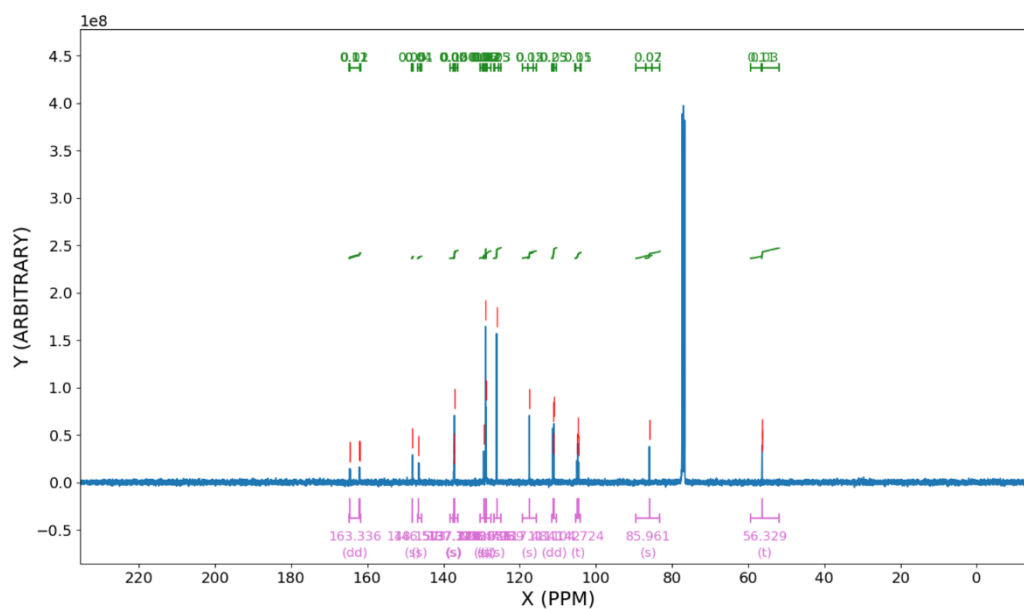


[21sd] 1-(3,5-difluorobenzyl)-3-(4-phenyl-1*H*-1,2,3-triazol-1-yl)-1*H*-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

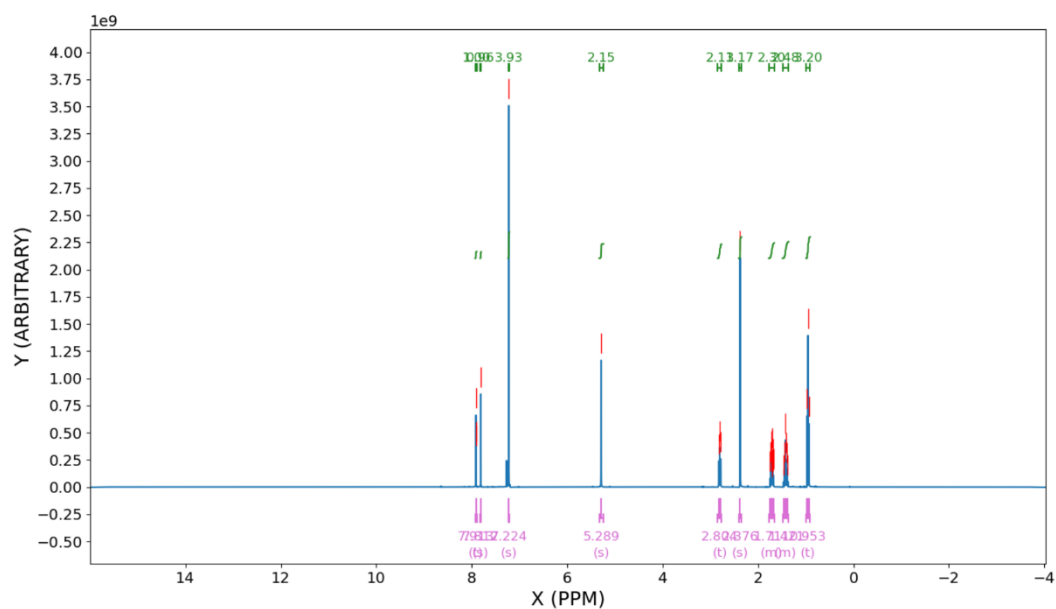


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

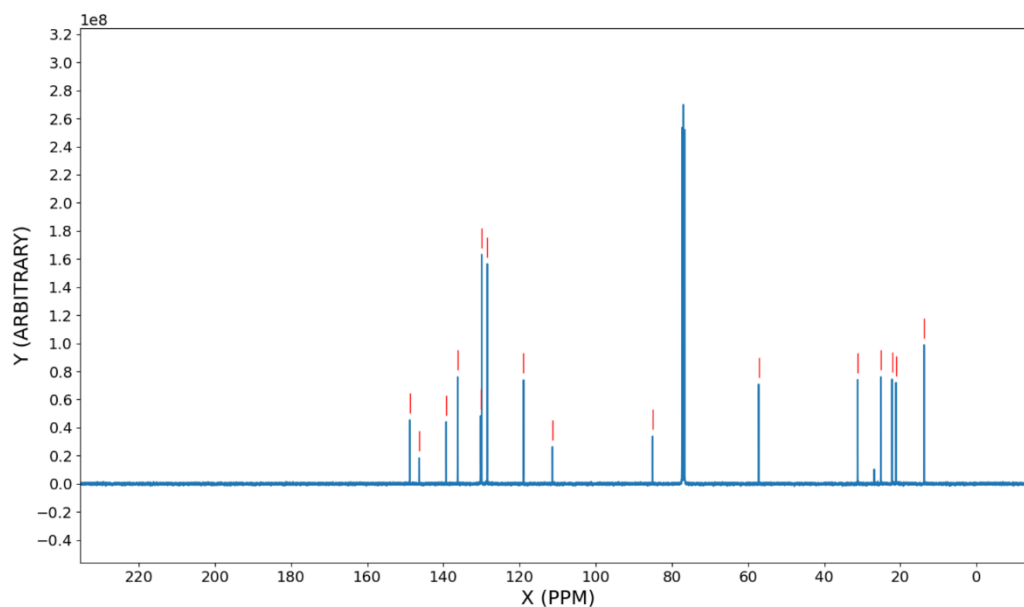


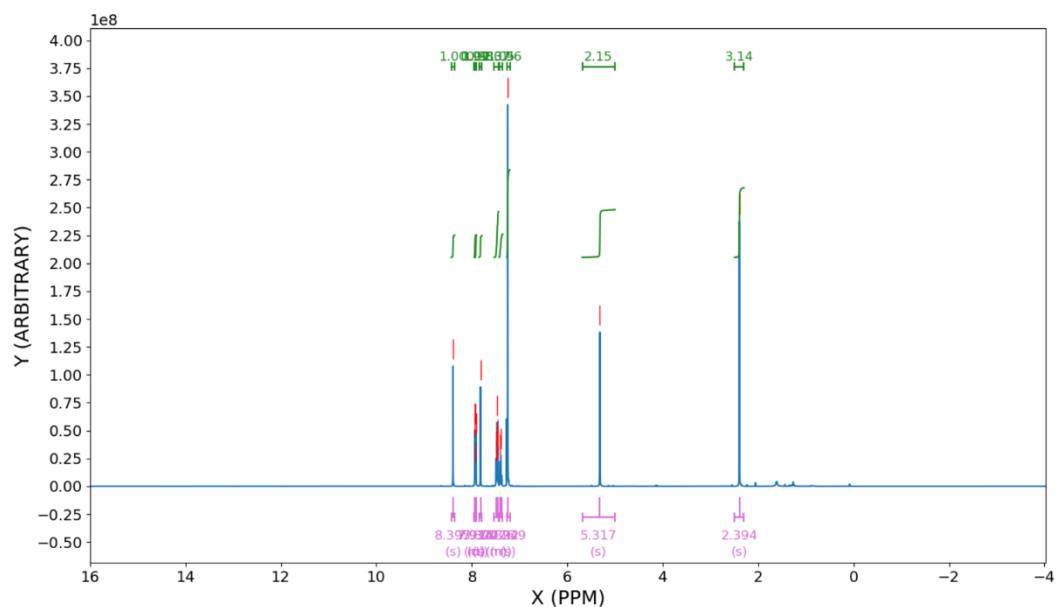
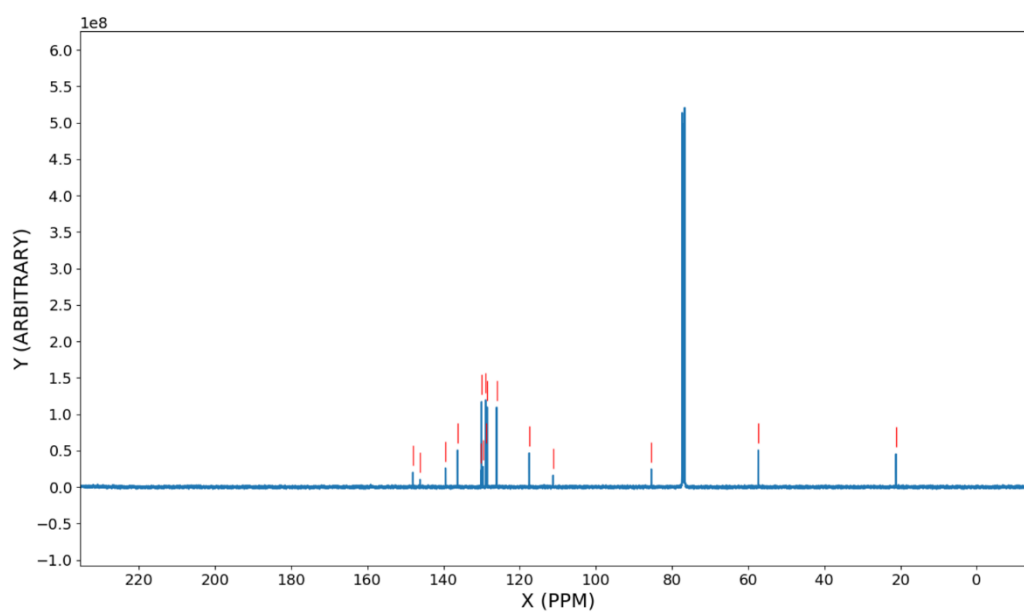
[21ta] 3-(4-butyl-1*H*-1,2,3-triazol-1-yl)-1-(4-methylbenzyl)-1*H*-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)



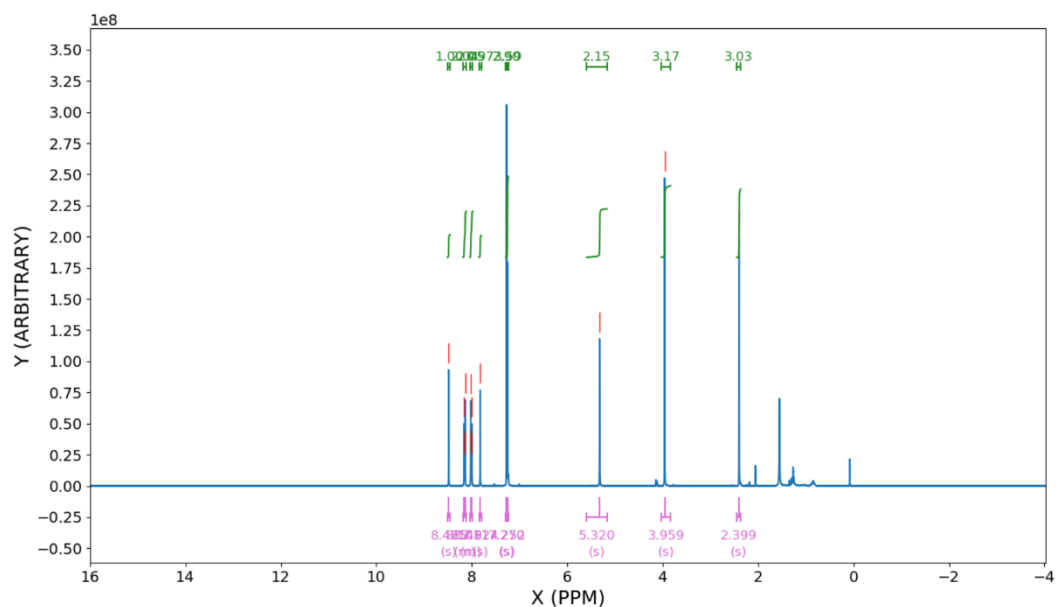
CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)



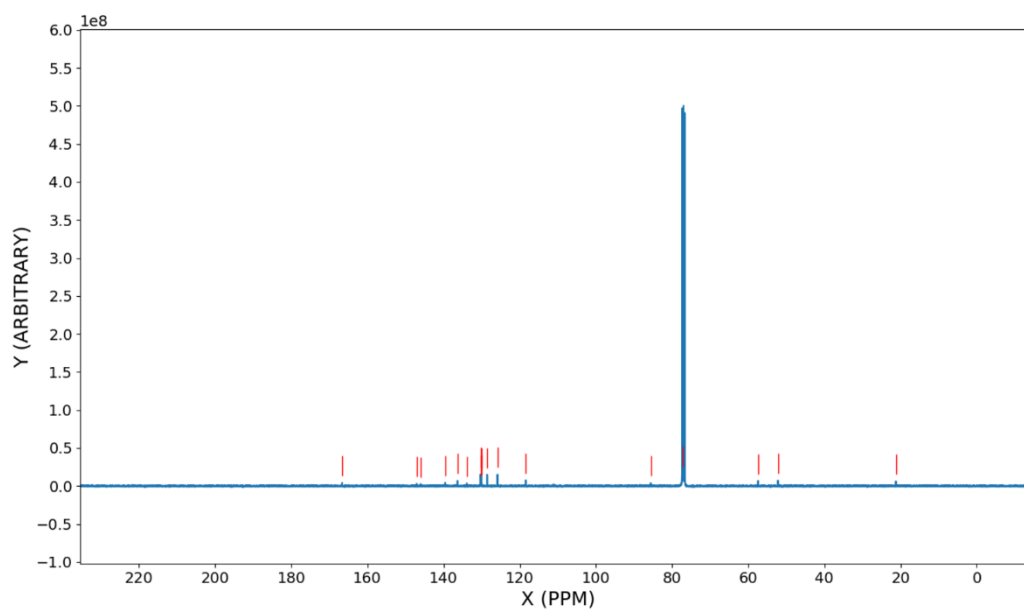
CHMO:0000593 | ¹H nuclear magnetic resonance spectroscopy (¹H NMR)CHMO:0000595 | ¹³C nuclear magnetic resonance spectroscopy (¹³C NMR)

[21tf] methyl 4-(1-(4-cyano-1-(4-methylbenzyl)-1*H*-pyrazol-3-yl)-1*H*-1,2,3-triazol-4-yl)benzoate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

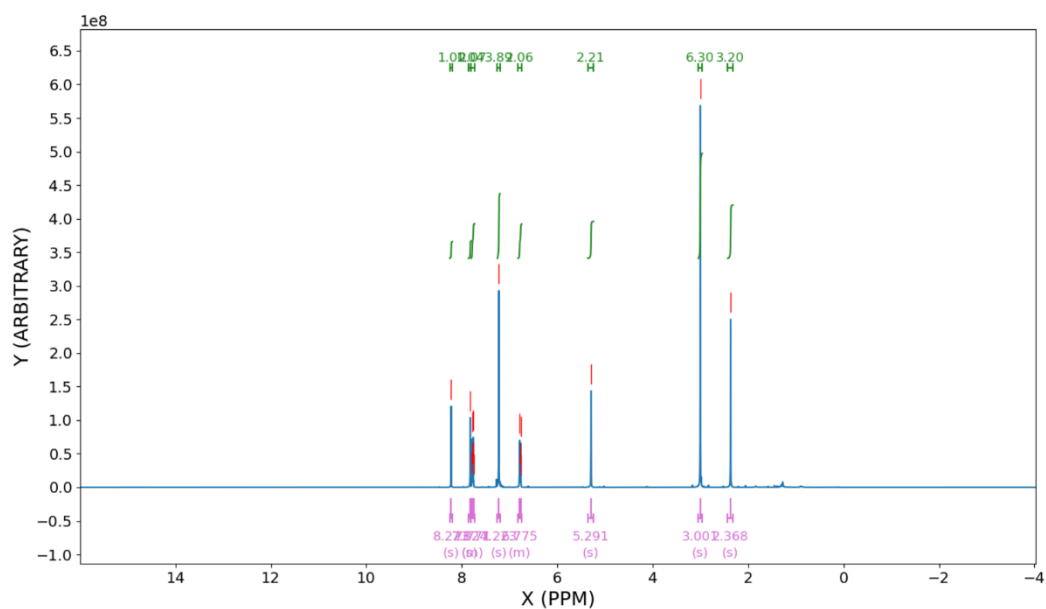


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

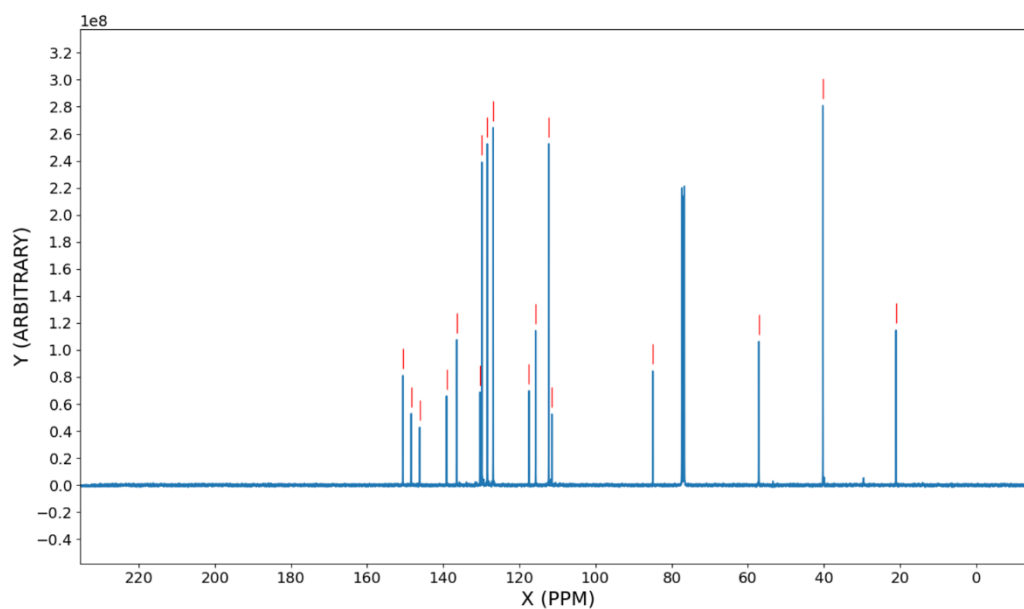


[21tg] 3-(4-(4-(dimethylamino)phenyl)-1*H*-1,2,3-triazol-1-yl)-1-(4-methylbenzyl)-1*H*-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

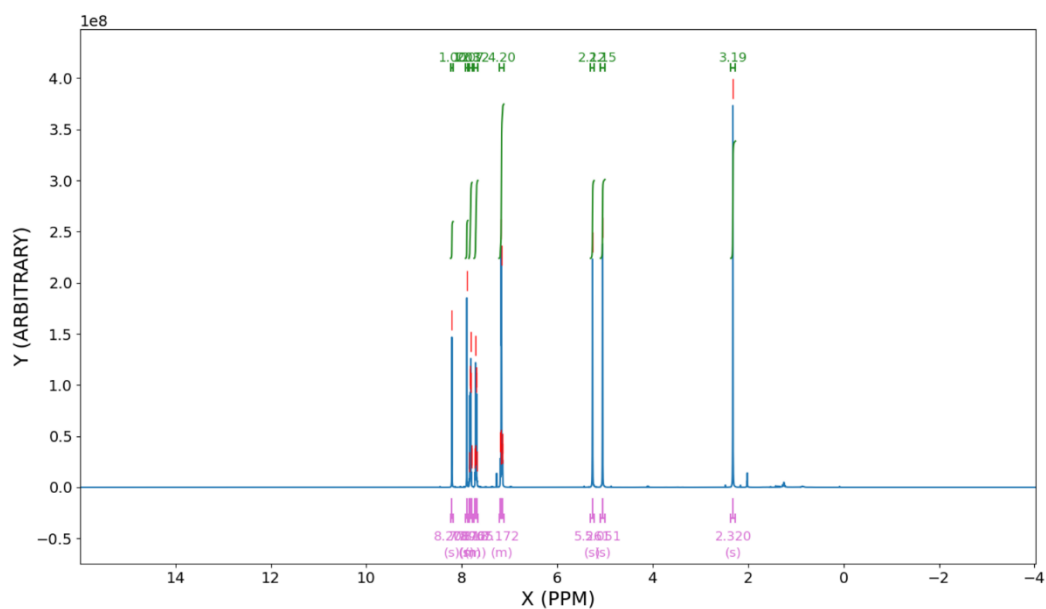


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

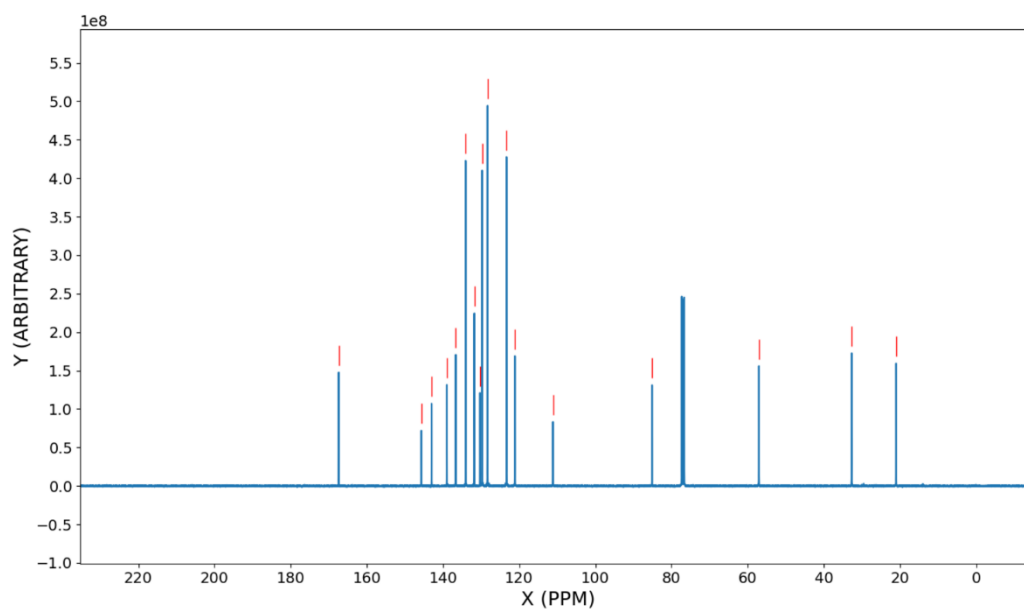


[21th] 3-(4-((1,3-dioxoisindolin-2-yl)methyl)-1*H*-1,2,3-triazol-1-yl)-1-(4-methylbenzyl)-1*H*-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

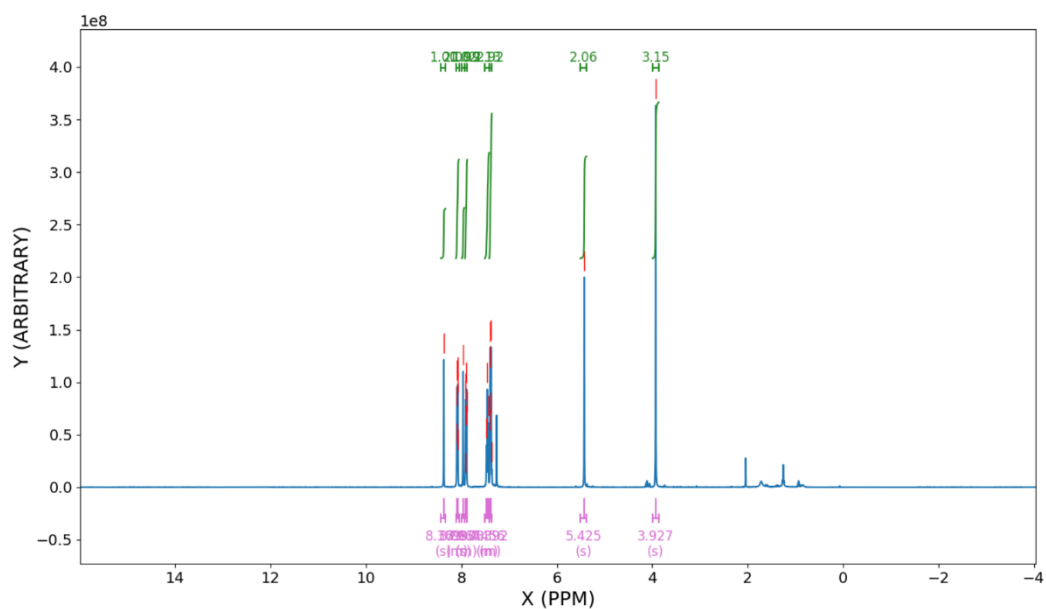


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

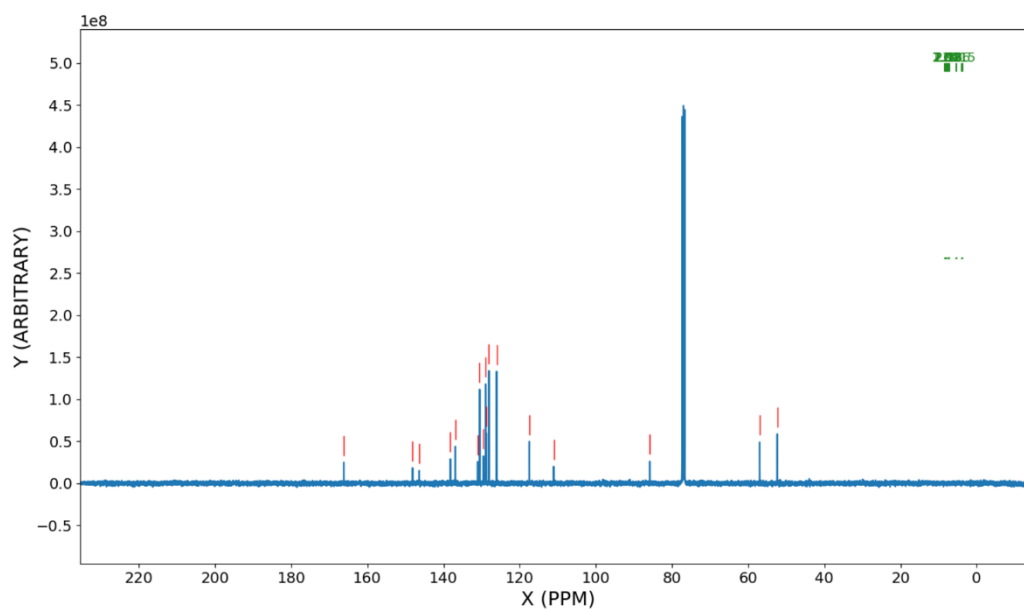


[**21ud**] methyl 4-((4-cyano-3-(4-phenyl-1*H*-1,2,3-triazol-1-yl)-1*H*-pyrazol-1-yl)methyl)benzoate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

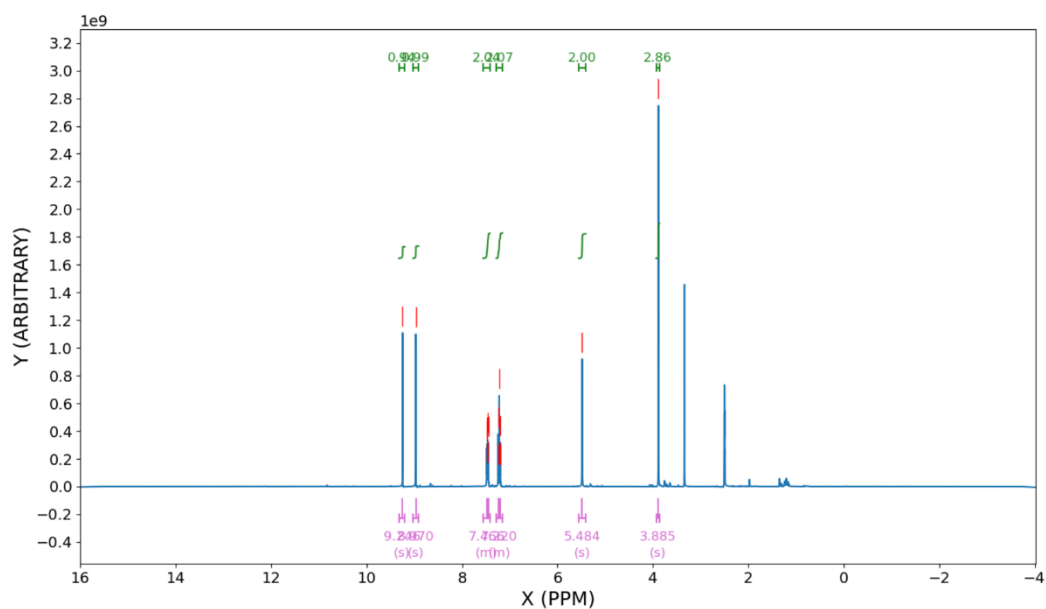


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

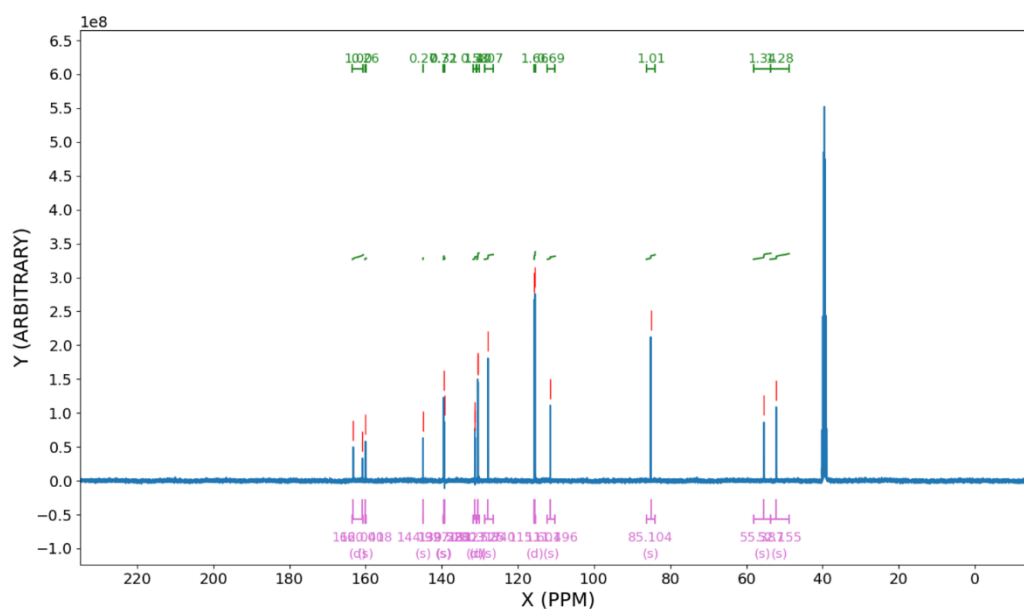


[21vb] methyl 1-(4-cyano-1-(4-fluorobenzyl)-1H-pyrazol-3-yl)-1H-1,2,3-triazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

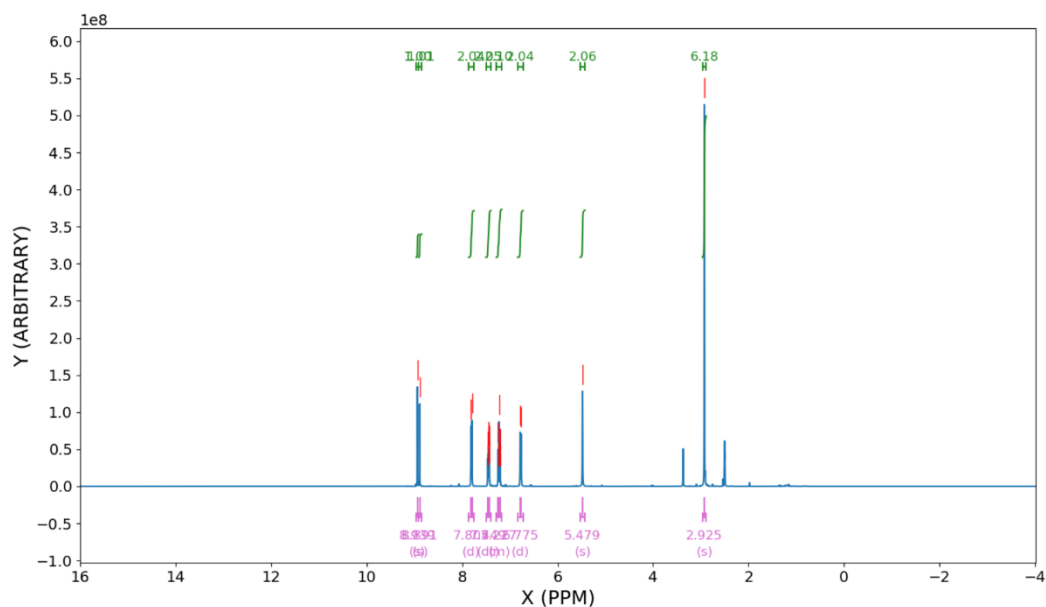


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

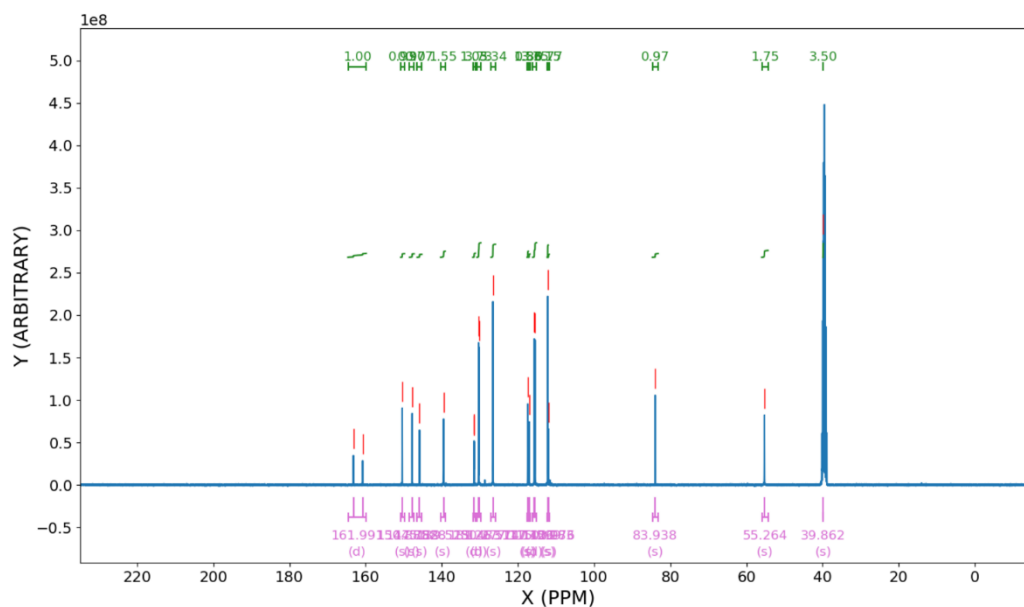


[21vg] 3-(4-(4-(dimethylamino)phenyl)-1*H*-1,2,3-triazol-1-yl)-1-(4-fluorobenzyl)-1*H*-pyrazole-4-carbonitrile

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)

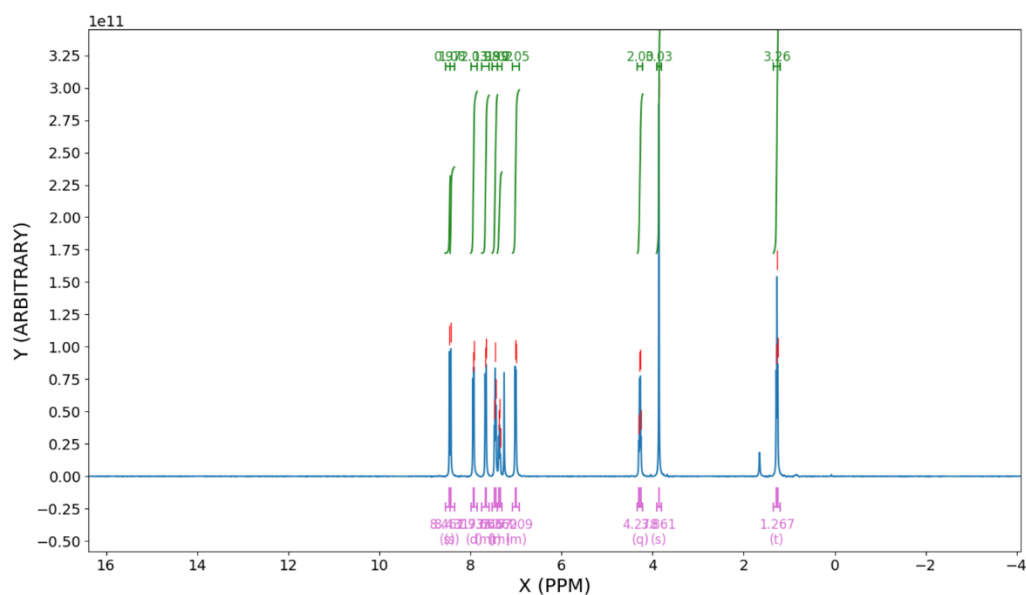


CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)



[S4] ethyl 1-(4-methoxyphenyl)-3-(4-phenyl-1H-1,2,3-triazol-1-yl)-1H-pyrazole-4-carboxylate

CHMO:0000593 | ^1H nuclear magnetic resonance spectroscopy (^1H NMR)



CHMO:0000595 | ^{13}C nuclear magnetic resonance spectroscopy (^{13}C NMR)

