Supporting Information

Synthesis of functionalized 1,2,3-triazoles using Bi_2WO_6 nanoparticles as efficient and reusable heterogeneous catalyst in aqueous medium†

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Experimental

General:

All the aldehydes utilized for the preparation of β-nitrostyrenes, chalcones were purchased from Loba / SRL / sd-fine chemicals and used as received. Commercial solvents (toluene, ethylacetate (EtOAc) petroleum ether) were used for the reaction and purification. TLC was visualized by exposing the TLC to iodine vapours or UV light. The ^{1}H- and ^{13}C-NMR were recorded on Bruker 500 MHz and 125 MHz instrument respectively. The mass spectra were recorded on Shimadzu instrument (ESI MS mode). Melting points were recorder in open capillaries using Stuart SMP30 melting point apparatus and uncorrected.

General procedure for the synthesis of functionalized triazoles / enaminones:

To a mixture of nitrostyrene / chalcone (1equiv) in water / toluene, was added alkyl/aryl (1 equiv) followed by Bi_2WO_6 (10 mol %) and the mixture was heated to 80 oC for 2-5 h. After completion of the reaction, the contents were transferred to a separating funnel and extracted with EtOAc (3 x 10 mL). The combined organic layers were washed with brine, water, dried over Na_2SO_4 and filtered. Evaporation of the solvent gave the crude product which was purified by silica gel column chromatography. Elution of the column with EtOAc:petroleium ether gave the desired product.

Procedure for the Cu-mediated Azide-alkyne (CuAAC) cycloaddition reaction using Bi_2WO_6 catalyst:

To a mixture of phenylacetylene / chalcone (1 equiv) and azide (1.5 equiv) in water were added Bi_2WO_6 (10 mol%), $CuSO_4$.$5H_2O$ (2 mol%) and sodium ascorbate (10 mol%) and the mixture was stirred at room temperature / heated at 80 oC. After completion of the reaction (as monitored by TLC), the contents were transferred to separating funnel and extracted with EtOAc (3X 10 mL). The combined organic layers were washed with brine, water, dried over Na_2SO_4 and filtered. Evaporation of the solvent gave the pure desired product.

Table-1: Physical data (Melting Points) of the known compounds:

S. No	Product Number	Measured M.P. ^oC	Reported M.P. ^oC
1	**6**	111-112	112-113[1]
2	**7**	169-170	170-172[2]
3	**12**	179-181	180-181[1]
4	**13**	130-133	132-134[1]
5	**14**	98-99	96-99[1]
6	**19**	150-152	149-151[1]
7	**21**	144-145	143-144[1]
8	**23**	144-145	144-145[5]
9	**34**	101-102	101-103[2]
10	**39**	101-102	100-101[3]
11	**40**	82-84	83-84[4]
12	**48**	110-112	111-113[3]
13	**49**	104-105	105-107[3]
14	**50**	128-130	129-131[3]
15	**61**	104-106	105-106[4]

1. Y-C. Wang, Y-Y. Xie, H-E. Qu, H-S. Wang, Y-M. Pan, F-P. Huang, *J. Org. Chem.*, **2014**, *79* , 4463–4469.
2. B. Kaboudin, Y. Abedi, T. Yokomatsu, *Org. Biomol. Chem.,* **2012**, *10*, 4543–4548.
3. Y-Y. Xie, Y-C. Wang, H-E. Qu, X-C. Tan, H-S. Wang, Y-M. Pan, *Adv. Synth. Catal.,* **2014,** *16*, 3347–3355.
4. W. Li, Z. Du, K. Zhang, J. Wang, *Green Chem.,* **2015**, *17*, 781–784.
5. S. Ueda, M. Su, S. L. Buchwald, *Angew. Chem.,* **2011**, *50*, 8944 –8947.
6. B. Paplal, S. Nagaraju, V. Palakollu, K. Sujatha, S. Kanvah, B.V. Kumar, D. Kashinath, *RSC Advances,* **2014**, 4, 54168–54174.

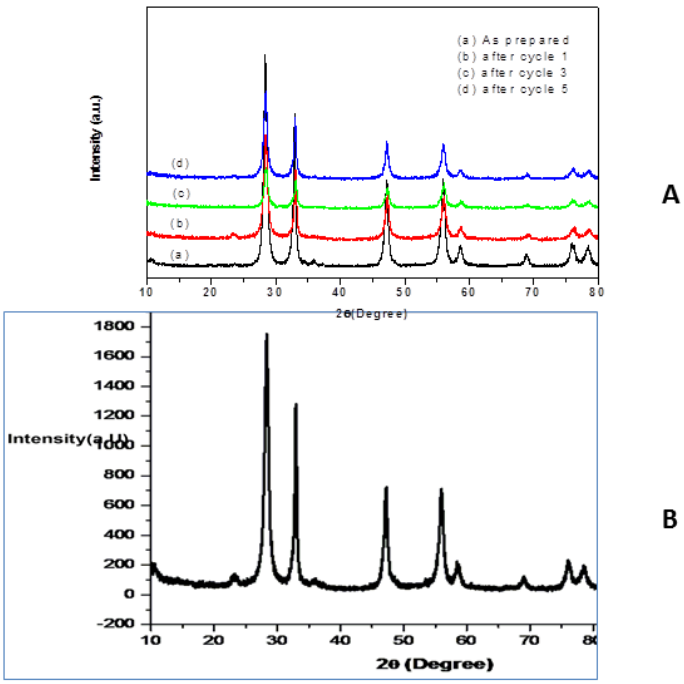
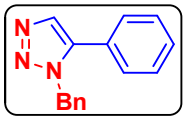


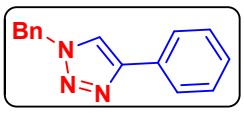
Figure-1: **A:** Reported Powder XRD data of Bi_2WO_6 reported in earlier publication[6]
B: Powder XRD data of current catalyst after 5th cycle of reaction in water

Characterization data of Triazoles and Enaminones:

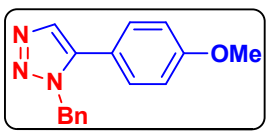
1-benzyl-5-phenyl -1*H*-1,2,3-triazole (3): Yield = 95% (White solid); M.P:73-74 °C; Mass (ESI-MS Spectrum): m/z Calculated: 235; Observed: 236 (M+1).



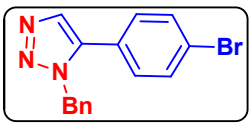
1-benzyl-4-phynyl-1*H*-1,2,3-triazole (4): Yield = 99% (White solid), M.P: 130-132 °C; ^{1}H-NMR (500 MHz, $CDCl_3$): δ 7.80 (d, *J* = 7.1 Hz, 2H), 7.66 (s, 1H), 7.42 – 7.37 (m, 5H), 7.33 – 7.26 (m, 3H), 5.58 (s, 2H). ^{13}C-NMR (126 MHz, $CDCl_3$): δ 151.75, 148.27, 134.71, 130.56, 129.18, 128.18, 125.72, 119.47, 54.25.
Mass (ESI-MS Spectrum): m/z Calculated: 235; Observed: 236 (M+1).



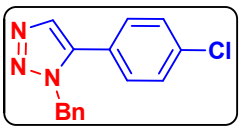
1-benzyl-5-(4-methoxyphenyl)-1*H*-1,2,3-triazole (8):
Yield = 90% (Yellow oil); ^{1}H-NMR (500 MHz, $CDCl_3$): δ 7.69 (s, 1H), 7.28 (d, *J* = 7 Hz, 3H), 7.16 (d, *J* = 9 Hz, 2H), 7.08 (t, *J* = 2 Hz, 2H), 6.92 (d, *J* = 8.5 Hz, 2H), 5.52 (s, 2H), 3.83 (s, 3H).
Mass (ESI-MS Spectrum): m/z Calculated: 265; Observed: 266 (M+1).



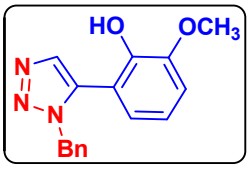
1-benzyl-5-(4-bromophenyl)-1*H*-1,2,3-triazole (9): Yield = 92% (Yellow solid), Mass (ESI-MS Spectrum): m/z Calculated: 313; Observed: 314.



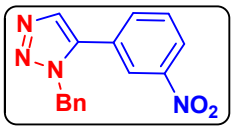
1-benzyl-5-(4-chlorophenyl)-1*H*-1,2,3-triazole (10):
Yield = 85% (White solid), M.P : 64-65°C, Mass (ESI-MS Spectrum): m/z Calculated: 269; Observed: 270 (M+1).



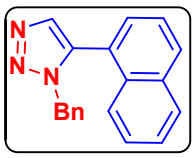
2-(1-benzyl-1*H*-1,2,3-triazol-5-yl)-6-methoxyphenol (11):
Yield = 92% (Yellow oil); ^{1}H-NMR (500 MHz, $CDCl_3$): δ 7.72 (s, 1H), 7.31 (t, *J* = 6.3 Hz, 3H), 7.13 (d, *J* = 6.2 Hz, 2H), 6.89 (d, *J* = 8.4 Hz, 2H), 6.77 (d, *J* = 6.4 Hz, 1H), 5.84 (s, 1H), 5.57 (s, 2H), 3.96 (s, 3H). ^{13}C-NMR (126 MHz, $CDCl_3$): δ 147.54, 145.95, 137.95, 135.63, 133.10, 128.83, 128.12, 127.12, 121.02, 119.86, 115.07, 110.82, 56.04, 51.70.
Mass (ESI-MS Spectrum): m/z Calculated: 281; Observed: 282 (M+1).



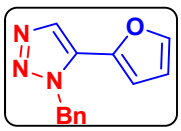
1-benzyl-5-(3-nitrophenyl)-1*H*-1,2,3-triazole(15): Yield = 83% (Yellow solid); Mass (ESI-MS Spectrum): m/z Calculated: 280; Observed: 281 (M+1).



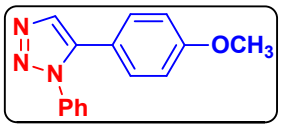
1-benzyl-5-(naphthalene-1-yl)-1*H*-1,2,3-triazole (16): Yield = 79% (Yellow oil); ^{1}H-NMR (500 MHz, $CDCl_3$): δ 8.00 (d, *J* = 8.2 Hz, 1H), 7.95 (d, *J* = 8.2 Hz, 1H), 7.84 (s, 1H), 7.55 (d, *J* = 7.1 Hz, 1H), 7.52 – 7.46 (m, 1H), 7.44 (t, *J* = 7.2 Hz, 1H), 7.37 (d, *J* = 8.3 Hz, 1H), 7.23 (d, *J* = 6.9 Hz, 1H), 7.15 (dt, *J* = 14.5, 7.0 Hz, 3H), 6.87 (d, *J* = 7.1 Hz, 2H), 5.36 (s, 2H). ^{13}C-NMR (126 MHz, $CDCl_3$): δ 135.88, 134.93, 134.80, 133.47, 131.97, 131.68, 130.29, 128.84, 128.77, 128.49, 128.09, 127.76, 127.21, 126.55, 124.99, 124.66, 124.30, 123.56, 52.25.
Mass (ESI-MS Spectrum): m/z Calculated: 285; Observed: 286 (M+1).



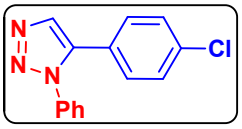
1-benzyl-5-(furan-2-yl)-1*H*-1,2,3-triazole (17): Yield = 80% (Yellow solid); M.P: 80-81 °C; Mass (ESI-MS Spectrum): m/z Calculated: 225; Observed: 226 (M+1).



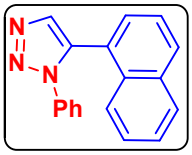
5-(4-methoxyphenyl)-1-phenyl-1*H*-1,2,3-triazol (18): Yield = 89% (Yellow oil); ^{1}H-NMR (500 MHz, $CDCl_3$): δ 7.82 (s, 1H), 7.46 – 7.49 (m, 3H), 7.37 (d, *J* = 5Hz, 2H), 7.15 (d, *J* = 8.7 Hz, 2H), 6.87 (d, *J* = 8.7 Hz, 2H), 3.81 (s, 3H).
Mass (ESI-MS Spectrum): m/z Calculated: 251; Observed: 252 (M+1).



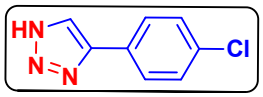
5-(4-chlorophenyl)-1-phenyl-1*H*-1,2,3-triazole(20): Yield = 86% (White solid); Mass (ESI-MS Spectrum): m/z Calculated: 255; Observed: 254 (M-1).



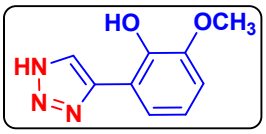
5-(naphthalene-1-yl)-1phenyl-1*H*-1,2,3-Triazole (22): Yield = 82% (Yellow oil); Mass (ESI-MS Spectrum): m/z Calculated: 271; Observed: 271



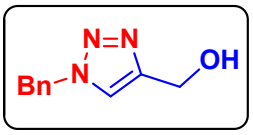
4-(4-chlorophenyl)-1*H*-1,2,3-triazole (24): Yield = 85% (White solid),^{1}H-NMR (500 MHz, $CDCl_3$) δ 7.98 (s, 1H), 7.79 (d, *J* = 8.4 Hz, 2H), 7.46 (d, *J* = 8.4 Hz, 2H).



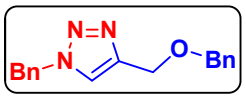
2-methoxy-6-(1*H*-1,2,3-triazol-4-yl) phenol (26):
Yield = 80% (White solid), Mass (ESI-MS Spectrum): m/z Calculated: 191; Observed: 192 (M+1).



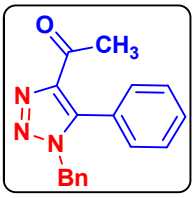
(1-benzyl-1H-1,2,3-triazole-4-yl)methanol (33): Yield = 92% (White solid), M.P: 79-80°C, ^{1}H-NMR (500 MHz, $CDCl_3$): δ 7.46 (s, 1H), 7.38 – 7.34 (m, 3H), 7.27 – 7.24 (m, 2H), 5.49 (s, 2H), 4.73 (s, 2H), 3.74 (s, 1H).
Mass (ESI-MS Spectrum): m/z Calculated: 189; Observed: 190 (M+1).



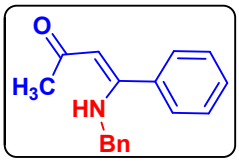
(1-benzyl-4-((benzyloxy)methyl)-1*H*-1,2,3-triazole (35): Yield = 95% (White solid), Mass (ESI-MS Spectrum): m/z Calculated: 279; Observed: 280 (M+1).



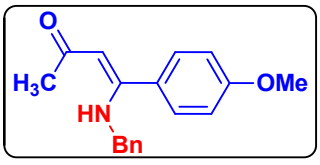
1-(1-benzyl-5-1*H*-1,2,3-triazol-4-yl)ethanone (37): Yield = 85% (Yellow oil), ^{1}H-NMR (500 MHz, $CDCl_3$) δ 7.51 (d, *J* = 7.4 Hz, 1H), 7.46 (t, *J* = 7.3 Hz, 2H), 7.30 (d, *J* = 6.3 Hz, 3H), 7.23 (d, *J* = 7.2 Hz, 2H), 7.05 (d, *J* = 4.6 Hz, 2H), 5.45 (s, 2H), 2.71 (s, 3H).^{13}C-NMR (126 MHz, $CDCl_3$): δ 192.77, 143.81, 139.55, 134.64, 130.36, 130.14, 129.71, 128.86, 128.66, 128.47, 127.58, 127.21, 126.02, 51.97, 28.04.
Mass (ESI-MS Spectrum): m/z Calculated: 277; Observed: 278 (M+1).



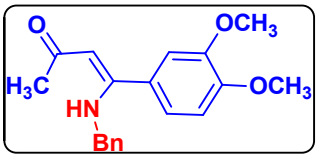
(*Z*)-4-(benzylamino)-4-phenylbut-3en-2-one (38): Yield = 85% (Yellow oil); Mass (ESI-MS Spectrum): m/z Calculated: 251; Observed: 252 (M+1).



(*Z*)-4-(benzylamino)-4-(4-methoxyphenyl)but-3en-2-one (41): Yield = 90% (Yellow oil), ^{1}H-NMR (500 MHz, $CDCl_3$): δ 11.16 (s, 1H), 7.31 (dd, *J* = 16.0, 8.1 Hz, 5H), 7.22 (d, *J* = 7.4 Hz, 2H), 6.92 (d, *J* = 8.7 Hz, 2H), 5.16 (s, 1H), 4.41 (s, 2H), 3.86 (s, 3H), 2.13 (s, 3H).^{13}C-NMR (126 MHz, $CDCl_3$): δ 195.98, 165.17, 160.57, 138.79, 129.26, 128.69,127.42, 127.27, 126.73, 113.85, 97.27, 55.35, 48.24, 29.26.
Mass (ESI-MS Spectrum): m/z Calculated: 281; Observed: 282 (M+1).

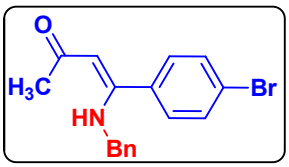


(*Z*)-4-(benzylamino)-4-(3,4-dimethoxyphenyl)but-3en-2-one (42): Yield = 91% (Yellow oil), ^{1}H-NMR (500 MHz, $CDCl_3$): δ 11.17 (s, 1H), 7.33 (d, *J* = 7.3 Hz, 2H), 7.29 – 7.25 (m, 1H), 7.23 (d, *J* = 7.5 Hz, 2H), 6.94 (d, *J* = 8.2 Hz, 1H), 6.88 (d, *J* = 8.2 Hz, 1H), 6.76 (s, 1H), 5.18 (s, 1H), 4.40 (s, 2H), 3.92 (s, 3H), 3.70 (s, 3H), 2.14 (s,



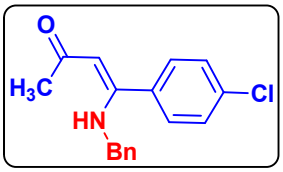
3H).^{13}C-NMR (126 MHz, $CDCl_3$): δ 196.11, 165.33, 150.02, 148.65, 139.12, 128.70, 127.59, 127.22, 126.58, 120.50, 110.87, 97.16, 55.94, 48.21, 29.27.
Mass (ESI-MS Spectrum): m/z Calculated: 311; Observed: 312 (M+1).

(*Z*)-4-(benzylamino)-4-(4-bromophenyl)but-3en-2-one (43): Yield = 92% (Yellow oil), ^{1}H-NMR (500 MHz, $CDCl_3$): δ 11.04 (s, 1H), 7.52 (s, 1H), 7.50 (s, 1H), 7.31 (t, *J* = 7.3 Hz, 2H), 7.25 (d, *J* = 8.2 Hz, 1H), 7.17 (dd, *J* = 13.4, 7.7 Hz, 4H), 5.10 (s, 1H), 4.31 (s, 2H), 2.11 (s, 3H).



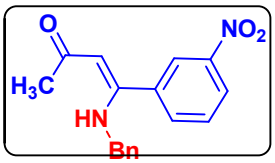
Mass (ESI-MS Spectrum): m/z Calculated: 330; Observed: 332 (M+2).

(*Z*)-4-(benzylamino)-4-(4-chlorophenyl)but-3en-2-one (44):
Yield = 87% (White solid), ^{1}H-NMR (500 MHz, $CDCl_3$): δ 11.04 (s, 1H), 7.35 (d, *J* = 8.5 Hz, 2H), 7.31 – 7.25 (m, 4H), 7.24 (d, *J* = 2.7 Hz, 1H), 7.16 (d, *J* = 6.9 Hz, 2H), 5.10 (s, 1H), 4.30 (s, 2H), 2.11 (s, 3H).^{13}C NMR (126 MHz, $CDCl_3$): δ 196.50, 163.73, 138.50, 135.57, 133.57, 129.16, 128.76, 128.74, 127.39, 126.68, 97.47, 48.16, 30.93.



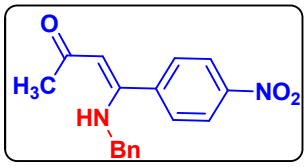
Mass (ESI-MS Spectrum): m/z Calculated: 285; Observed: 286 (M+1).

(*Z*)-4-(benzylamino)-4-(3-nitrophenyl)but-3en-2-one (45):
Yield = 85% (Yellow oil), ^{1}H-NMR (500 MHz, $CDCl_3$): δ 11.03 (s, 1H), 8.29 (d, *J* = 10 Hz, 1H), 8.20 (s, 1H), 7.66-7.59 (m, 2H), 7.34-7.28 (m 3H), 7.15 (d, *J* = 5 Hz, 2H), 5.17 (s, 1H), 4.33 (s, 2H), 2.17 (s, 3H). ^{13}C-NMR (126 MHz, $CDCl_3$): δ 197.01, 161.82, 138.13, 136.83, 133.69, 129.60, 128.84, 127.60, 126.68, 124.70, 124.23, 122.96, 98.03, 48.26, 29.53.



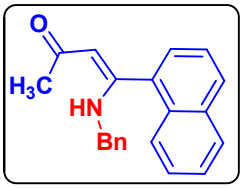
Mass (ESI-MS Spectrum): m/z Calculated: 296; Observed: 297 (M+1).

(*Z*)-4-(benzylamino)-4-(4-nitrophenyl)but-3en-2-one (46):
Yield = 80% (Yellow oil); ^{1}H-NMR (500 MHz, $CDCl_3$): δ 10.99 (s, 1H), 8.23 (d, *J* = 8.6 Hz, 2H), 7.48 (d, *J* = 8.6 Hz, 2H), 7.31 (t, *J* = 7.2 Hz, 2H), 7.26 (d, *J* = 4.7 Hz, 1H), 7.13 (d, *J* = 7.2 Hz, 2H), 5.12 (s, 1H), 4.27 (s, 2H), 2.14 (s, 3H). ^{13}C NMR (126 MHz, $CDCl_3$): δ 197.02, 162.13, 148.36, 141.44, 138.15, 128.92, 128.84, 127.99, 126.61, 123.73, 97.84, 48.24, 29.55.

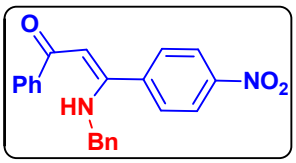


Mass (ESI-MS Spectrum): m/z Calculated: 296; Observed: 297 (M+1).

(*Z*)-4-(benzylamino)-4-(naphthalene-1-yl)but-3en-2-one (47):
Yield = 80% (Yellow oil), Mass (ESI-MS Spectrum): m/z Calculated: 301; Observed: 302 (M+1).

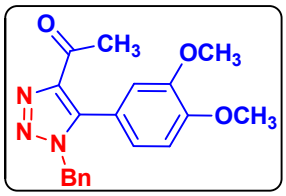


(*Z*)-3-(benzylamino)-3-(4-nitrophenyl)-1-phenylprop-2en-1-one (50):
Yield = 82% (Yellow solid), M.P: 142-143 °C, ^{1}H-NMR (500 MHz, $CDCl_3$): δ 11.61 (s, 1H), 8.31 (d, *J* = 8.7 Hz, 2H), 7.93 (d, *J* = 7.1 Hz, 2H), 7.59 (d, *J* = 8.7 Hz, 2H), 7.48 (dd, *J* = 18.8, 7.4 Hz, 2H), 7.36 (t, *J* = 7.3 Hz, 2H), 7.32 – 7.29 (m, 2H), 7.21 (d, *J* = 7.3 Hz, 2H), 5.85



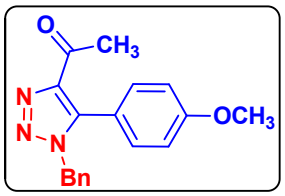
(s, 1H), 4.39 (s, 2H). ^{13}C NMR (126 MHz, $CDCl_3$): δ 189.40, 163.77, 141.69, 139.61, 137.94, 131.33, 128.94, 128.38, 127.70, 127.18, 126.75, 123.84, 94.36, 48.50.
Mass (ESI-MS Spectrum): m/z Calculated: 358; Observed: 359 (M+1).

1-(1-benzyl-5-(3,4-dimethoxyphenyl)-1*H*-1,2,3-triazol-4-yl)ethanone (52):

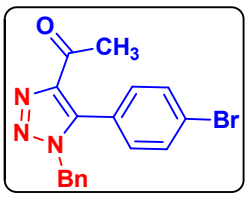


Yield = 85% (Yellow oil), ^{1}H-NMR (500 MHz, $CDCl_3$): δ 7.30 (s, 3H), 7.08 (d, *J* = 2.8 Hz, 2H), 6.93 (d, *J* = 8.1 Hz, 1H), 6.85 (d, *J* = 8.2 Hz, 1H), 6.62 (s, 1H), 5.44 (s, 2H), 3.94 (s, 3H), 3.67 (s, 3H), 2.70 (s,3H).^{13}C-NMR (126 MHz, $CDCl_3$): δ 192.83, 150.43, 148.81, 143.64, 139.54, 135.14,128.90,128.39, 127.33, 122.65, 117.82, 112.76, 111.02, 55.94, 55.75, 51.90, 28.10.
Mass (ESI-MS Spectrum): m/z Calculated: 337.14; Observed: 338 (M+1)

1-(1-benzyl-5-(4-methoxyphenyl)-1*H*-1,2,3-Triazole-4-yl)ethanone (53): Yield = 88% (Yellow oil); Mass (ESI-MS Spectrum): m/z Calculated: 307; Observed: 308 (M+1).

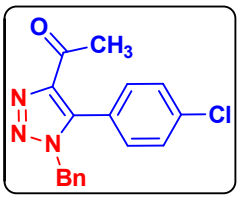


1-(1-benzyl-5-(4-bromophenyl)-1*H*-1,2,3-triazol-4-yl)ethanone (54):



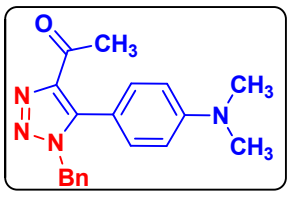
Yield = 82% (Yellow oil), ^{1}H-NMR (500 MHz, $CDCl_3$): δ 7.59 (d, *J* = 8.3 Hz, 2H), 7.31 (d, *J* = 15.7 Hz, 4H),7.10 – 7.05 (m, 3H), 5.44 (s, 2H), 2.72 (s, 3H).^{13}C-NMR (126 MHz, $CDCl_3$): δ 192.82, 151.75, 143.89, 138.41, 134.47, 131.94, 131.36, 131.30, 128.98, 128.89, 128.62, 127.83, 127.44, 127.19, 124.90, 124.81, 52.07, 27.99.
Mass (ESI-MS Spectrum): m/z Calculated: 356; Observed: 358 (M+2).

1-(1-benzyl-5-(4-chlorophenyl)-1*H*-1,2,3-triazol-4-yl)ethanone (55):



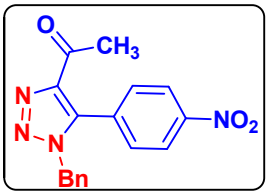
Yield = 79% (Yellow oil); ^{1}H-NMR (500 MHz, $CDCl_3$): δ 7.40 (d, *J* = 8.4 Hz, 2H), 7.30 – 7.25 (m, 4H), 7.12 (d, *J* = 8.3 Hz, 2H), 7.02 (s, 1H), 5.41 (s, 2H), 2.69 (s, 3H).
Mass (ESI-MS Spectrum): m/z Calculated: 251; Observed: 252 (M+1).

1-(1-benzyl-5-(4-(dimethylamino)phenyl)-1*H*-1,2,3-triazol-4-yl)ethanone (56):



Yield = 85% (White solid), M.P: 125-127 °C; ^{1}H-NMR (500 MHz, $CDCl_3$): δ 7.31 (t, *J* = 10.2 Hz, 3H), 7.16 – 7.14 (m, 4H), 6.74 (d, *J* = 8.7 Hz, 2H), 5.47 (s, 2H), 3.05 (s, 6H), 2.70 (s, 3H).^{13}C-NMR (126 MHz, $CDCl_3$): δ 192.83, 151.30, 143.27, 140.46, 135.29, 130.81, 128.83, 128.25, 127.44, 112.04, 111.59, 51.56, 40.14, 28.16.
Mass (ESI-MS Spectrum): m/z Calculated: 320; Observed: 321 (M+1).

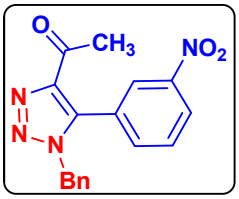
1-(1-benzyl-5-(4-nitrophenyl)-1*H*-1,2,3-triazol-4-yl)ethanone (57):



Yield = 81% (Yellow oil); ^{1}H-NMR (500 MHz, $CDCl_3$): δ 8.27 (d, *J* = 8.8 Hz, 2H), 7.36 (d, *J* = 8.8 Hz, 2H), 7.30 – 7.26 (m, 3H), 6.99 (d, *J* = 6.4 Hz, 2H), 5.45 (s, 2H), 2.72 (s, 3H). ^{13}C-NMR (126 MHz, $CDCl_3$): δ

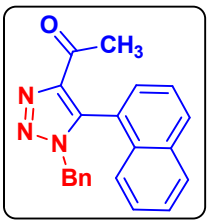
192.82, 154.17, 144.33, 137.23, 134.05, 132.74, 131.00, 130.15, 129.20 – 128.78, 127.35, 123.68, 52.48, 27.90.
Mass (ESI-MS Spectrum): m/z Calculated: 322; Observed: 323 (M+1).

1-(1-benzyl-5-(3-nitrophenyl)-1*H*-1,2,3-triazol-4-yl) ethanone (58):



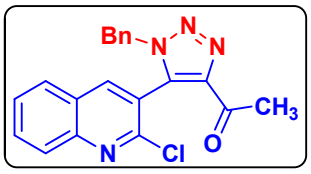
Yield = 80% (Yellow oil), ^{1}H-NMR (500 MHz, $CDCl_3$): δ 8.36 (d, *J* = 7.2 Hz, 1H), 8.04 (s, 1H), 7.64 (t, *J* = 8.0 Hz, 1H), 7.54 (d, *J* = 7.5 Hz, 1H), 7.32 – 7.29 (m, 3H), 7.03 (d, *J* = 6.0 Hz, 2H), 5.49 (s, 2H), 2.75 (s, 3H). ^{13}C-NMR (126 MHz, $CDCl_3$): δ 192.88, 135.91, 133.96, 129.70, 129.13, 128.96, 128.90, 127.43, 127.21, 124.89, 124.83, 52.56, 27.89.

1-(1-benzyl-5-(naphthalen-1-yl)-1*H*-1,2,3-triazol-4-yl)ethanone (59):



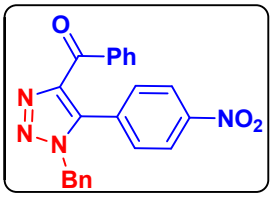
Yield = 78% (Yellow oil),^{1}H-NMR (500 MHz, $CDCl_3$): δ 8.03 (d, *J* = 8.3 Hz, 1H), 7.95 (d, *J* = 8.2 Hz, 1H), 7.56 – 7.48 (m,3H), 7.36 (dt, *J* = 12.3, 7.1 Hz, 2H), 7.20 (dd, *J* = 18.3, 7.2 Hz, 2H), 7.15 – 7.06 (m, 3H), 6.83 (d, *J* = 7.5 Hz, 2H), 5.41 (s, 1H), 5.16 (s, 1H), 2.66 (s, 3H). ^{13}C-NMR (126 MHz, $CDCl_3$): δ 192.22, 153.78, 145.39, 137.89, 134.10, 133.44, 131.32, 130.69, 128.87, 128.62, 128.39, 127.98, 127.27, 126.55, 125.04, 124.16, 123.74, 52.45, 27.87.
Mass (ESI-MS Spectrum): m/z Calculated: 327; Observed: 328 (M+1).

1-(1-benzyl-5-(2-chlroquinolin-3-yl)-1*H*-1,2,3-triazol-4-yl)ethanone (60):



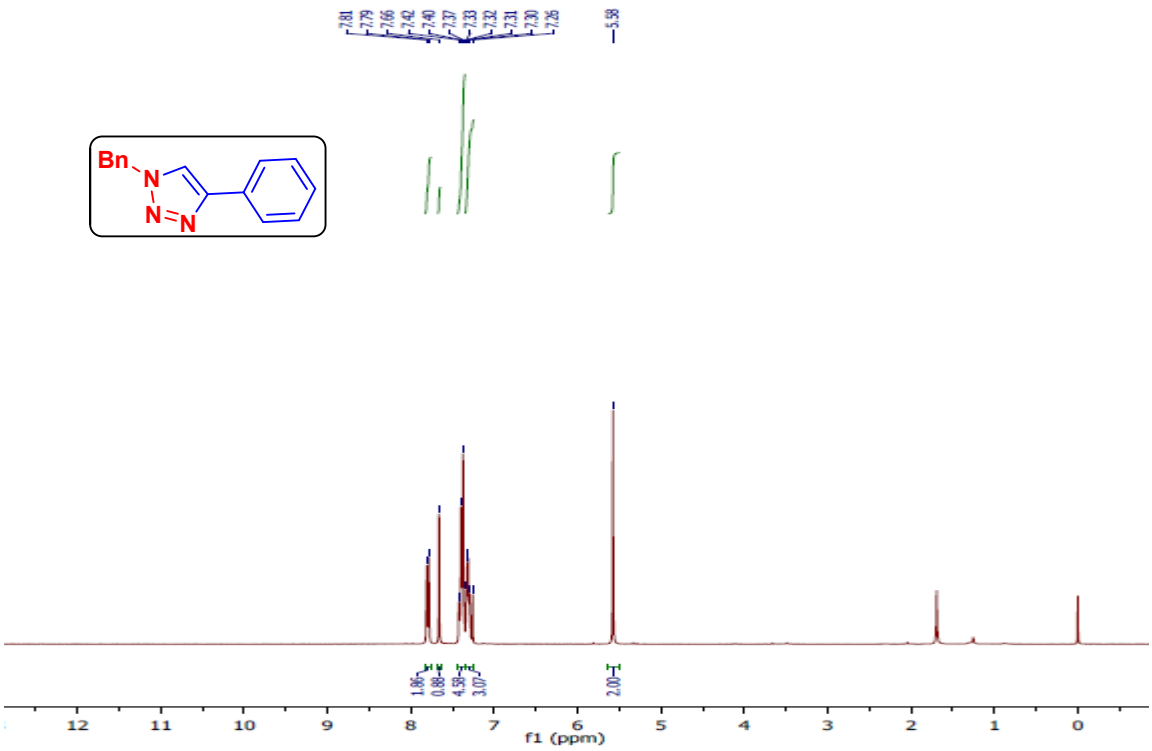
Yield = 75% (Yellow oil), ^{1}H-NMR (500 MHz, $CDCl_3$): δ 8.11 (d, *J* = 8.5 Hz, 1H), 7.86 (t, *J* = 7.6 Hz, 1H), 7.72 (s, 1H), 7.69 – 7.60 (m, 2H), 7.29 (s, 1H), 7.24 (d, *J* = 7.3 Hz, 1H), 7.18 (d, *J* = 7.4 Hz, 1H), 6.95 (d, *J* = 7.5 Hz, 2H), 5.68 (s, 1H), 5.32 (s, 1H), 2.73 (s, 3H). ^{13}C-NMR (126 MHz, $CDCl_3$): δ 192.57, 148.45, 147.99, 145.57, 140.90, 134.96, 133.74, 132.05, 128.85, 128.63, 127, 126.01, 120.07, 53.05, 27.64.
Mass (ESI-MS Spectrum): m/z Calculated: 362; Observed: 363 (M+1).

(1-benzyl-5-(4-nitrophenyl)-1*H*-1,2,3-triazol-4-yl)(phenyl)methanone (62):

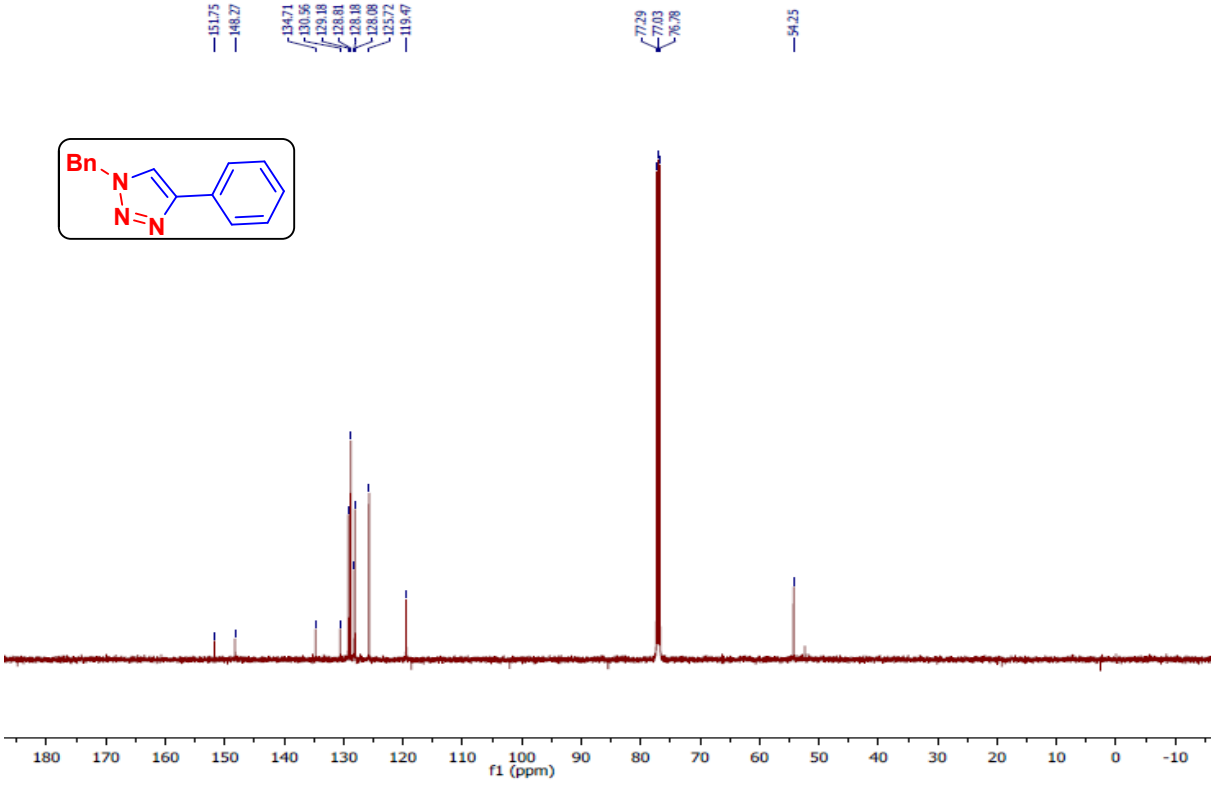


Yield = 87% (Yellow solid), M.P : 105-106 ^{o}C, ^{1}H-NMR (500 MHz, $CDCl_3$): δ 8.37 (d, *J* = 7.3 Hz, 2H), 8.32 (d, *J* = 8.8 Hz, 2H), 7.64 (t, *J* = 7.4 Hz, 1H), 7.54 (d,*J* = 7.7 Hz, 2H), 7.45 (d, *J* = 8.8 Hz, 2H), 7.34 – 7.29 (m, 3H), 7.06 (d, *J* = 7.9 Hz, 2H), 5.53(s, 2H). ^{13}C-NMR (126 MHz, $CDCl_3$): δ 185.90, 148.68, 144.55, 139.72, 136.58, 134.07, 133.47, 133.24, 131.07, 130.75, 129.13, 128.89, 128.40, 127.45, 123.71, 52.57.
Mass (ESI-MS Spectrum): m/z Calculated: 384; Observed: 385 (M+1).

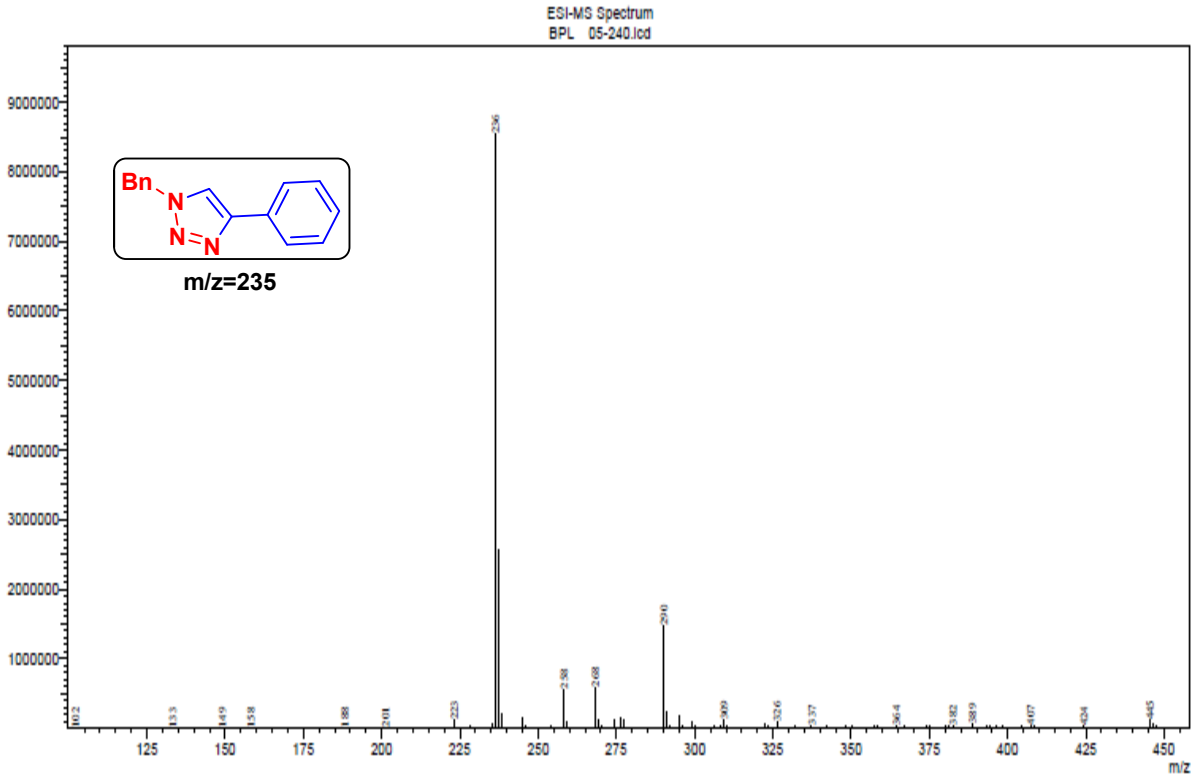
1-benzyl-4-phynyl-1*H*-1,2,3-triazole



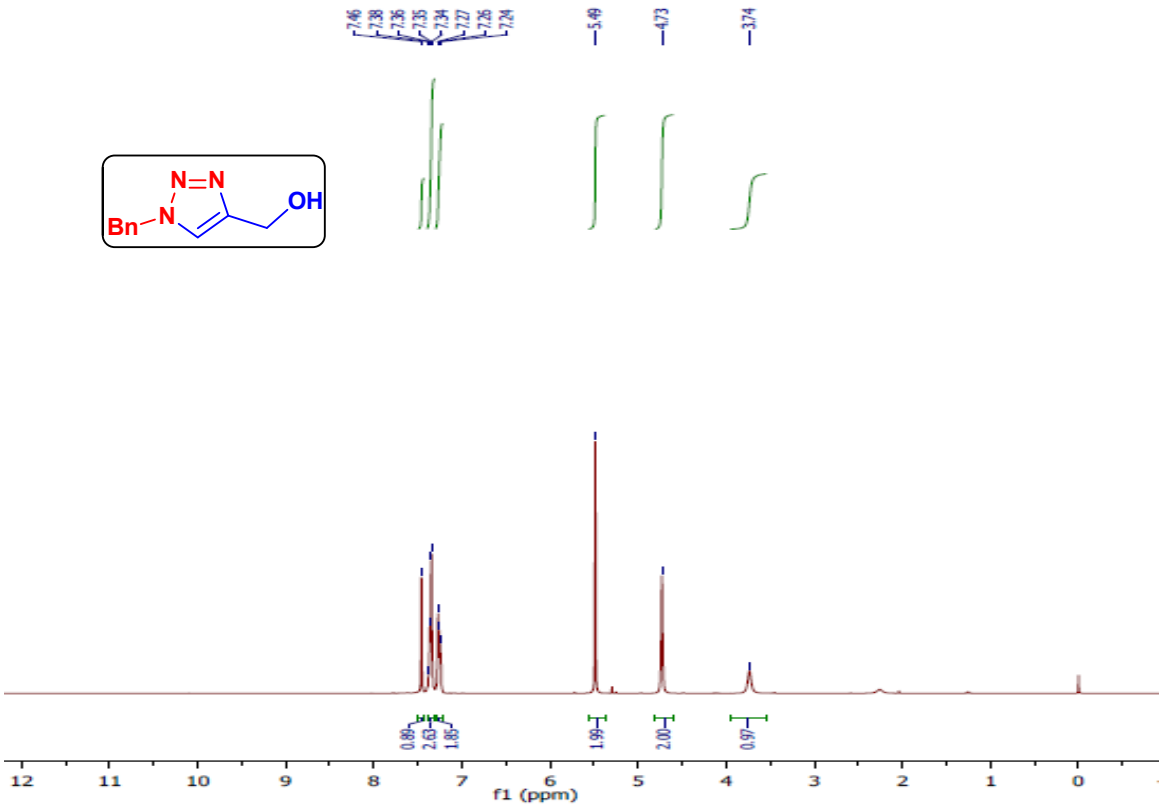
1-benzyl-4-phynyl-1*H*-1,2,3-triazole:



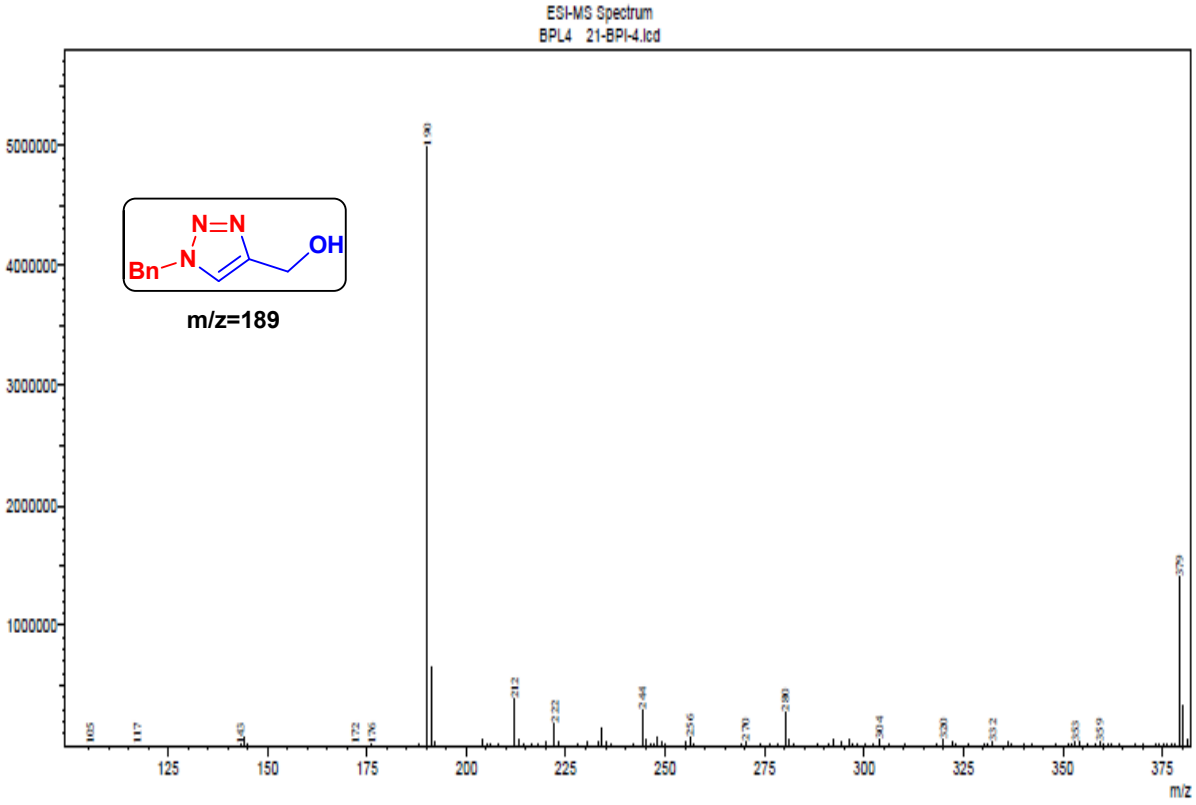
1-benzyl-4-phynyl-1*H*-1,2,3-triazole:



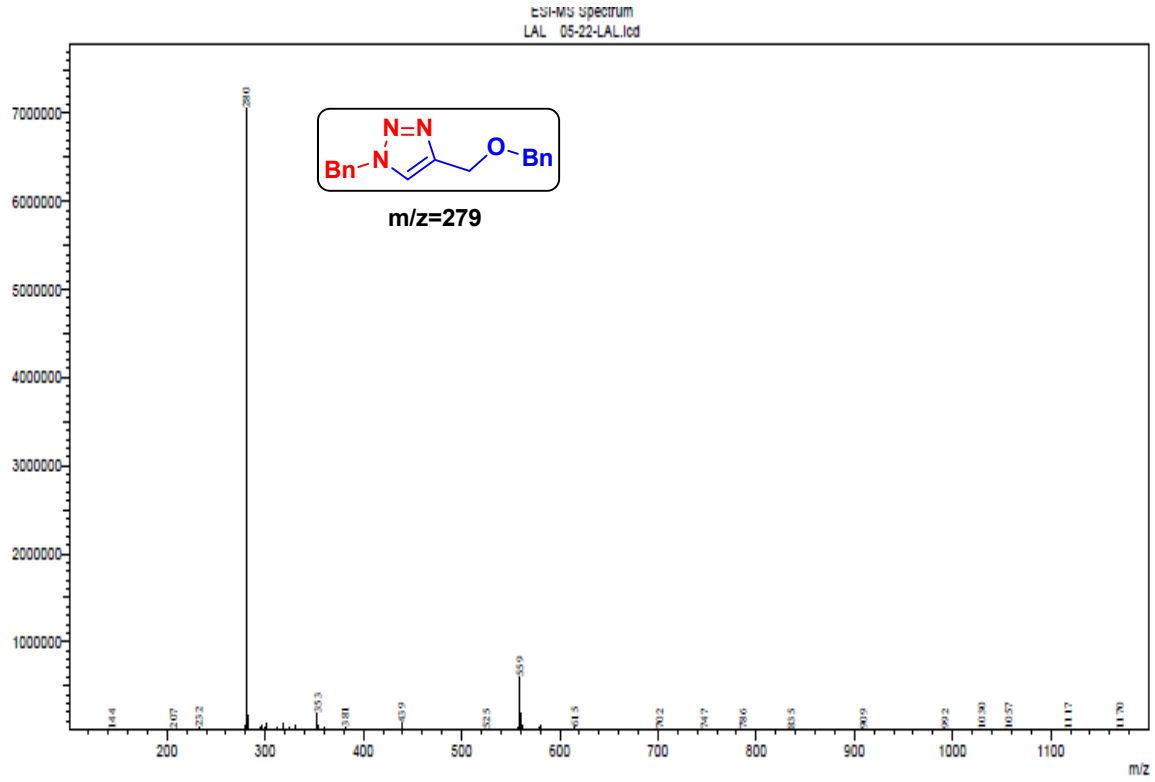
(1-benzyl-1H-1,2,3-triazole-4-yl)methanol :



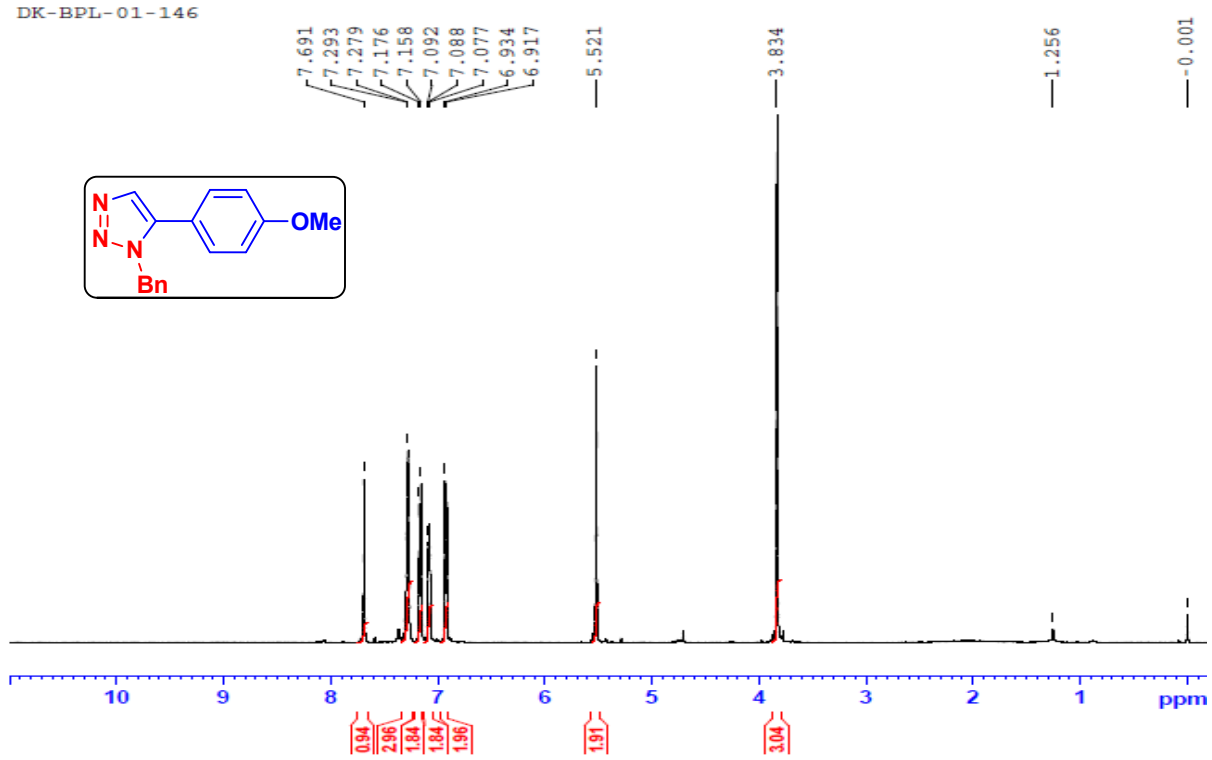
(1-benzyl-1H-1,2,3-triazole-4-yl)methanol:



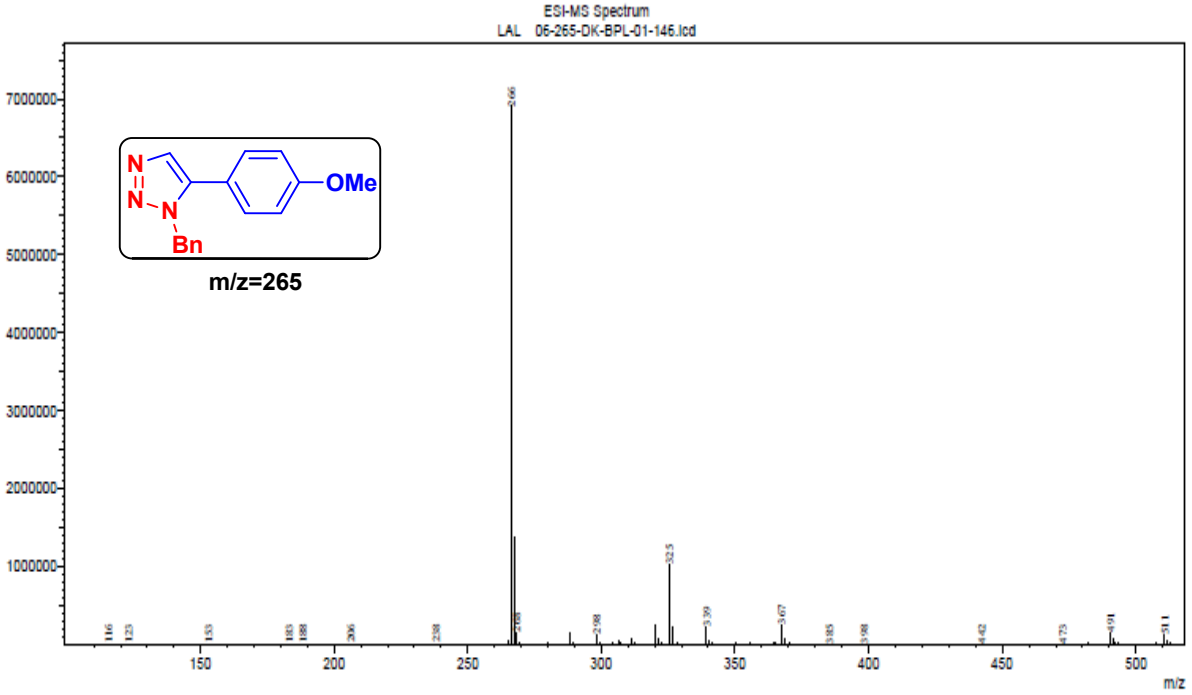
(1-benzyl-4-((benzyloxy)methyl)-1*H*-1,2,3-triazole:



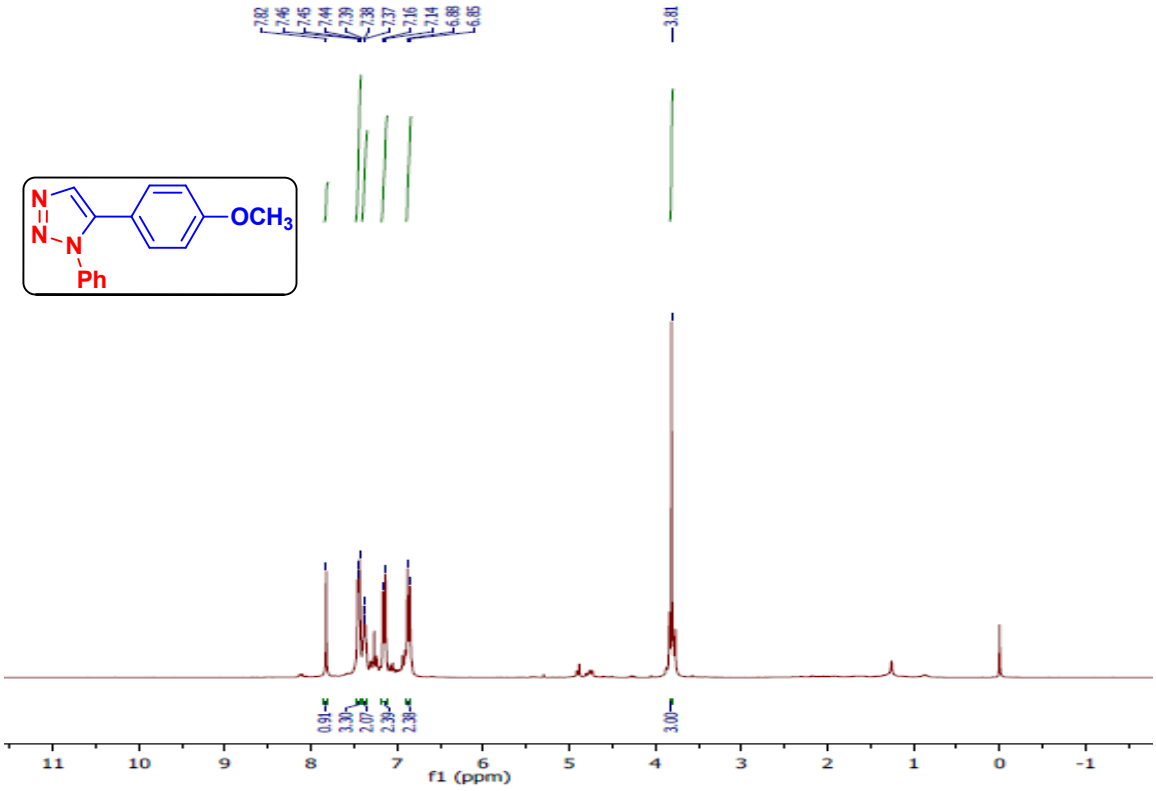
1-benzyl-5-(4-methoxyphenyl)-1*H*-1,2,3-triazole:



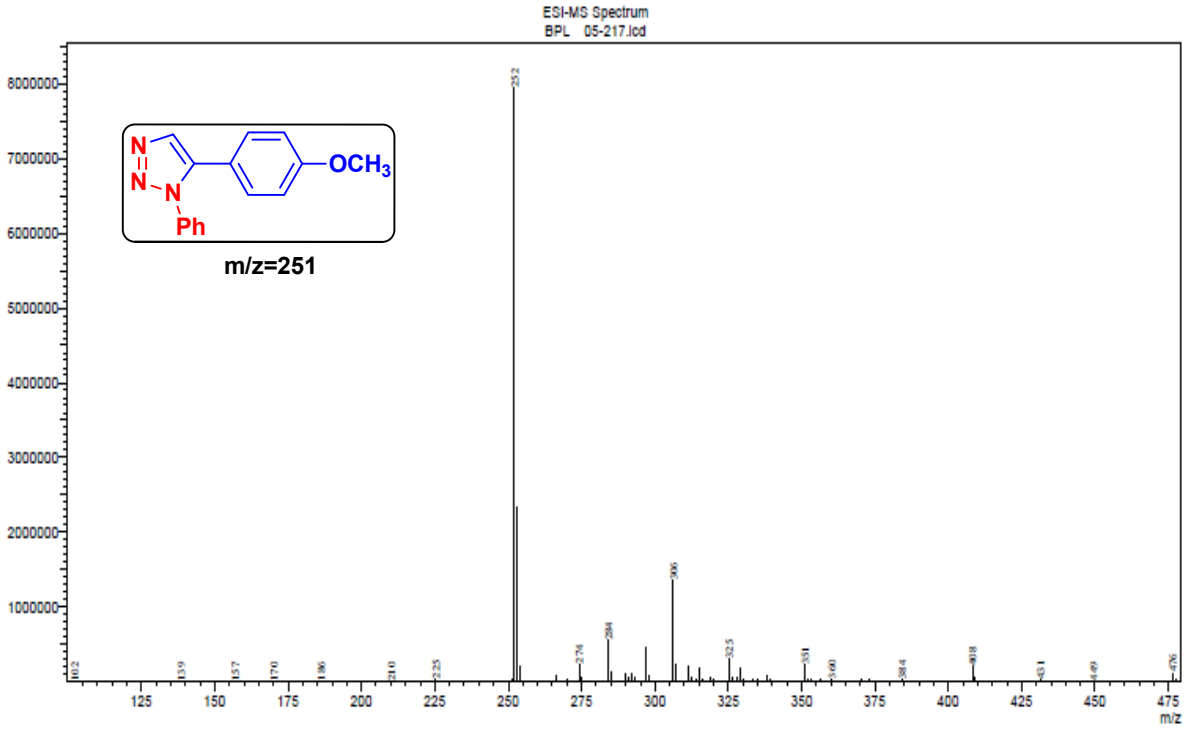
1-benzyl-5-(4-methoxyphenyl)-1*H*-1,2,3-triazole:



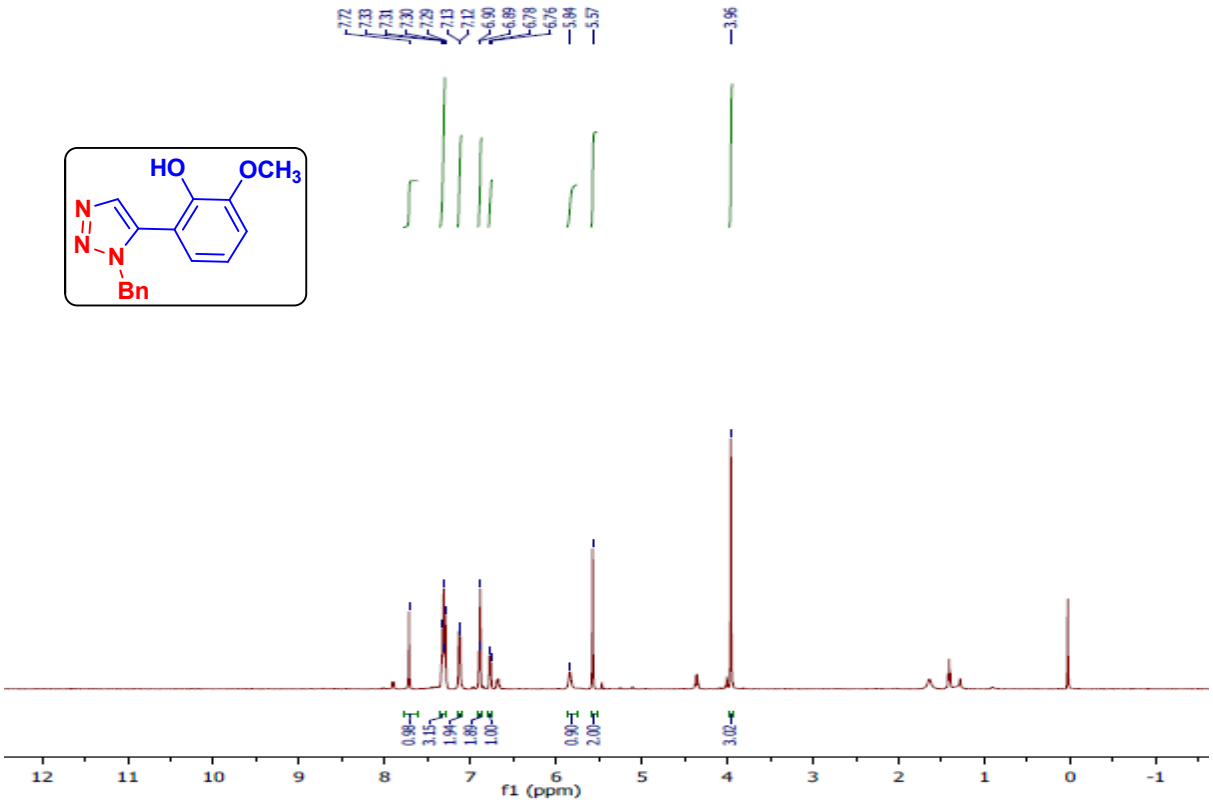
5-(4-methoxyphenyl)-1-phenyl-1*H*-1,2,3-triazol:



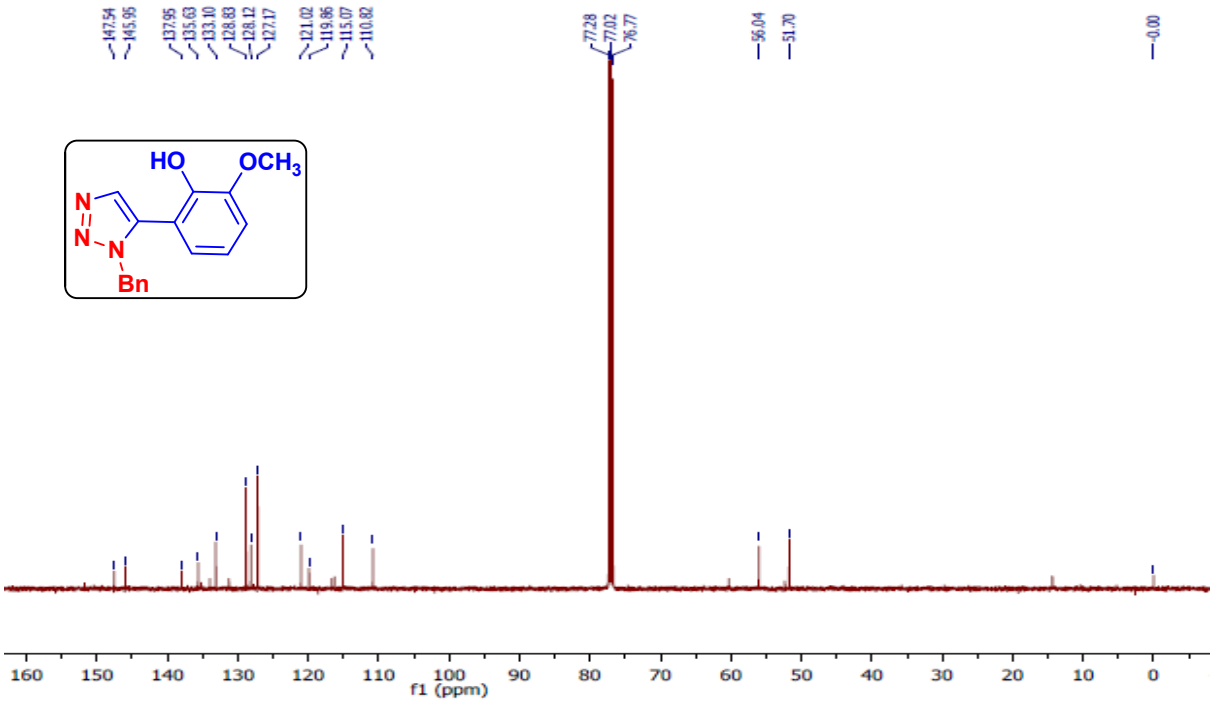
5-(4-methoxyphenyl)-1-phenyl-1*H*-1,2,3-triazol:



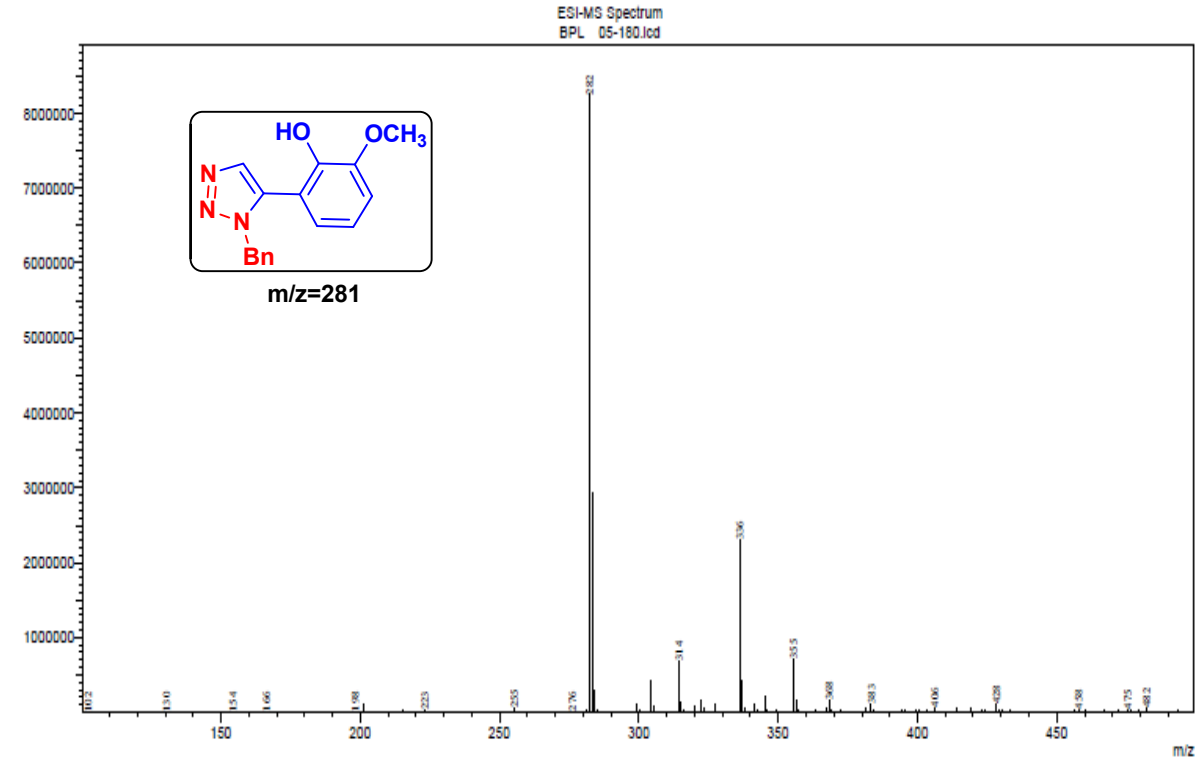
2-(1-benzyl-1*H*-1,2,3-triazol-5-yl)-6-methoxyphenol:



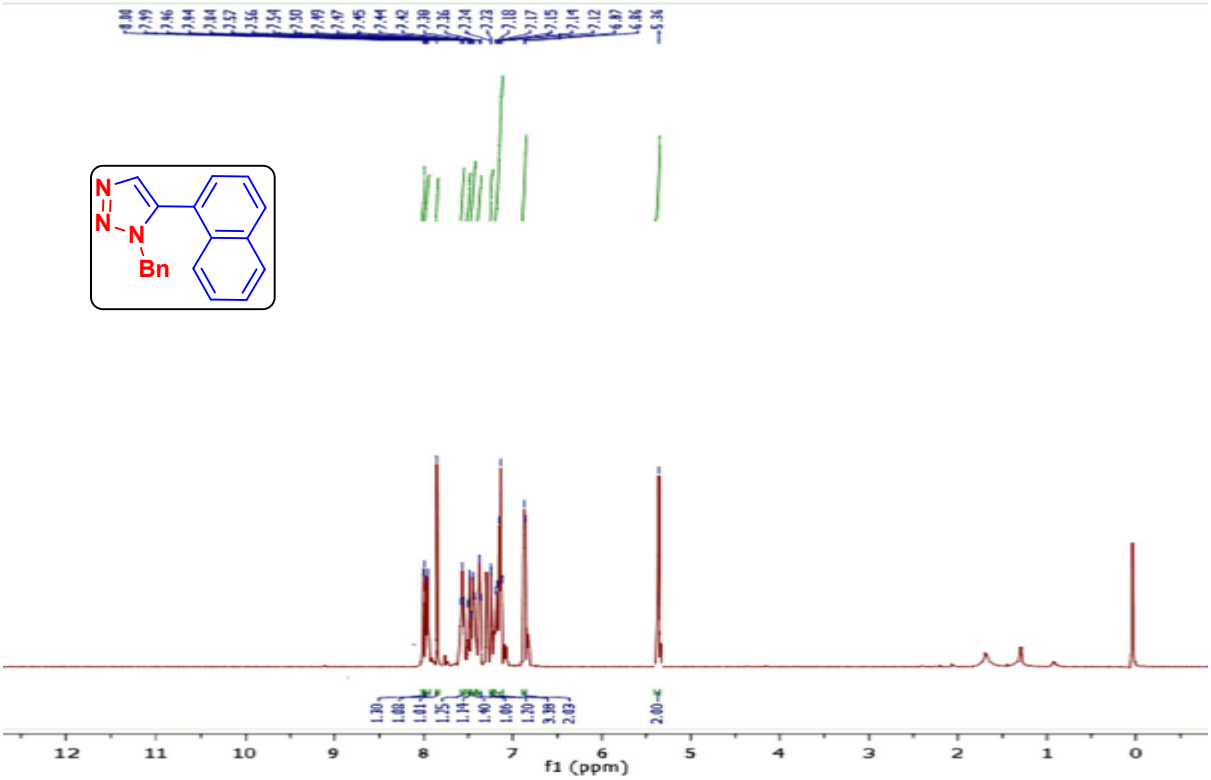
2-(1-benzyl-1*H*-1,2,3-triazol-5-yl)-6-methoxyphenol:



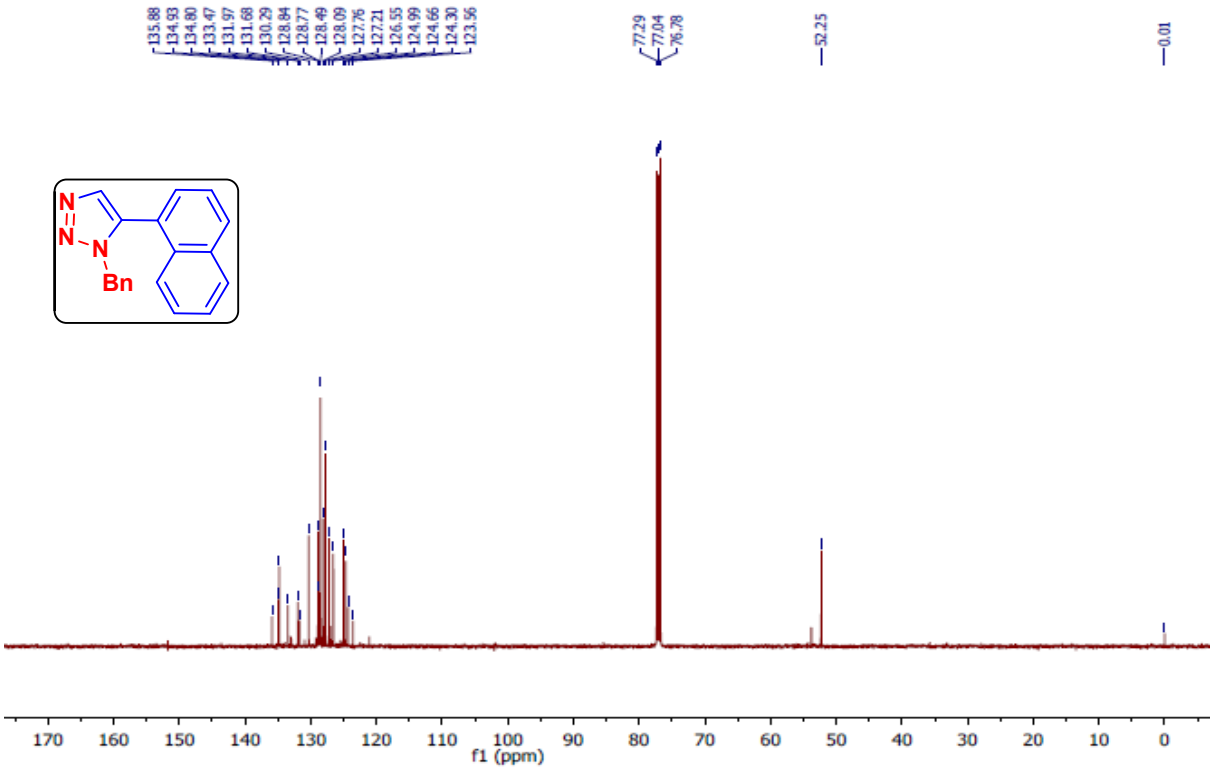
2-(1-benzyl-1*H*-1,2,3-triazol-5-yl)-6-methoxyphenol:



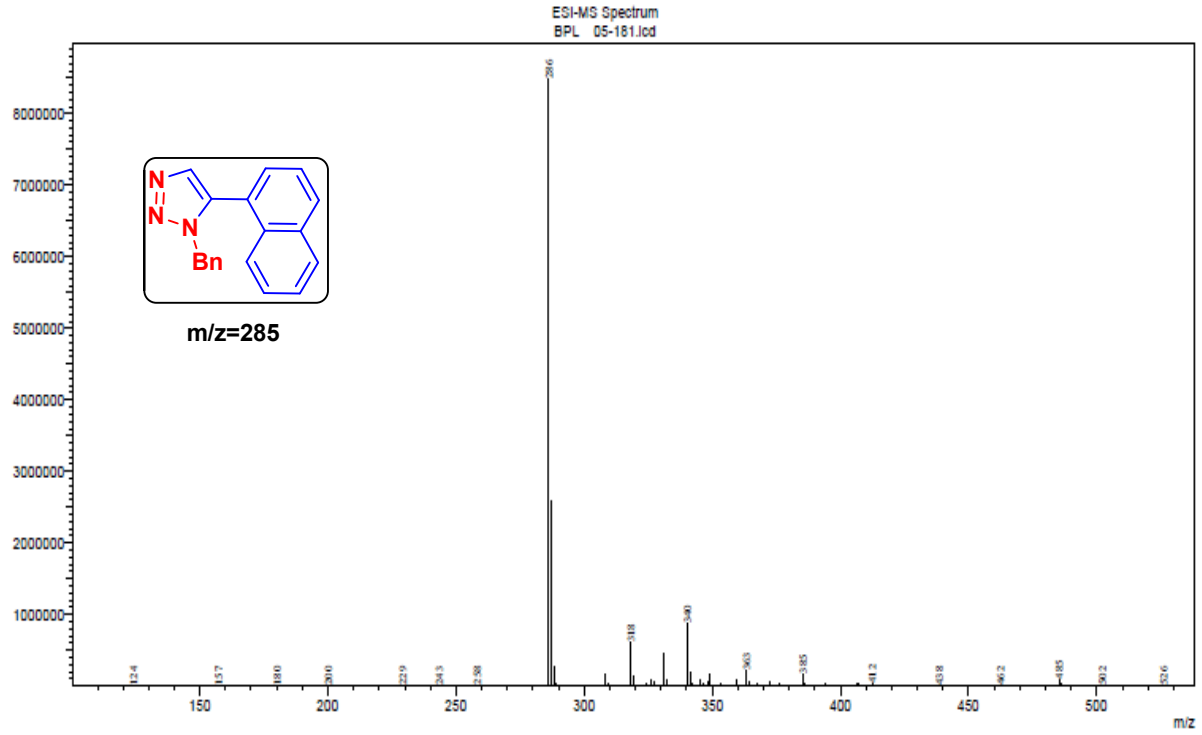
1-benzyl-5-(naphthalene-1-yl)-1*H*-1,2,3-triazole:



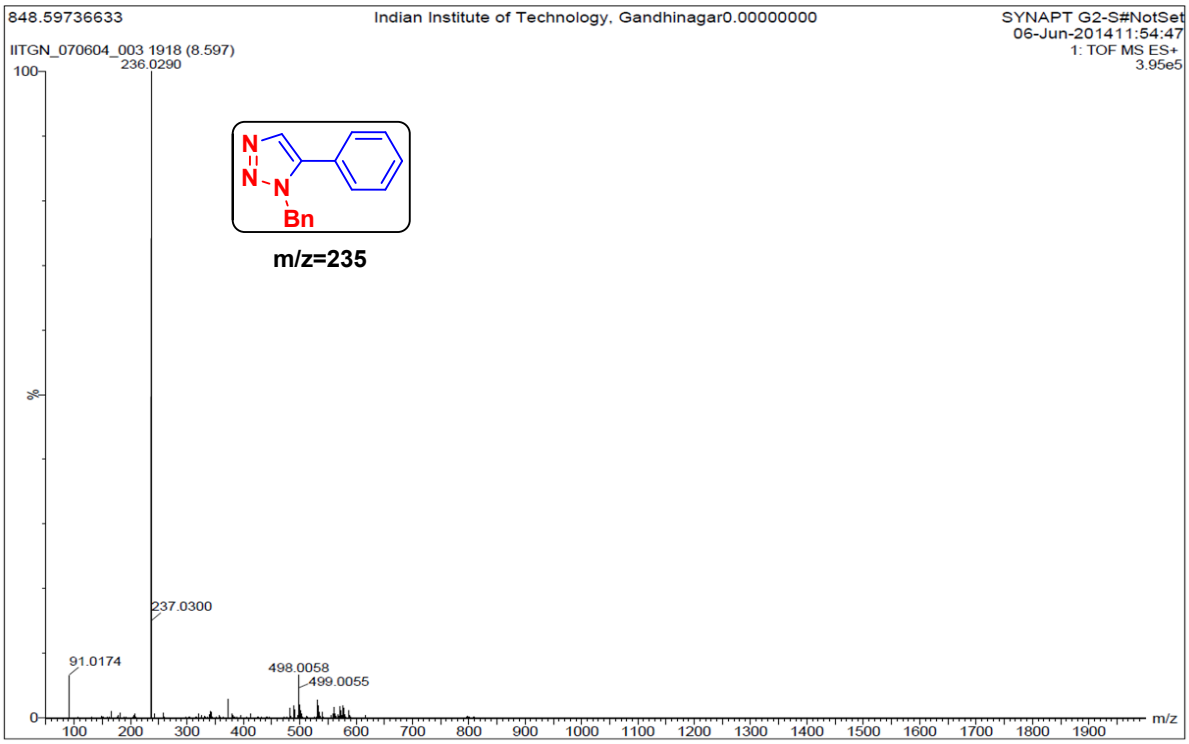
1-benzyl-5-(naphthalene-1-yl)-1*H*-1,2,3-triazole:



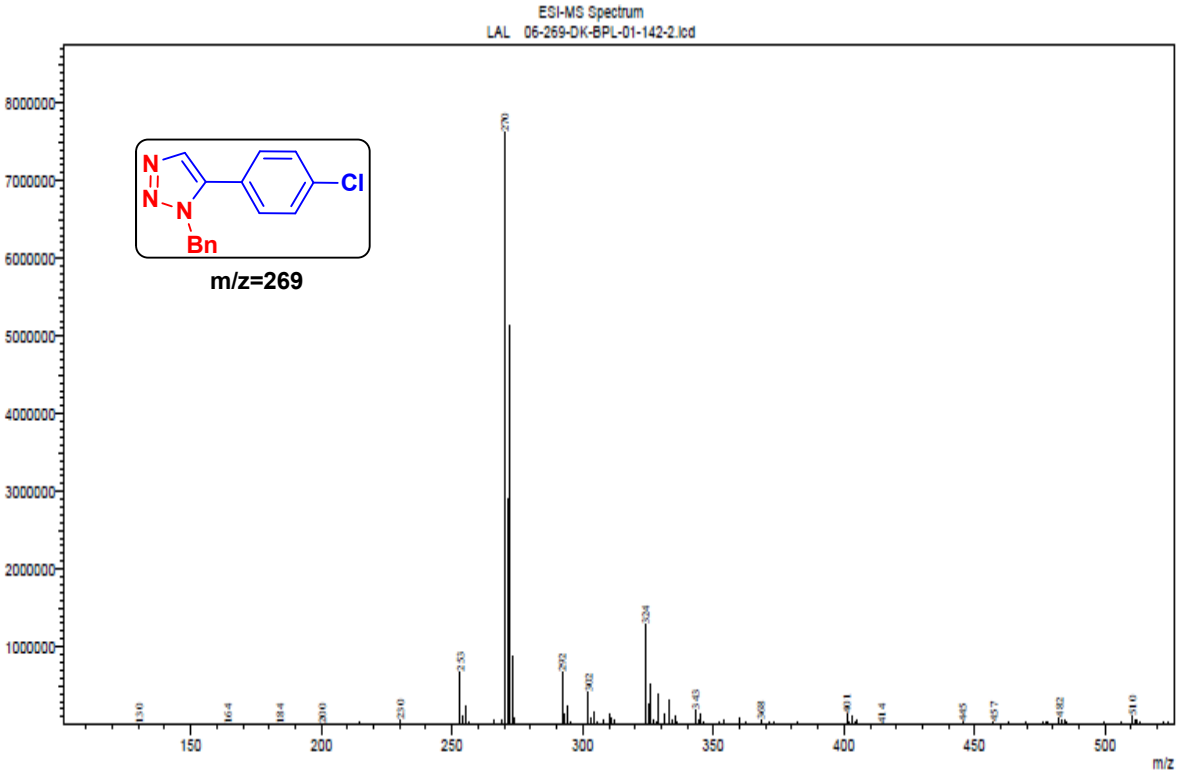
1-benzyl-5-(naphthalene-1-yl)-1*H*-1,2,3-triazole:



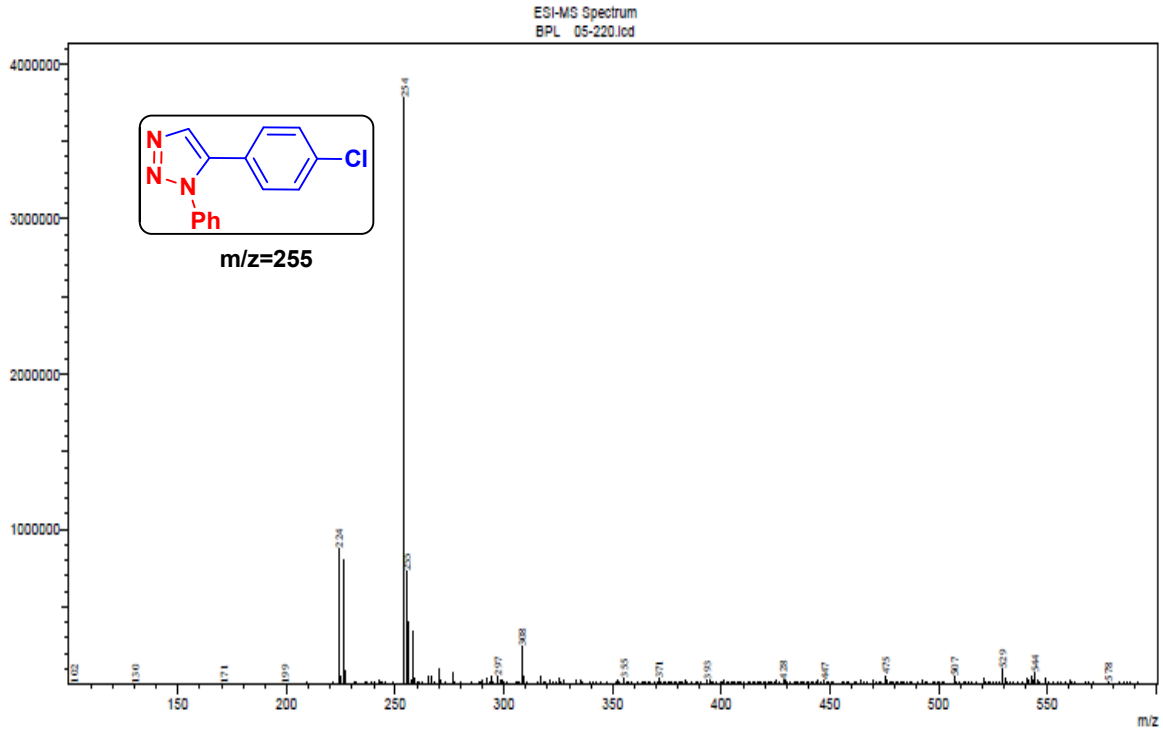
1-benzyl-5-phenyl -1*H*-1,2,3-triazole :



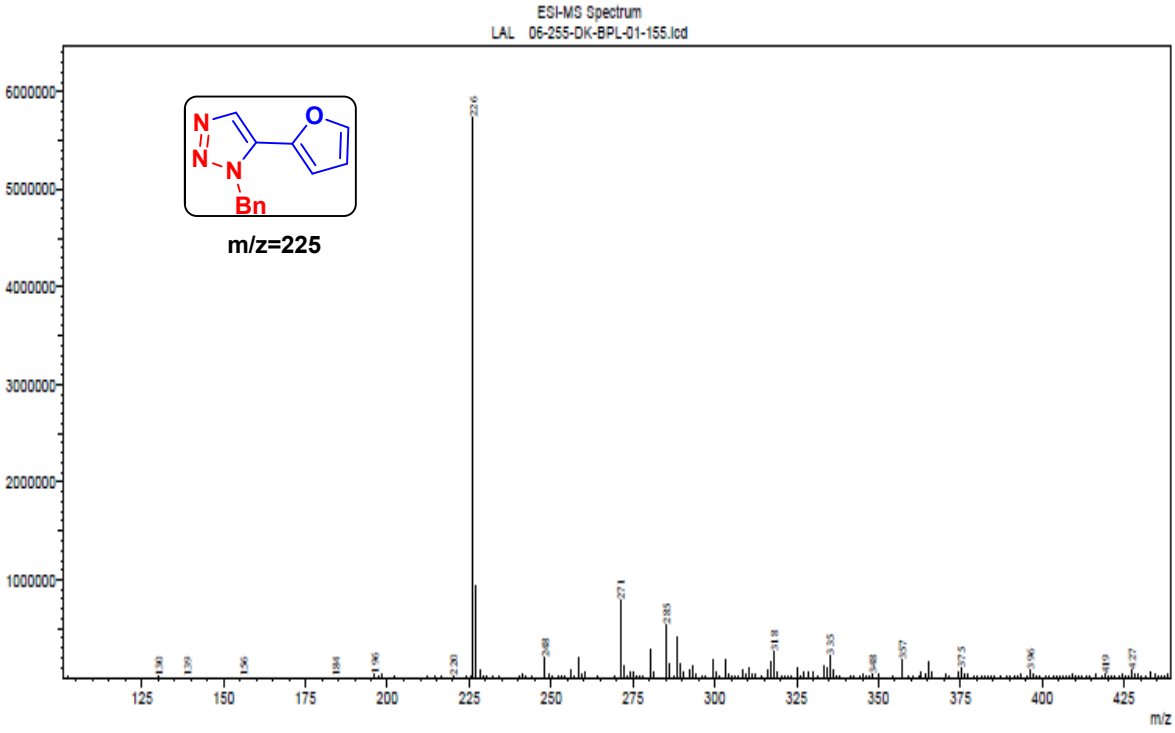
1-benzyl-5-(4-chlorophenyl)-1*H*-1,2,3-triazole:



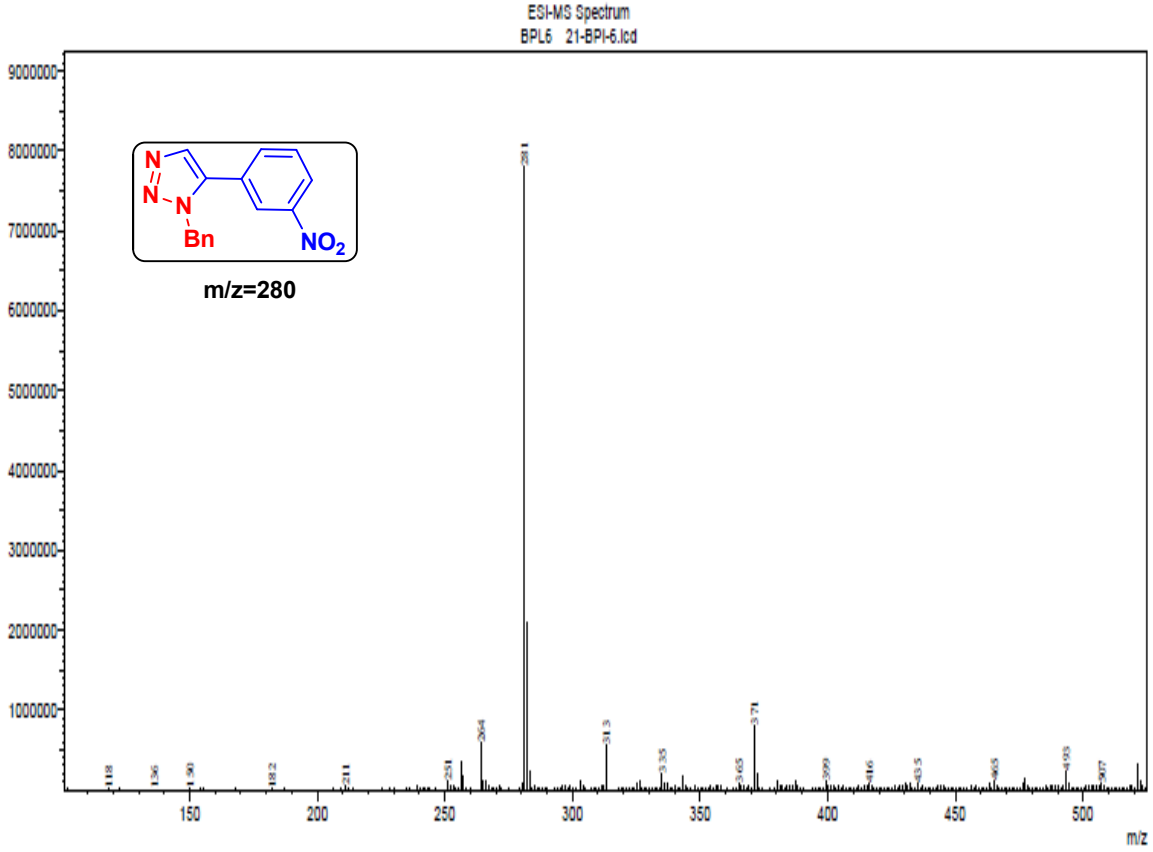
5-(4-chlorophenyl)-1-phenyl-1*H*-1,2,3-triazole:



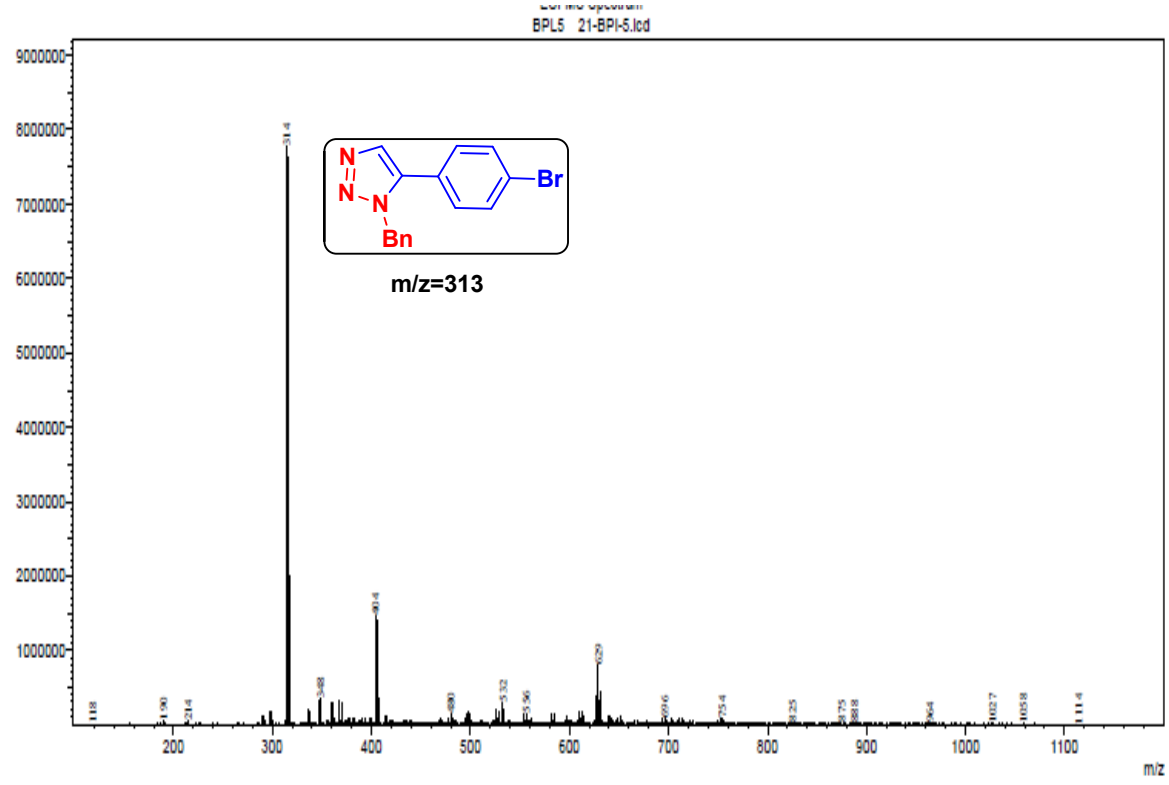
1-benzyl-5-(furan-2-yl)-1*H*-1,2,3-triazole:



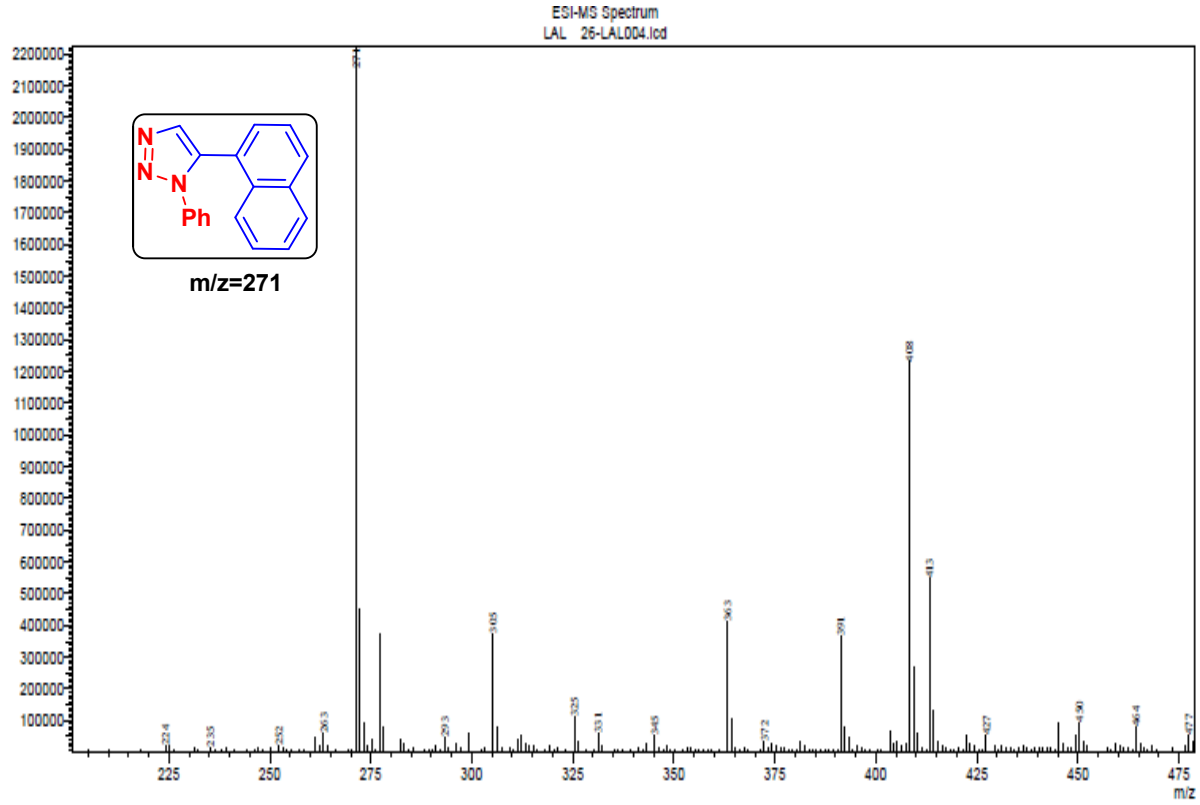
1-benzyl-5-(3-nitrophenyl)-1*H*-1,2,3-triazole:



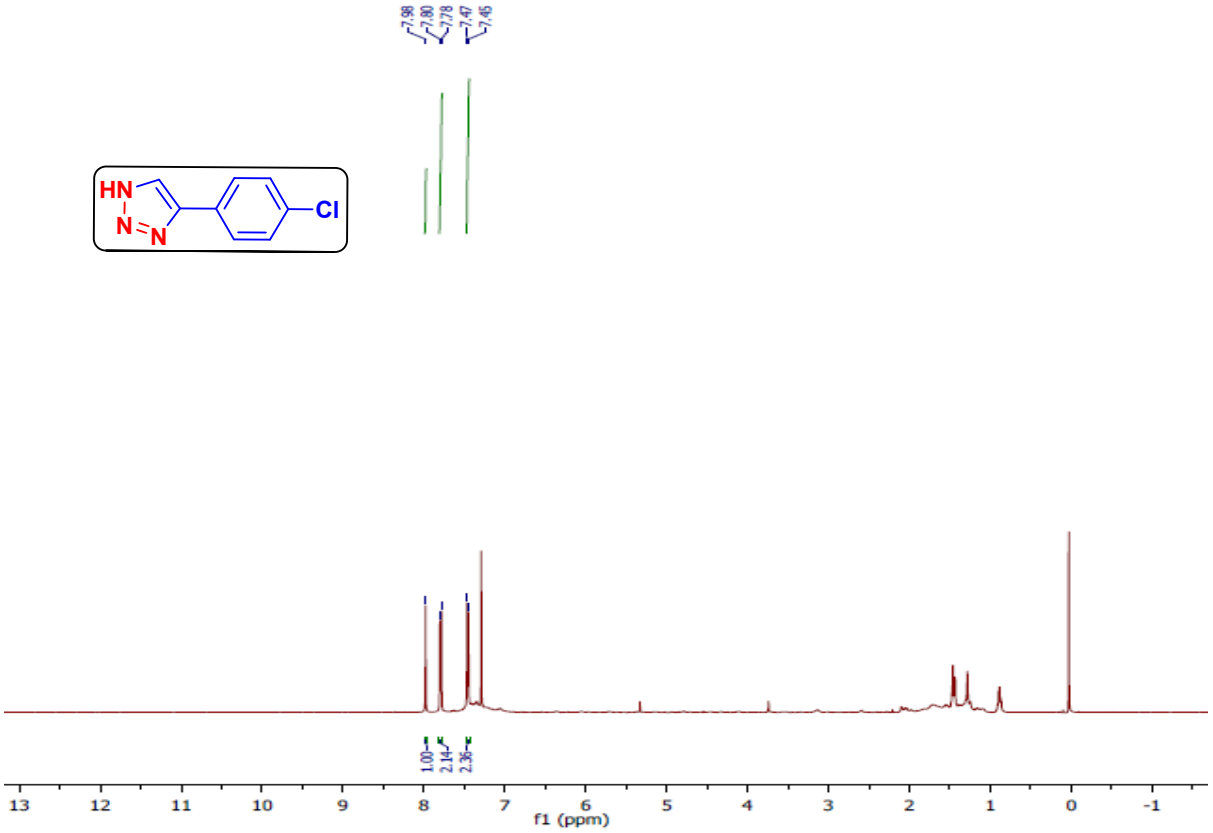
1-benzyl-5-(4-bromophenyl)-1*H*-1,2,3-triazole:



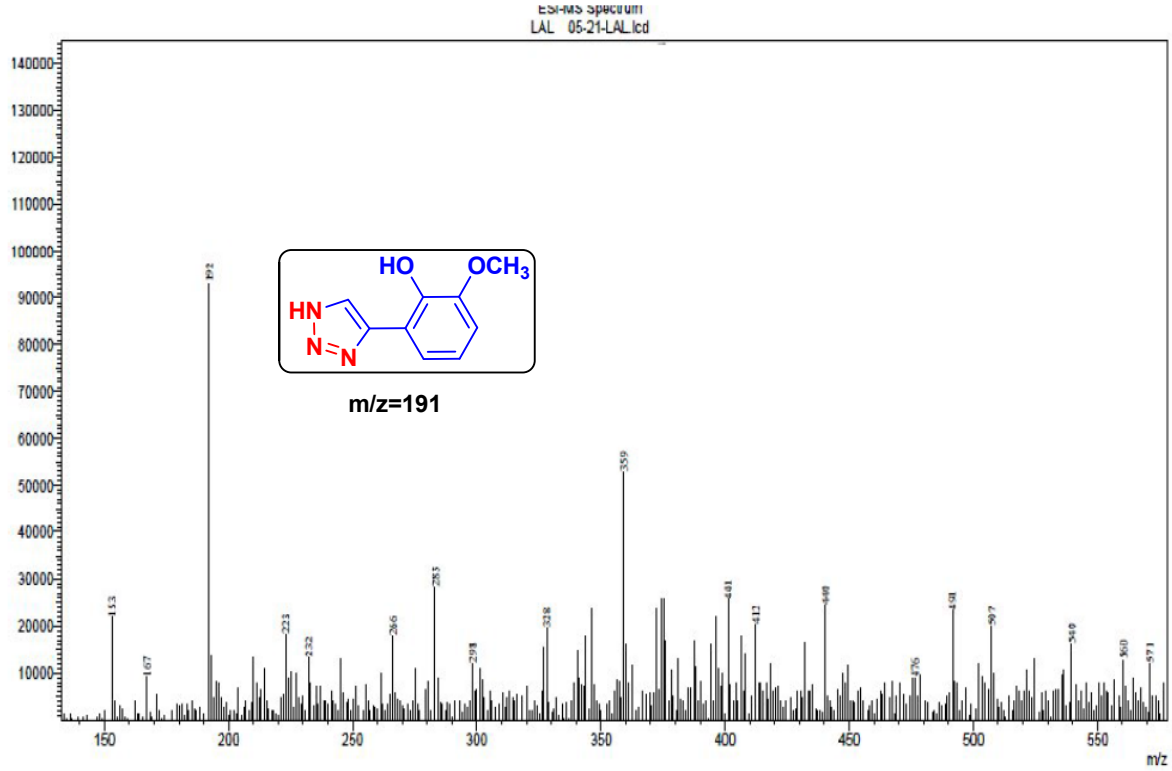
5-(naphthalene-1-yl)-1phenyl-1*H*-1,2,3-Triazole:



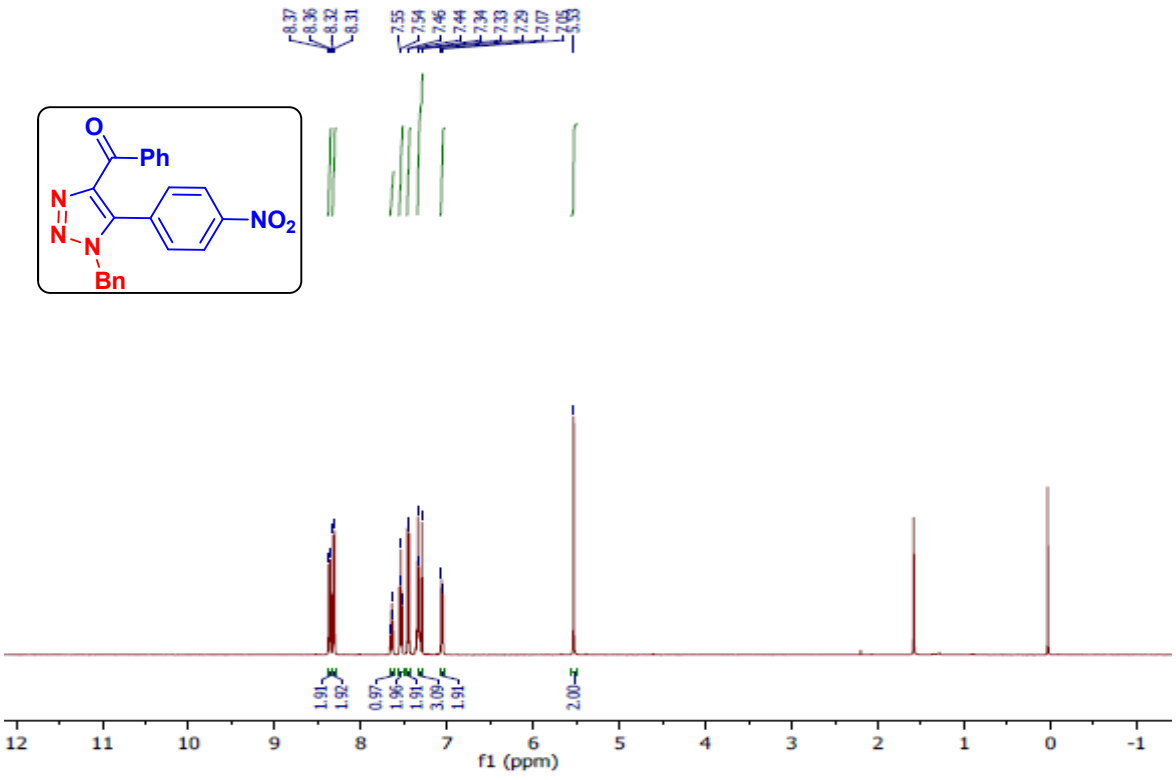
4-(4-chlorophenyl)-1*H*-1,2,3-triazole:



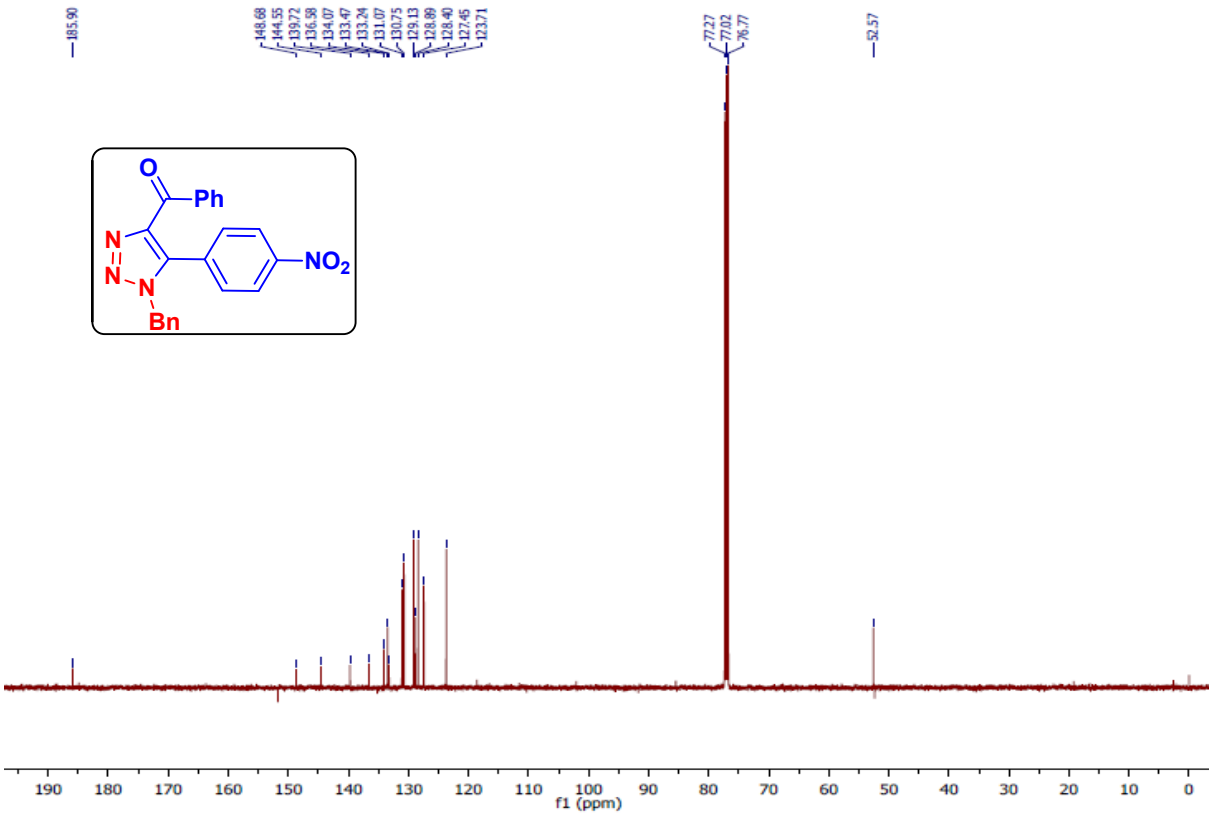
2-methoxy-6-(1*H*-1,2,3-triazol-4-yl) phenol:



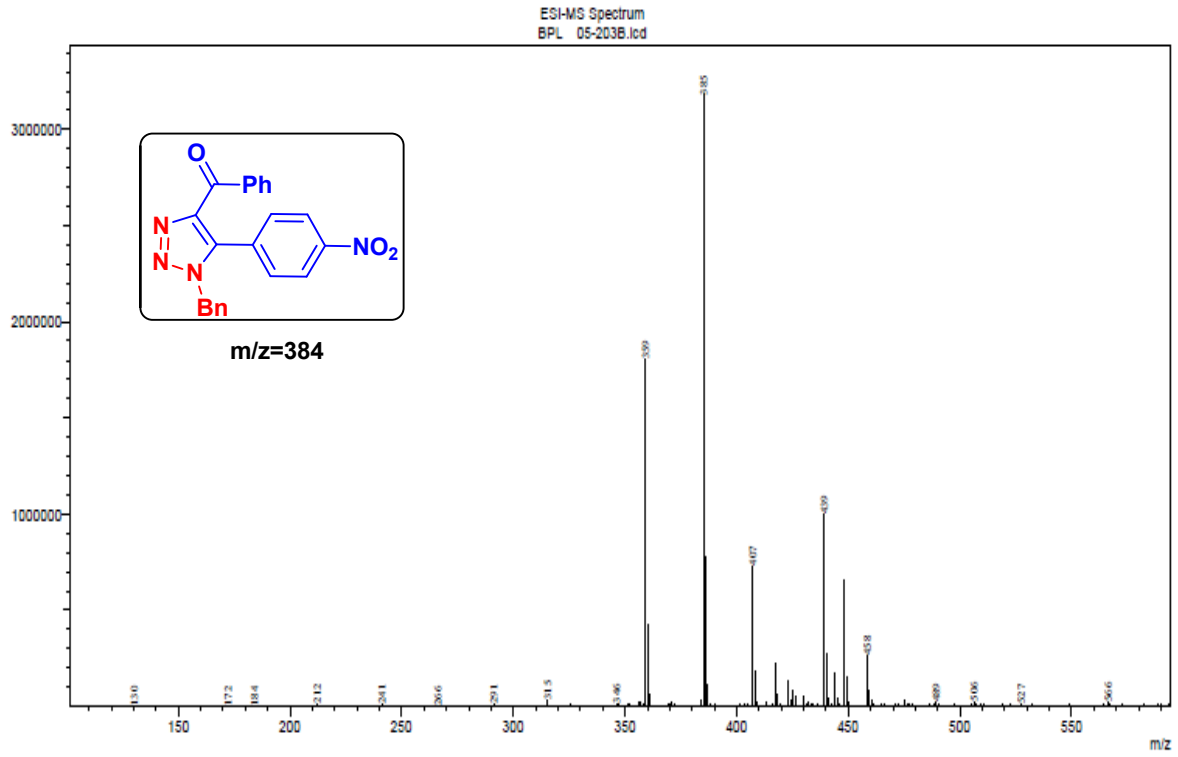
^{1}H NMR: (1-benzyl-5-(4-nitrophenyl)-1*H*-1,2,3-triazol-4-yl)(phenyl)methanone:



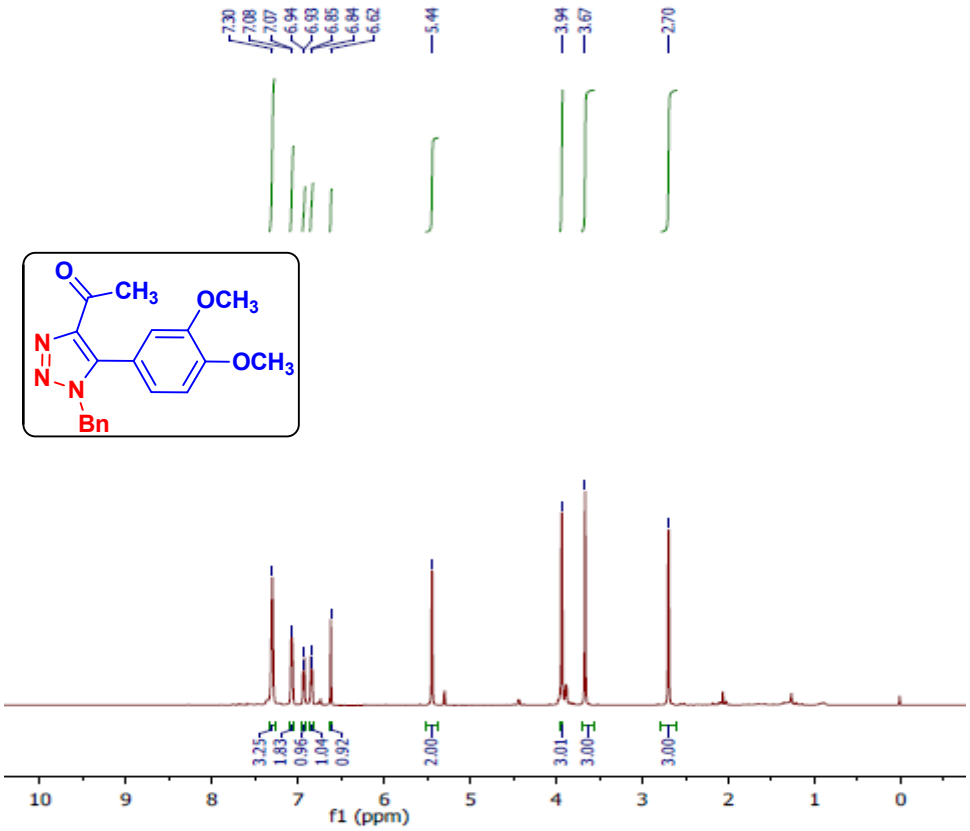
^{1}H NMR: (1-benzyl-5-(4-nitrophenyl)-1*H*-1,2,3-triazol-4-yl)(phenyl)methanone:



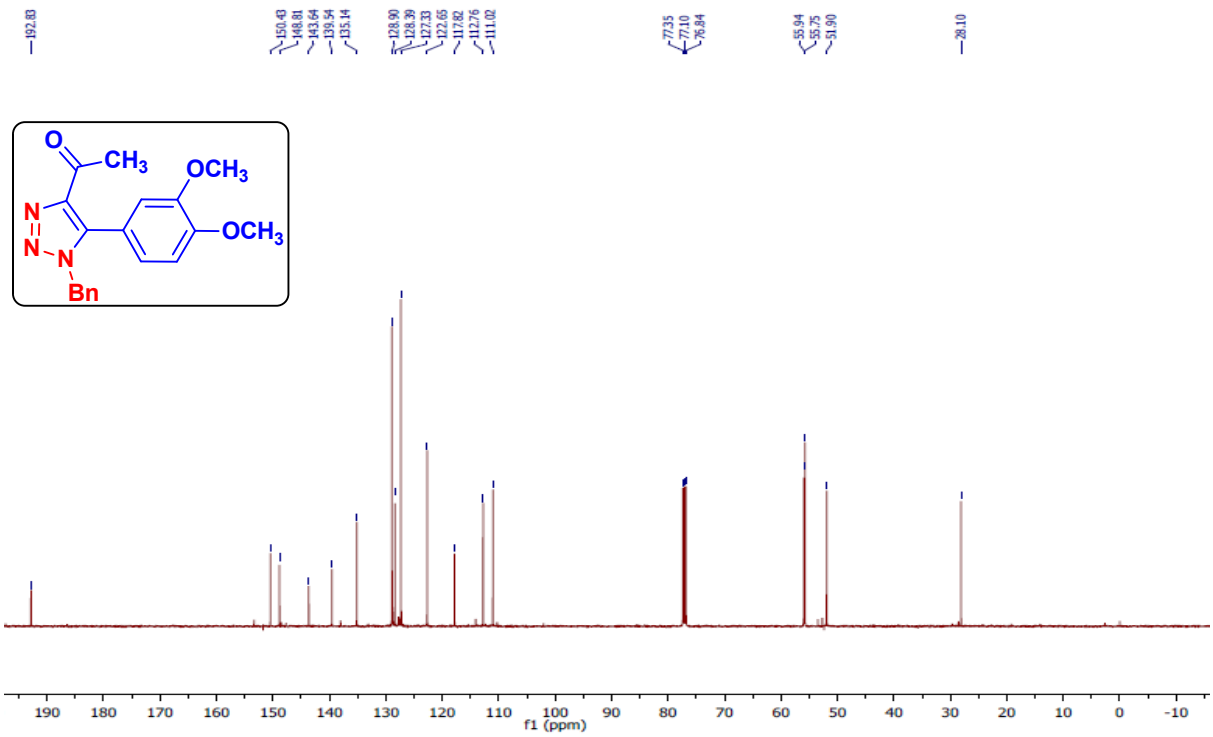
[1]H NMR: (1-benzyl-5-(4-nitrophenyl)-1*H*-1,2,3-triazol-4-yl)(phenyl)methanone:



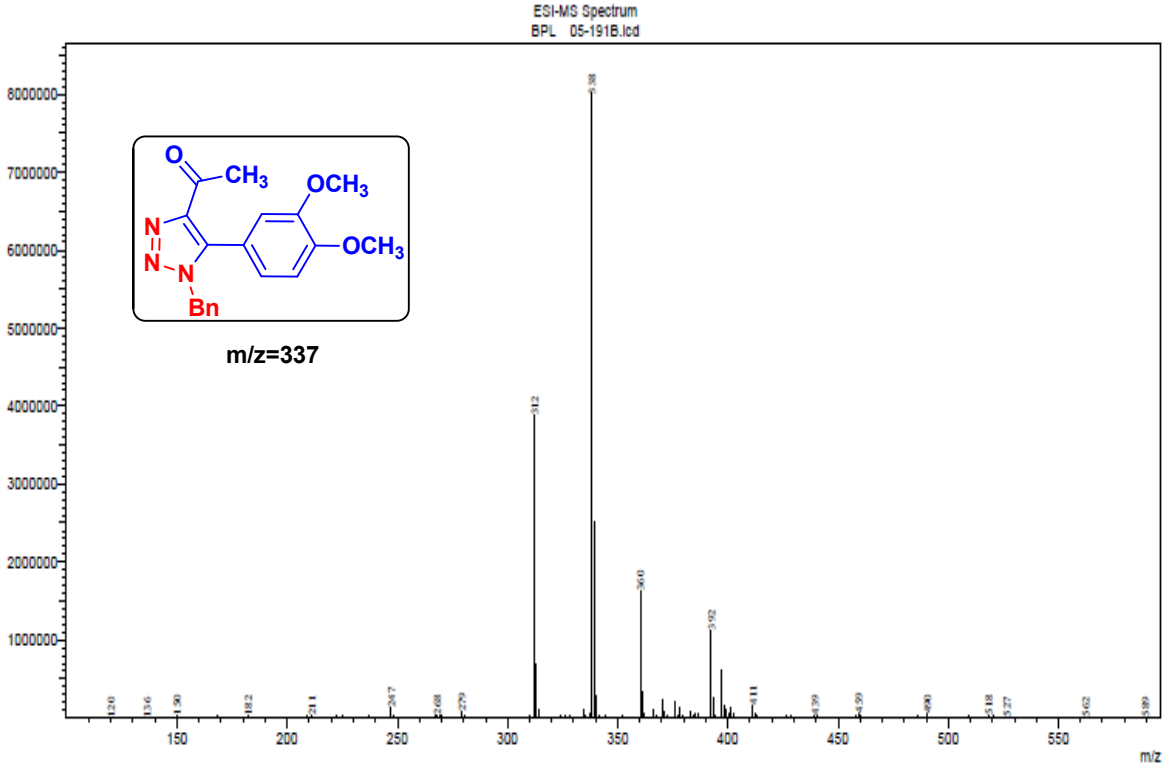
[1]H NMR1-(1-benzyl-5-(3,4-dimethoxyphenyl)-1*H*-1,2,3-triazol-4-yl)ethanone :



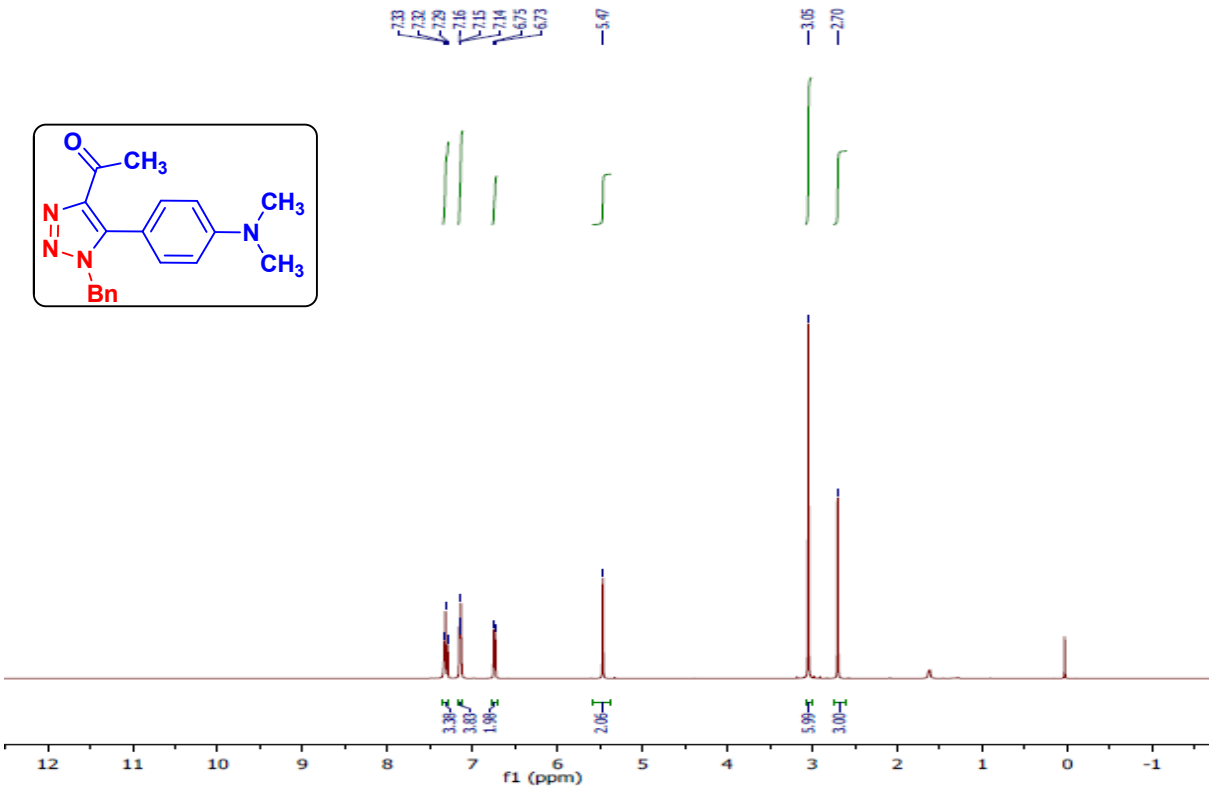
[1]H NMR1-(1-benzyl-5-(3,4-dimethoxyphenyl)-1*H*-1,2,3-triazol-4-yl)ethanone :



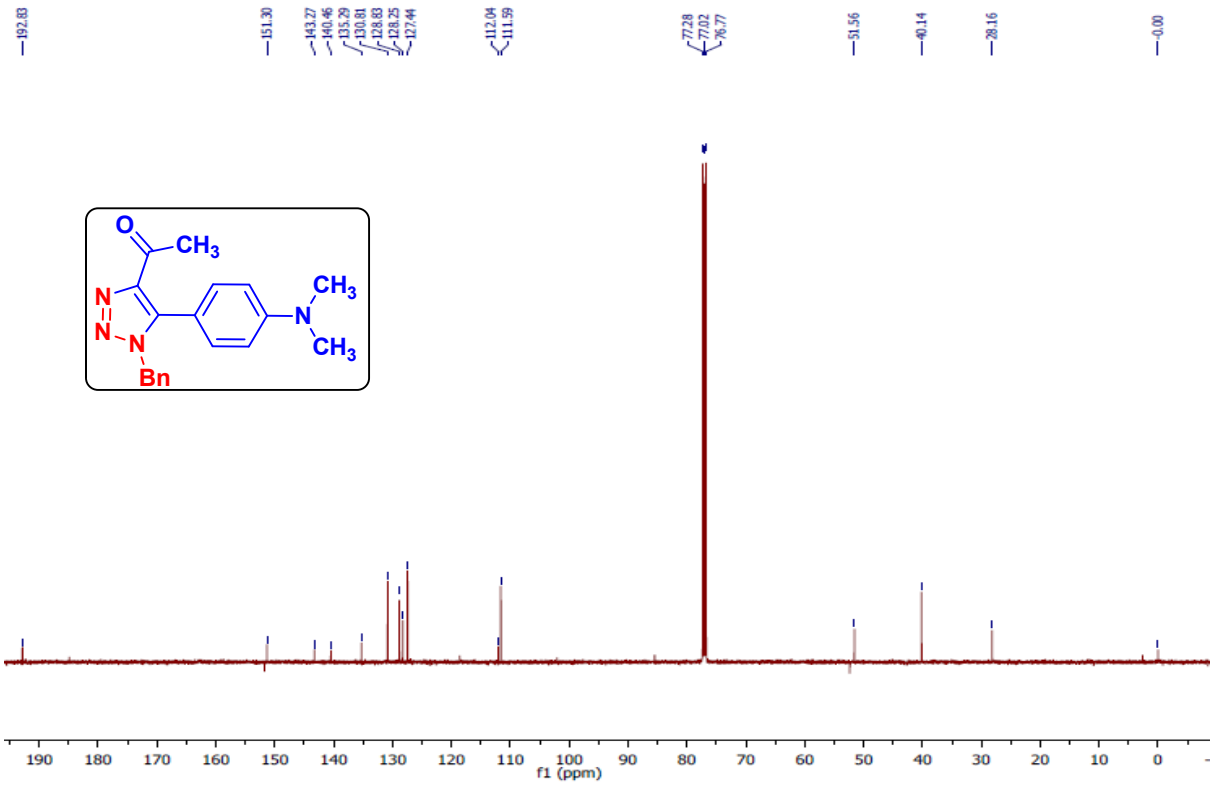
[1]H NMR1-(1-benzyl-5-(3,4-dimethoxyphenyl)-1*H*-1,2,3-triazol-4-yl)ethanone :



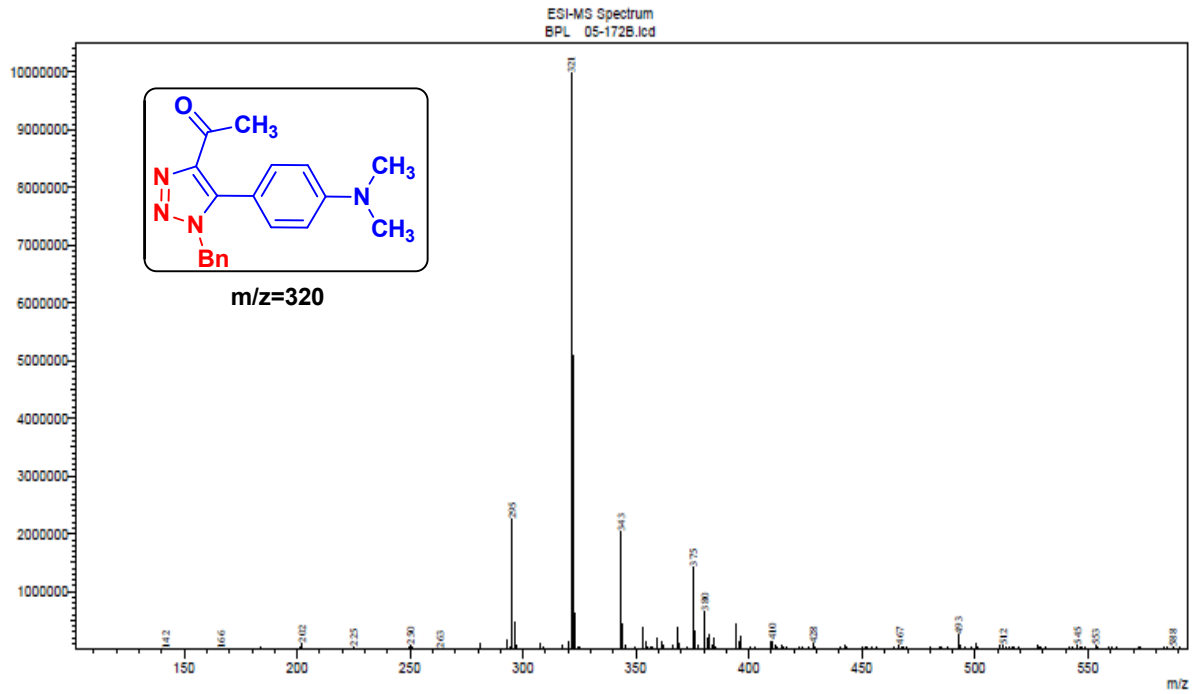
1-(1-benzyl-5-(4-(dimethylamino)phenyl)-1*H*-1,2,3-triazol-4-yl)ethanone:



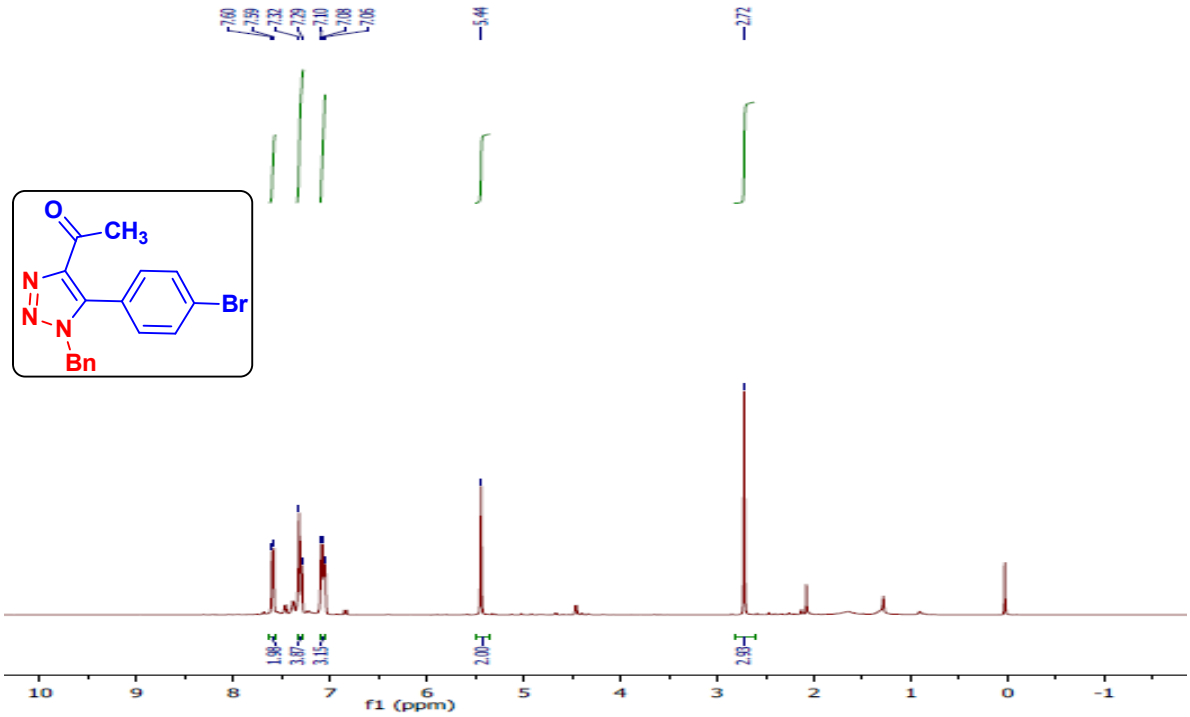
1-(1-benzyl-5-(4-(dimethylamino)phenyl)-1*H*-1,2,3-triazol-4-yl)ethanone:



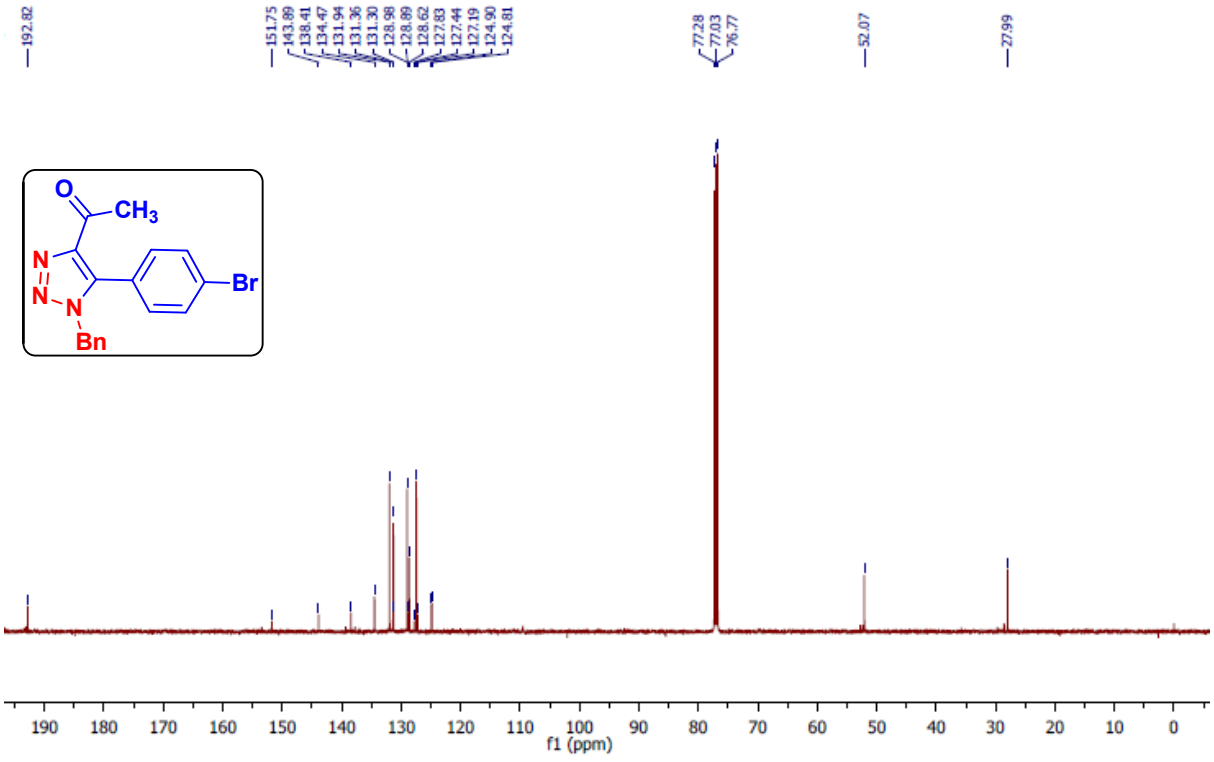
1-(1-benzyl-5-(4-(dimethylamino)phenyl)-1*H*-1,2,3-triazol-4-yl)ethanone:



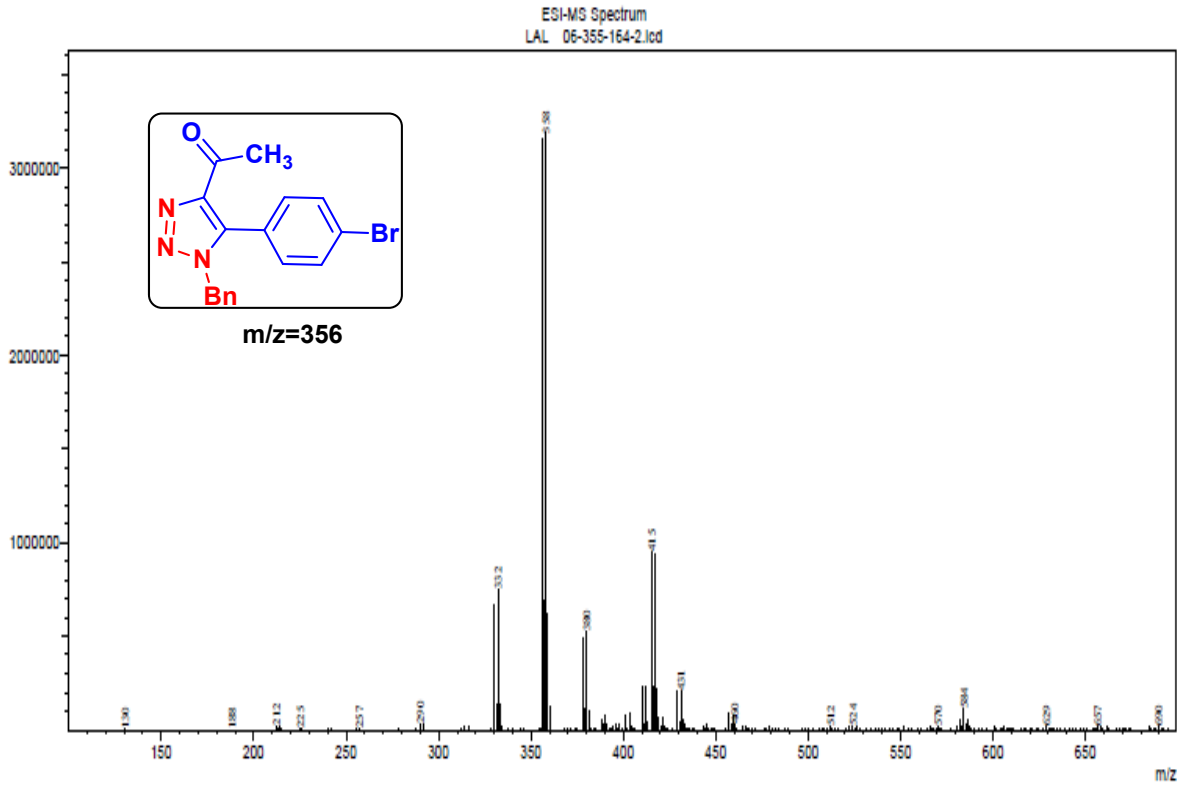
1-(1-benzyl-5-(4-bromophenyl)-1*H*-1,2,3-triazol-4-yl)ethanone:



1-(1-benzyl-5-(4-bromophenyl)-1*H*-1,2,3-triazol-4-yl)ethanone:



1-(1-benzyl-5-(4-bromophenyl)-1*H*-1,2,3-triazol-4-yl)ethanone:



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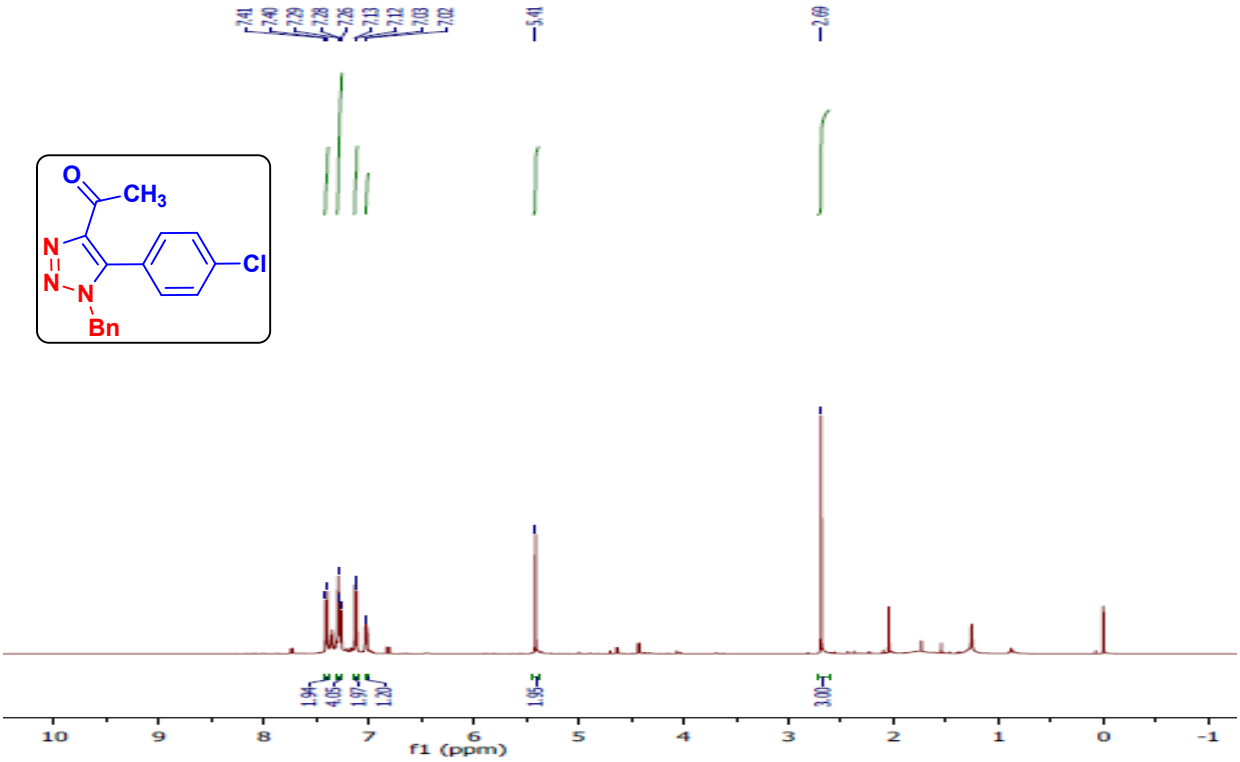

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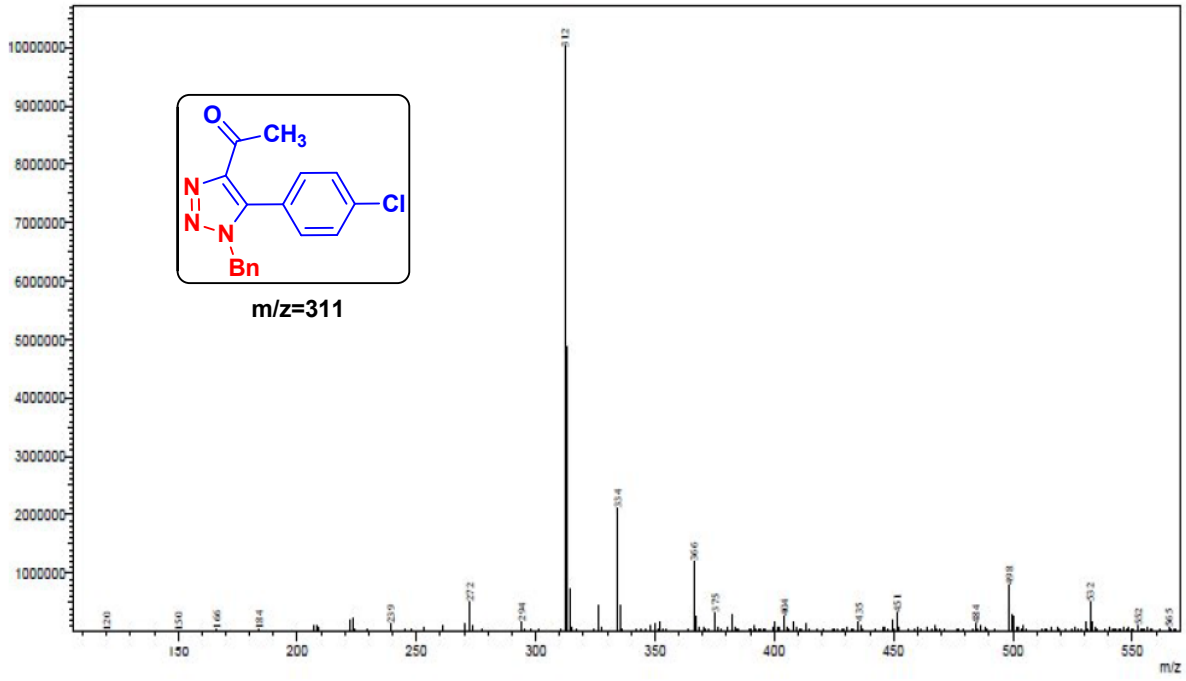

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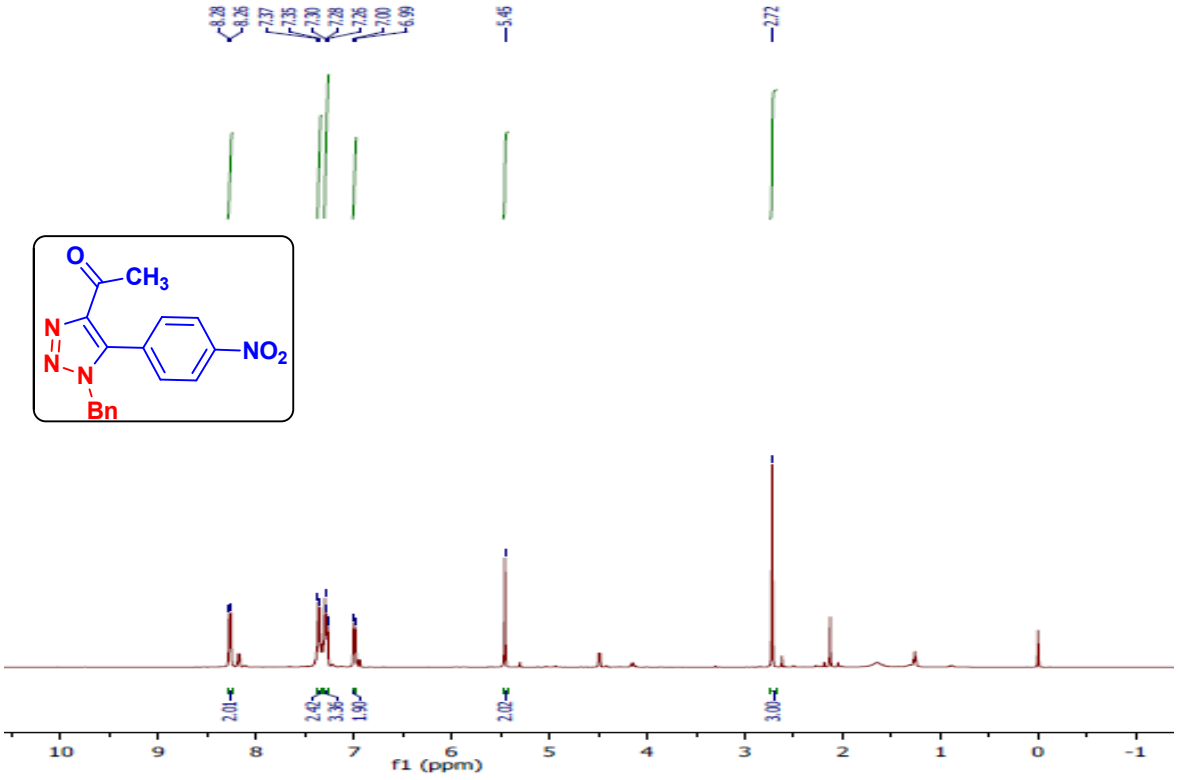
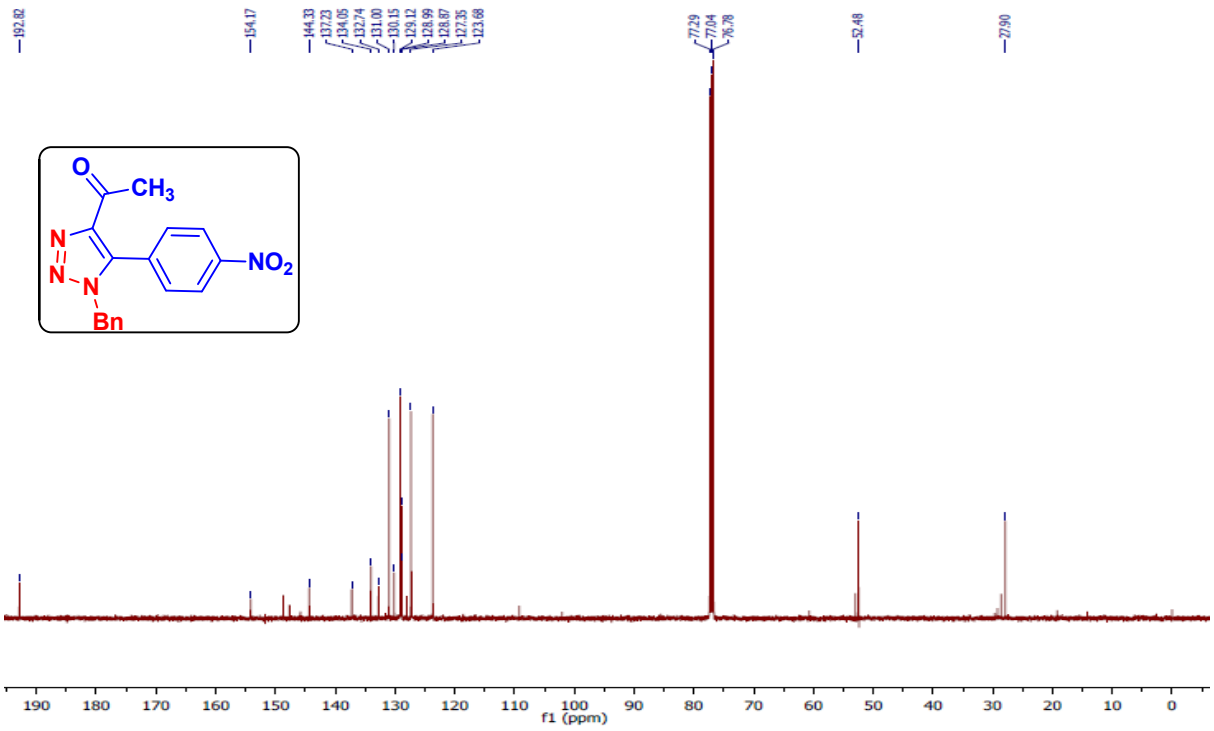


1-(1-benzyl-5-(4-nitrophenyl)-1*H*-1,2,3-triazol-4-yl)ethanone:



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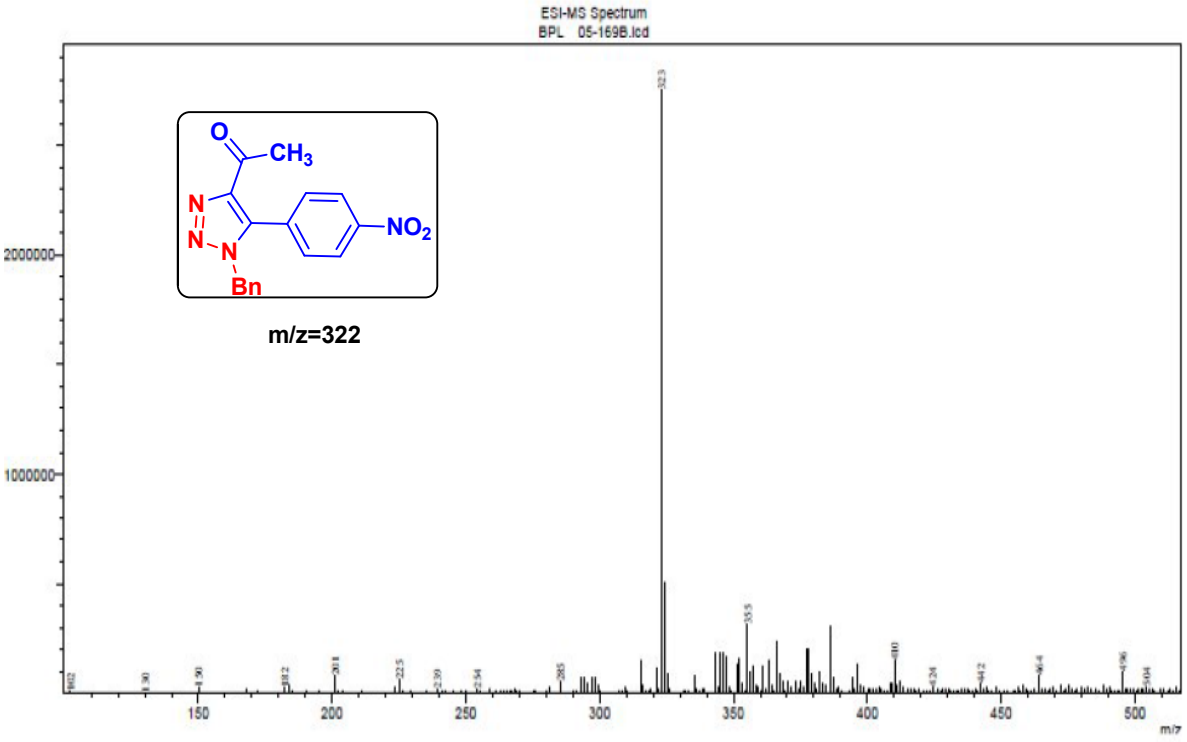

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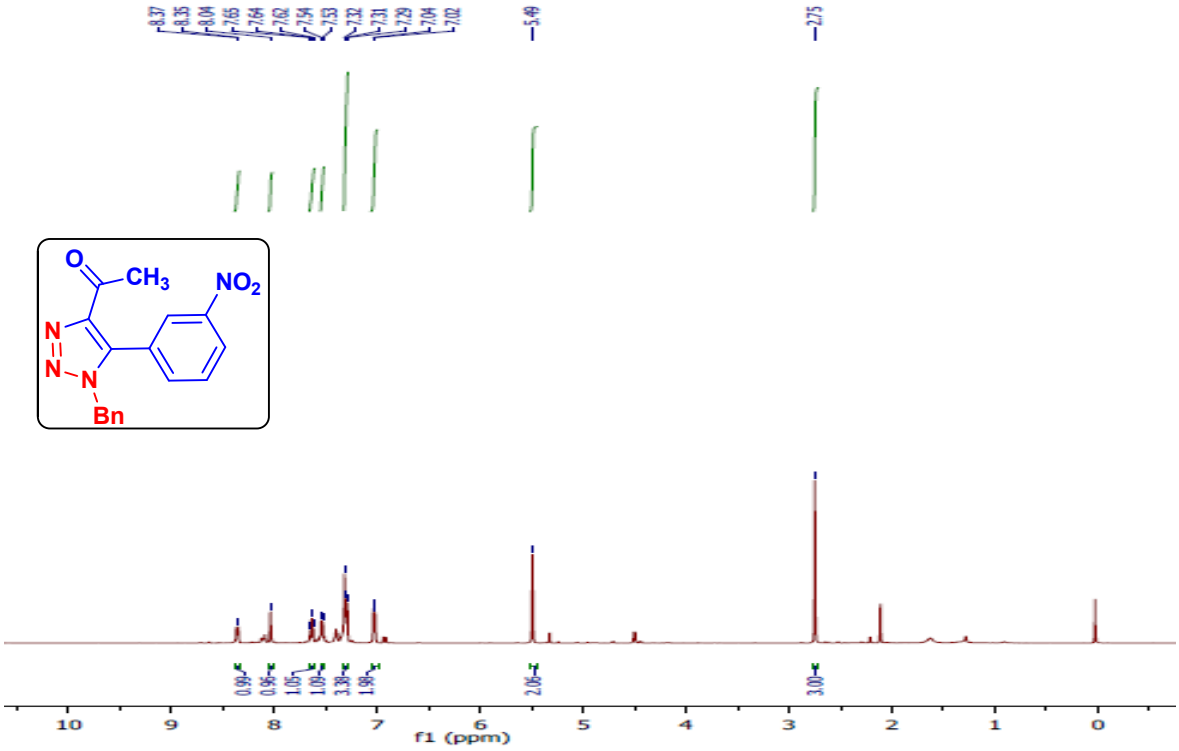

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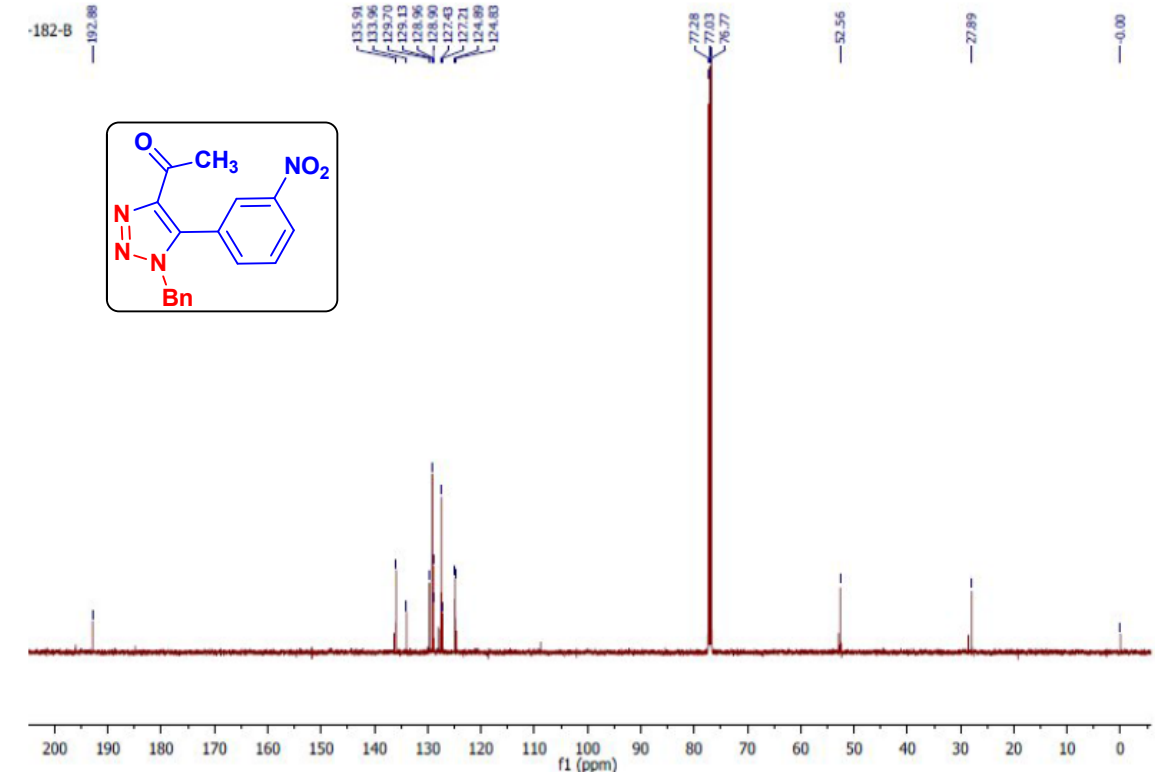
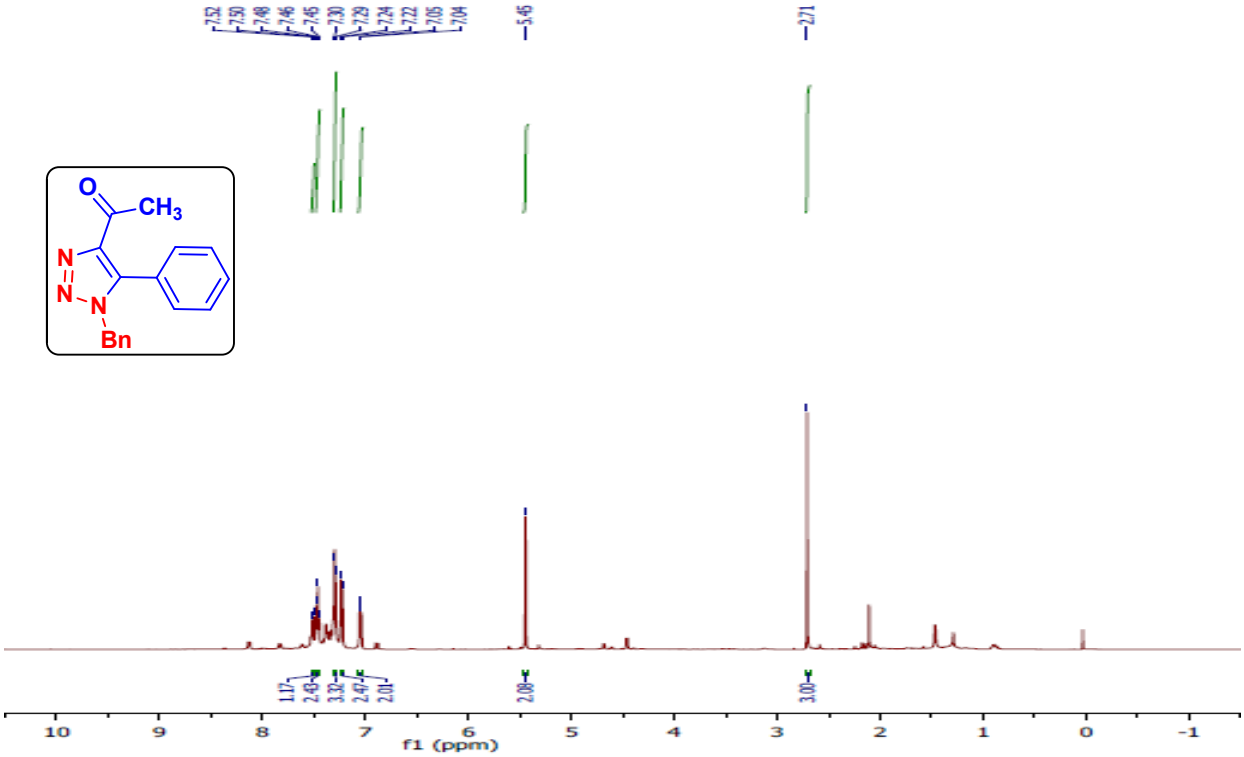
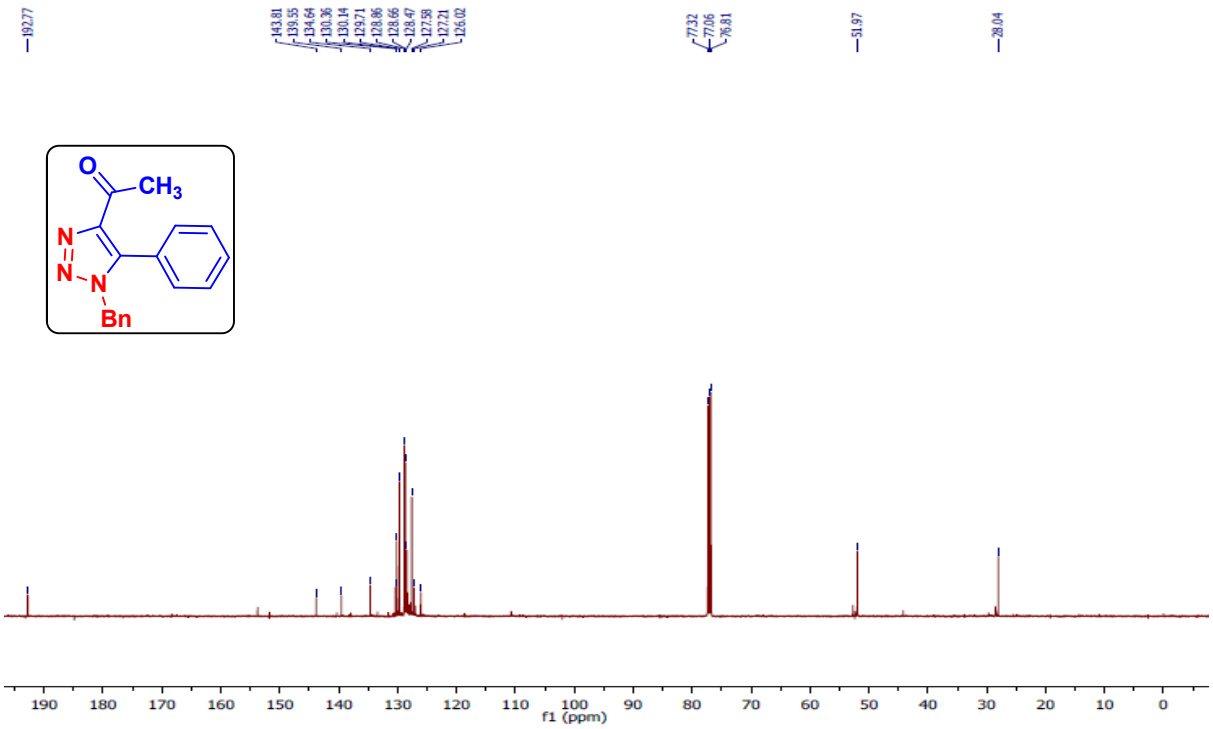


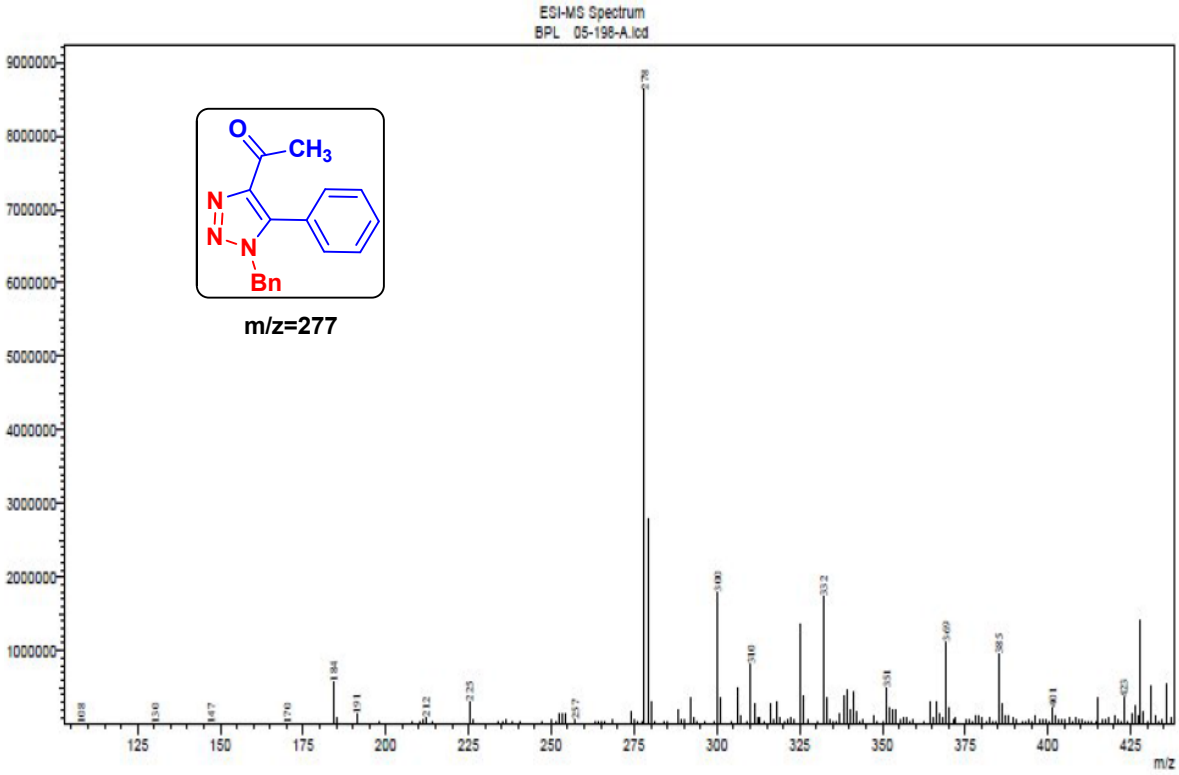
1-(1-benzyl-5-1*H*-1,2,3-triazol-4-yl)ethanone:



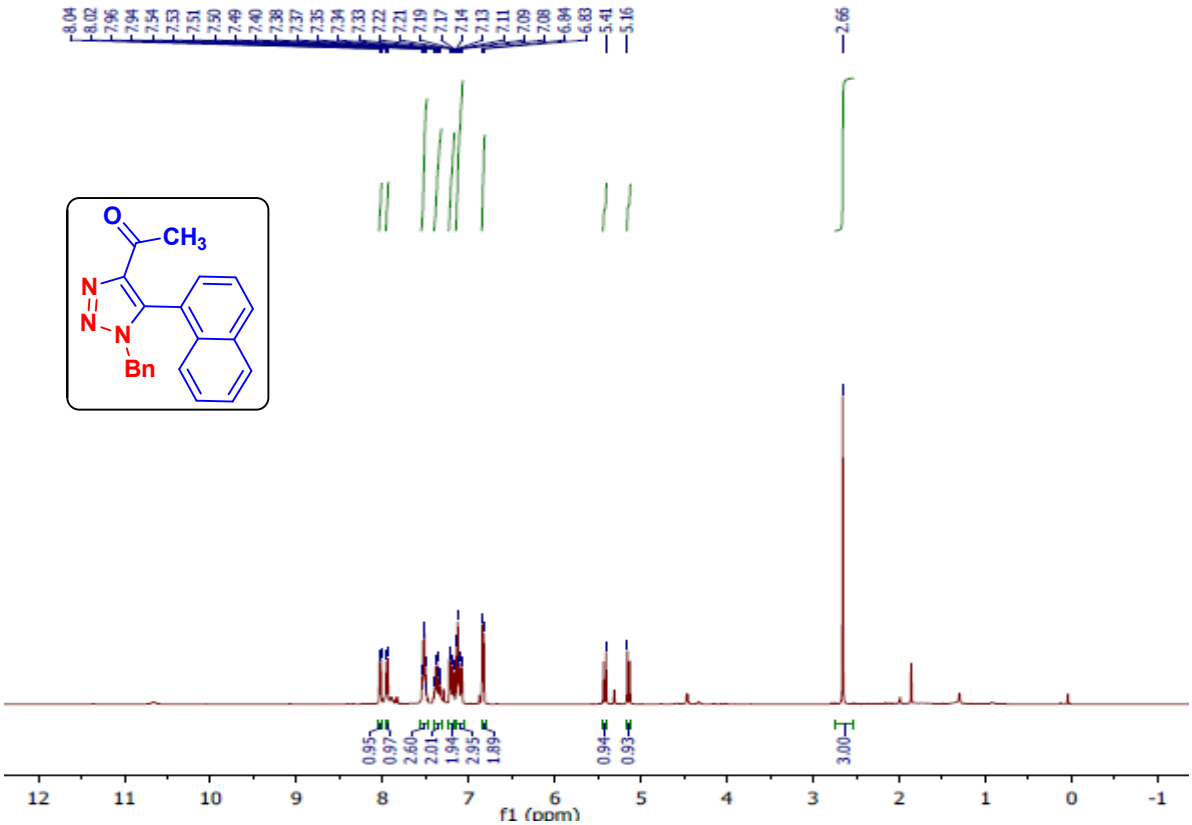
1-(1-benzyl-5-1*H*-1,2,3-triazol-4-yl)ethanone:



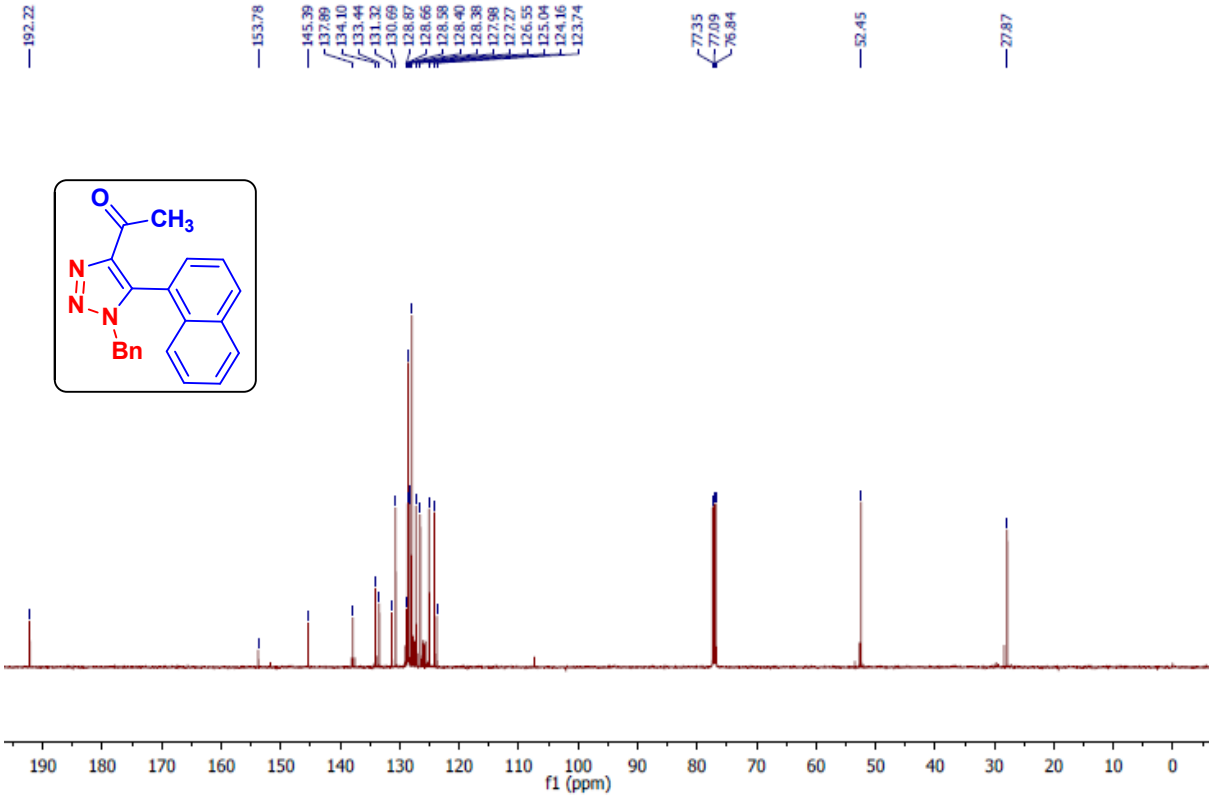
1-(1-benzyl-5-1*H*-1,2,3-triazol-4-yl)ethanone:



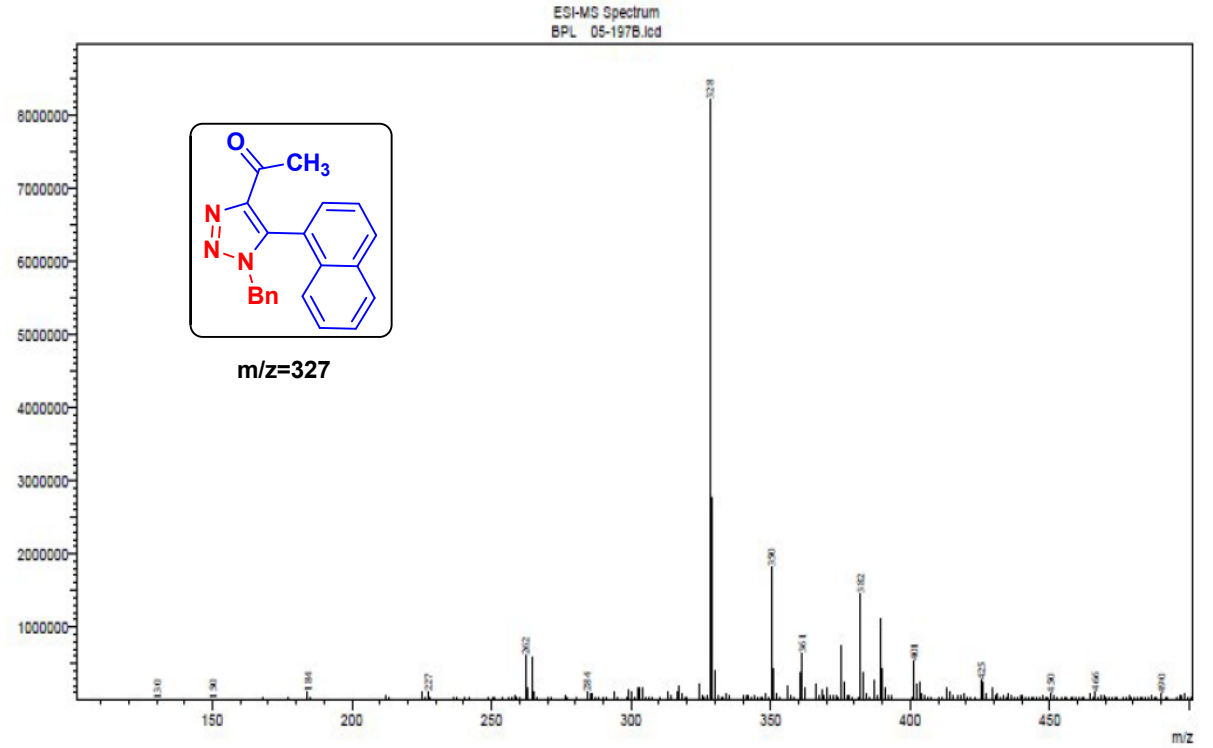
1-(1-benzyl-5-(naphthalen-1-yl)-1*H*-1,2,3-triazol-4-yl)ethanone:



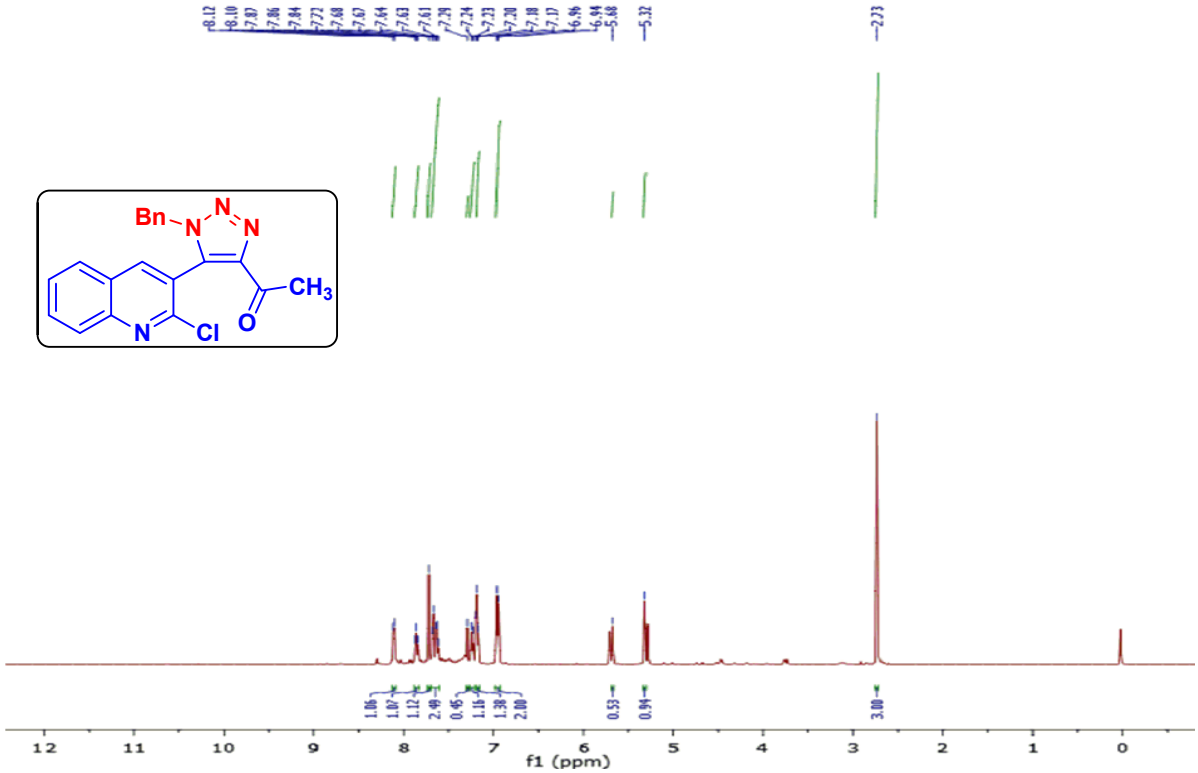
1-(1-benzyl-5-(naphthalen-1-yl)-1*H*-1,2,3-triazol-4-yl)ethanone:



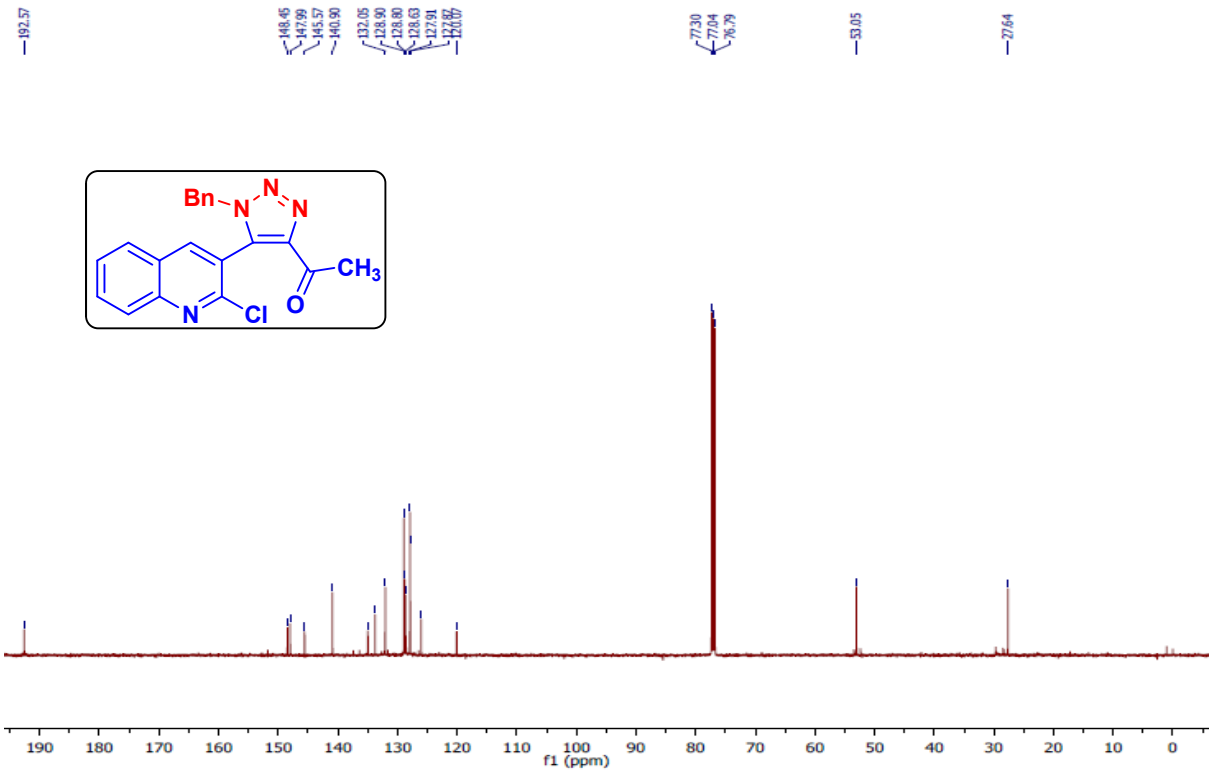
1-(1-benzyl-5-(naphthalen-1-yl)-1*H*-1,2,3-triazol-4-yl)ethanone:



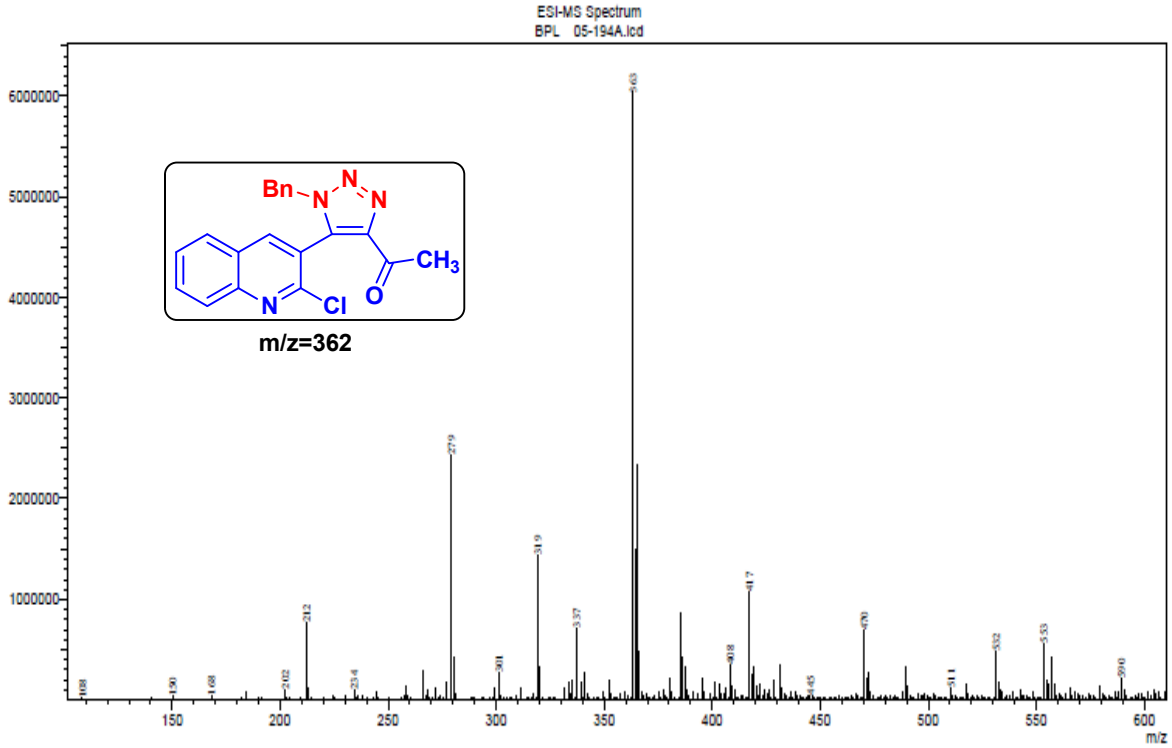
1-(1-benzyl-5-(2-chlroquinolin-3-yl)-1*H*-1,2,3-triazol-4-yl)ethanone:



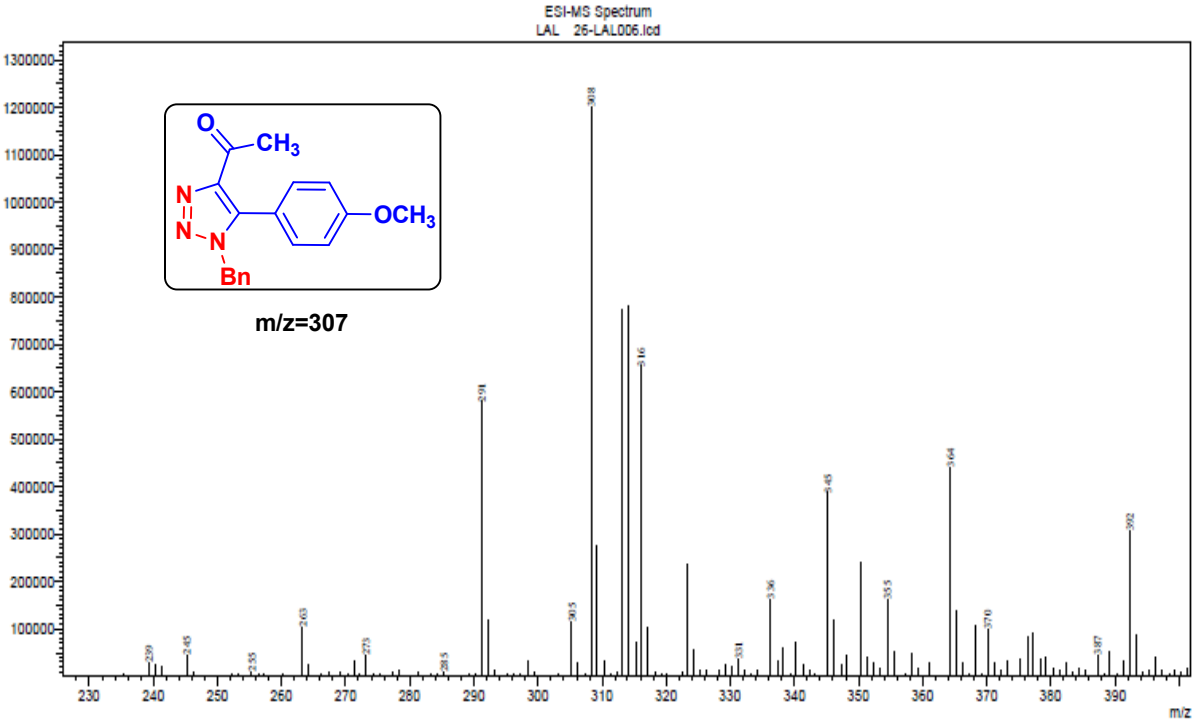
1-(1-benzyl-5-(2-chlroquinolin-3-yl)-1*H*-1,2,3-triazol-4-yl)ethanone:



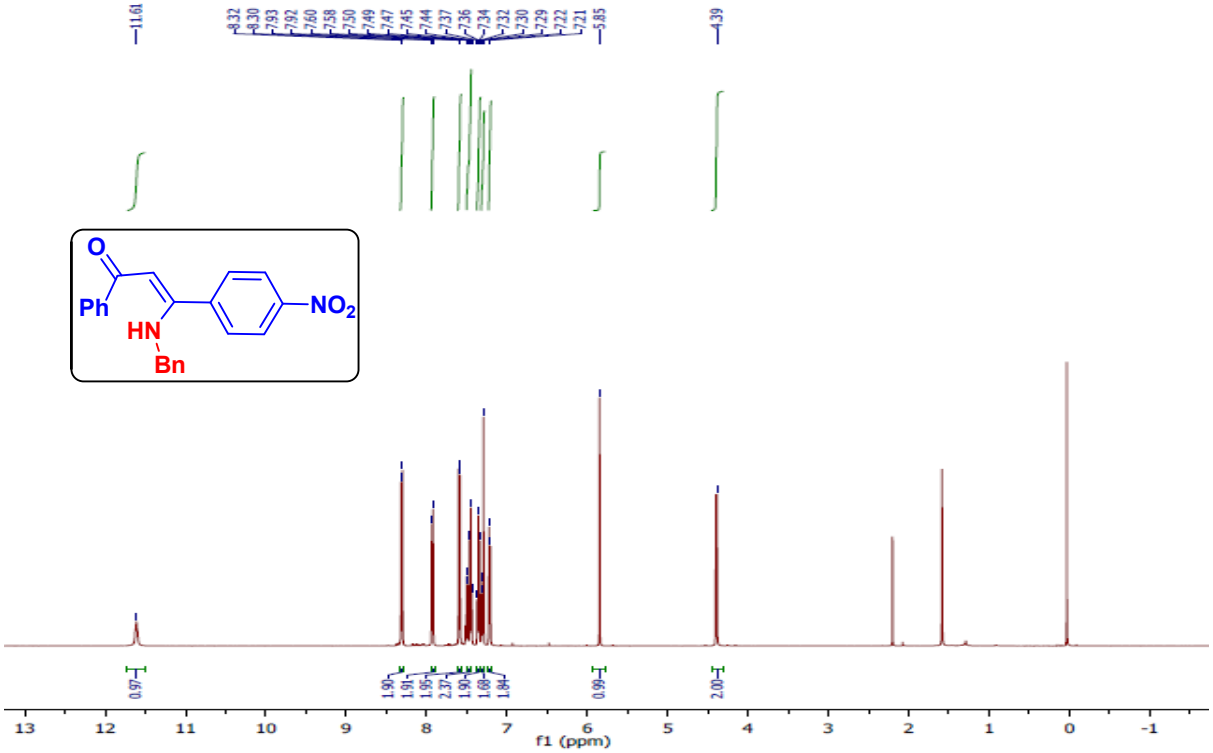
1-(1-benzyl-5-(2-chlroquinolin-3-yl)-1*H*-1,2,3-triazol-4-yl)ethanone:



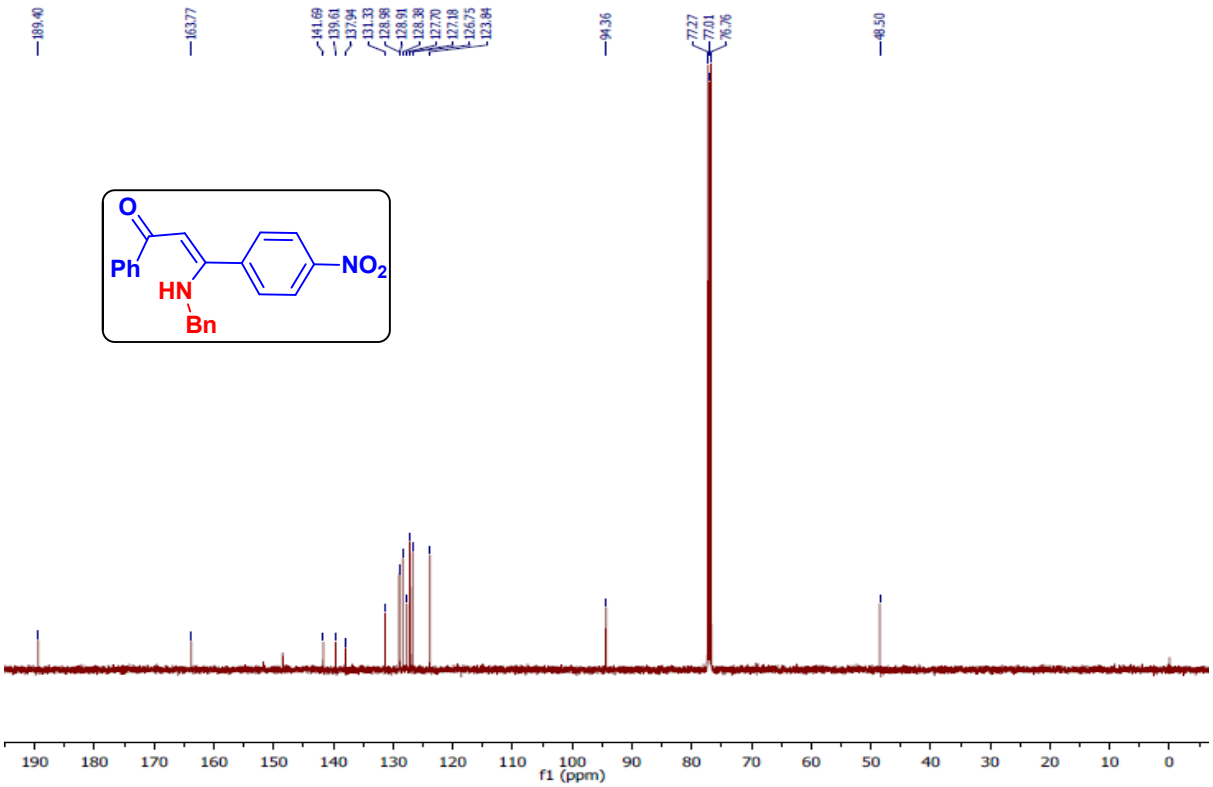
1-(1-benzyl-5-(4-methoxyphenyl)-1*H*-1,2,3-Triazole-4-yl)ethanone:



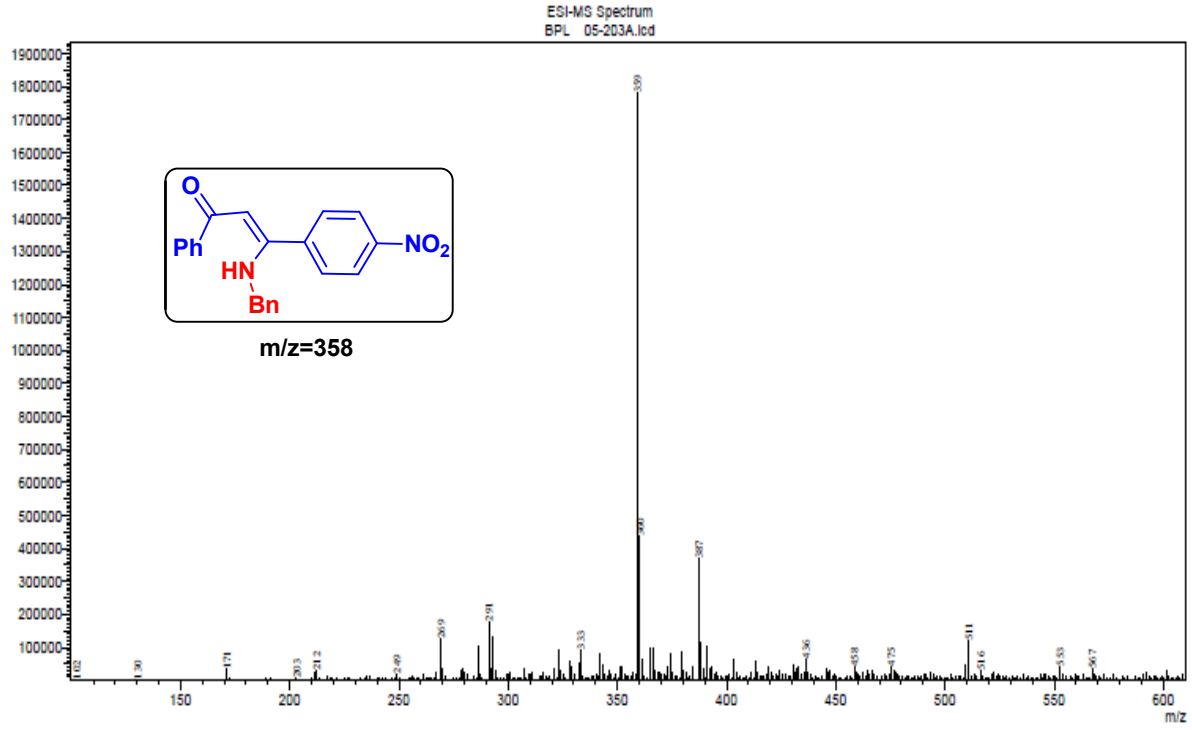
(*Z*)-3-(benzylamino)-3-(4-nitrophenyl)-1-phenylprop-2en-1-one:



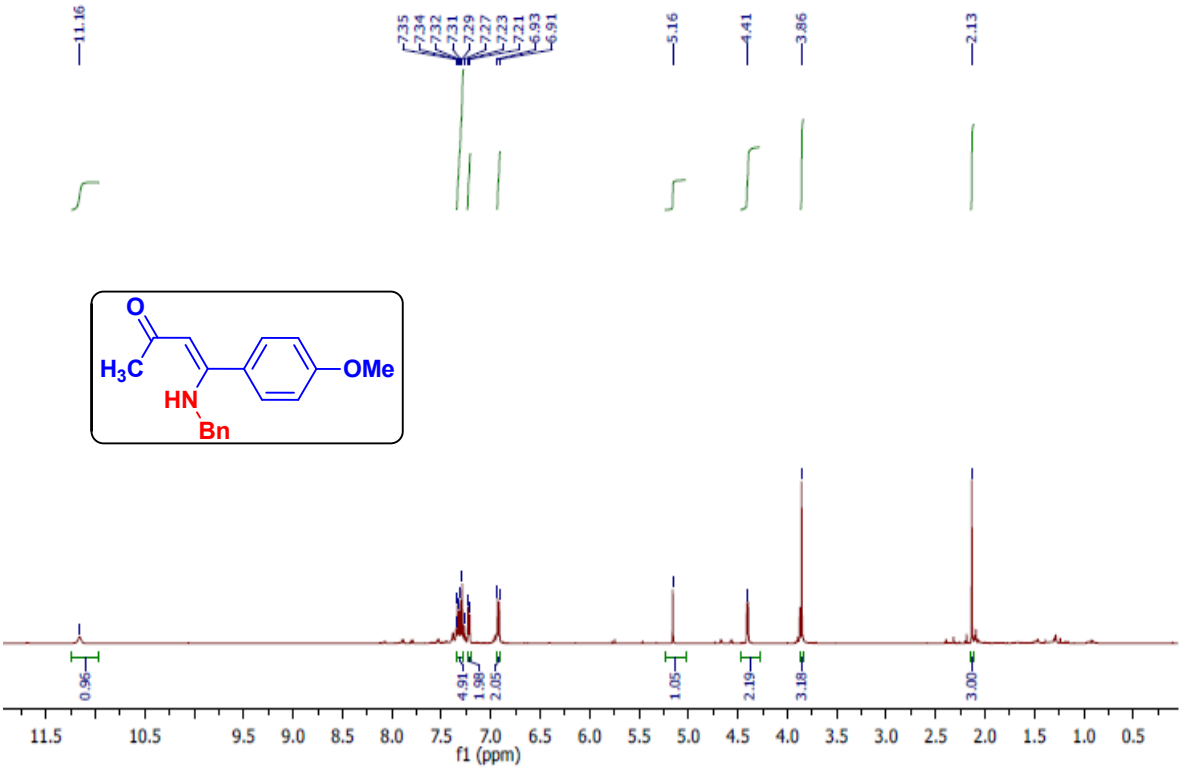
(*Z*)-3-(benzylamino)-3-(4-nitrophenyl)-1-phenylprop-2en-1-one:



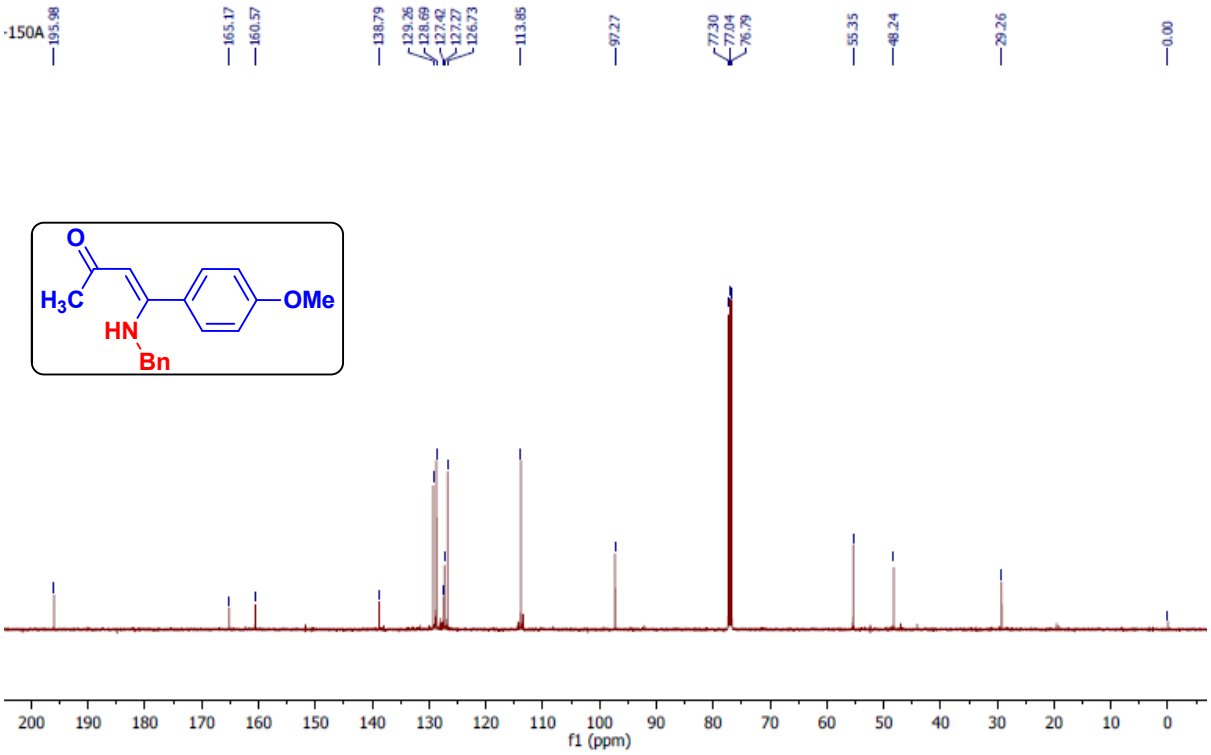
(*Z*)-3-(benzylamino)-3-(4-nitrophenyl)-1-phenylprop-2en-1-one:



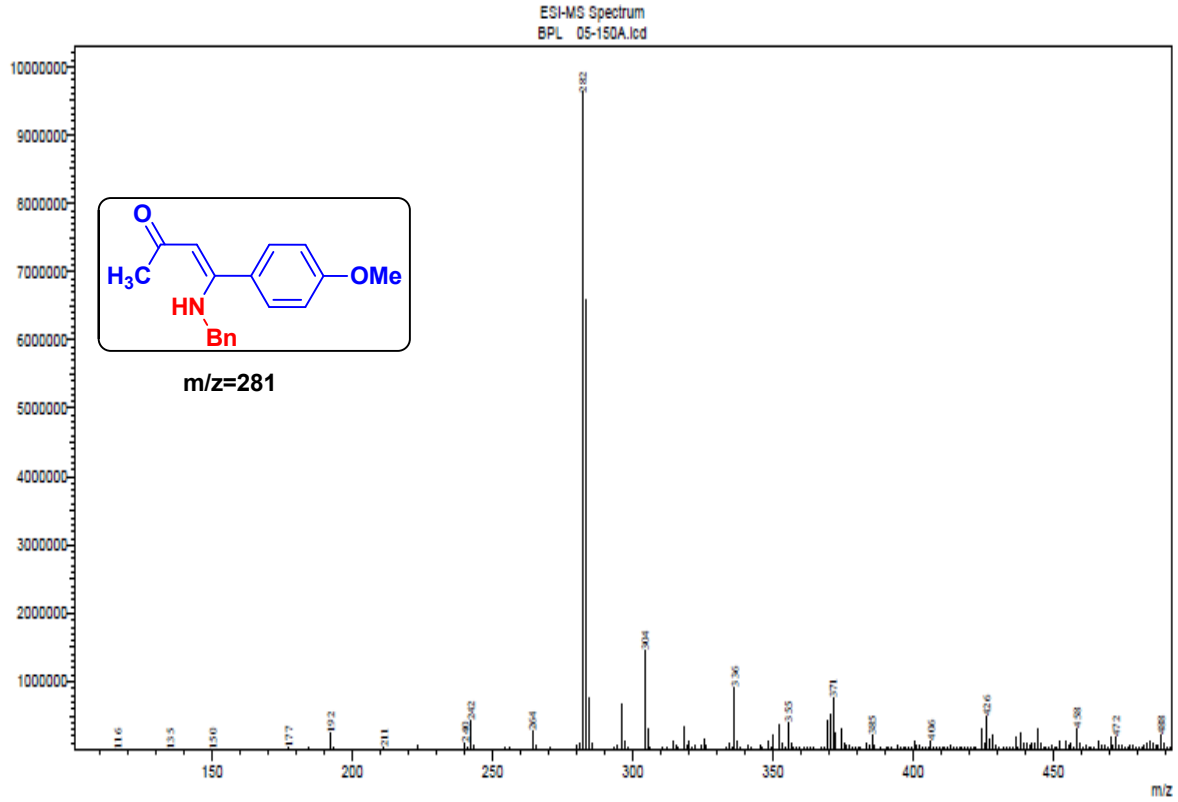
(*Z*)-4-(benzylamino)-4-(4-methoxyphenyl)but-3en-2-one:



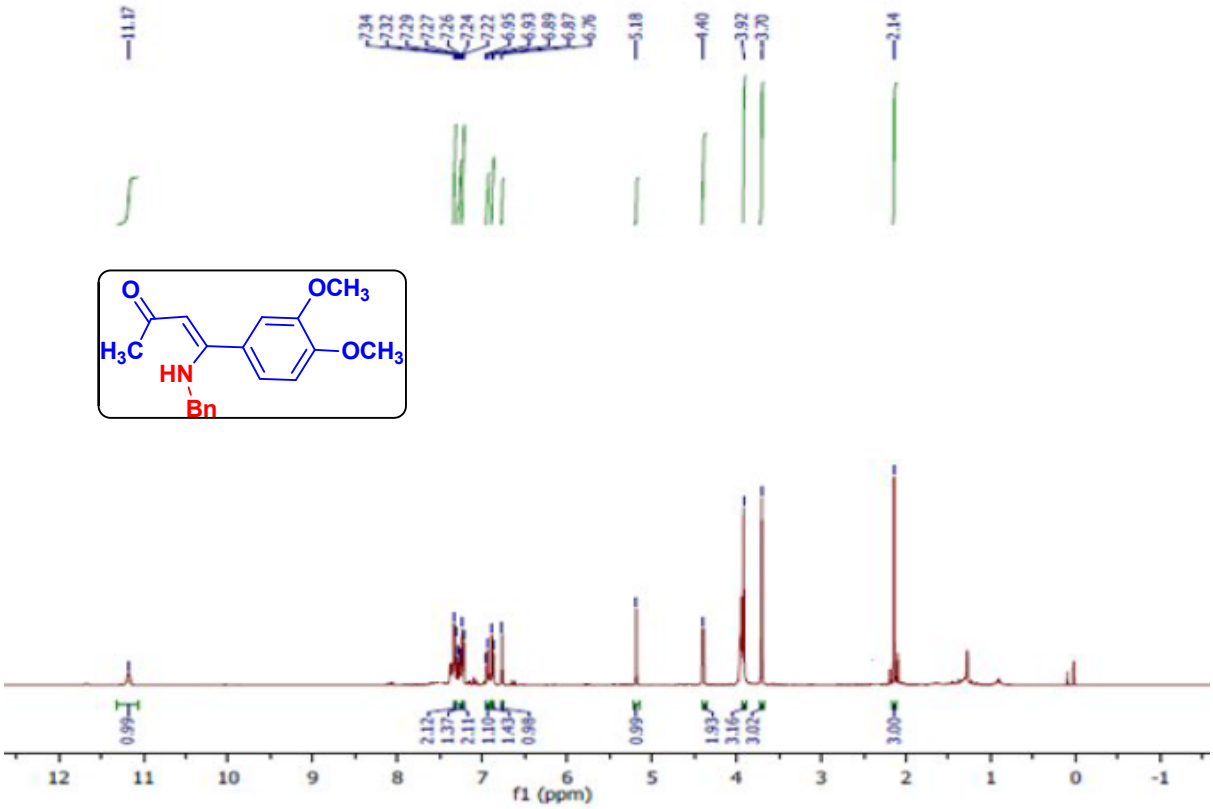
(*Z*)-4-(benzylamino)-4-(4-methoxyphenyl)but-3en-2-one:



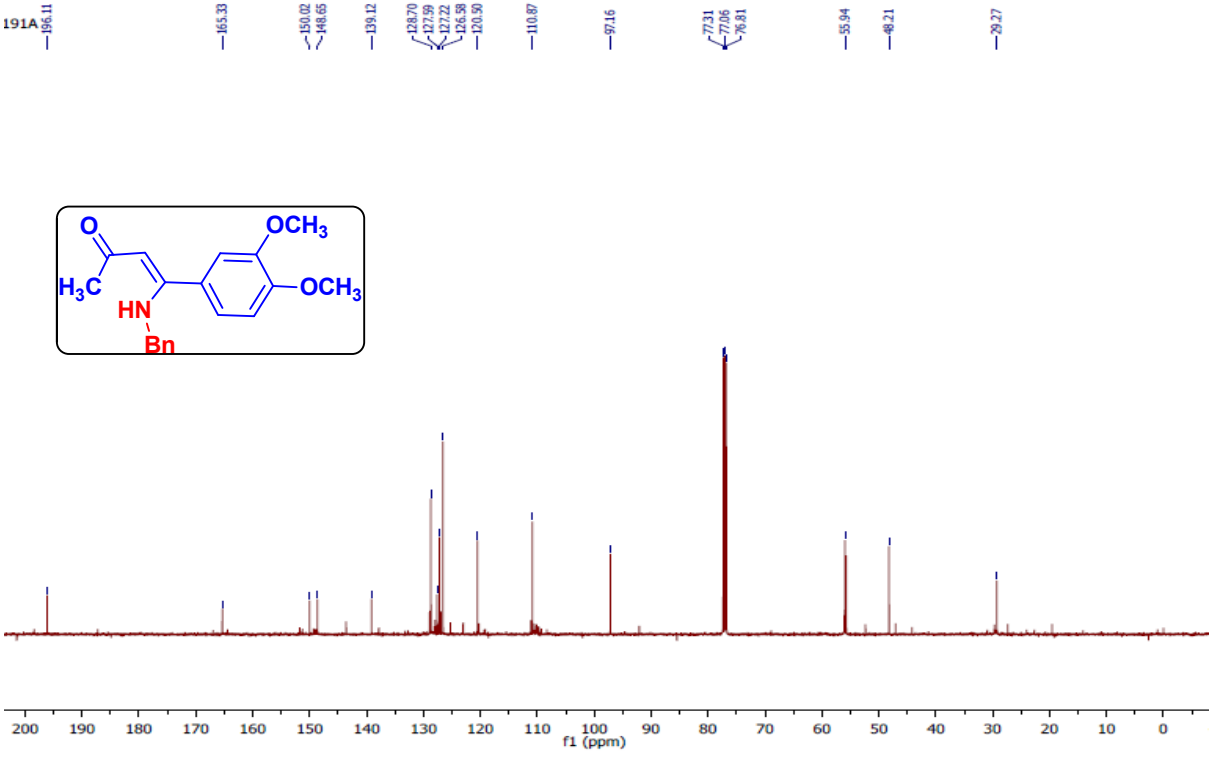
(*Z*)-4-(benzylamino)-4-(4-methoxyphenyl)but-3en-2-one:



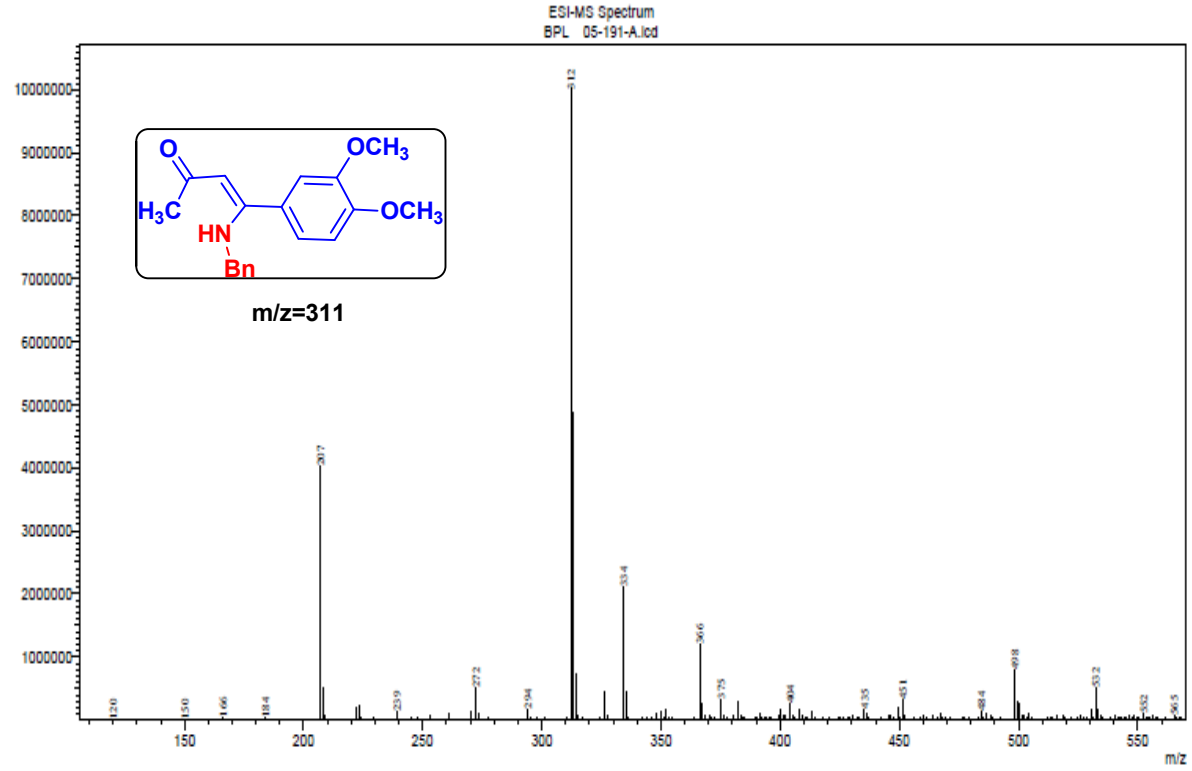
(*Z*)-4-(benzylamino)-4-(3,4-dimethoxyphenyl)but-3en-2-one:



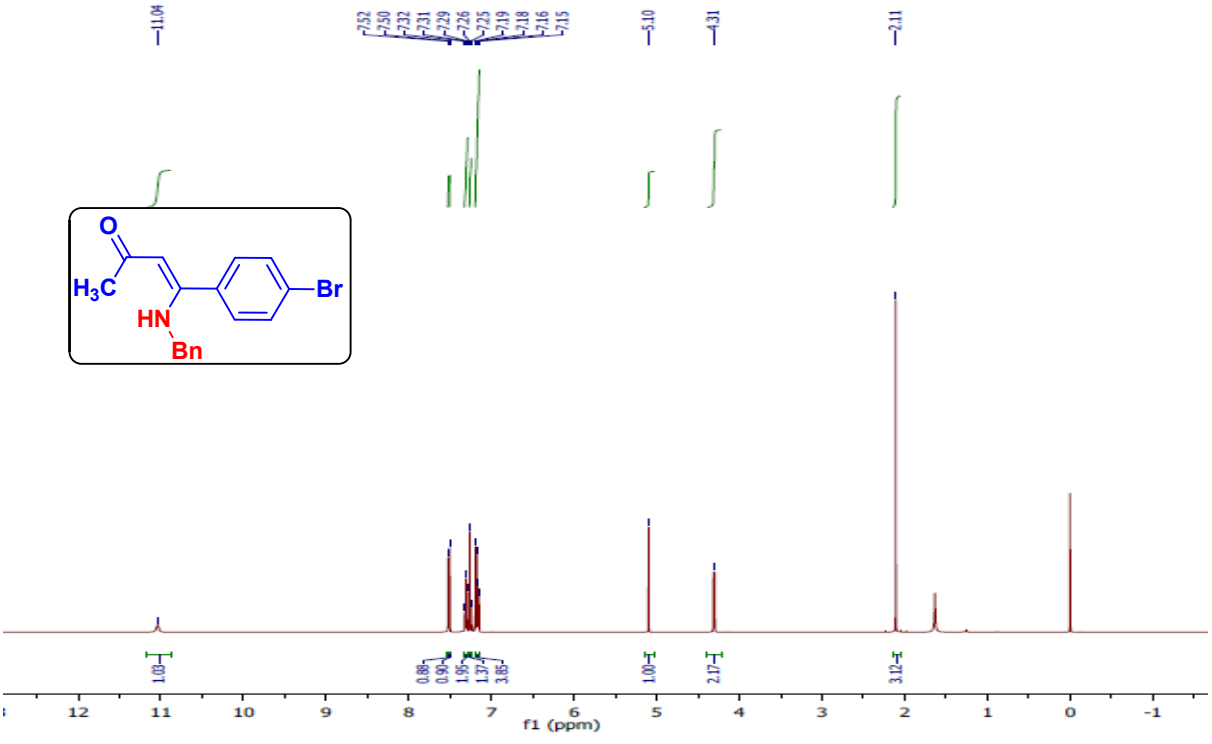
(*Z*)-4-(benzylamino)-4-(3,4-dimethoxyphenyl)but-3en-2-one:



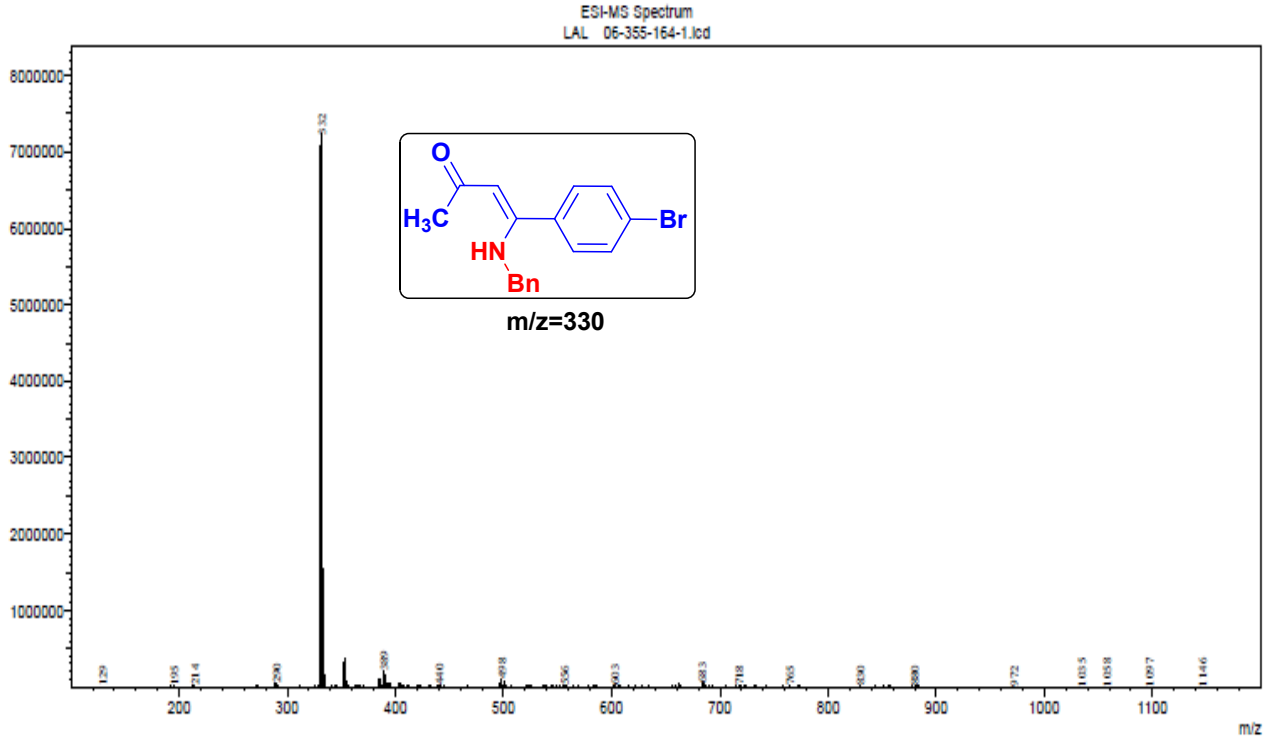
(*Z*)-4-(benzylamino)-4-(3,4-dimethoxyphenyl)but-3en-2-one:



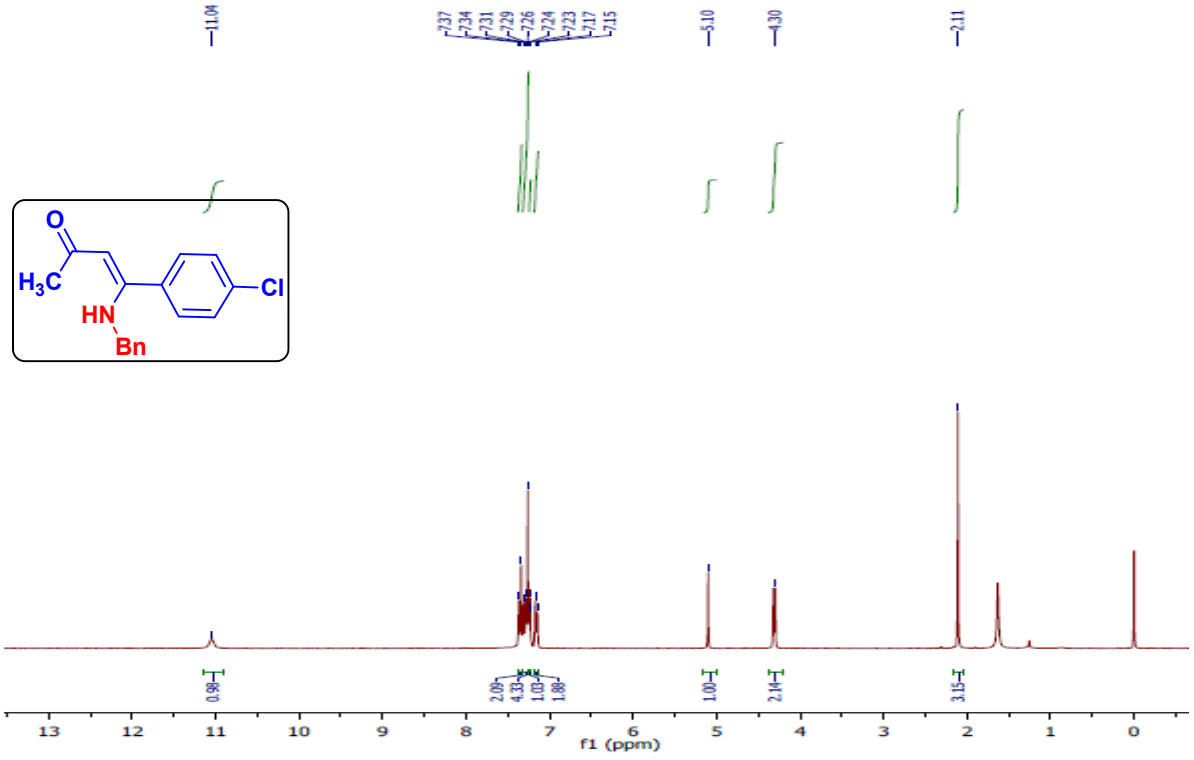
(*Z*)-4-(benzylamino)-4-(4-bromophenyl)but-3en-2-one:



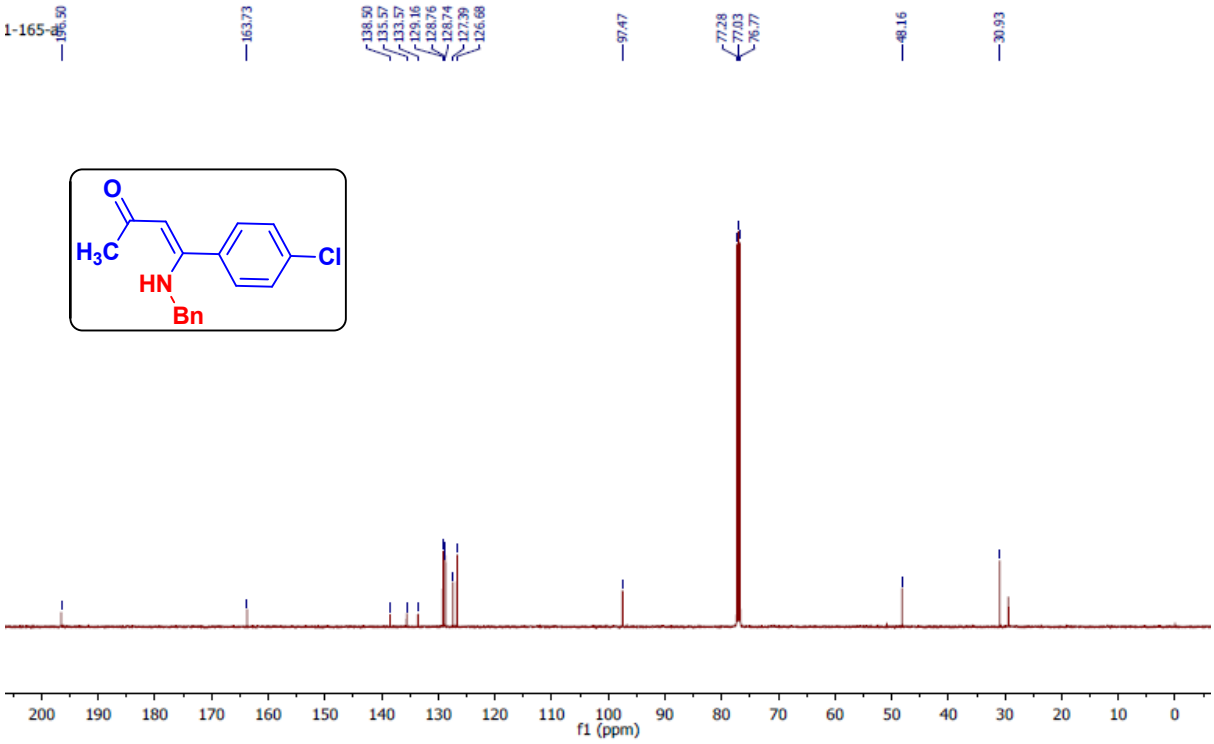
(*Z*)-4-(benzylamino)-4-(4-bromophenyl)but-3en-2-one:



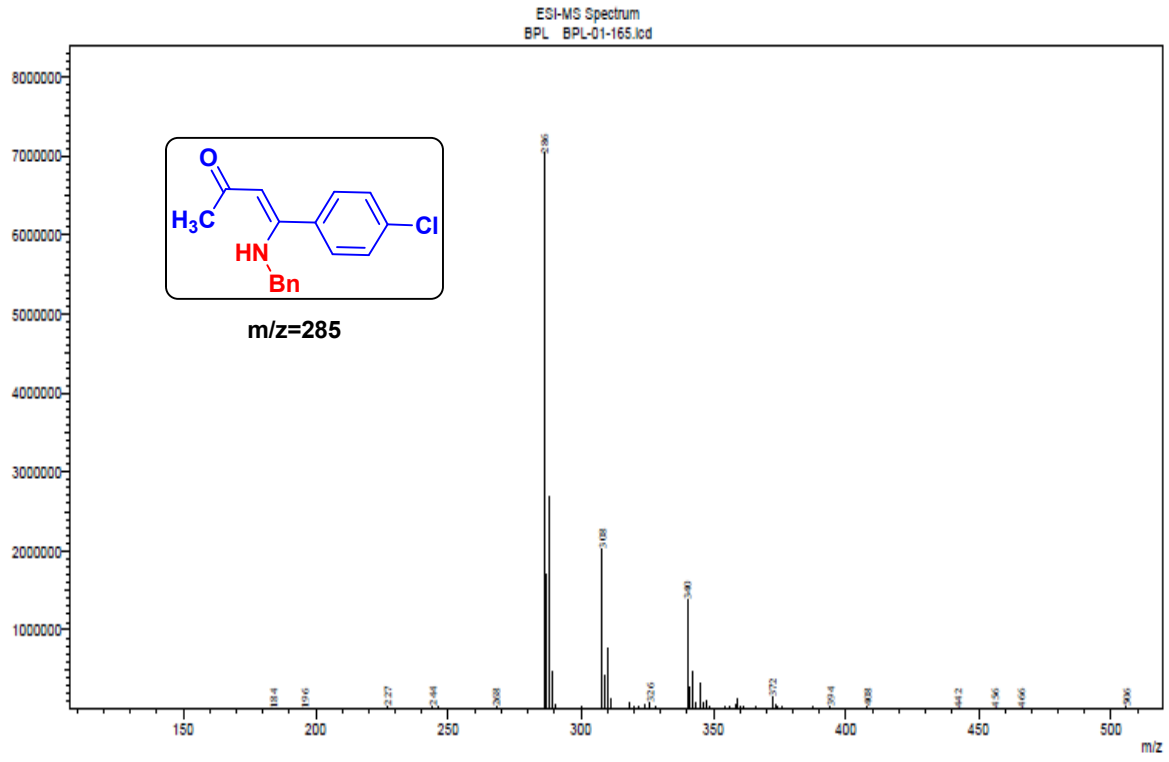
(*Z*)-4-(benzylamino)-4-(4-chlorophenyl)but-3en-2-one:



(*Z*)-4-(benzylamino)-4-(4-chlorophenyl)but-3en-2-one:



(*Z*)-4-(benzylamino)-4-(4-chlorophenyl)but-3en-2-one:



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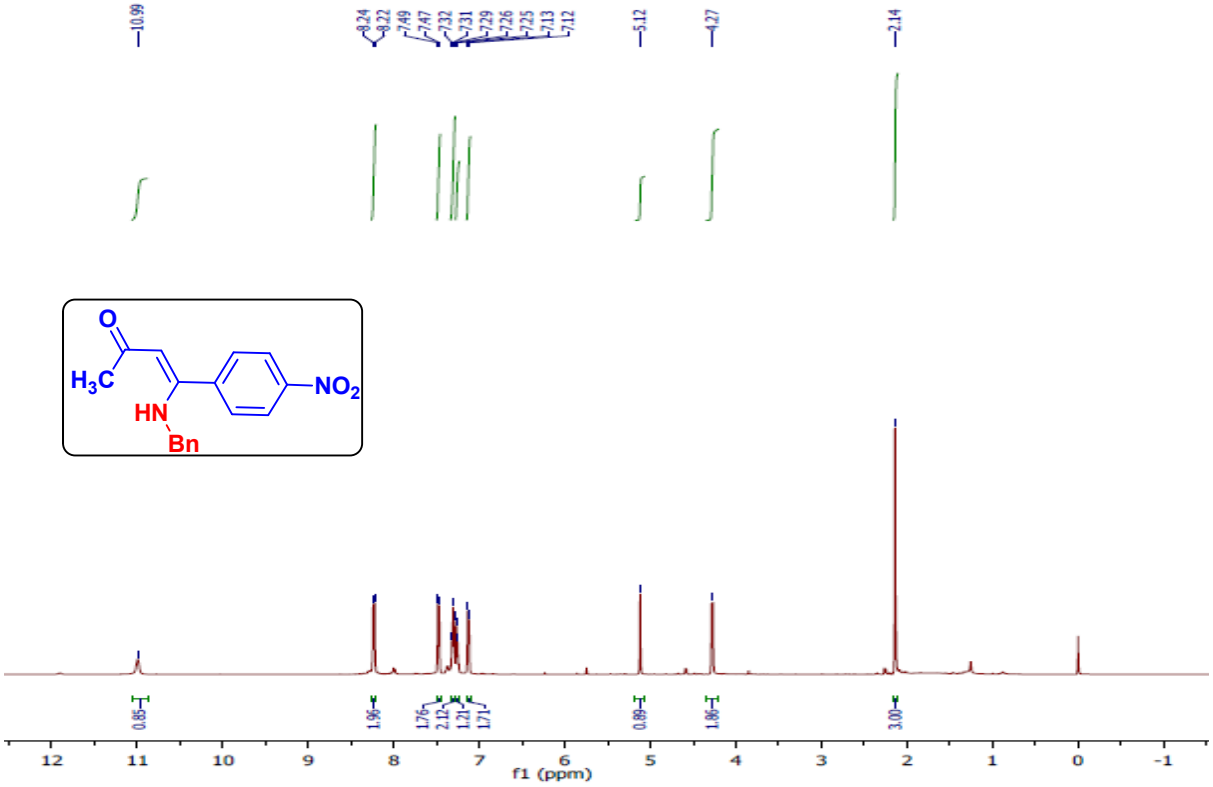
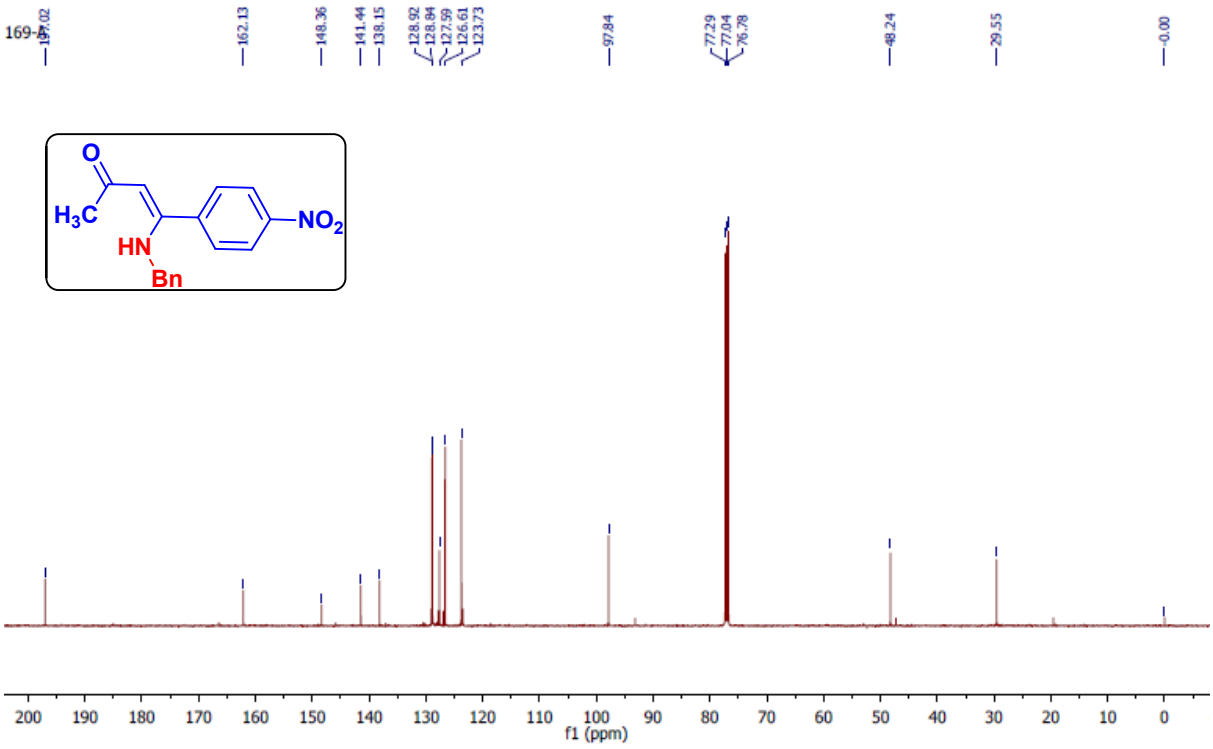
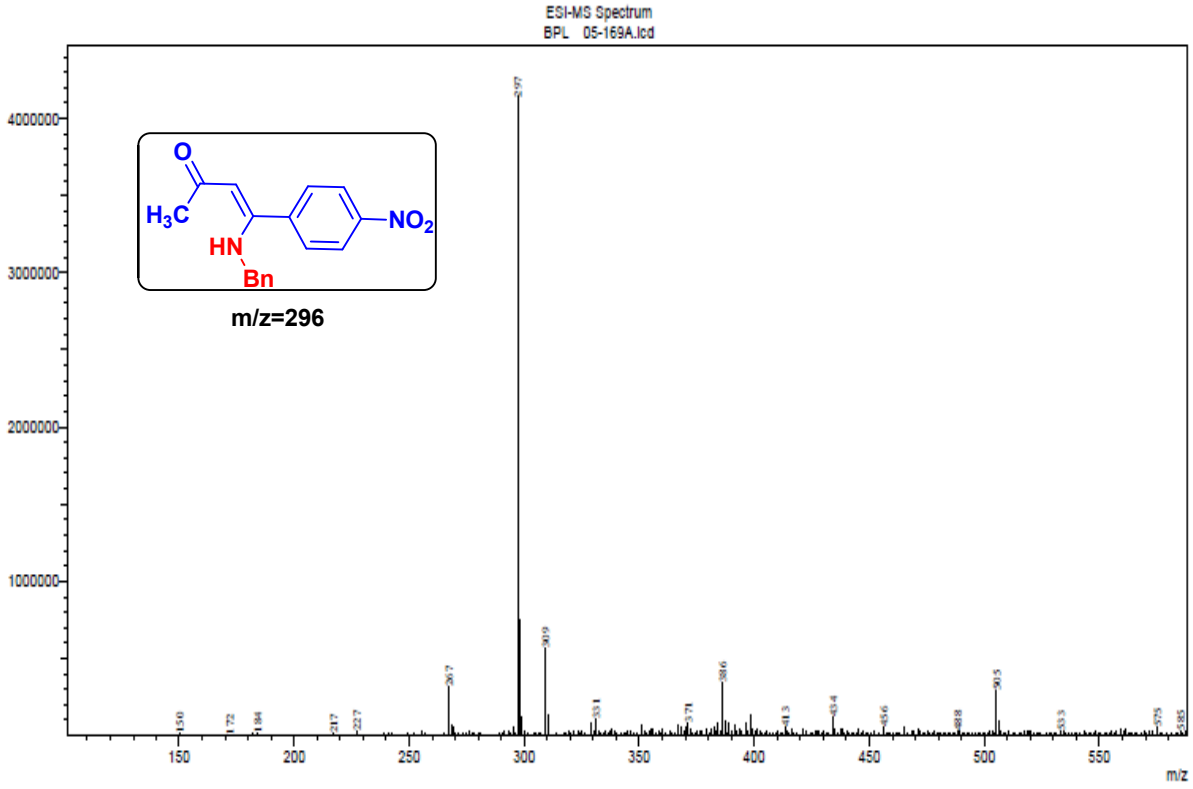


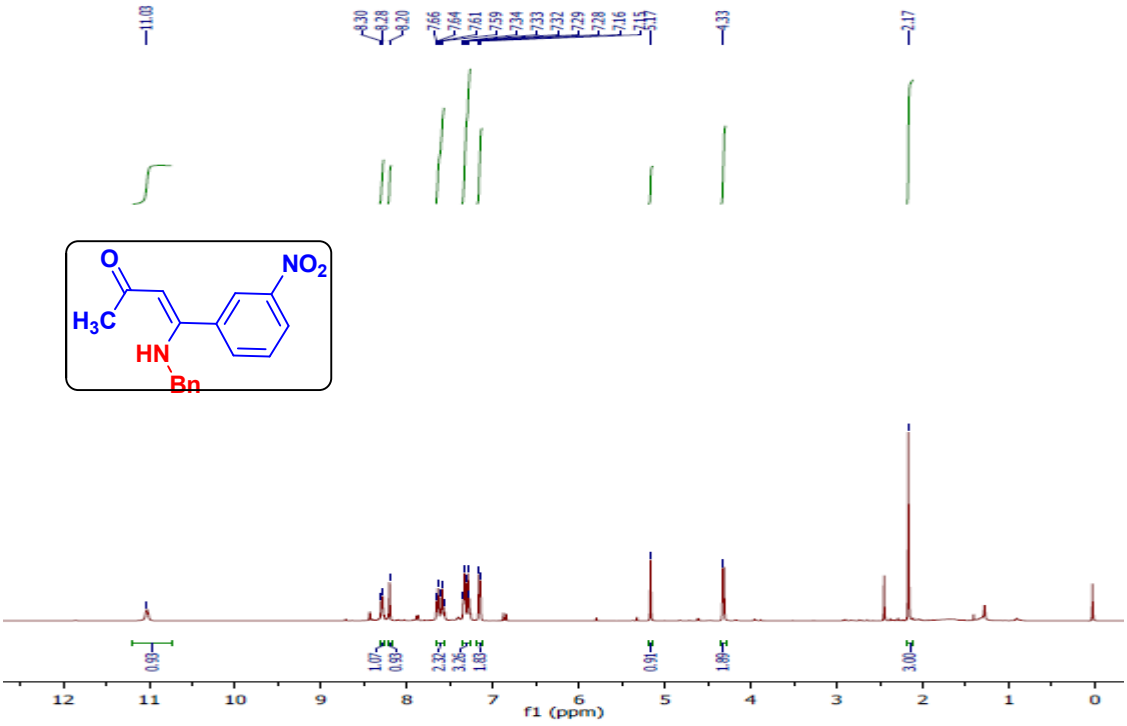
(*Z*)-4-(benzylamino)-4-(4-nitrophenyl)but-3en-2-one:



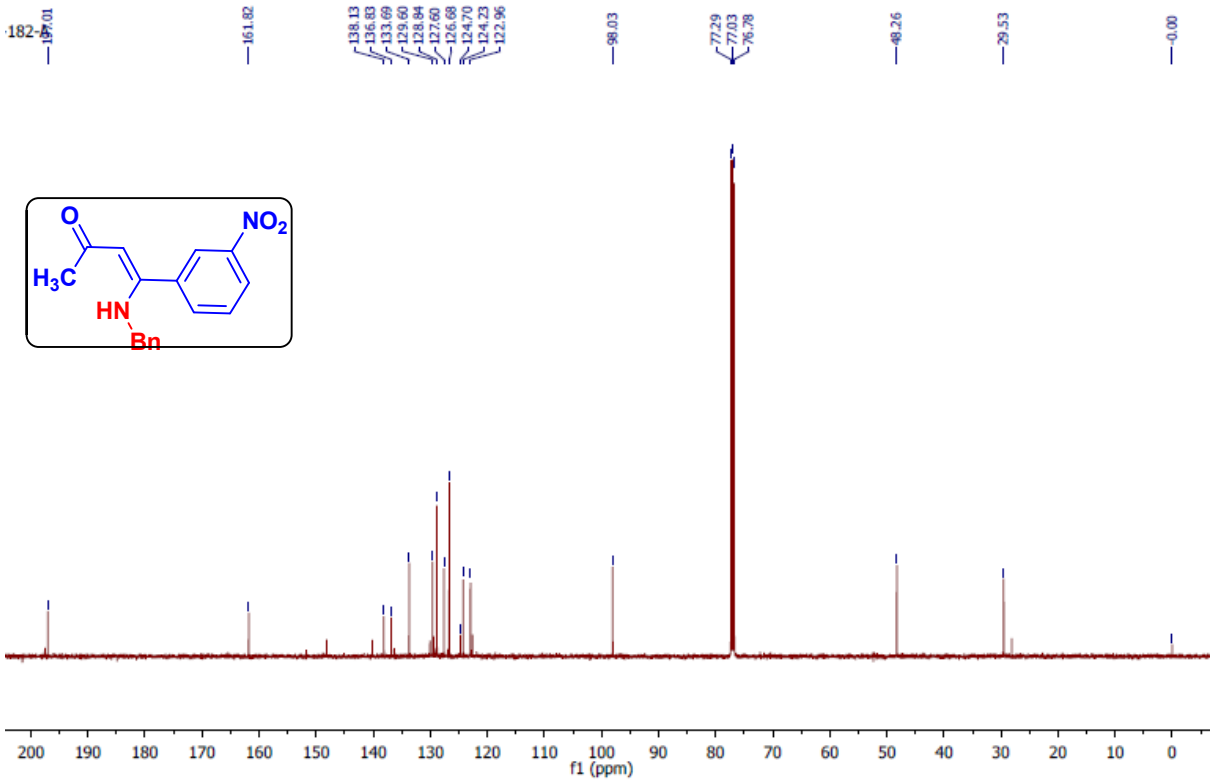
(*Z*)-4-(benzylamino)-4-(4-nitrophenyl)but-3en-2-one:



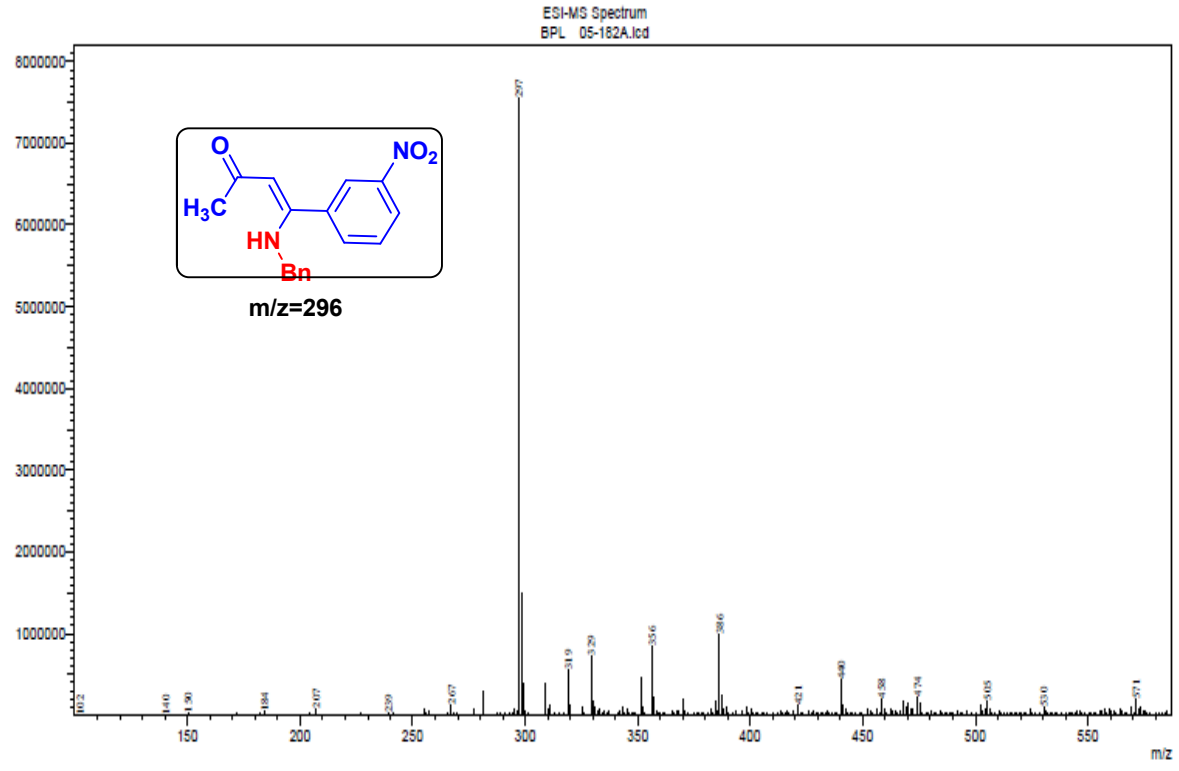
(*Z*)-4-(benzylamino)-4-(3-nitrophenyl)but-3en-2-one:



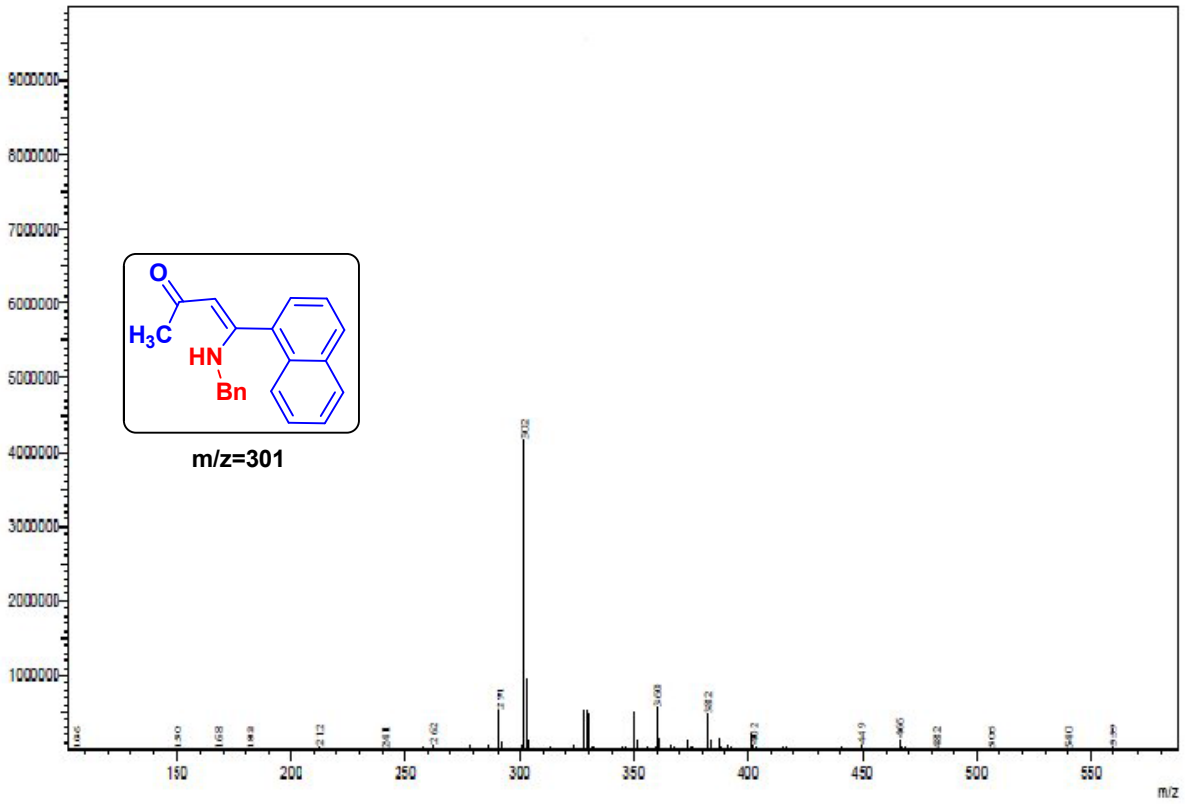
(*Z*)-4-(benzylamino)-4-(3-nitrophenyl)but-3en-2-one:



(*Z*)-4-(benzylamino)-4-(3-nitrophenyl)but-3en-2-one:



(*Z*)-4-(benzylamino)-4-(naphthalene-1-yl)but-3en-2-one:



(*Z*)-4-(benzylamino)-4-phenylbut-3en-2-one: