

SUPPORTING INFORMATION

A layered double hydroxide, a synthetically useful heterogeneous catalyst for azide–alkyne cycloadditions in a continuous-flow reactor

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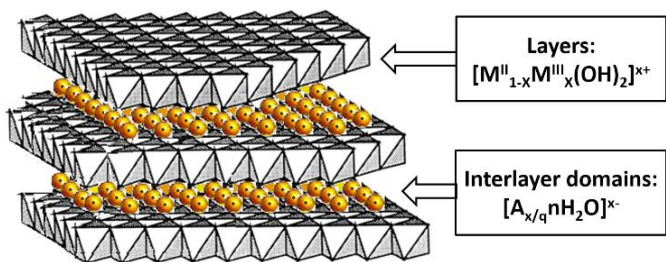


Fig. 1S Schematic structure of LDHs.

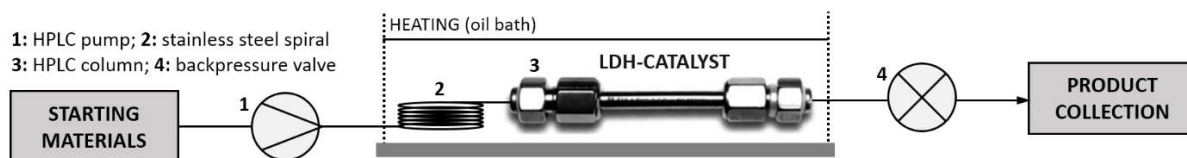


Fig. 2S Experimental setup for the CF reactions.

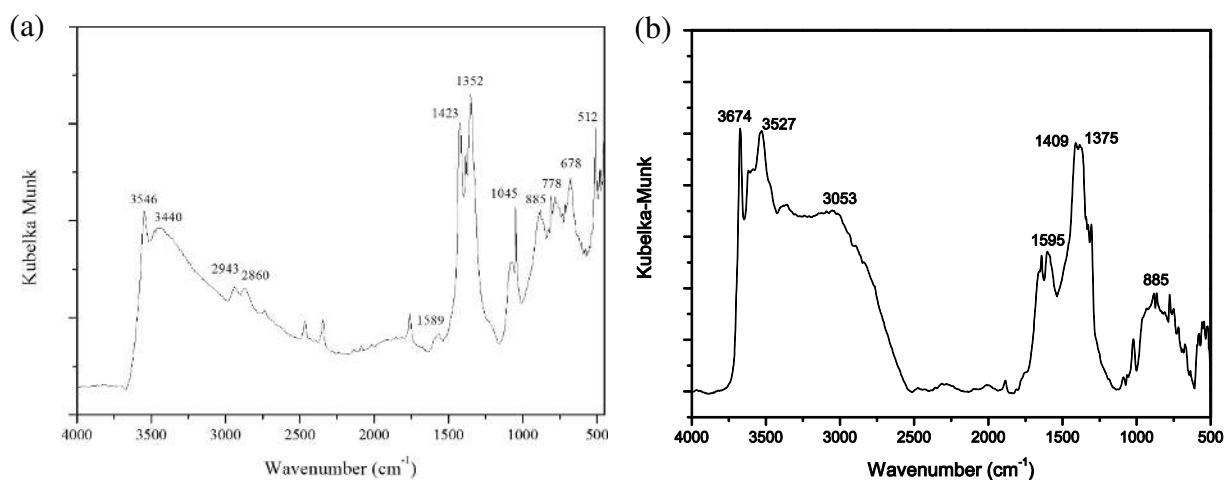


Fig. 3S FT-IR spectra of the Cu(II)Fe(III)-LDH: as-prepared material (a), after the 10-hour long synthesis (b).

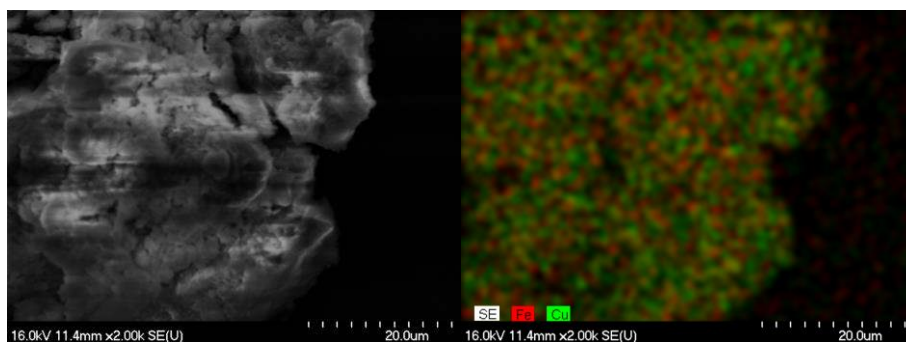


Fig. 4S. Elemental map of the as-prepared Cu(II)Fe(III)-LDH.

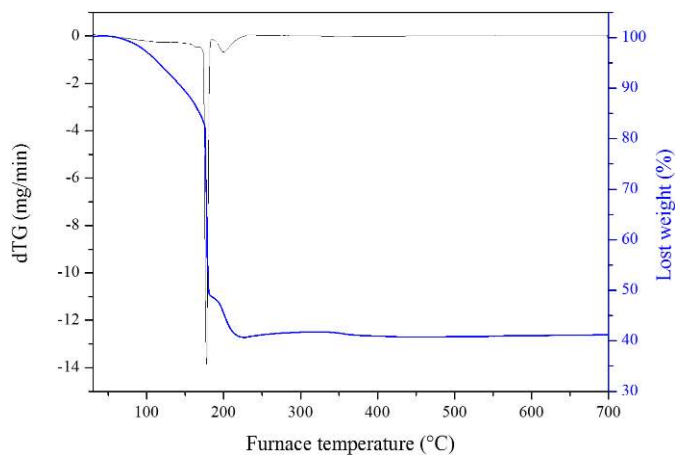


Fig. 5S TG/dTG curves of the as-prepared Cu(II)Fe(III)-LDH.

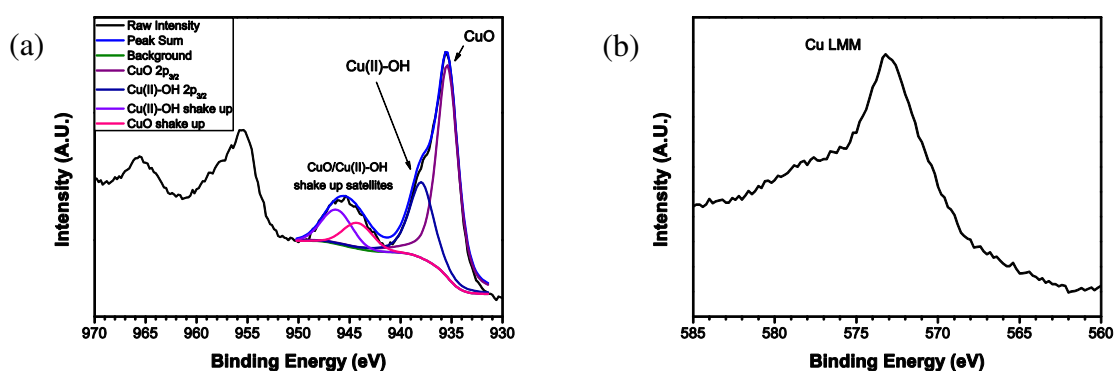
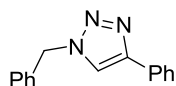


Fig. 6S XPS spectra indicating the presence of only Cu(II) ions for the as-prepared material (a) and as well as for the LDH sample after the 10-hour long run.

Table 1S Elemental composition of the Cu(II)Fe(III)-LDH determined by ICP–AES.

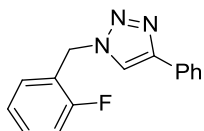
Sample	Cu		Fe		Cu/Fe
	wt%	mmol/g	wt%	mmol/g	
as-prepared	32.4510	5.107	16.2111	2.903	1.76
after the 10-hour long run	32.4422	5.105	16.2084	2.902	1.76

1-Benzyl-4-phenyl-1H-1,2,3-triazole, 1:



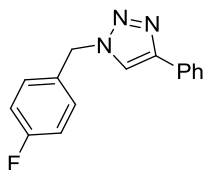
White solid; mp: 121–124 °C (lit.^[S1] mp: 123–125 °C); NMR data is in agreement with the literature reference.^[S1] ¹H NMR (400.1 MHz, CDCl₃) δ_H: 5.60 (s, 2H, CH₂), 7.31–7.38 (m, 3H, Ar-H), 7.38–7.47 (m, 5H, Ar-H), 7.70 (s, 1H, Ar-H), 7.80–7.88 (d, 2H, Ar-H, *J*=7.8 Hz).

1-(2-Fluorobenzyl)-4-phenyl-1H-1,2,3-triazole, 2:



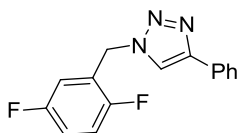
White solid; mp: 87–91 °C (lit.^[S2] mp: 89–92 °C); NMR data is in agreement with the literature reference.^[S3] ¹H NMR (400.1 MHz, CDCl₃) δ_H: 5.63 (s, 2H, CH₂), 7.07–7.21 (m, 2H, Ar-H), 7.27–7.47 (m, 5H, Ar-H), 7.77 (s, 1H, Ar-H), 7.78–7.86 (d, 2H, Ar-H, *J*=7.8 Hz).

1-(4-Fluorobenzyl)-4-phenyl-1H-1,2,3-triazole, 3:



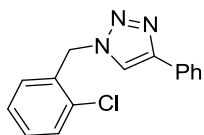
White solid; mp: 130–133 °C (lit.^[S4] mp: 129–131 °C); NMR data is in agreement with the literature reference.^[S4] ¹H NMR (400.1 MHz, CDCl₃) δ_H: 5.52 (s, 2H, CH₂), 6.98–7.11 (t, 2H, Ar-H, *J*=8.1 Hz), 7.23–7.35 (m, 3H, Ar-H), 7.36–7.45 (m, 2H, Ar-H), 7.67 (s, 1H, Ar-H), 7.74–7.85 (d, 2H, Ar-H, *J*=7.4 Hz).

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



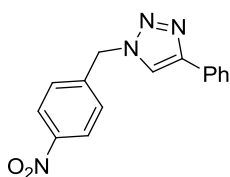
White solid; mp: 100–103 °C (lit.^[S2] mp: 98–102 °C); NMR data is in agreement with the literature reference.^[S2] ¹H NMR (400.1 MHz, CDCl₃) δ_H: 5.61 (s, 2H, CH₂), 6.93–7.16 (m, 3H, Ar-H), 7.29–7.36 (m, 1H, Ar-H), 7.37–7.46 (m, 2H, Ar-H), 7.73–7.89 (m, 3H, Ar-H).

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



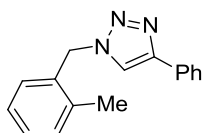
White solid; mp: 80–83 °C (lit.^[S5] mp: 79–81 °C); NMR data is in agreement with the literature reference.^[S5] ¹H NMR (400.1 MHz, CDCl₃) δ_{H} : 5.71 (s, 2H, CH₂), 7.18–7.35 (m, 4H, Ar-H), 7.36–7.48 (m, 3H, Ar-H), 7.78 (s, 1H, Ar-H), 7.79–7.88 (d, 2H, Ar-H, $J=7.8$ Hz).

1-(4-Nitrobenzyl)-4-phenyl-1H-1,2,3-triazole, 6:



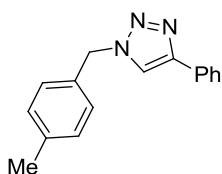
Yellowish solid; mp: 156–159 °C (lit.^[S1] mp: 158–159 °C); NMR data is in agreement with the literature reference.^[S1] ¹H NMR (400.1 MHz, CDCl₃) δ_{H} : 5.71 (s, 2H, CH₂), 7.30–7.40 (t, 1H, Ar-H, $J=7.9$ Hz), 7.40–7.50 (m, 4H, Ar-H), 7.77 (s, 1H, Ar-H), 7.80–7.88 (d, 2H, Ar-H, $J=7.7$ Hz), 8.20–8.31 (d, 2H, Ar-H, $J=8.3$ Hz).

1-(2-Methylbenzyl)-4-phenyl-1H-1,2,3-triazole, 7:



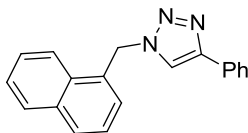
White solid; mp: 91–94 °C (lit.^[S6] mp: 94–95 °C); NMR data is in agreement with the literature reference.^[S6] ¹H NMR (400.1 MHz, CDCl₃) δ_{H} : 2.32 (s, 3H, CH₃), 5.56 (s, 2H, CH₂), 7.18–7.27 (m, 3H, Ar-H), 7.27–7.34 (m, 2H, Ar-H), 7.35–7.43 (t, 2H, Ar-H, $J=7.3$ Hz), 7.55 (s, 1H, Ar-H), 7.75–7.84 (d, 2H, Ar-H, $J=7.3$ Hz).

1-(4-Methylbenzyl)-4-phenyl-1H-1,2,3-triazole, 8:



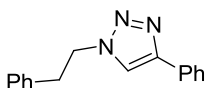
White solid; mp: 92–94 °C (lit.^[S1] mp: 93–95 °C); NMR data is in agreement with the literature reference.^[S1] ¹H NMR (400.1 MHz, CDCl₃) δ_{H} : 2.36 (s, 3H, CH₃), 5.52 (s, 2H, CH₂), 7.15–7.25 (m, 4H, Ar-H), 7.29–7.34 (m, 1H, Ar-H), 7.35–7.43 (m, 2H, Ar-H), 7.65 (s, 1H, Ar-H), 7.75–7.83 (d, 2H, Ar-H, $J=7.4$ Hz).

1-(Naphthalen-1-ylmethyl)-4-phenyl-1H-1,2,3-triazole, 9:



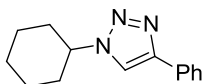
White solid; mp: 138–141 °C (lit.^[S7] mp: 141–142 °C); NMR data is in agreement with the literature reference.^[S7] ¹H NMR (400.1 MHz, CDCl₃) δ_H: 5.76 (s, 2H, CH₂), 7.30–7.37 (m, 1H, Ar-H), 7.38–7.45 (m, 3H, Ar-H), 7.50–7.59 (m, 2H, Ar-H), 7.71 (s, 1H, Ar-H), 7.78–7.92 (m, 6H, Ar-H).

1-Phenethyl-4-phenyl-1H-1,2,3-triazole, 10:



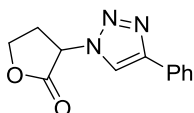
White solid; mp: 139–142 °C (lit.^[S1] mp: 141–142 °C); NMR data is in agreement with the literature reference.^[S1] ¹H NMR (400.1 MHz, CDCl₃) δ_H: 3.19–3.31 (t, 2H, CH₂, *J*=7.2 Hz), 4.56–4.68 (t, 2H, CH₂, *J*=7.2 Hz), 7.09–7.18 (d, 2H, Ar-H, *J*=7.3 Hz), 7.23–7.37 (m, 4H, Ar-H), 7.37–7.46 (m, 2H, Ar-H), 7.49 (s, 1H, Ar-H), 7.73–7.83 (d, 2H, Ar-H, *J*=7.3 Hz).

1-Cyclohexyl-4-phenyl-1H-1,2,3-triazole, 11:



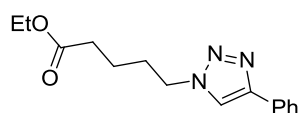
White solid; mp: 106–109 °C (lit.^[S1] mp: 108–109 °C); NMR data is in agreement with the literature reference.^[S1] ¹H NMR (400.1 MHz, CDCl₃) δ_H: 1.20–1.37 (m, 1H, CH₂), 1.38–1.56 (m, 2H, CH₂), 1.69–1.86 (m, 3H, 2 CH₂), 1.86–2.01 (m, 2H, CH₂), 2.16–2.32 (m, 2H, CH₂), 4.40–4.54 (m, 1H, CH), 7.28–7.35 (m, 1H, Ar-H), 7.36–7.46 (m, 2H, Ar-H), 7.70–7.90 (m, 3H, Ar-H).

3-(4-Phenyl-1H-1,2,3-triazol-1-yl)dihydrofuran-2(3H)-one, 12:



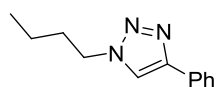
White solid; mp: 138–142 °C (lit.^[S1] mp: 140–141 °C); NMR data is in agreement with the literature reference.^[S1] ¹H NMR (400.1 MHz, CDCl₃) δ_H: 2.98–3.20 (m, 2H, CH₂), 4.46–4.62 (m, 1H, CH₂), 4.62–4.79 (m, 1H, CH₂), 5.30–5.46 (t, 1H, CH, *J*=9.1 Hz), 7.30–7.39 (m, 1H, Ar-H), 7.39–7.49 (m, 2H, Ar-H), 7.77–7.90 (d, 2H, Ar-H, *J*=7.7 Hz), 8.05 (s, 1H, Ar-H).

Ethyl 5-(4-phenyl-1H-1,2,3-triazol-1-yl)pentanoate, 13:



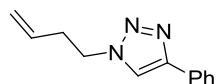
White solid; mp: 50–53 °C (lit.^[S8] mp: 50–53 °C); NMR data is in agreement with the literature reference.^[S8] ¹H NMR (400.1 MHz, CDCl₃) δ_{H} : 1.17–1.29 (m, 3H, CH₃), 1.61–1.74 (m, 2H, CH₂), 1.92–2.05 (m, 2H, CH₂), 2.23–2.40 (m, 2H, CH₂), 4.03–4.17 (m, 2H, CH₂), 4.33–4.45 (m, 2H, CH₂), 7.28–7.35 (m, 1H, Ar-H), 7.36–7.45 (m, 2H, Ar-H), 7.72–7.86 (m, 3H, Ar-H).

1-Butyl-4-phenyl-1H-1,2,3-triazole, 14:



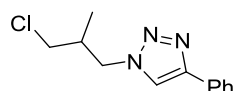
White solid; mp: 46–49 °C (lit.^[S9] mp: 46–47 °C); NMR data is in agreement with the literature reference.^[S9] ¹H NMR (400.1 MHz, CDCl₃) δ_{H} : 0.92–1.04 (t, 3H, CH₃, $J=7.4$ Hz), 1.36–1.46 (m, 2H, CH₂), 1.88–1.99 (m, 2H, CH₂), 4.35–4.44 (t, 2H, CH₂, $J=7.3$ Hz), 7.30–7.37 (m, 1H, Ar-H), 7.38–7.46 (m, 2H, Ar-H), 7.75 (s, 1H, Ar-H), 7.79–7.88 (d, 2H, Ar-H, $J=7.5$ Hz).

1-(But-3-en-1-yl)-4-phenyl-1H-1,2,3-triazole, 15:



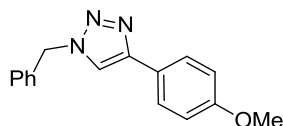
Brownish solid, mp: 40–43 °C (lit.^[S10] mp: 42–44 °C); NMR data is in agreement with the literature reference.^[S11] ¹H NMR (400.1 MHz, CDCl₃) δ_{H} : 2.63–2.76 (m, 2H, CH₂), 4.38–4.53 (t, 2H, CH₂, $J=7.2$ Hz), 5.03–5.19 (d, 2H, CH₂, $J=12.7$ Hz), 5.71–5.87 (m, 1H, CH), 7.29–7.36 (m, 1H, Ar-H), 7.37–7.46 (m, 2H, Ar-H), 7.75 (s, 1H, Ar-H), 7.78–7.87 (d, 2H, Ar-H, $J=7.4$ Hz).

1-(3-Chloro-2-methylpropyl)-4-phenyl-1H-1,2,3-triazole, 16:



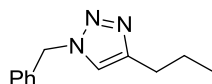
White solid; mp: 48–50 °C (lit.^[S8] mp: 50–51 °C); NMR data is in agreement with the literature reference.^[S8] ¹H NMR (400.1 MHz, CDCl₃) δ_{H} : 1.06–1.15 (d, 3H, CH₃, $J=6.7$ Hz), 2.51–2.64 (m, 1H, CH),), 3.40–3.52 (m, 2H, CH₂), 4.28–4.52 (m, 2H, CH₂), 7.28–7.37 (m, 1H, Ar-H), 7.38–7.47 (m, 2H, Ar-H), 7.75–7.89 (m, 3H, Ar-H).

1-benzyl-4-(4-methoxyphenyl)-1H-1,2,3-triazole, 17:



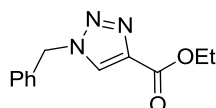
White solid; mp: 140–143 °C (lit.^[S1] mp: 143–145 °C); NMR data is in agreement with the literature reference.^[S1] ¹H NMR (400.1 MHz, CDCl₃) δ_H: 3.81 (s, 3H, CH₃), 5.53 (s, 2H, CH₂), 6.88–6.97 (d, 2H, Ar-H, *J*=8.5 Hz), 7.27–7.41 (m, 5H, Ar-H), 7.59 (s, 1H, Ar-H), 7.69–7.76 (d, 2H, Ar-H, *J*=8.6 Hz).

1-Benzyl-4-propyl-1H-1,2,3-triazole, 18:



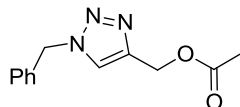
Brownish oil; NMR data is in agreement with the literature reference.^[S11] ¹H NMR (400.1 MHz, CDCl₃) δ_H: 0.93–1.01 (t, 3H, CH₃, *J*=7.2 Hz), 1.64–1.76 (m, 2H, CH₂), 2.65–2.76 (t, 2H, CH₂, *J*=7.6 Hz), 5.52 (s, 2H, CH₂), 7.25–7.30 (m, 2H, Ar-H), 7.32–7.45 (m, 4H, Ar-H).

Ethyl 1-benzyl-1H-1,2,3-triazole-4-carboxylate, 19:



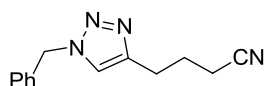
Yellowish solid; mp: 79–82 °C (lit.^[S1] mp: 82–83 °C); NMR data is in agreement with the literature reference.^[S1] ¹H NMR (400.1 MHz, CDCl₃) δ_H: 1.30–1.46 (t, 3H, CH₃, *J*=7.2 Hz), 4.32–4.46 (q, 2H, CH₂, *J*=7.1 Hz), 5.59 (s, 2H, CH₂), 7.24–7.35 (m, 2H, Ar-H), 7.35–7.46 (m, 3H, Ar-H), 8.02 (s, 1H, Ar-H).

(1-Benzyl-1H-1,2,3-triazol-4-yl)methyl acetate, 20:



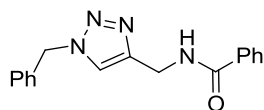
Yellowish solid; mp: 55–58 °C (lit.^[S8] mp: 55–56 °C); NMR data is in agreement with the literature reference.^[S8] ¹H NMR (400.1 MHz, CDCl₃) δ_H: 2.05 (s, 3H, CH₃), 5.20 (s, 2H, CH₂), 5.52 (s, 2H, CH₂), 7.23–7.31 (m, 2H, Ar-H), 7.34–7.41 (m, 3H, Ar-H), 7.57 (s, 1H, Ar-H).

4-(1-Benzyl-1H-1,2,3-triazol-4-yl)butanenitrile, 21:



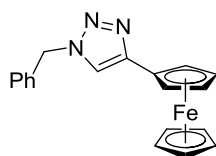
White solid; mp: 61–64 °C (lit.^[S8] mp: 64–66 °C); NMR data is in agreement with the literature reference.^[S8] ¹H NMR (400.1 MHz, CDCl₃) δ_{H} : 2.05–2.14 (m, 2H, CH₂), 2.40–2.47 (t, 2H, CH₂, $J=7.0$ Hz), 2.83–2.91 (t, 2H, CH₂, $J=7.20$ Hz), 5.53 (s, 2H, CH₂), 7.27–7.32 (m, 3H, Ar-H), 7.36–7.45 (m, 3H, Ar-H).

N-((1-benzyl-1H-1,2,3-triazol-4-yl)methyl)benzamide, 22:



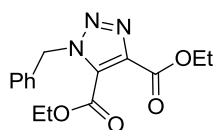
White solid; mp: 125–128 °C (lit.^[S10] mp: 126–128 °C); NMR data is in agreement with the literature reference.^[S12] ¹H NMR (400.1 MHz, CDCl₃) δ_{H} : 4.69–4.75 (d, 2H, CH₂, $J=5.6$ Hz), 5.55 (s, 2H, CH₂), 6.86 (m, 1H, NH), 7.31–7.34 (m, 1H, Ar-H), 7.37–7.50 (m, 5H, Ar-H), 7.51–7.58 (m, 2H, Ar-H), 7.77–7.84 (m, 2H, Ar-H).

1-Benzyl-4-ferrocenyl-1H-1,2,3-triazole, 23:



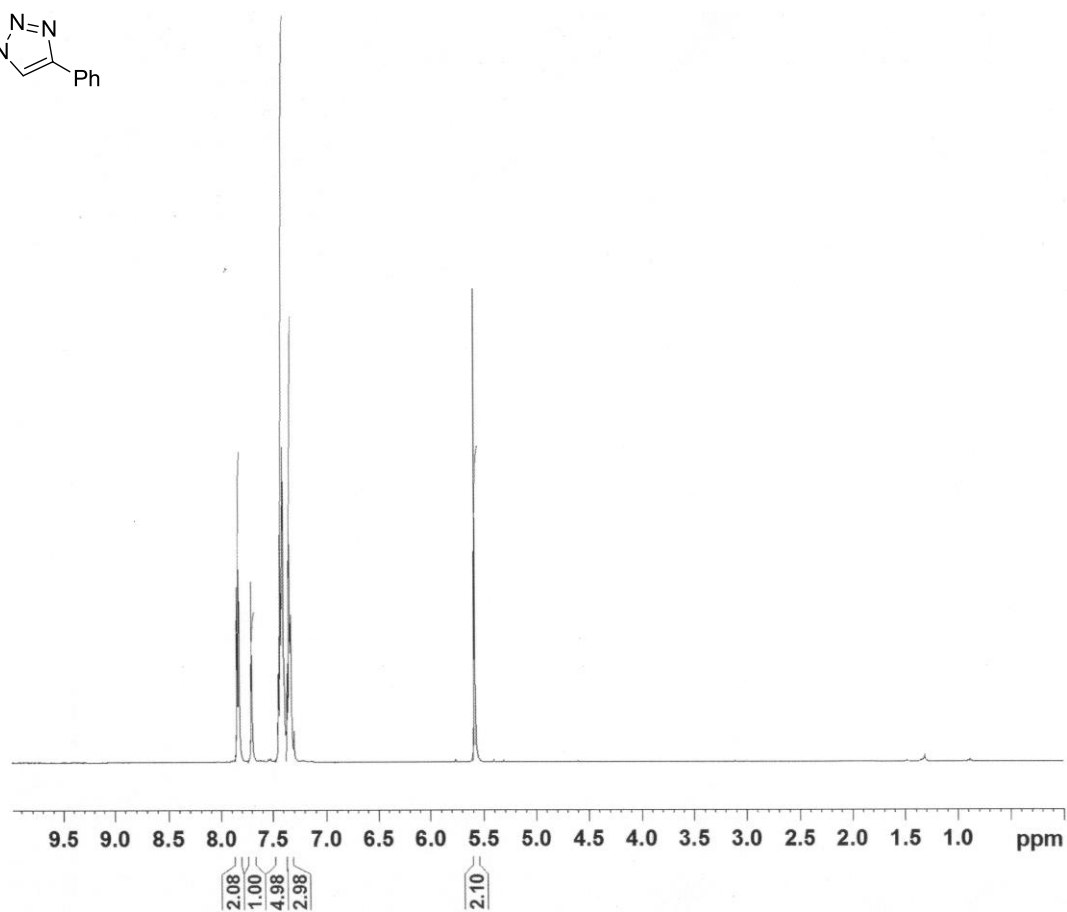
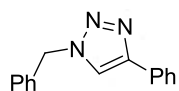
Golden yellow solid; mp: 147–150 °C (lit.^[S13] mp: 145–147 °C); NMR data is in agreement with the literature reference.^[S3] ¹H NMR (400.1 MHz, CDCl₃) δ_{H} : 4.08 (s, 5H, Ar-H), 4.27–4.32 (m, 2H, Ar-H), 4.68–4.75 (m, 2H, Ar-H), 5.58 (s, 2H, CH₂), 7.31–7.34 (m, 2H, Ar-H), 7.35–7.45 (m, 4H, Ar-H).

Diethyl 1-benzyl-1H-1,2,3-triazole-4,5-dicarboxylate, 24:

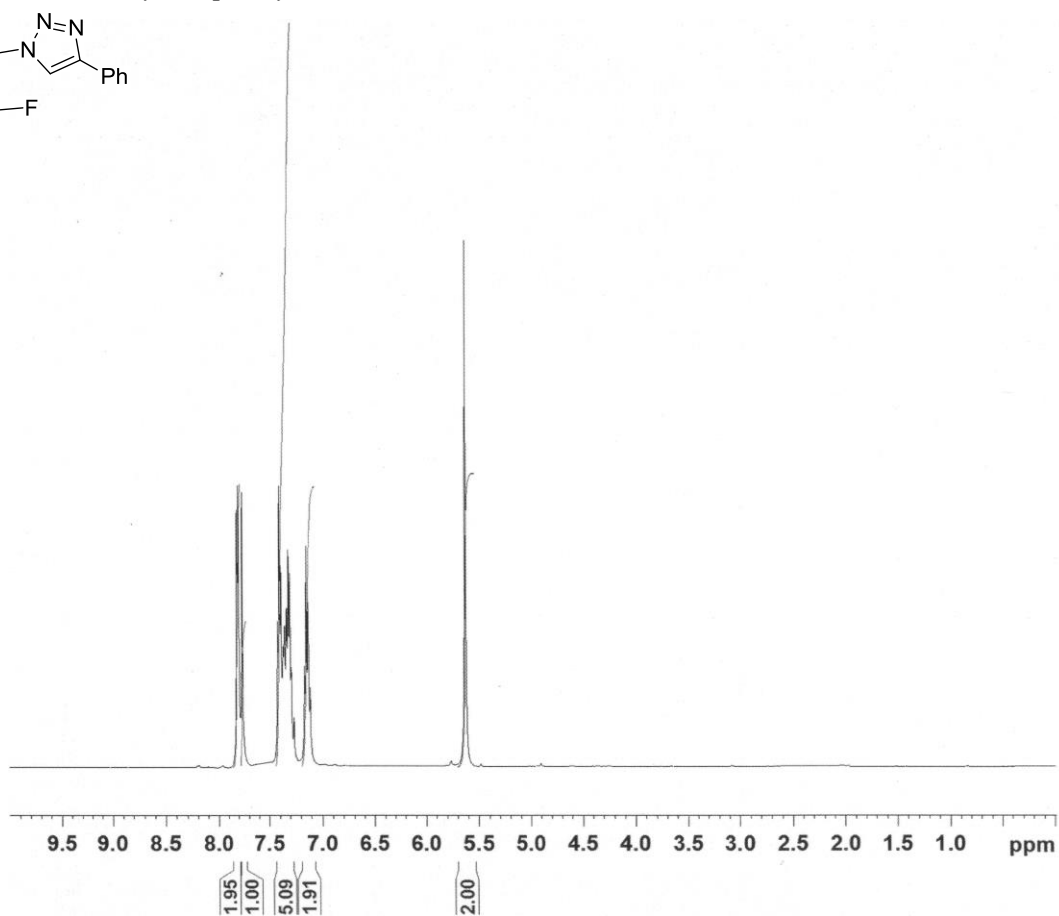
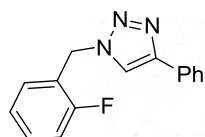


Colorless oil; NMR data is in agreement with the literature reference.^[S14] ¹H NMR (400.1 MHz, CDCl₃) δ_{H} : 1.26–1.33 (t, 3H, CH₃, $J=7.3$ Hz), 1.39–1.44 (t, 3H, CH₃, $J=7.3$ Hz), 4.31–4.40 (q, 2H, CH₂, $J=7.3$ Hz), 4.41–4.50 (q, 2H, CH₂, $J=7.3$ Hz), 5.85 (s, 2H, CH₂), 7.26–7.31 (m, 3H, Ar-H), 7.33–7.38 (m, 2H, Ar-H).

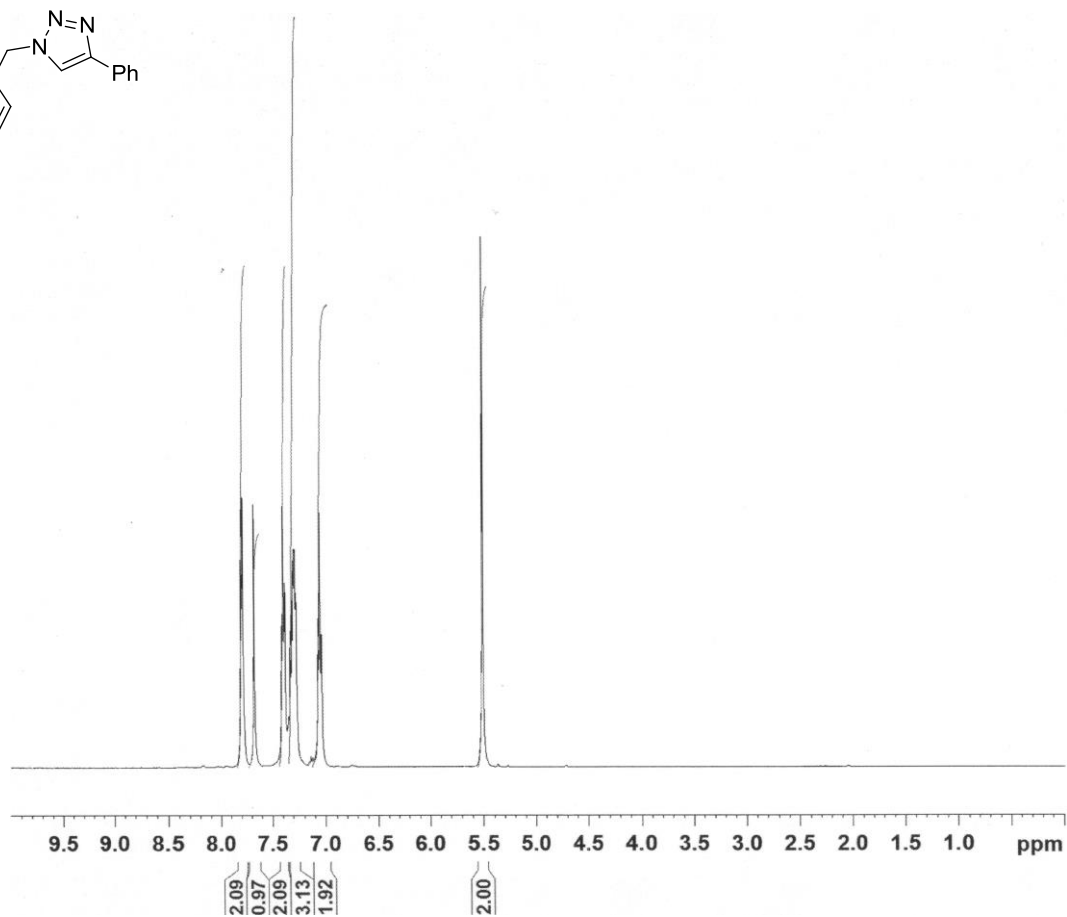
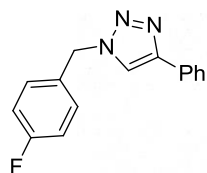
1-Benzyl-4-phenyl-1H-1,2,3-triazole, 1, ¹H NMR in CDCl₃:



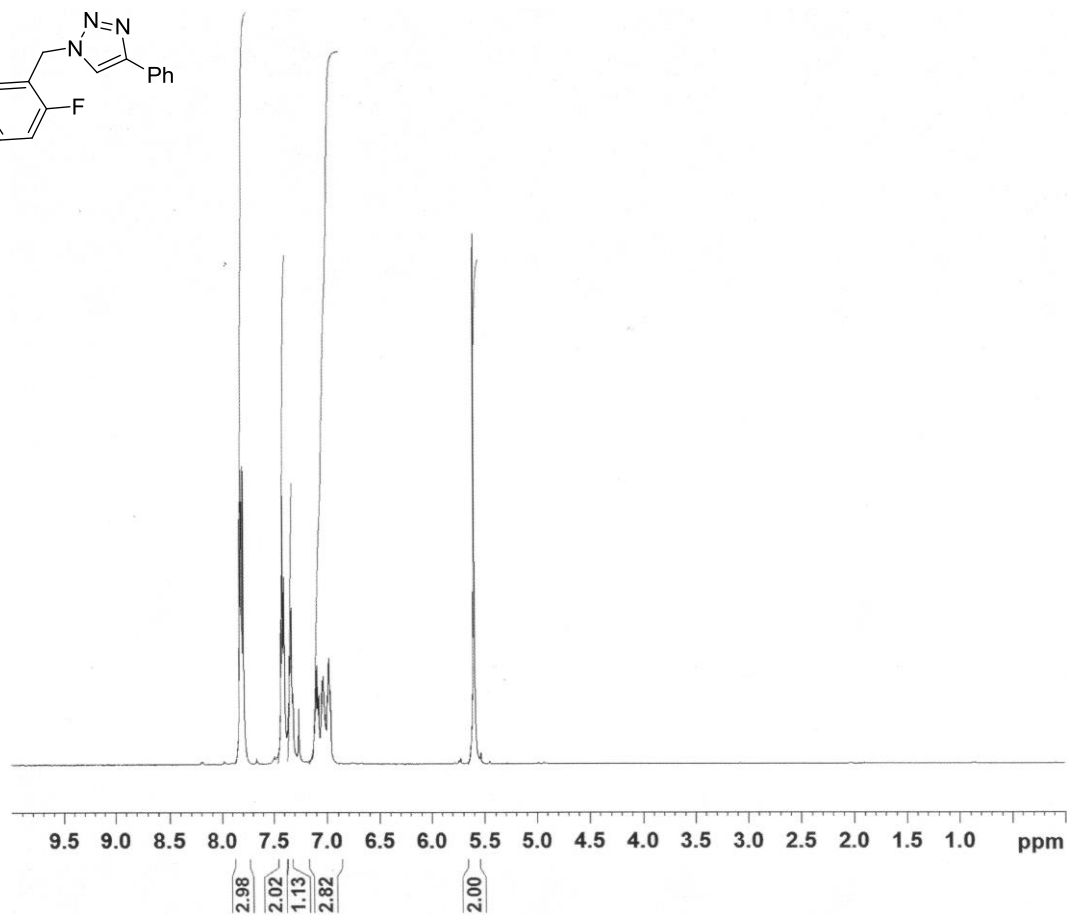
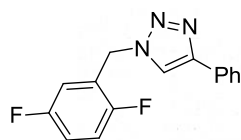
1-(2-Fluorobenzyl)-4-phenyl-1H-1,2,3-triazole, 2, ¹H NMR in CDCl₃:



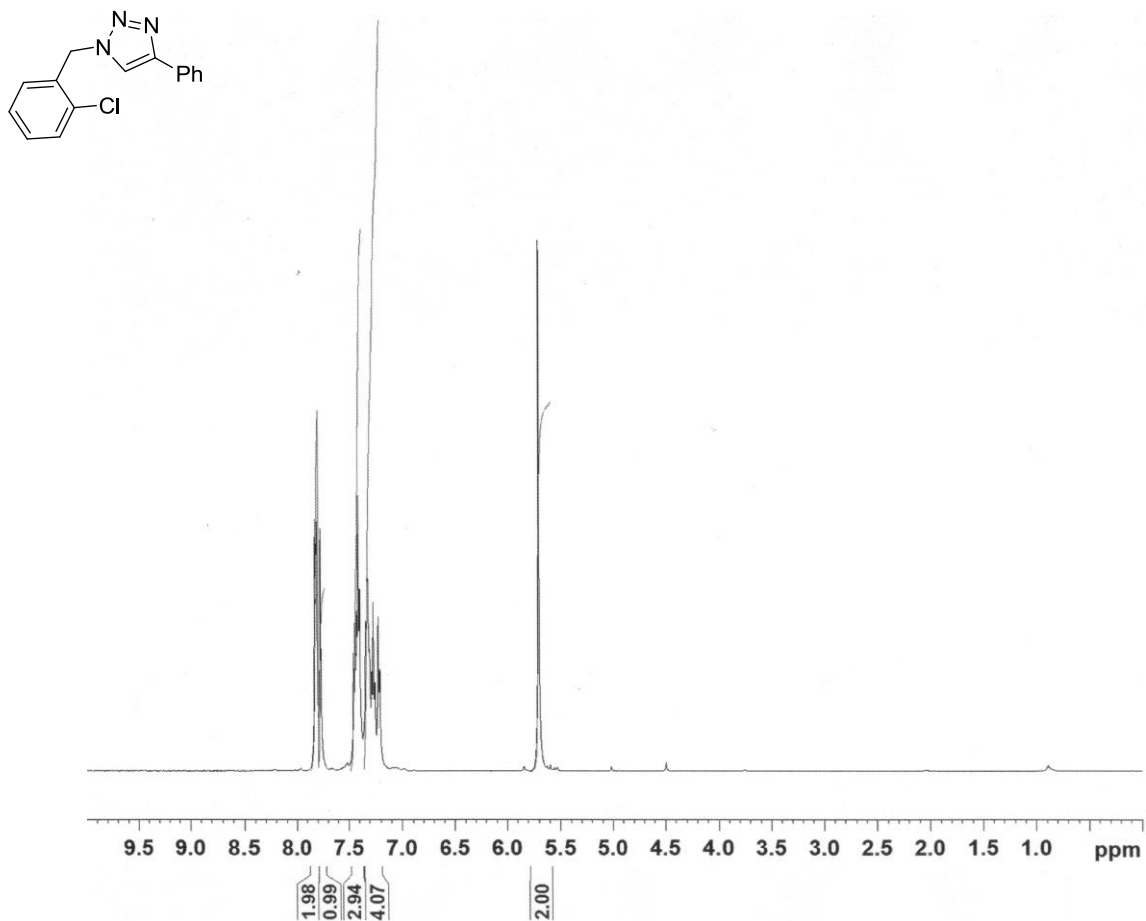
1-(4-Fluorobenzyl)-4-phenyl-1H-1,2,3-triazole, **3**, ^1H NMR in CDCl_3 :



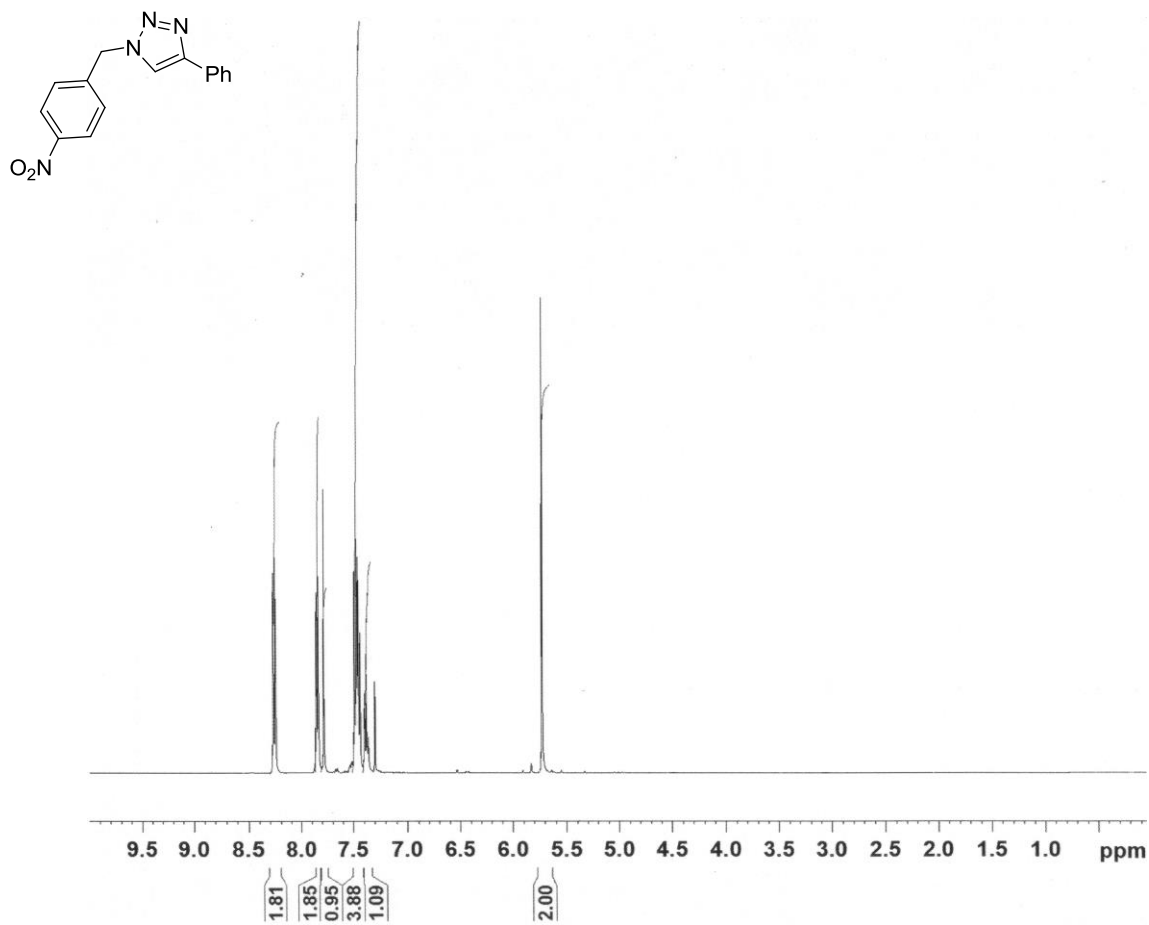
1-(2,5-Difluorobenzyl)-4-phenyl-1H-1,2,3-triazole, **4**, ^1H NMR in CDCl_3 :



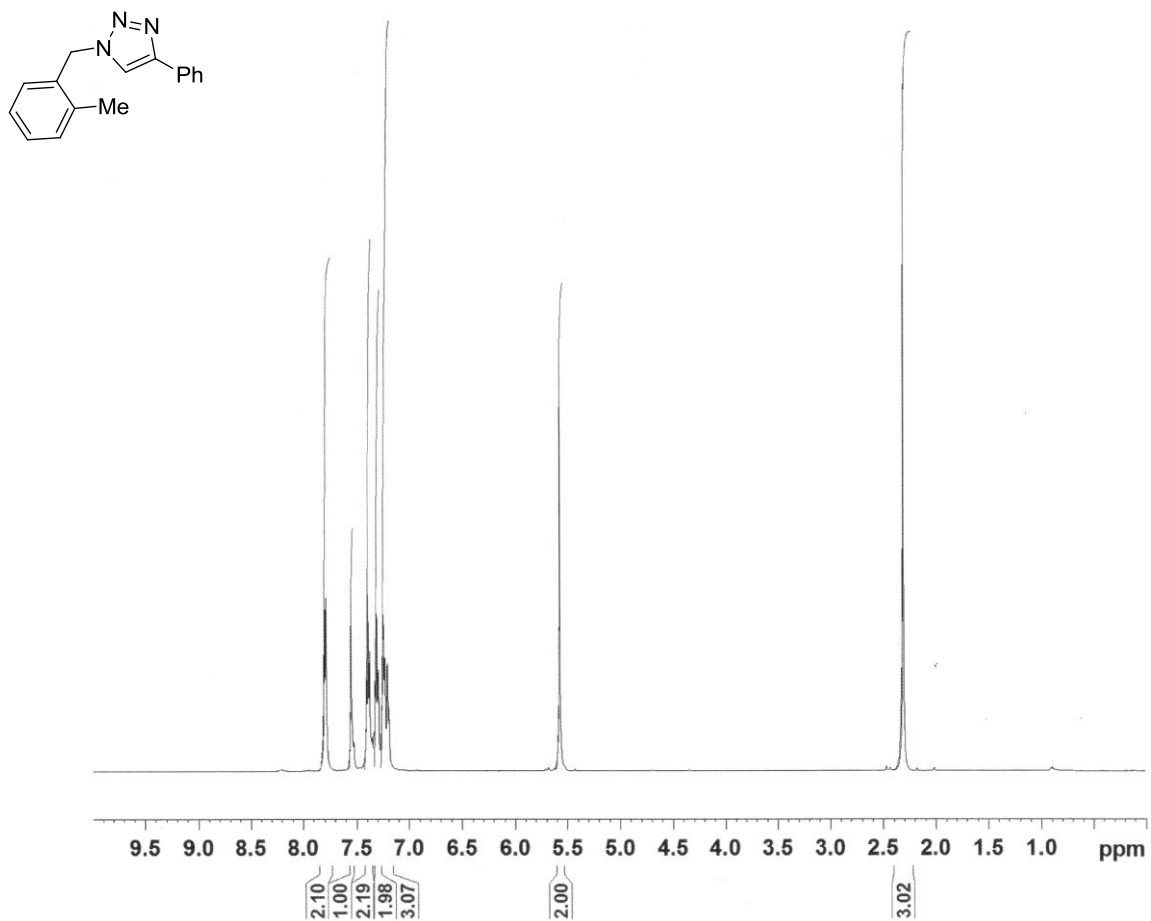
1-(2-Chlorobenzyl)-4-phenyl-1H-1,2,3-triazole, **5**, ^1H NMR in CDCl_3 :



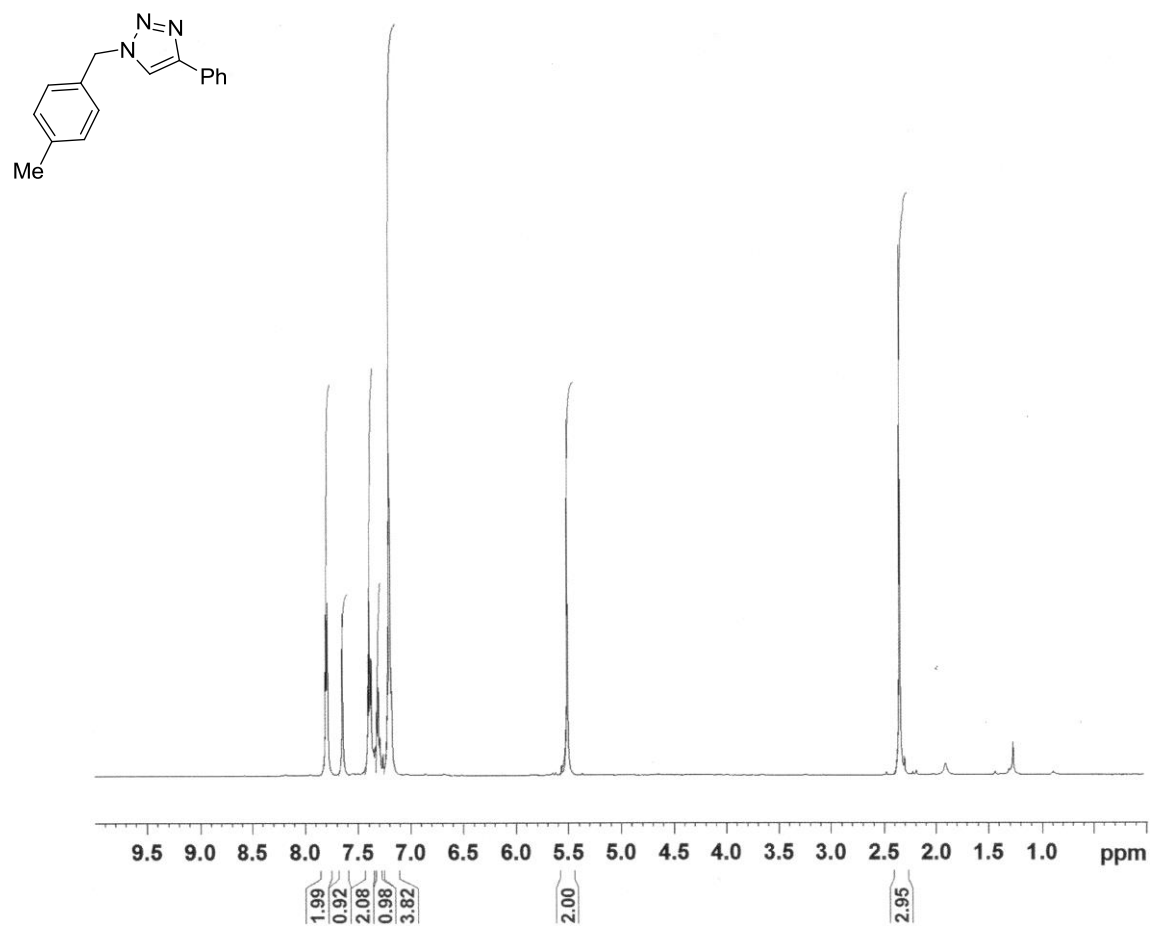
1-(4-Nitrobenzyl)-4-phenyl-1H-1,2,3-triazole, **6**, ^1H NMR in CDCl_3 :



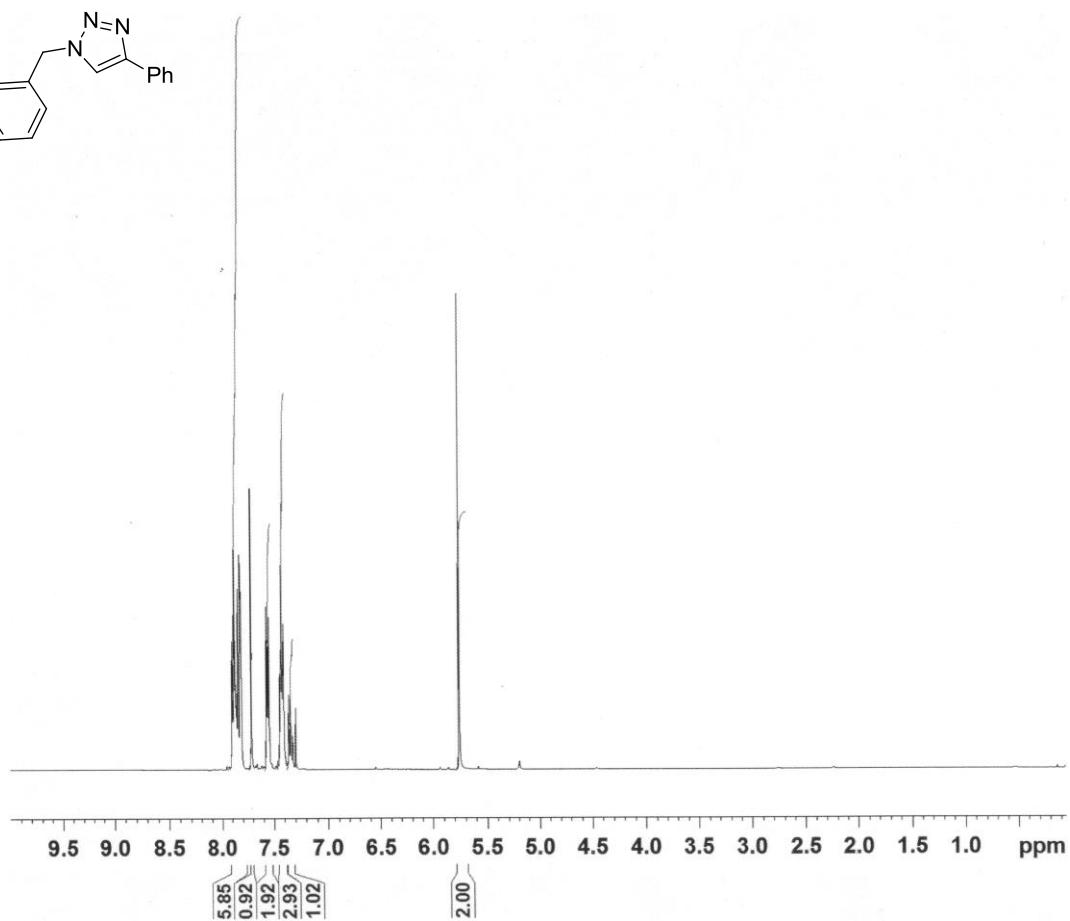
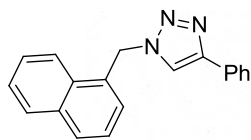
1-(2-Methylbenzyl)-4-phenyl-1H-1,2,3-triazole, **7**, ^1H NMR in CDCl_3 :



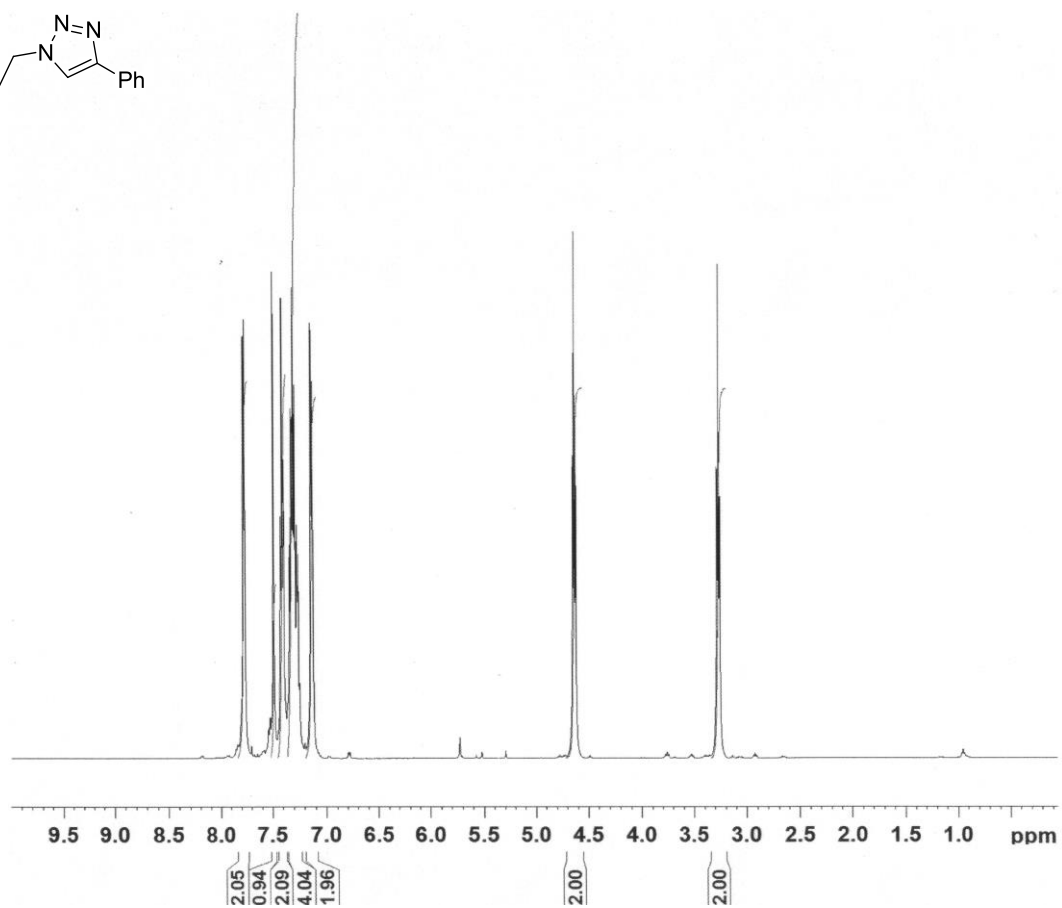
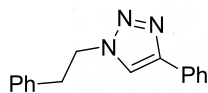
1-(4-Methylbenzyl)-4-phenyl-1H-1,2,3-triazole, **8**, ^1H NMR in CDCl_3 :



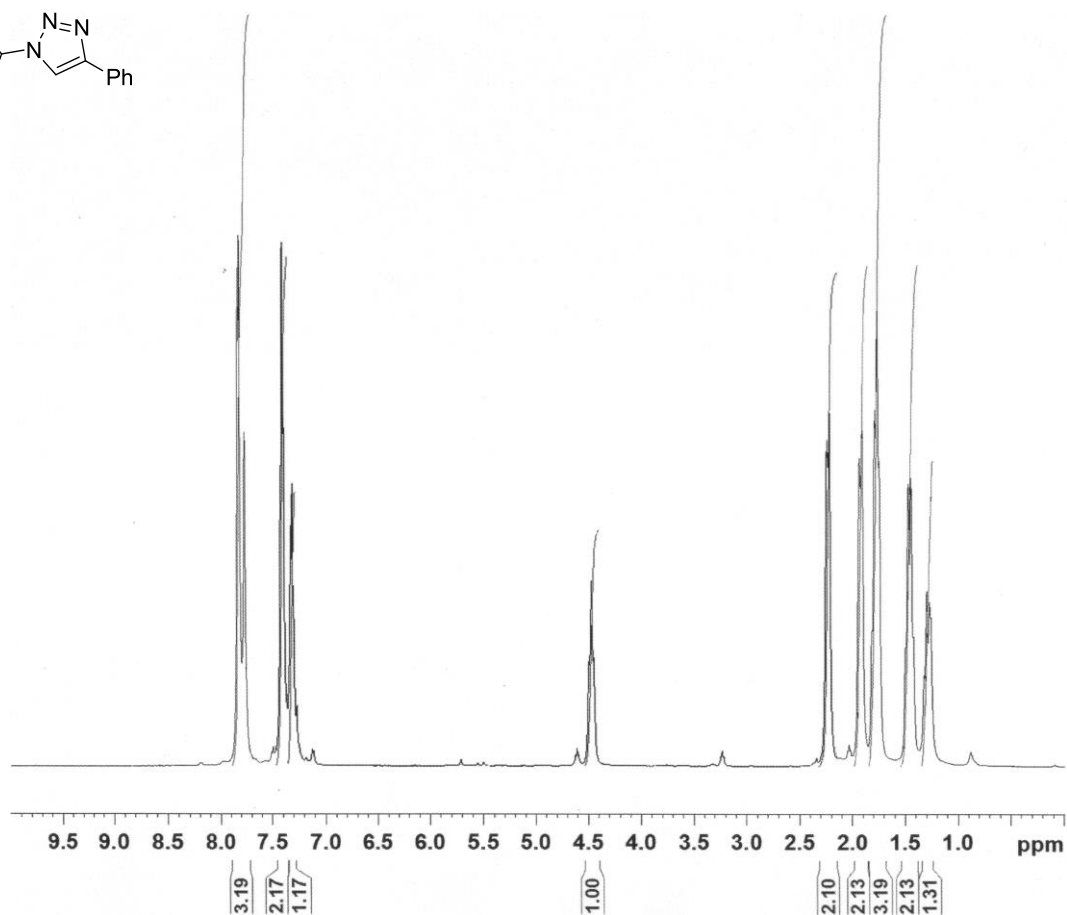
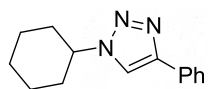
1-(Naphthalen-1-ylmethyl)-4-phenyl-1H-1,2,3-triazole, **9**, ^1H NMR in CDCl_3 :



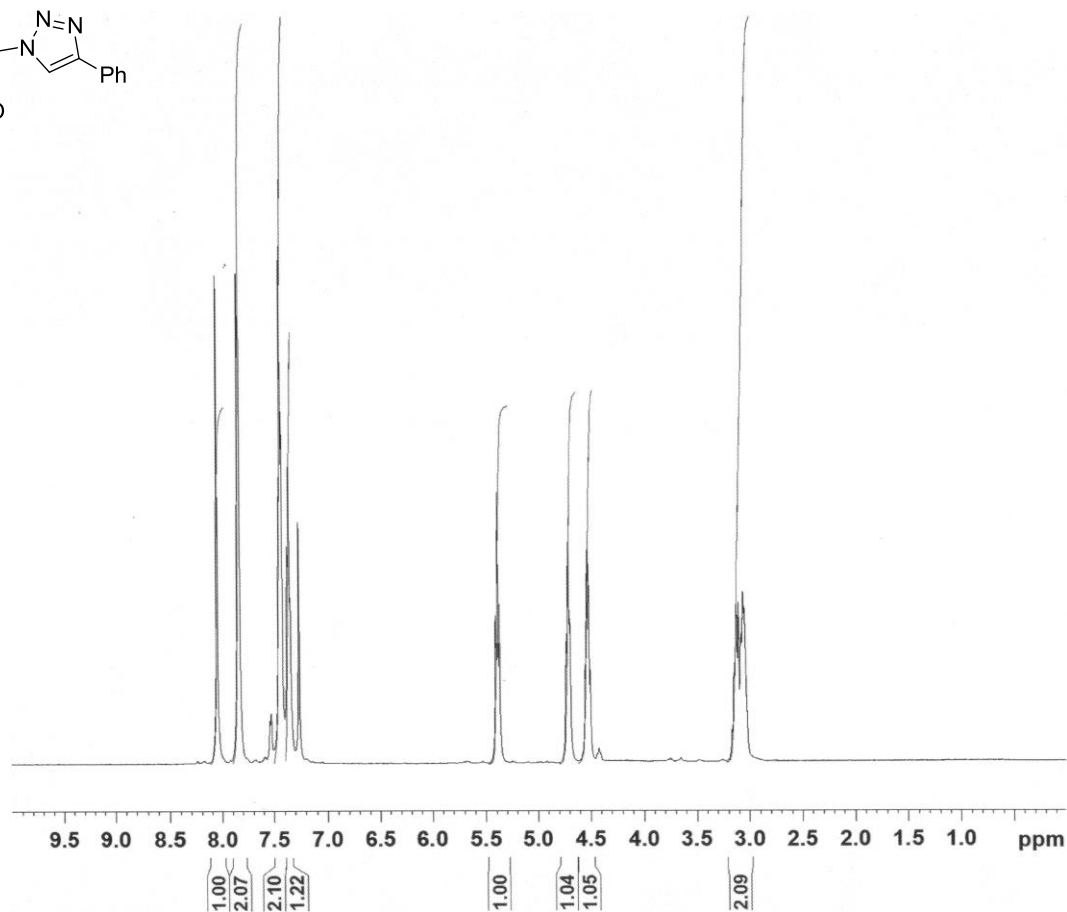
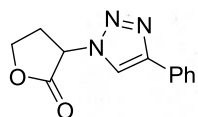
1-Phenethyl-4-phenyl-1H-1,2,3-triazole, **10**, ^1H NMR in CDCl_3 :



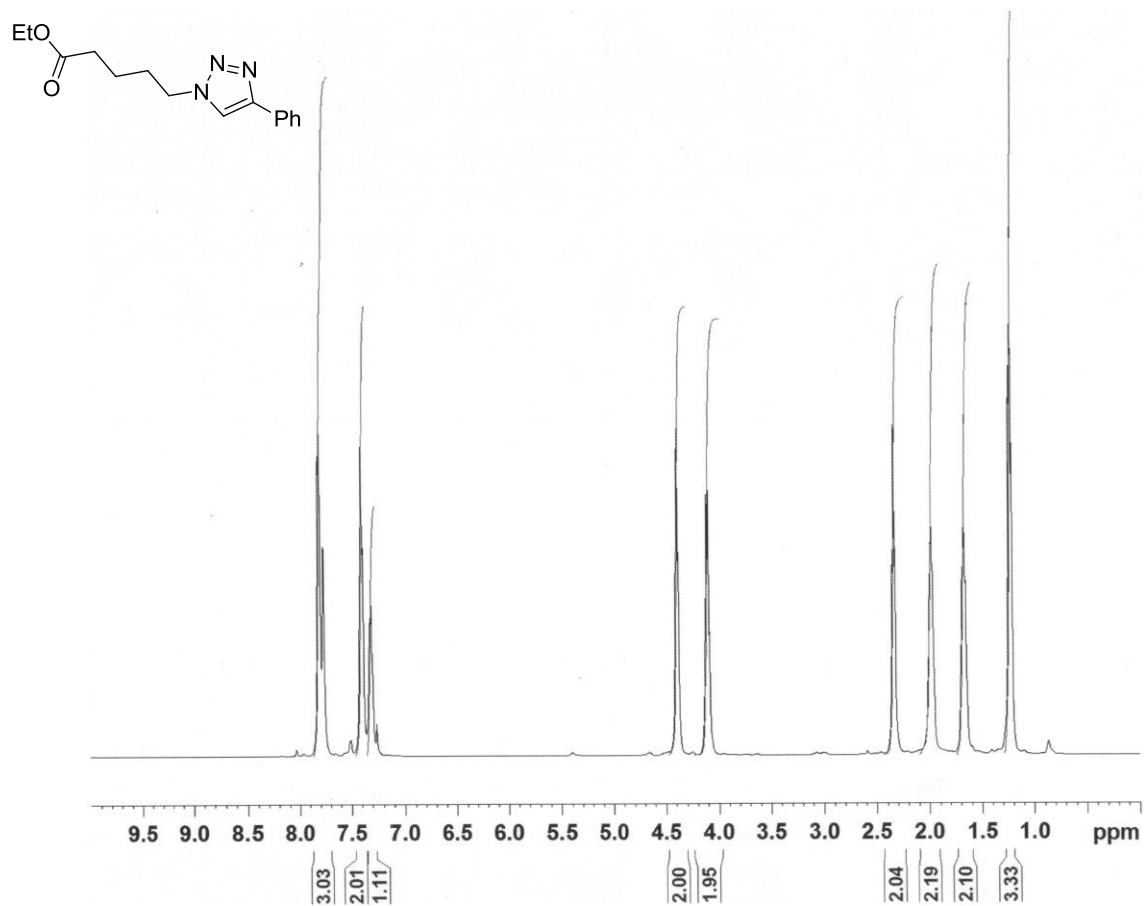
1-Cyclohexyl-4-phenyl-1H-1,2,3-triazole, **11**, ^1H NMR in CDCl_3 :



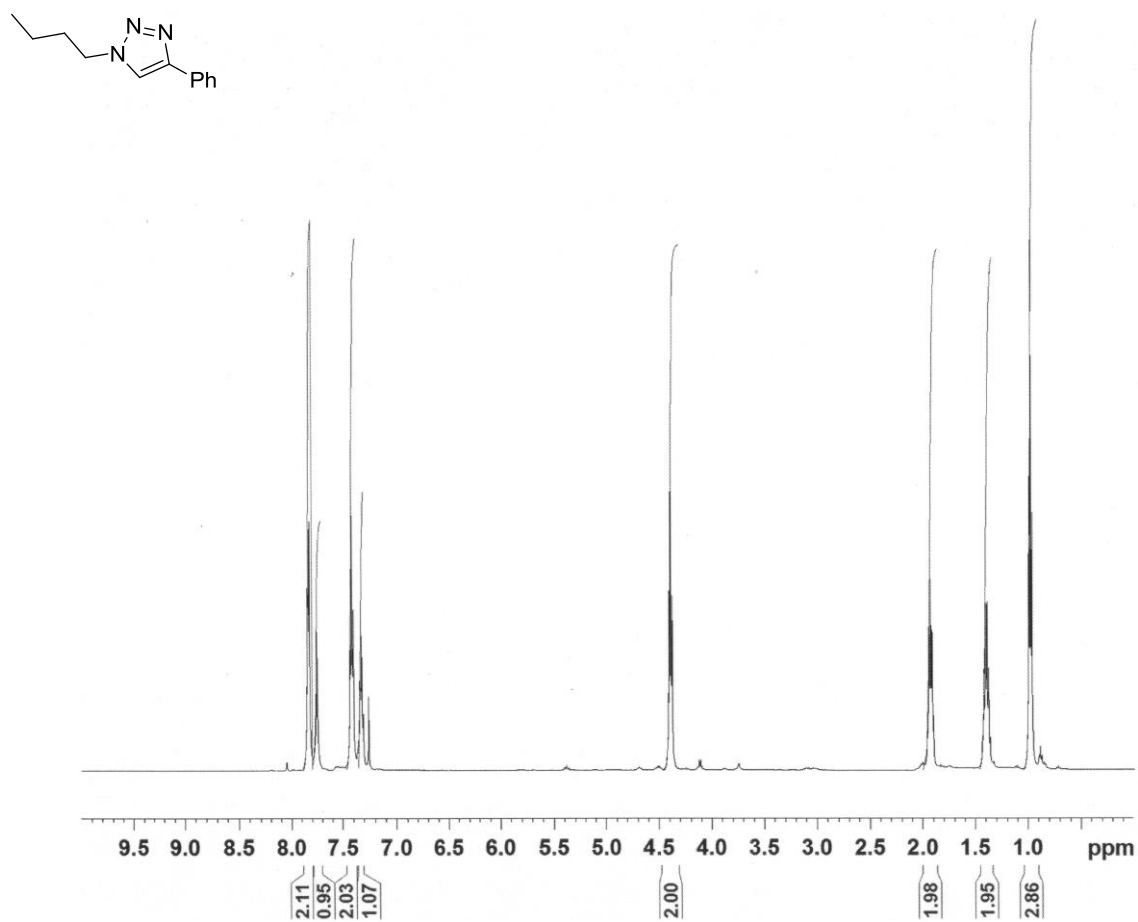
3-(4-Phenyl-1H-1,2,3-triazol-1-yl)dihydrofuran-2(3H)-one, **12**, ^1H NMR in CDCl_3 :



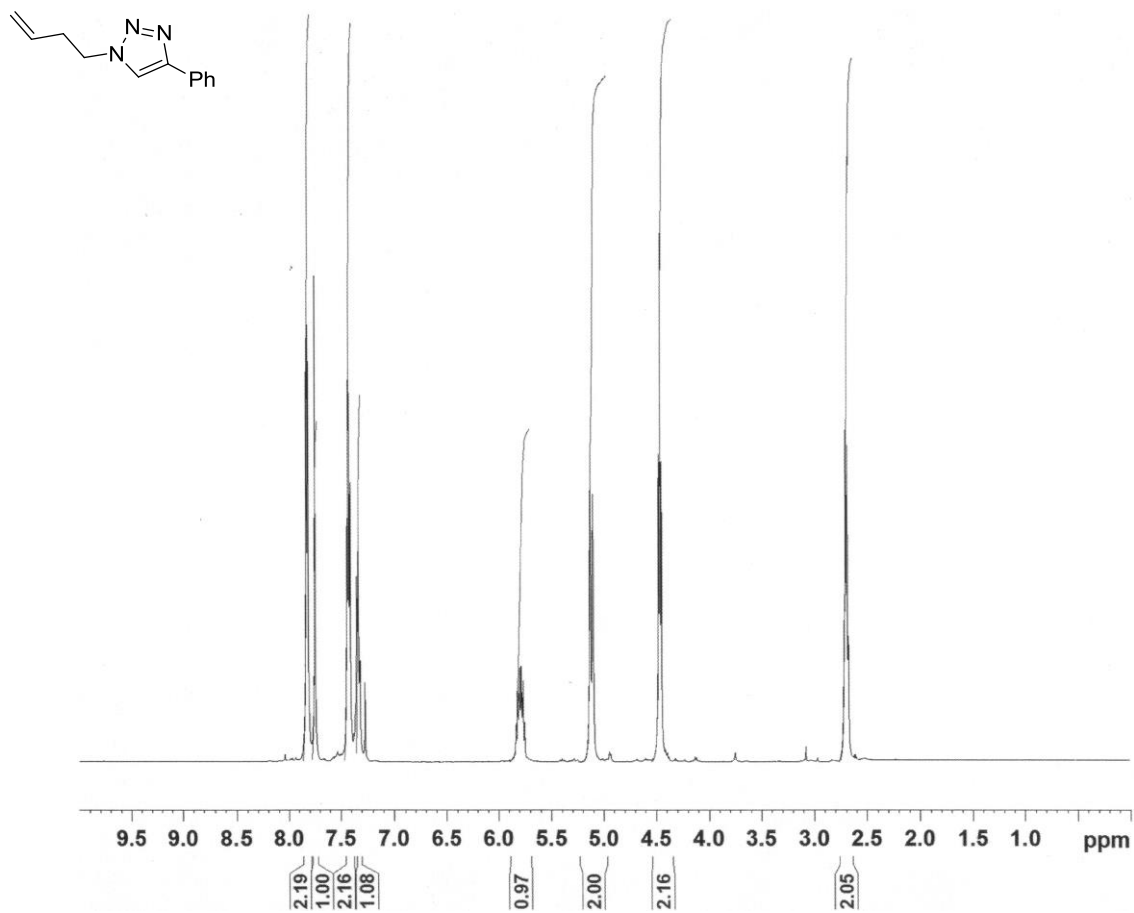
Ethyl 5-(4-phenyl-1H-1,2,3-triazol-1-yl)pentanoate, **13**, ^1H NMR in CDCl_3 :



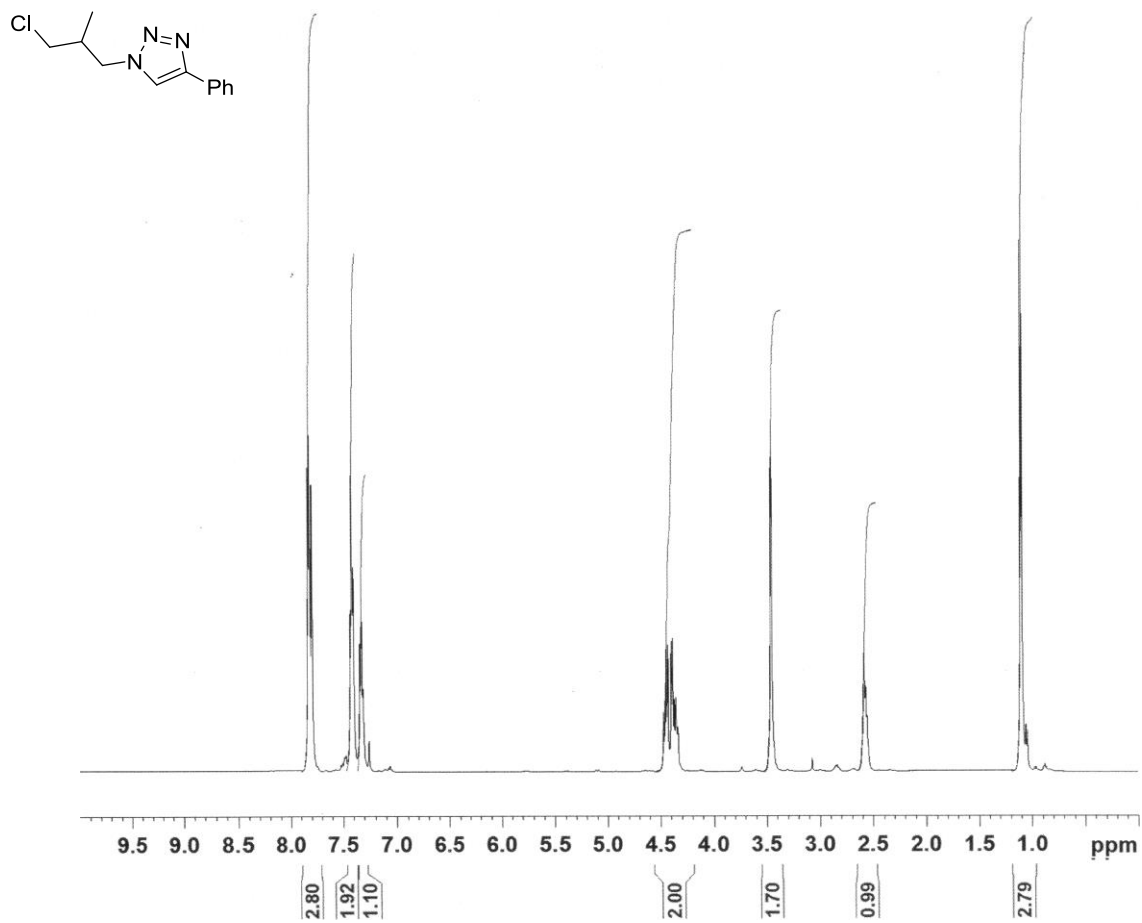
1-Butyl-4-phenyl-1H-1,2,3-triazole, **14**, ^1H NMR in CDCl_3 :



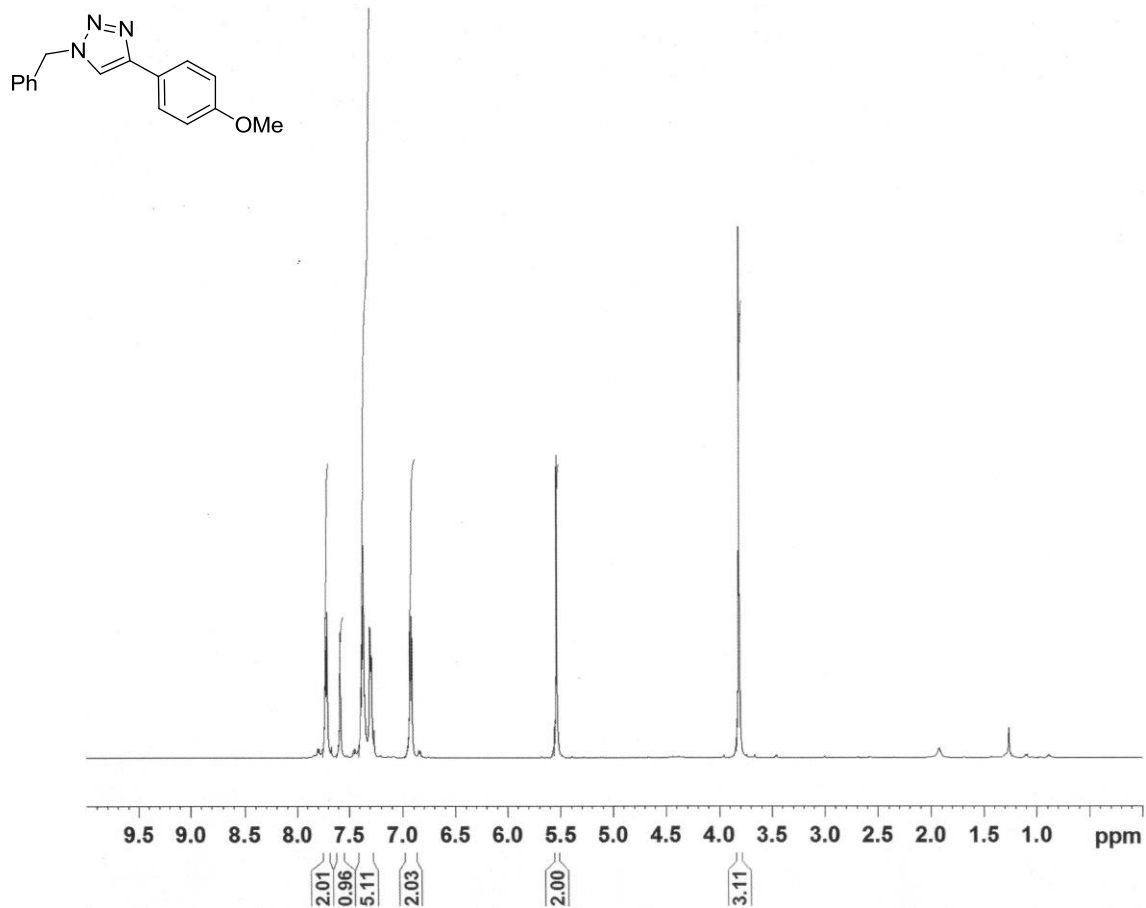
1-(But-3-en-1-yl)-4-phenyl-1H-1,2,3-triazole, 15, ^1H NMR in CDCl_3 :



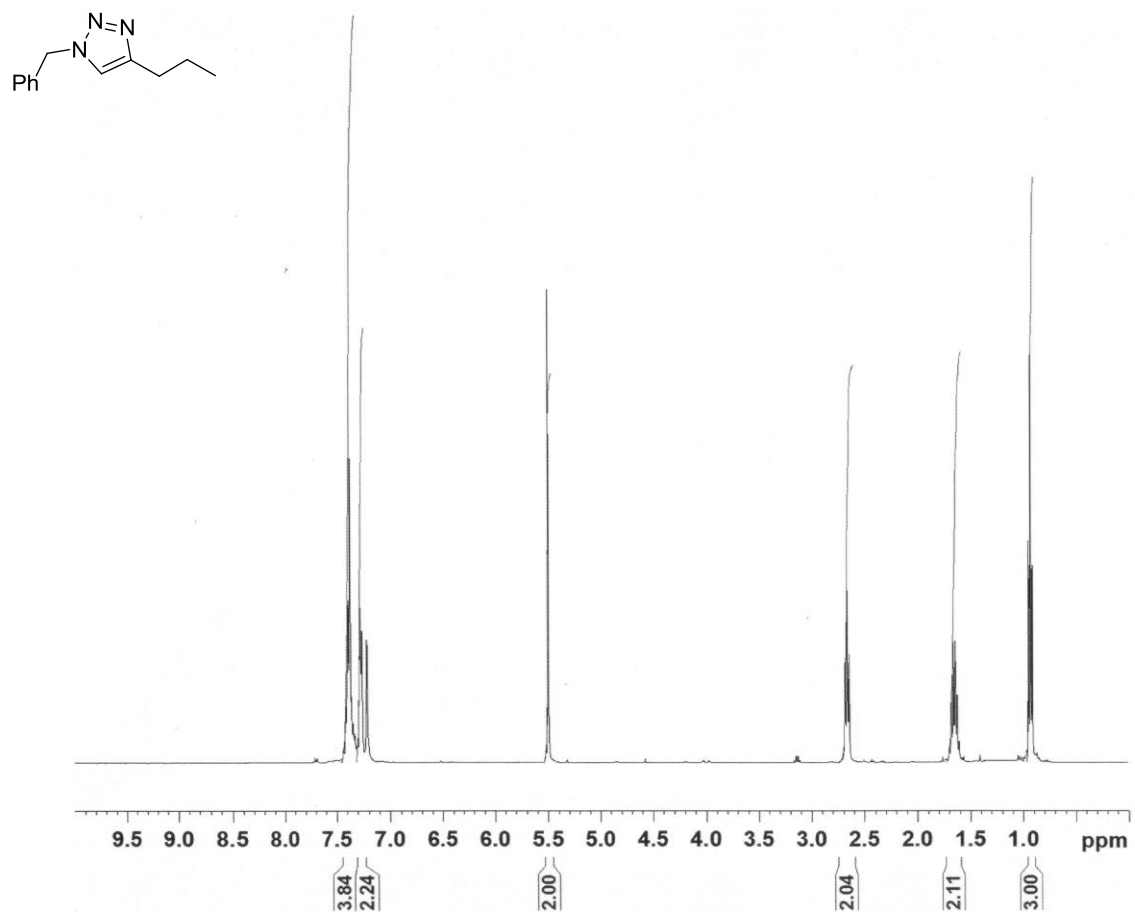
1-(3-Chloro-2-methylpropyl)-4-phenyl-1H-1,2,3-triazole, 16, ^1H NMR in CDCl_3 :



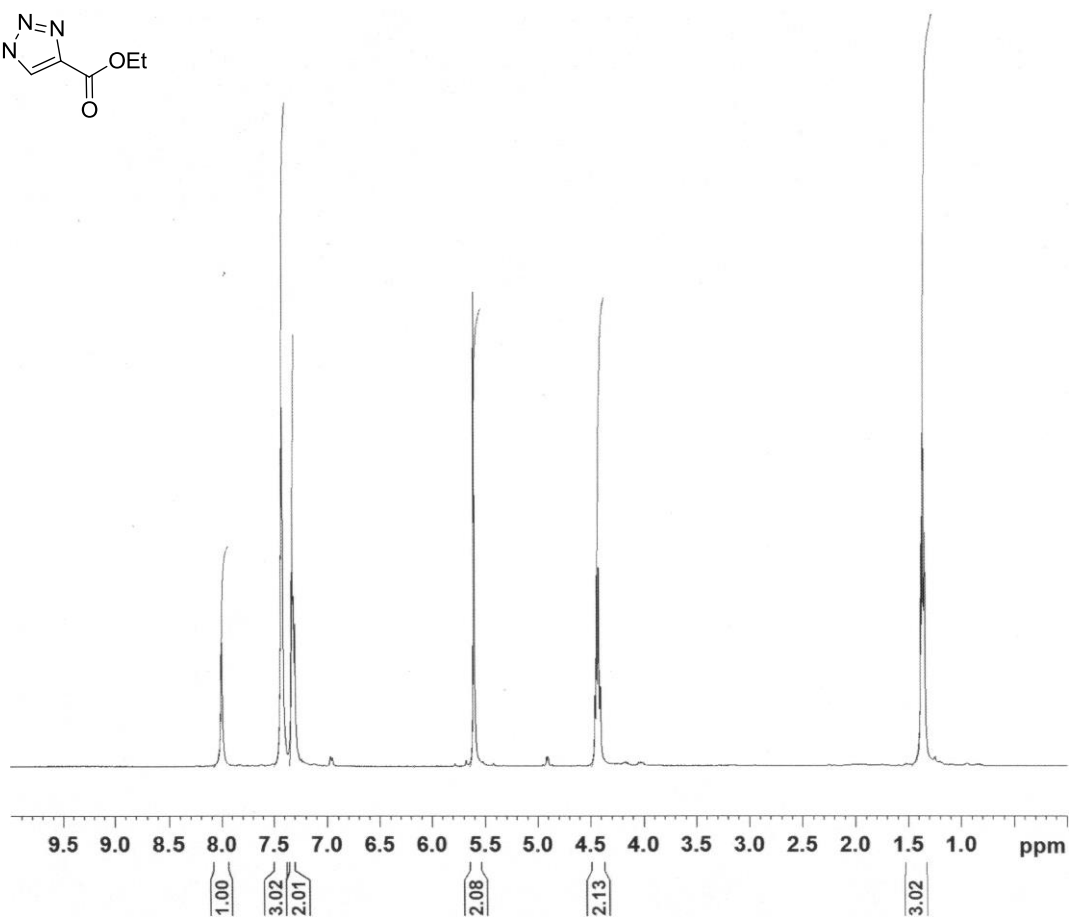
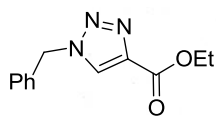
1-benzyl-4-(4-methoxyphenyl)-1H-1,2,3-triazole, **17**, ^1H NMR in CDCl_3 :



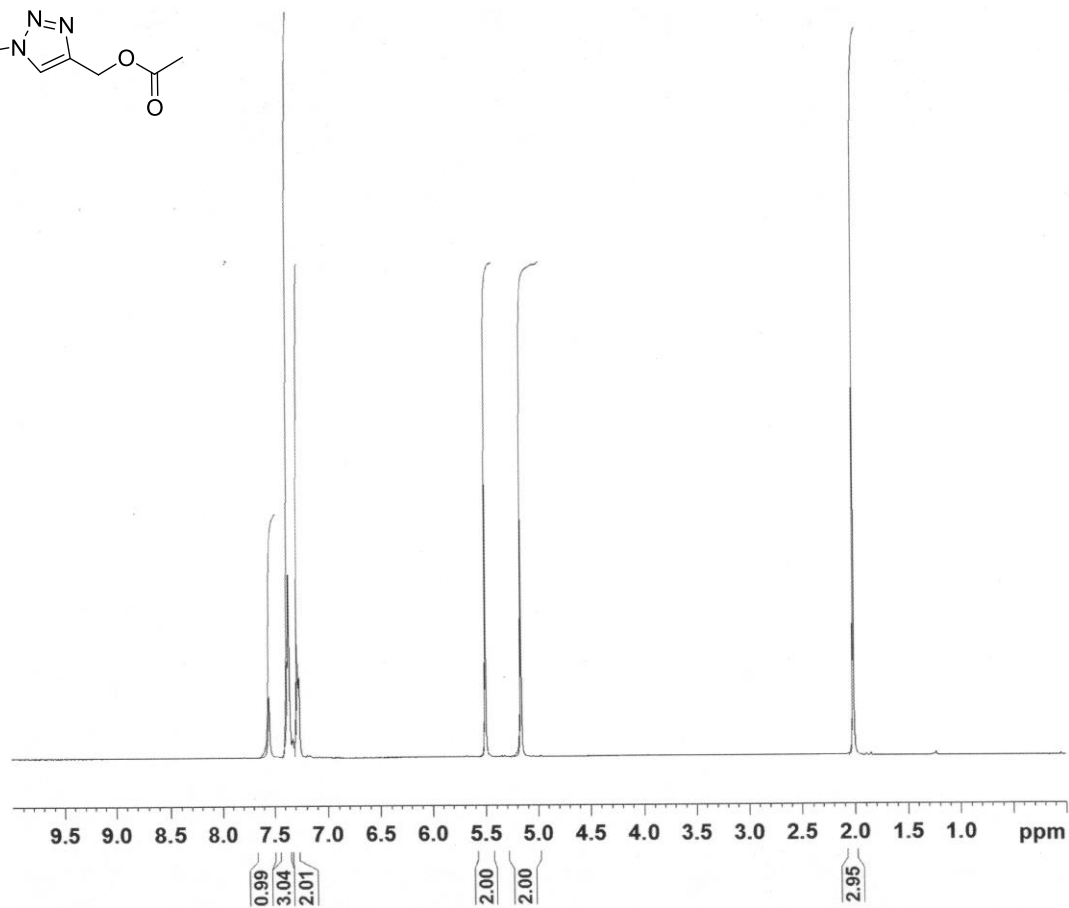
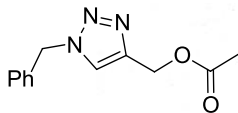
1-Benzyl-4-propyl-1H-1,2,3-triazole, **18**, ^1H NMR in CDCl_3 :



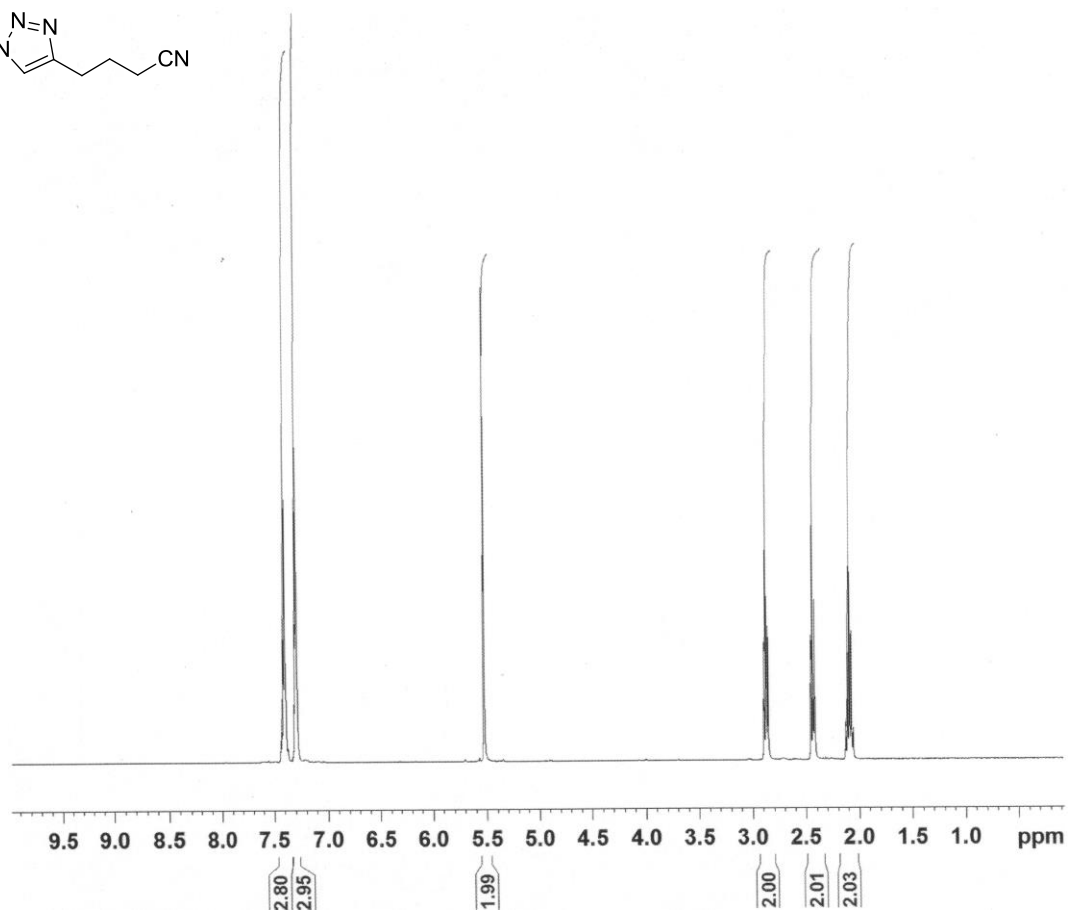
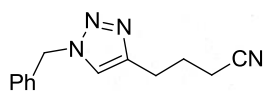
Ethyl 1-benzyl-1H-1,2,3-triazole-4-carboxylate, **19**, ^1H NMR in CDCl_3 :



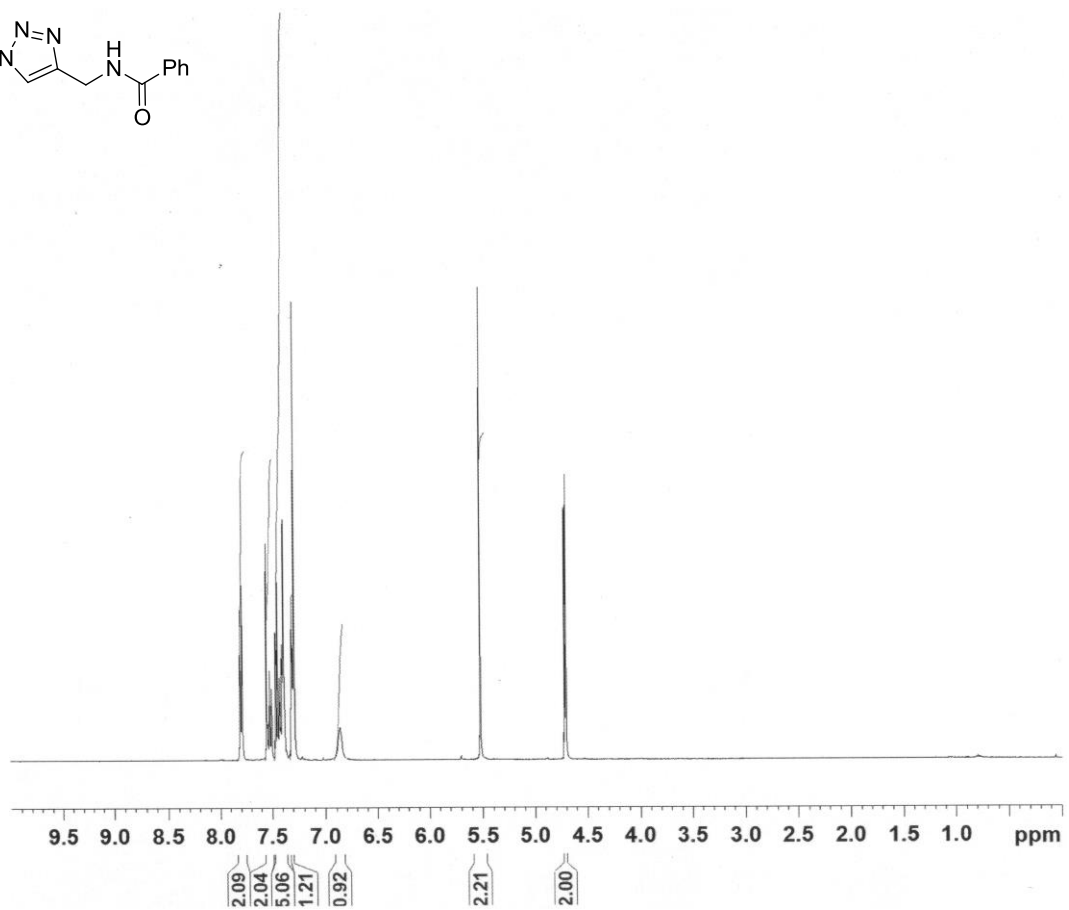
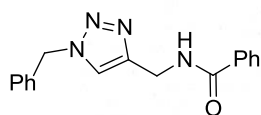
(1-Benzyl-1H-1,2,3-triazol-4-yl)methyl acetate, **20**, ^1H NMR in CDCl_3 :



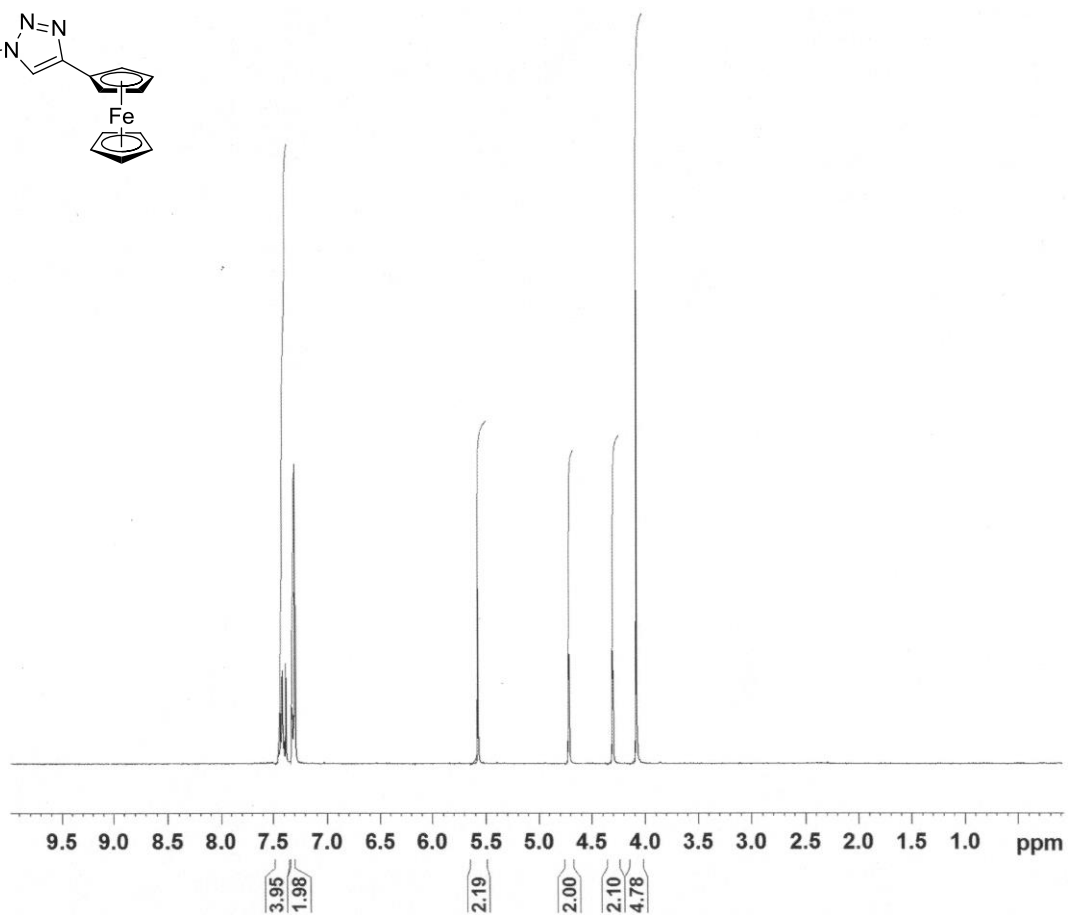
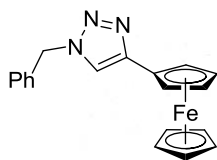
4-(1-Benzyl-1H-1,2,3-triazol-4-yl)butanenitrile, **21**, ^1H NMR in CDCl_3 :



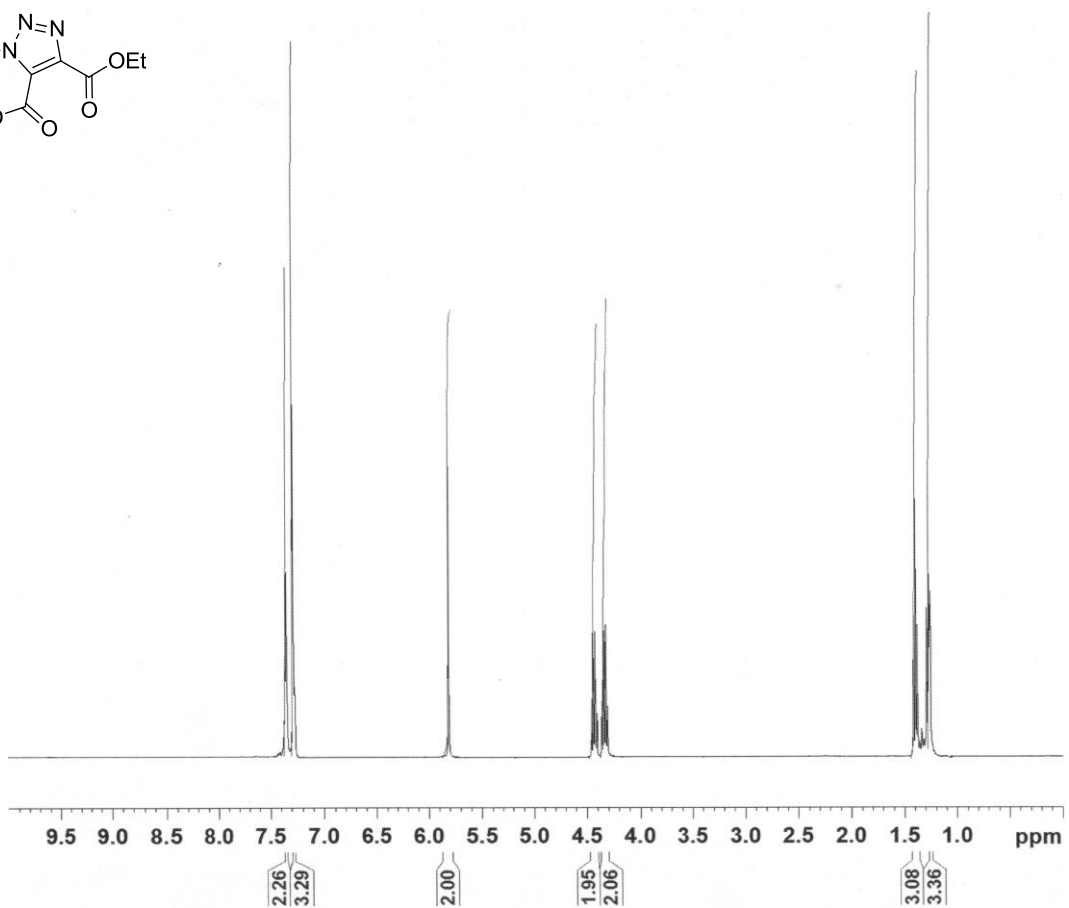
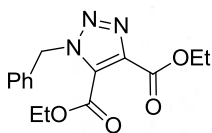
N-((1-benzyl-1H-1,2,3-triazol-4-yl)methyl)benzamide, **22**, ^1H NMR in CDCl_3 :



1-Benzyl-4-ferrocenyl-1H-1,2,3-triazole, 23, ^1H NMR in CDCl_3 :



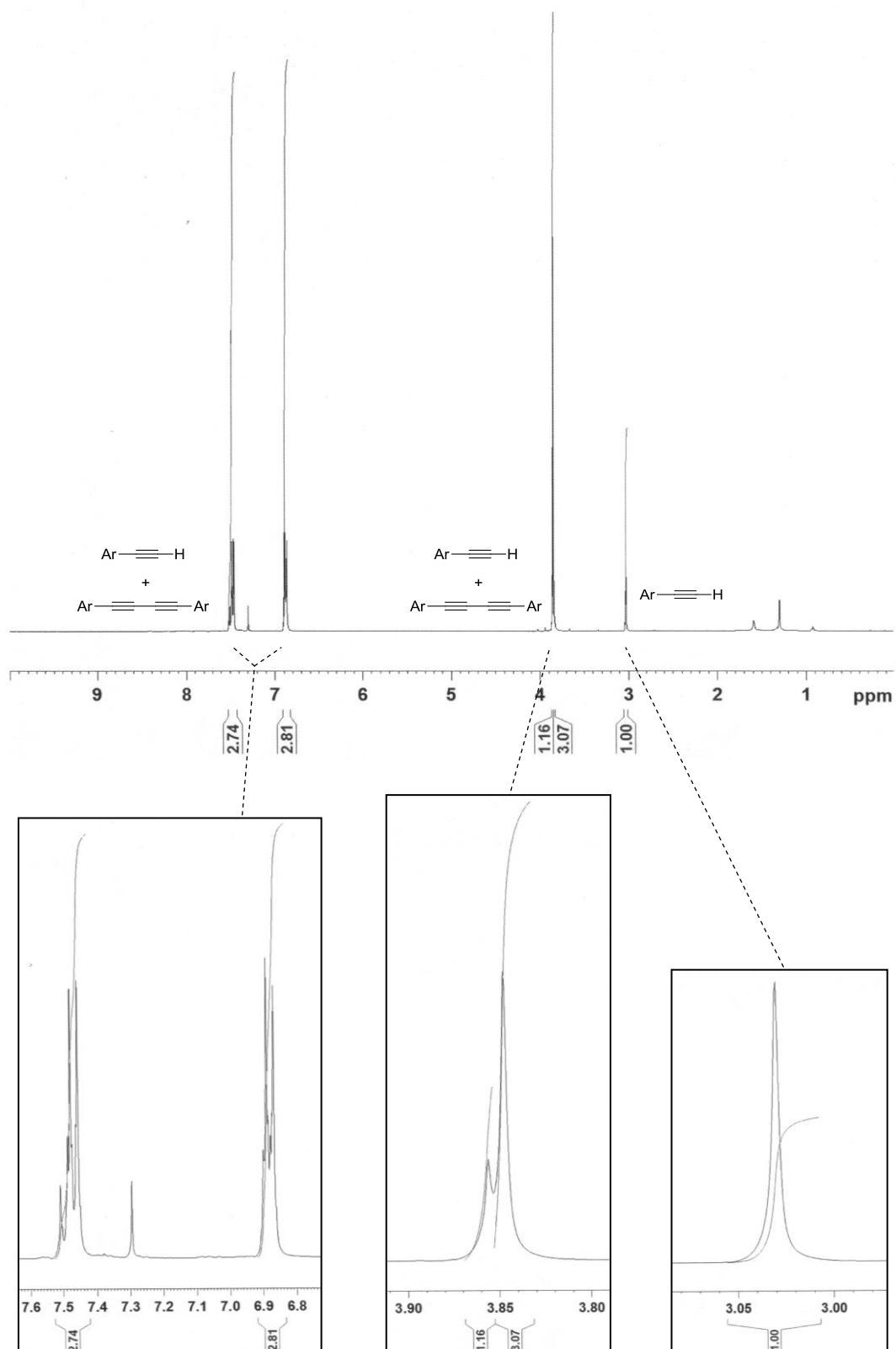
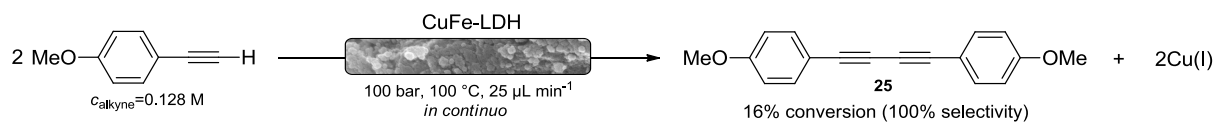
Diethyl 1-benzyl-1H-1,2,3-triazole-4,5-dicarboxylate, 24, ^1H NMR in CDCl_3 :



The test reactions to check the efficacy of the individual LDH components ($\text{Cu}(\text{NO}_3)_2 \cdot 3\text{H}_2\text{O}$ and $\text{Fe}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$) were carried out as follows.

The benzyl azide–phenylacetylene model reaction (1 equiv. azide, 1.5 equiv. alkyne, $c_{\text{azide}}=0.085 \text{ M}$) was repeated in a flask with 10 mol% of $\text{Cu}(\text{NO}_3)_2 \cdot 3\text{H}_2\text{O}$ and then with 10 mol% of $\text{Fe}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$ in 5 mL acetonitrile as solvent (the metal salts were not soluble in CH_2Cl_2). After 6 hours of stirring at reflux temperature, the mixture was concentrated under vacuum and was worked up with aqueous NaCl solution and CH_2Cl_2 . The combined organic layers were dried over Na_2SO_4 and concentrated under reduced pressure. No traces of triazole products was found according to ^1H NMR measurements with either of the metal salts.

Continuous-flow oxidative homocoupling of 4-ethynylanisole (in CH_2Cl_2 as solvent) mediated by the Cu(II)Fe(III)-LDH (1 g loaded into the catalyst bed, unused portion), and the ^1H NMR spectra of the crude product in CDCl_3 with signal assignments. [S15]



The test reactions to check the efficacy of the individual LDH components ($\text{Cu}(\text{NO}_3)_2 \cdot 3\text{H}_2\text{O}$ and $\text{Fe}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$) were carried out as follows.

The benzyl azide–phenylacetylene model reaction (1 equiv. azide, 1.5 equiv. alkyne, $c_{\text{azide}}=0.085 \text{ M}$) was repeated in a flask with 10 mol% of $\text{Cu}(\text{NO}_3)_2 \cdot 3\text{H}_2\text{O}$ and then with 10 mol% of $\text{Fe}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$ in 5 mL acetonitrile as solvent (the metal salts were not soluble in CH_2Cl_2). After 6 hours of stirring at reflux temperature, the mixture was concentrated under vacuum and was worked up with aqueous NaCl solution and CH_2Cl_2 . The combined organic layers were dried over Na_2SO_4 and concentrated under reduced pressure. No traces of triazole products was found according to ^1H NMR measurements with either of the metal salts.

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