Supporting Information
for
An Efficient Method for the Synthesis of Chiral Pyrrolidine Derivatives via
Ring Closing Enyne Metathesis Reaction

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I General

Unless otherwise noted, materials were purchased from commercial suppliers and used without further purification. Methanol was distilled from sodium prior to use. Sulphorous oxychloride was freshly distilled. Acetonitrile, dichloromethane were freshly distilled from calcium hydride. Column chromatography was performed using 200-300 mesh silica gel. All ^1H and ^{13}C NMR spectra were recorded at room temperature on a Bruker 300 or 400MHz spectrometer. Chemical shifts are reported in ppm with the solvent resonance as the internal standard (CDCl_3 7.26 ppm for proton, and 77.0ppm for carbon magnetic resonance spectroscopy). Data are reported as follows: chemical shift, multiplicity (s=singlet, d=doublet, t=triplet, q=quartet, br=broad, m=multiplet), coupling constants (Hz). Mass spectra were obtained on a VG7070E mass spectrometer. Esterification¹ of amino acids and monoallylation² were performed according to the literature procedure.

II General Procedure for the preparation of enyne substrates (6a-6m).

All enyne substrates were prepared analogous to the following procedure: To a solution of the monoallylation compound (10mmol) in acetonitrile (50mL) at room temperature was added potassium bicarbonate (40mmol), followed by adding propargyl bromide or 1-bromo-2-butyne (12mmol), and then began to heat it to 70°C. The reaction solution was stirred at this temperature for 12-24 hours. Then the reaction system was allowed to cool to room temperature. Filtered the inorganic salt and then the solvent was evaporated and the oily residue was purified with flash chromatography to give enynes in good to excellent yields.

III General Procedure for ring closing enyne metathesis: Synthesis of pyrrolidine derivatives (7a-7m).

A typical procedure for the ring closing enyne metathesis is as follows: precursor enyne (1mmol) was dissolved in freshly distilled and degassed dichloromethane (17mL) under nitrogen atmosphere. This solution was degassed again using nitrogen. After stirring for 10 minutes at room temperature, ruthenium catalyst **1** or **2** (41.2mg, 0.05mmol) dissolved in dichloromethane (3mL) was added by syringe. After 14-20 hours of reflux, the reaction was complete as indicated by TLC. The solution was concentrated

via rotavapor. Flash column chromatography of the crude oil gave the corresponding pyrrolidine derivatives.

IV Spectral data of enyne substrates:

2-(Allyl-prop-2-ynyl-amino)-3-phenyl-propionic acid methyl ester (6a): yield: 89%; ¹HNMR (300MHz, CDCl₃): δ 7.30-7.18 (m, 5H), 5.80-5.67 (m, 1H), 5.29-5.14 (m, 2H), 3.77-3.72 (t, 1H, J=7.6 Hz), 3.58 (s, 3H), 3.55-3.20 (m, 4H), 3.05-3.02 (m, 2H), 2.23-2.21 (t, 1H, J=2.5Hz); ¹³CNMR (75MHz, CDCl₃): δ 172.5, 137.8, 135.1, 129.2, 128.3, 126.4, 118.3, 79.5, 72.6, 65.5, 53.4, 51.2, 39.7, 36.1; HRMS (EI) *m/z* calcd for C₁₆H₁₉NO₂ (M⁺) 257.1416, found 257.1424.

(Allyl-prop-2-ynyl-amino)-phenyl-acetic acid methyl ester (6b): yield: 81%; ¹HNMR (400MHz, CDCl₃): δ 7.50-7.31 (m, 5H), 5.80-5.67 (m, 1H), 5.89-5.79 (m, 1H), 5.29-5.17 (m, 2H), 4.45 (s, 1H), 3.68 (s, 1H), 3.53-3.27 (m, 2H), 3.17-3.15 (d, 2H, J= 6.4 Hz), 2.24-2.23 (t, 1H, J= 2.4 Hz); ¹³CNMR (100MHz, CDCl₃): δ 172.1, 136.0, 134.8, 128.9, 128.6, 128.5, 118.5, 77.9, 73.6, 69.5, 53.8, 52.1, 39.0; HRMS (EI) *m/z* calcd for C₁₅H₁₇NO₂ (M⁺) 243.1259, found 243.1263.

2-(Allyl-prop-2-ynyl-amino)-3-(1H-indol-3-yl)-propionic acid methyl ester (6c): yield: 83%; ¹HNMR (300MHz, CDCl₃): δ 8.03 (br, s, 1H), 7.66-7.63 (d, 1H, J =7.8Hz), 7.35-7.33 (d, 1H, J =7.8Hz), 7.19-7.05 (m, 3H), 5.89-5.76 (m, 1H), 5.31-5.16 (m, 2H), 3.91-3.86 (t, 1H, J= 7.5Hz), 3.69-3.47 (m, 6H, one single at 3.57 inside), 3.32-3.15 (m, 3H), 2.26-2.25 (t, 1H, J=2.1Hz); ¹³CNMR (75MHz, CDCl₃): δ 172.9, 136.0, 135.2, 127.4, 122.7, 121.9, 119.3, 118.7, 118.3, 111.6, 111.1, 79.7, 72.7, 64.5, 53.6, 51.2, 39.7, 25.8; HRMS (EI) *m/z* calcd for C₁₈H₂₀N₂O₂ (M⁺) 296.1525, found 296.1534.

2-(Allyl-prop-2-ynyl-amino)-pentanedioic acid dimethyl ester (6d): yield: 84%; ¹HNMR (300MHz, CDCl₃): δ 5.80-5.67 (m, 1H), 5.29-5.12 (m, 2H), 3.70 (s, 3H), 3.66 (s, 3H), 3.44-3.14 (m, 4H), 2.91-2.63 (m, 2H), 2.18-2.16 (t, 1H, J=2.4Hz); ¹³CNMR (75MHz, CDCl₃): δ 173.5, 172.7, 135.4, 118.0, 80.0, 72.1, 61.7, 53.1,

51.6, 51.3, 39.6, 30.4, 24.5; **HRMS** (EI) m/z calcd for $C_{13}H_{19}NO_4$ (M^+) 253.1314, found 253.1315.

2-(Allyl-prop-2-ynyl-amino)-succinic acid dimethyl ester (6e): yield: 76%; **1H NMR** (300MHz, $CDCl_3$): δ 5.79-5.66 (m, 1H), 5.25-5.12 (m, 2H), 4.07-4.02 (m, 1H), 3.69 (s, 3H), 3.66 (s, 3H), 3.58-3.36 (m, 4H), 3.44-3.14 (m, 4H), 2.91-2.63 (m, 2H), 2.21-2.19 (t, 1H, $J=2.1$ Hz); **^{13}C NMR** (75MHz, $CDCl_3$): δ 171.8, 171.5, 135.0, 118.3, 79.6, 72.6, 59.5, 53.5, 51.8, 51.6, 39.8, 34.5; **HRMS** (EI) m/z calcd for $C_{12}H_{17}NO_4$ (M^+) 239.1158, found 239.1151.

2-(Allyl-prop-2-ynyl-amino)-4-methyl-pentanoic acid methyl ester (6f): yield: 78%; **1H NMR** (400MHz, $CDCl_3$): δ 5.81-5.71 (m, 1H), 5.25-5.12 (m, 2H), 3.67 (s, 3H), 3.59-3.56 (t, 1H, $J=7.6$ Hz), 3.52-3.39 (m, 3H), 3.16-3.11 (m, 1H), 2.18-2.17 (t, 1H, $J=2.4$ Hz), 1.66-1.54 (m, 3H), 0.92-0.89 (m, 6H); **^{13}C NMR** (100MHz, $CDCl_3$): δ 173.6, 135.7, 117.7, 80.2, 72.0, 61.3, 53.0, 51.1, 39.7, 38.7, 24.8, 22.7, 22.2; **HRMS** (EI) m/z calcd for $C_{13}H_{21}NO_2$ (M^+) 223.1572, found 223.1561.

2-(Allyl-prop-2-ynyl-amino)-3-methyl-butyric acid methyl ester (6g): yield: 81%; **1H NMR** (300MHz, $CDCl_3$): δ 5.82-5.69 (m, 1H), 5.27-5.12 (m, 2H), 3.68 (s, 3H), 3.51-3.35 (m, 3H), 3.08-2.98 (m, 2H), 2.18-2.17 (t, 1H, $J=2.4$ Hz), 2.10-1.97 (m, 1H), 0.99-0.97 (d, 3H, $J=6.9$ Hz), 0.88-0.86 (d, 3H, $J=6.6$ Hz); **^{13}C NMR** (75MHz, $CDCl_3$): δ 172.7, 135.6, 117.7, 80.1, 71.9, 70.4, 52.3, 50.7, 40.2, 27.7, 19.5; **HRMS** (EI) m/z calcd for $C_{12}H_{19}NO_2$ (M^+) 209.1416, found 209.1395.

2-(Allyl-prop-2-ynyl-amino)-propionic acid methyl ester (6h): yield: 78%; **1H NMR** (300MHz, $CDCl_3$): δ 5.88-5.74 (m, 1H), 5.27-5.13 (m, 2H), 3.69 (s, 3H), 3.62-3.47 (m, 3H), 3.30-3.15 (m, 2H), 1.34-1.32 (m, 3H); **^{13}C NMR** (75MHz, $CDCl_3$): δ 174.2, 135.2, 118.3, 79.2, 72.7, 58.8, 53.8, 51.6, 39.1, 15.5; **HRMS** (EI) m/z calcd for $C_{10}H_{15}NO_2$ (M^+) 181.1103, found 181.1097.

Phenyl- [(3-phenyl-allyl)-prop-2-ynyl-amino]-acetic acid methyl ester (6i): yield: 83%; ¹HNMR (300MHz, CDCl₃): δ 7.61-7.27 (m, 10H), 6.66-6.61 (d, 1H), 6.37-6.27 (m, 1H), 4.57 (s, 1H), 3.72 (s, 3H), 3.66-3.37 (m, 4H), 2.34 (s, 1H); ¹³CNMR (75MHz, CDCl₃): δ 172.0, 136.6, 135.8, 133.2, 128.8, 128.7, 128.5, 128.4, 127.4, 126.2, 126.1, 77.8, 73.8, 69.5, 53.2, 52.0, 39.1; HRMS (EI) *m/z* calcd for C₂₁H₂₁NO₂ (M⁺) 319.1572, found 319.1564.

(Allyl-but-2-ynyl-amino)-phenyl-acetic acid methyl ester (6j): yield: 79%; ¹HNMR (300MHz, CDCl₃): δ 7.49-7.29 (m, 5H), 5.91-5.80 (m, 1H), 5.26-5.11 (m, 2H), 4.46 (s, 1H), 3.68 (s, 3H), 3.46-3.40 (m, 1H), 3.25-3.07 (m, 2H), 1.86-1.84 (t, 1H, J= 2.4Hz); ¹³CNMR (75MHz, CDCl₃): δ 172.3, 136.1, 135.1, 128.9, 128.5, 128.4, 118.2, 81.2, 73.0, 69.5, 53.8, 52.0, 39.5, 3.5; HRMS (EI) *m/z* calcd for C₁₆H₁₉NO₂ (M⁺) 257.1416, found 257.1451.

[But-2-ynyl-(3-phenyl-allyl)-amino]-phenyl-acetic acid methyl ester (6k): yield: 84%; ¹HNMR (300MHz, CDCl₃): δ 7.53-7.22 (m, 10H), 6.57-6.52 (d, 1H), 6.31-6.22 (m, 1H), 4.51 (s, 1H), 3.69 (s, 3H), 3.52-3.24 (m, 4H), 1.89 (s, 3H); ¹³CNMR (75MHz, CDCl₃): δ 172.4, 136.9, 136.1, 133.1, 128.9, 128.6, 128.5, 128.4, 127.4, 126.6, 126.3, 81.4, 73.1, 69.6, 53.3, 52.1, 39.8, 3.6; HRMS (EI) *m/z* calcd for C₂₂H₂₃NO₂ (M⁺) 333.1729, found 333.1716.

2-(Allyl-prop-2-ynyl-amino)-4-methylsulfanyl-butyric acid ethyl ester (6l): Yield: 48%; ¹HNMR (300MHz, CDCl₃): δ 5.80-5.66 (m, 1H), 5.23-5.09 (m, 2H), 4.16-4.08 (q, 2H), 3.64-3.59 (t, 1H, J= 7.4Hz), 3.44-3.35 (m, 3H), 3.17-3.10 (m, 1H), 2.55-2.49 (m, 2H), 2.16-2.15 (t, 1H, J= 2.4Hz), 2.05 (s, 3H), 1.98-1.89 (m, 2H), 1.27-1.22 (t, 3H, J= 7.2Hz); ¹³CNMR (75MHz, CDCl₃): δ 172.3, 135.4, 117.8, 80.0, 72.1, 61.7, 60.3, 53.1, 39.6, 30.6, 29.1, 15.3, 14.2; HRMS (EI) *m/z* calcd for C₁₃H₂₁NO₂S (M⁺) 255.1293, found 255.1298.

Allyl-phenyl-prop-2-ynyl-amine (6m): yield: 89%; ¹HNMR (400MHz, CDCl₃): δ 7.33-7.29 (m, 2H), 6.92-6.83 (m, 3H), 6.00-5.90 (m, 1H), 5.35-5.23 (m, 2H), 2.24-

2.23 (m, 1H); ¹³CNMR (100MHz, CDCl₃): δ 148.3, 134.0, 129.1, 118.1, 116.7, 114.0, 79.9, 71.8, 53.7, 39.6; HRMS (EI) *m/z* calcd for C₁₂H₁₃N (M⁺) 171.1048, found 171.1042.

V Spectral data of pyrrolidine derivatives:

3-Phenyl-2- (3-vinyl-2, 5-dihydro-pyrrol-1-yl)-propionic acid methyl ester (7a): yield: 84%; ¹HNMR (300MHz, CDCl₃): δ 7.31-7.21(m, 5H), 6.52-6.43 (m, 1H), 5.72 (s, 1H), 5.12-4.98 (m, 2H), 3.90-3.69 (m, 5H); 3.60 (s, 3H), 3.10-3.04 (m, 2H); ¹³CNMR (75MHz, CDCl₃): δ 172.6, 139.2, 137.7, 137.1, 128.9, 128.3, 126.4, 125.8, 115.0, 66.5, 56.6, 54.8, 51.2, 37.4; HRMS (EI) *m/z* calcd for C₁₆H₁₉NO₂ (M⁺) 257.1416, found 257.1409.

Phenyl- (3-vinyl-2, 5-dihydro-pyrrol-1-yl)-acetic acid methyl ester (7b): yield: 81%; ¹HNMR (400MHz, CDCl₃): δ 7.48-7.24 (m, 5H), 6.42-6.35 (m, 1H), 5.65-5.64 (d, 2H, J=3.6Hz), 5.02- 4.86 (m, 2H), 4.31 (s, 1H), 3.64 (s, 3H), 3.61-3.45 (m, 4H); ¹³CNMR (100MHz, CDCl₃): δ 171.9, 139.2, 137.0, 130.9, 128.5, 128.3, 128.2, 125.6, 114.9, 72.4, 58.3, 56.5, 51.8; HRMS (EI) *m/z* calcd for C₁₅H₁₇NO₂ (M⁺) 243.1259, found 243.1254.

3-(1H-Indol-3-yl)-2-(3-vinyl-2,5-dihydro-pyrrol-1-yl)-propionic acid methyl ester (7c): yield: 76%; ¹HNMR (300MHz, CDCl₃): δ 8.39 (br, s, 1H), 7.65-7.63 (d, 2H, J= 7.2Hz), 7.30-7.01 (m, 4H), 6.57-6.47(m, 1H), 5.78 (s, 1H), 5.17-5.03(m, 2H); 3.97-3.83 (m, 5H), 3.61 (s, 3H), 3.38-3.18 (m, 2H); ¹³CNMR (75MHz, CDCl₃): δ 173.2, 139.3, 136.0, 131.1, 127.2, 125.8, 122.7, 121.7, 119.1, 118.3, 115.1, 111.22, 111.18, 66.0, 56.8, 55.0, 51.3, 27.0; HRMS (EI) *m/z* calcd for C₁₈H₂₀N₂O₂ (M⁺) 296.1525, found 296.1522.

2-(3-Vinyl-2,5-dihydro-pyrrol-1-yl)-pentanedioic acid dimethyl ester (7d): yield:73%; ¹HNMR (400MHz, CDCl₃): δ 6.46-6.39 (m, 1H), 5.67 (s, 1H), 5.06-4.93 (m, 12H), 3.71-3.67 (m, 4H), 3.67 (s, 3H), 3.63 (s, 3H), 3.46-3.42 (t, 3H),

$J=7.4\text{Hz}$), 2.43-2.40 (t, 2H, $J=7.4\text{Hz}$), 2.10-1.95(m, 2H); $^{13}\text{CNMR}$ (100MHz, CDCl_3): δ 173.4, 172.9, 139.2, 131.2, 125.8, 114.9, 63.1, 56.4, 54.6, 51.5, 51.3, 30.5, 26.0; **HRMS** (EI) m/z calcd for $\text{C}_{13}\text{H}_{19}\text{NO}_4$ (M^+) 253.1314, found 253.1325.

2-(3-Vinyl-2,5-dihydro-pyrrol-1-yl)-succinic acid dimethyl ester (7e): yield: 89%; $^1\text{HNMR}$ (300MHz, CDCl_3): δ 6.46-6.37 (m, 1H), 5.65 (s, 1H), 5.07-4.91 (m, 2H), 3.98-3.93 (t, 1H, $J=7.4\text{Hz}$), 3.75-3.65 (m, 10H, two singles at 3.73 and 3.71 inside) 2.90-2.60 (m, 2H); $^{13}\text{CNMR}$ (75MHz, CDCl_3): δ 171.8, 171.4, 139.1, 131.0, 125.7, 115.0, 59.9, 56.3, 54.5, 51.8, 51.6, 35.6; **HRMS** (EI) m/z calcd for $\text{C}_{12}\text{H}_{17}\text{NO}_4$ (M^+) 239.1158, found 239.1155.

4-Methyl-2-(3-vinyl-2,5-dihydro-pyrrol-1-yl)-pentanoic acid methyl ester (7f): yield: 86%; $^1\text{HNMR}$ (400MHz, CDCl_3): δ 6.51-6.41 (m, 1H), 5.71 (s, 1H), 5.10-4.95 (m, 2H), 3.87-3.65 (m, 7H, one single at 3.80 inside), 3.53-3.48 (t, 1H, $J=7.4\text{Hz}$), 1.72-1.55 (m, 3H), 0.95-0.91 (m, 6H); $^{13}\text{CNMR}$ (100MHz, CDCl_3): δ 174.1, 139.3, 131.3, 126.0, 114.8, 62.3, 56.4, 54.6, 51.2, 40.2, 25.0, 22.6, 22.5; **HRMS** (EI) m/z calcd for $\text{C}_{13}\text{H}_{21}\text{NO}_2$ (M^+) 223.1572, found 223.1568.

3-Methyl-2-(3-vinyl-2,5-dihydro-pyrrol-1-yl)-butyric acid methyl ester (7g): yield: 81%; $^1\text{HNMR}$ (300MHz, CDCl_3): δ 6.49-6.40 (m, 1H), 5.70 (s, 1H), 5.09-4.95 (m, 2H), 3.86-3.79 (m, 2H), 3.69 (s, 3H), 3.64-3.61 (m, 2H), 3.09-3.06 (d, 1H, $J=9.3\text{Hz}$), 2.08-1.96 (m, 1H), 1.03-1.01 (d, 3H, $J=6.6\text{Hz}$), 0.93-0.90 (d, 3H, $J=6.9\text{Hz}$); $^{13}\text{CNMR}$ (75MHz, CDCl_3): δ 173.1, 139.2, 131.3, 126.0, 114.8, 70.8, 56.1, 54.3, 50.8, 29.2, 19.9, 19.1; **HRMS** (EI) m/z calcd for $\text{C}_{12}\text{H}_{19}\text{NO}_2$ (M^+) 209.1416, found 209.1408.

2-(3-Vinyl-2,5-dihydro-pyrrol-1-yl)-propionic acid methyl ester (7h): yield: 78%; $^1\text{HNMR}$ (400MHz, CDCl_3): δ 6.53-6.43 (m, 1H), 5.74 (s, 1H), 5.12-4.98 (m, 2H), 3.74-3.71 (m, 7H, one single at 3.73 inside), 3.56-3.49 (m, 1H), 1.42-1.40 (d, 3H, $J=9.6\text{Hz}$); $^{13}\text{CNMR}$ (100MHz, CDCl_3): δ 174.2, 139.4, 137.2, 125.8, 115.0,

60.3, 56.9, 55.2, 51.6, 17.1; **HRMS** (EI) m/z calcd for $C_{10}H_{15}NO_2$ (M^+) 181.1103, found 181.1104.

Phenyl-(3-styryl-2,5-dihydro-pyrrol-1-yl)-acetic acid methyl ester (mixture of *cis*- and *trans*-): yield: 81%; $^1\text{H NMR}$ (300MHz, $CDCl_3$): δ 7.59-7.22 (m, 10H), 6.94-6.88 (m, 1H), 6.57-6.21 (m, 1H), 5.85-5.79 (d, 1H), 4.43, 4.24 (s, 1H), 3.85-3.47 (m, 7H); $^{13}\text{C NMR}$ (75MHz, $CDCl_3$): δ 172.0, 171.8, 139.0, 136.9, 136.8, 130.4, 129.7, 128.9, 128.6, 128.5, 128.4, 128.3, 128.2, 128.1, 127.6, 127.4, 126.20, 126.17, 122.8, 72.5, 72.2, 58.9, 58.5, 57.3, 56.9, 52.0, 51.8; **HRMS** (EI) m/z calcd for $C_{15}H_{17}NO_2$ (M^+) 319.1572, found 319.1568.

(3-Isopropenyl-2,5-dihydro-pyrrol-1-yl)-phenyl-acetic acid methyl ester (7j): yield: 84%; $^1\text{H NMR}$ (300MHz, $CDCl_3$): δ 7.50-7.30 (m, 5H), 5.71-5.70 (d, 1H, $J=2.4\text{Hz}$), 4.88 (s, 1H), 4.68 (s, 1H), 4.33 (s, 1H), 3.68 (s, 3H), 3.58-3.48 (m, 4H), 1.87 (s, 3H); $^{13}\text{C NMR}$ (75MHz, $CDCl_3$): δ 172.0, 141.0, 137.5, 137.0, 128.9, 128.6, 128.4, 128.3, 122.8, 113.1, 72.6, 58.8, 57.7, 52.0, 20.0; (EI) m/z calcd for $C_{16}H_{19}NO_2$ (M^+) 257.1416, found 257.1407.

[3-(1-Methyl-2-phenyl-vinyl)-2,5-dihydro-pyrrol-1-yl]-phenyl-acetic acid methyl ester (mixture of *cis*- and *trans*-) (7k): yield: 31%; $^1\text{H NMR}$ (300MHz, $CDCl_3$): δ 7.57-7.08 (m, 10H), 6.53- 6.28 (m, 1H), 5.88-5.67 (m, 1H), 4.42, 4.21 (s, 1H), 3.75-3.12 (m, 7H), 2.06-1.97(m, 3H); $^{13}\text{C NMR}$ (75MHz, $CDCl_3$): δ 172.1, 171.8, 142.5, 140.4, 137.6, 137.1, 135.4, 134.7, 132.5, 129.1, 128.83, 128.80, 128.7, 128.6, 128.5, 128.4, 128.3, 128.0, 127.9, 127.5, 127.4, 72.6, 72.5, 59.1, 58.8, 57.8, 57.7, 52.1, 51.9, 50.5, 50.2, 19.0, 15.2; **HRMS** (EI) m/z calcd for $C_{15}H_{17}NO_2$ (M^+) 333.1729, found 333.1718.

4-Methylsulfanyl-2-(3-vinyl-2,5-dihydro-pyrrol-1-yl)-butyric acid ethyl ester (7l): yield: 68%; $^1\text{H NMR}$ (300MHz, $CDCl_3$): δ 6.53-6.43 (m, 1H), 5.73 (s, 1H), 5.12-4.97 (m, 2H), 4.23-4.16 (m, 2H), 3.86-3.69 (m, 3H), 3.63-3.58 (t, 1H, $J=7.2\text{Hz}$), 2.64-2.59 (t, 2H, $J=7.4\text{Hz}$), 2.12 (s, 3H), 2.08-1.94 (m, 2H), 1.30-1.24

(m, 3H); ¹³CNMR (75MHz, CDCl₃): δ 172.8, 139.2, 131.2, 125.9, 114.9, 62.8, 60.4, 56.5, 54.7, 30.7, 30.6, 15.5, 14.3; HRMS (EI) *m/z* calcd for C₁₃H₂₁NO₂S (M⁺) 255.1293, found 255.1301.

1-Phenyl-3-vinyl-2, 5-dihydro-1H-pyrrole (7m): yield: 80%; ¹HNMR (400MHz, CDCl₃): δ 7.35-7.31 (m, 2H), 6.79-6.76 (t, 1H, J= 7.4Hz), 6.65-6.58 (m, 3H), 5.94 (s, 1H), 5.29-5.21 (m, 2H), 4.29-4.22 (m, 4H); ¹³CNMR (100MHz, CDCl₃): δ 147.0, 138.4, 131.0, 129.3, 124.8, 115.6, 115.5, 111.0, 54.8, 53.1; HRMS (EI) *m/z* calcd for C₁₂H₁₃N (M⁺) 171.1048, found 171.1045.

References

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VI ^1H NMR spectra and ^{13}C NMR spectra of enyne substrates

VII ^1H NMR spectra and ^{13}C NMR spectra of pyrrolidine derivatives