



SUPPLEMENTARY MATERIAL TO
**Facile and efficient conjugate additions of β -dicarbonyl
compounds and nitroalkanes to 4-aryl-4-oxobut-2-enoates**

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SPECTRAL DATA OF THE PRODUCTS

4-Ethyl-1-methyl 2-acetyl-3-(2-oxo-2-phenylethyl)succinate (3a). New compound. Yield: 88 %; oil; Anal. Calcd. for $C_{17}H_{20}O_6$: C, 63.74; H, 6.29 %. Found: C, 63.90; H, 6.26 %. IR (film, cm^{-1}): 3062, 2983, 2956, 1729, 1686, 1598, 1449, 1362, 1257, 1030. MS (m/z): 320 (M^+). 1H -NMR (400 MHz, $CDCl_3$, δ / ppm), major: 1.18–1.22 (3H, *m*), 2.40 (3H, *s*), 3.41 (1H, *dd*, $J_1 = 5.2$ Hz, $J_2 = 18.0$ Hz), 3.53–3.62 (1H, *m*), 3.72 (3H, *s*), 3.83–3.85 (1H, *m*), 4.11–4.18 (2H, *m*), 4.25 (1H, *d*, $J = 8.0$ Hz), 7.49 (2H, *t*, $J = 8.0$ Hz), 7.60 (1H, *t*, $J = 7.2$ Hz), 7.96–7.98 (2H, *m*). ^{13}C -NMR (100 MHz, $CDCl_3$, δ / ppm), major: 13.9, 30.3, 37.5, 39.7, 52.6, 58.6, 61.4, 128.1, 128.7, 133.4, 136.7, 168.6, 172.5, 197.6, 202.3. 1H -NMR (400 MHz, $CDCl_3$, δ / ppm), minor: 1.18–1.22 (3H, *m*), 2.33 (3H, *s*), 3.31 (1H, *dd*, $J_1 = 5.2$ Hz, $J_2 = 18.0$ Hz), 3.53–3.62 (1H, *m*), 3.77 (3H, *s*), 3.83–3.85 (1H, *m*), 4.11–4.18 (2H, *m*), 4.25 (1H, *d*, $J = 8.0$ Hz), 7.49 (2H, *t*, $J = 8.0$ Hz), 7.60 (1H, *t*, $J = 7.2$ Hz), 7.96–7.98 (2H, *m*). ^{13}C -NMR (100 MHz, $CDCl_3$, δ / ppm), minor: 13.9, 29.9, 37.4, 39.4, 52.7, 59.4, 61.4, 128.1, 128.7, 133.4, 136.7, 169.1, 172.4, 197.7, 202.2.

4-Benzyl-1-ethyl 2-acetyl-3-(2-oxo-2-phenylethyl)succinate (3b). New compound. Yield: 85 %; oil; Anal. Calcd. for $C_{23}H_{24}O_6$: C, 69.68; H, 6.10 %. Found: C, 69.49; H, 6.15 %. IR (film, cm^{-1}): 2925, 1723, 1598, 1450, 1385, 1260, 1085. MS (m/z): 396 (M^+). 1H -NMR (400 MHz, $CDCl_3$, δ / ppm), major: 1.22–1.32 (3H, *m*), 2.39 (3H, *s*), 3.48 (1H, *dd*, $J_1 = 5.2$ Hz, $J_2 = 18.0$ Hz), 3.60–3.74 (1H, *m*), 3.86–3.99 (1H, *m*), 4.16–4.27 (2H, *m*), 4.30 (1H, *d*, $J = 8.0$ Hz), 5.17 (2H, *d*, $J = 4.0$ Hz), 7.32–7.41 (5H, *m*), 7.40–7.54 (2H, *m*), 7.61–7.70 (1H, *m*), 7.98–8.01 (2H, *m*). ^{13}C -NMR (100 MHz, $CDCl_3$, δ / ppm), major: 13.9, 30.3, 37.4, 39.6, 59.4, 61.8, 67.2, 128.1, 128.2, 128.3, 128.5, 128.6, 133.4, 135.4, 168.1, 172.4,

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197.6, 202.0. $^1\text{H-NMR}$ (400 MHz, CDCl_3 , δ / ppm), minor: 1.22–1.32 (3H, *m*), 2.32 (3H, *s*), 3.38 (1H, *dd*, $J_1 = 5.2$ Hz, $J_2 = 18.0$ Hz), 3.60–3.74 (1H, *m*), 3.86–3.99 (1H, *m*), 4.16–4.27 (2H, *m*), 4.30 (1H, *d*, $J = 8.0$ Hz), 5.17 (2H, *d*, $J = 4.0$ Hz), 7.32–7.41 (5H, *m*), 7.40–7.54 (2H, *m*), 7.61–7.70 (1H, *m*), 7.98–8.01 (2H, *m*). $^{13}\text{C-NMR}$ (100 MHz, CDCl_3 , δ / ppm), minor: 13.9, 29.9, 37.3, 39.4, 58.7, 61.8, 67.2, 128.1, 128.2, 128.3, 128.5, 128.6, 133.4, 135.4, 168.6, 172.3, 197.6, 202.3.

Diethyl 2-acetyl-3-(2-(4-bromophenyl)-2-oxoethyl)succinate (3c). New compound. Yield: 82 %; oil; Anal. Calcd. for $\text{C}_{18}\text{H}_{21}\text{BrO}_6$: C, 52.31; H, 5.12 %. Found: C, 52.43; H, 5.10 %. IR (film, cm^{-1}): 3093, 2960, 1727, 1687, 1586, 1465, 1399, 1255, 1071. MS (m/z): 412 (^{79}Br , M^+), 414 (^{81}Br , M^+). $^1\text{H-NMR}$ (400 MHz, CDCl_3 , δ / ppm), major: 1.21–1.29 (3H, *m*), 1.42–1.44 (3H, *m*), 2.37 (3H, *s*), 3.33 (1H, *dd*, $J_1 = 5.2$ Hz, $J_2 = 18.0$ Hz), 3.50 (1H, *dd*, $J_1 = 6.0$ Hz, $J_2 = 18.0$ Hz), 3.75–3.90 (1H, *m*), 4.06–4.21 (5H, *m*), 7.60–7.62 (2H, *m*), 7.80–7.83 (2H, *m*). $^{13}\text{C-NMR}$ (100 MHz, CDCl_3 , δ / ppm), major: 14.0, 30.3, 37.0, 39.6, 58.7, 59.4, 61.8, 64.1, 128.6, 129.6, 132.0, 135.1, 168.1, 172.5, 196.6, 201.7. $^1\text{H-NMR}$ (400 MHz, CDCl_3 , δ / ppm), minor: 1.21–1.29 (3H, *m*), 1.52–1.54 (3H, *m*), 2.30 (3H, *s*), 3.22 (1H, *dd*, $J_1 = 5.2$ Hz, $J_2 = 18.0$ Hz), 3.59 (1H, *dd*, $J_1 = 6.0$ Hz, $J_2 = 18.0$ Hz), 3.75–3.90 (1H, *m*), 4.06–4.21 (5H, *m*), 7.60–7.62 (2H, *m*), 7.80–7.83 (2H, *m*). $^{13}\text{C-NMR}$ (100 MHz, CDCl_3 , δ / ppm), minor: 14.0, 29.9, 37.3, 39.4, 58.7, 59.4, 61.9, 64.1, 128.6, 129.6, 132.0, 135.1, 168.5, 172.3, 196.7, 202.0.

4-Benzyl-1-ethyl 2-acetyl-3-(2-oxo-2-(4-phenoxyphenyl)ethyl)succinate (3d). New compound. Yield: 77 %; oil; Anal. Calcd. for $\text{C}_{29}\text{H}_{28}\text{O}_7$: C, 71.30; H, 5.78 %. Found: C, 71.15; H, 5.81 %. IR (film, cm^{-1}): 3066, 2982, 2931, 1731, 1679, 1679, 1584, 1488, 1245, 1023. MS (m/z): 488 (M^+). $^1\text{H-NMR}$ (400 MHz, CDCl_3 , δ / ppm), major: 1.14–1.21 (3H, *m*), 2.30 (3H, *s*), 3.33 (1H, *dd*, $J_1 = 5.2$ Hz, $J_2 = 18.0$ Hz), 3.48–3.55 (1H, *m*), 3.88–3.91 (1H, *m*), 4.07–4.16 (2H, *m*), 4.23 (1H, *d*, $J = 8.0$ Hz), 5.08 (2H, *s*), 6.96 (2H, *d*, $J = 8.0$ Hz), 7.04 (2H, *d*, $J = 8.0$ Hz), 7.18 (1H, *t*, $J = 7.4$ Hz), 7.27–7.35 (5H, *m*), 7.37 (2H, *t*, $J = 7.8$ Hz), 7.89 (2H, *d*, $J = 8.8$ Hz). $^{13}\text{C-NMR}$ (100 MHz, CDCl_3 , δ / ppm), major: 14.0, 30.3, 37.2, 39.7, 58.8, 61.7, 67.2, 117.3, 120.2, 124.7, 128.3, 128.5, 130.1, 130.4, 130.5, 135.4, 150.6, 162.2, 168.1, 172.5, 196.1, 201.7. $^1\text{H-NMR}$ (400 MHz, CDCl_3 , δ / ppm), minor: 1.14–1.21 (3H, *m*), 2.18 (3H, *s*), 3.23 (1H, *dd*, $J_1 = 5.2$ Hz, $J_2 = 18.0$ Hz), 3.48–3.55 (1H, *m*), 3.88–3.91 (1H, *m*), 4.07–4.16 (2H, *m*), 4.23 (1H, *d*, $J = 8.0$ Hz), 5.09 (2H, *s*), 6.96 (2H, *d*, $J = 8.0$ Hz), 7.04 (2H, *d*, $J = 8.0$ Hz), 7.18 (1H, *t*, $J = 7.4$ Hz), 7.27–7.35 (5H, *m*), 7.37 (2H, *t*, $J = 7.8$ Hz), 7.89 (2H, *d*, $J = 8.8$ Hz). $^{13}\text{C-NMR}$ (100 MHz, CDCl_3 , δ / ppm), minor: 14.0, 29.9, 37.2, 39.5, 59.5, 61.8, 67.2, 117.3, 120.2, 124.7, 128.3, 128.5, 130.1, 130.4, 130.5, 135.4, 150.6, 162.2, 168.6, 172.5, 196.1, 202.0.

Diethyl 2-acetyl-3-(2-(3,4-dimethylphenyl)-2-oxoethyl)succinate (3e). New compound. Yield: 89 %; oil; Anal. Calcd. for $C_{20}H_{26}O_6$: C, 66.28; H, 7.23 %. Found: C, 66.13; H, 7.25 %. IR (film, cm^{-1}): 2981, 2927, 1733, 1681, 1608, 1573, 1450, 1257, 1028. MS (m/z): 362 (M^+). 1H -NMR (400 MHz, $CDCl_3$, δ / ppm), major: 1.18–1.30 (6H, *m*), 2.33 (6H, *s*), 2.39 (3H, *s*), 3.38 (1H, *dd*, $J_1 = 5.2$ Hz, $J_2 = 18.0$ Hz), 3.54 (1H, *dd*, $J_1 = 5.6$ Hz, $J_2 = 18.0$ Hz), 3.75–3.90 (1H, *m*), 4.18–4.24 (5H, *m*), 7.23 (1H, *d*, $J = 8.0$ Hz), 7.69–7.74 (2H, *m*). ^{13}C -NMR (100 MHz, $CDCl_3$, δ / ppm), major: 14.0, 20.1, 30.3, 37.3, 39.7, 58.8, 61.3, 61.8, 125.8, 129.2, 129.9, 134.3, 137.0, 143.0, 168.2, 172.7, 197.5, 202.3. 1H -NMR (400 MHz, $CDCl_3$, δ / ppm), minor: 1.18–1.30 (6H, *m*), 2.33 (6H, *s*), 2.39 (3H, *s*), 3.28 (1H, *dd*, $J_1 = 5.2$ Hz, $J_2 = 18.0$ Hz), 3.59 (1H, *dd*, $J_1 = 5.6$ Hz, $J_2 = 18.0$ Hz), 3.75–3.90 (1H, *m*), 4.18–4.24 (5H, *m*), 7.23 (1H, *d*, $J = 8.0$ Hz), 7.69–7.74 (2H, *m*). ^{13}C -NMR (100 MHz, $CDCl_3$, δ / ppm), minor: 14.0, 19.8, 29.9, 37.4, 39.4, 59.7, 61.3, 61.8, 125.8, 129.2, 129.9, 134.3, 137.0, 143.0, 168.0, 172.6, 197.5, 201.9.

Triethyl 4-oxo-4-phenylbutane-1,1,2-tricarboxylate (3f).¹ Yield: 90 %; oil. IR (film, cm^{-1}): 2983, 2930, 1732, 1688, 1597, 1449, 1370, 1261, 1031. 1H -NMR (400 MHz, $CDCl_3$, δ / ppm): 1.06–1.16 (9H, *m*), 3.19–3.32 (1H, *m*), 3.47–3.60 (1H, *m*), 3.68–3.71 (1H, *m*), 3.90 (1H, *d*, $J = 6.6$ Hz), 4.03–4.11 (6H, *m*), 7.32–7.45 (3H, *m*), 7.83–7.86 (2H, *m*). ^{13}C -NMR (100 MHz, $CDCl_3$, δ / ppm): 13.83, 13.85, 37.3, 39.5, 52.2, 61.13, 61.15, 61.56, 61.58, 127.9, 128.5, 133.2, 136.4, 167.8, 167.9, 171.9, 197.0.

Triethyl 4-oxo-4-p-tolylbutane-1,1,2-tricarboxylate (3g). New compound. Yield: 82 %; oil; Anal. Calcd for $C_{20}H_{26}O_7$: C, 63.48; H, 6.93 %. Found: C, 63.24; H, 6.96 %. IR (film, cm^{-1}): 2983, 2936, 1733, 1683, 1607, 1558, 1369, 1228, 1097. MS (m/z): 378 (M^+). 1H -NMR (400 MHz, $CDCl_3$, δ / ppm): 1.14–1.23 (9H, *m*), 2.36 (3H, *s*), 3.26 (1H, *dd*, $J_1 = 4.8$ Hz, $J_2 = 17.8$ Hz), 3.53 (1H, *dd*, $J_1 = 7.0$ Hz, $J_2 = 17.8$ Hz), 3.79–3.80 (1H, *m*), 3.95 (1H, *d*, $J = 6.6$ Hz), 4.09–4.17 (6H, *m*), 7.21 (2H, *d*, $J = 8.0$ Hz), 7.82 (2H, *d*, $J = 8.0$ Hz). ^{13}C -NMR (100 MHz, $CDCl_3$, δ / ppm): 13.92, 13.94, 21.6, 37.2, 39.6, 52.4, 61.2, 61.6, 61.7, 128.2, 129.2, 134.0, 144.1, 168.00, 168.02, 172.1, 196.7.

Triethyl 4-(4-chlorophenyl)-4-oxobutane-1,1,2-tricarboxylate (3h). New compound. Yield: 86 %; oil; Anal. Calcd. for $C_{19}H_{23}ClO_7$: C, 57.22; H, 5.81 %. Found: C, 57.01; H, 5.76 %. IR (film, cm^{-1}): 2983, 2937, 1732, 1689, 1590, 1466, 1370, 1221, 1093. MS (m/z): 398 (^{35}Cl , M^+), 400 (^{37}Cl , M^+). 1H -NMR (400 MHz, $CDCl_3$, δ / ppm): 1.23–1.33 (9H, *m*), 3.32 (1H, *dd*, $J_1 = 4.8$ Hz, $J_2 = 17.8$ Hz), 3.35–3.68 (1H, *dd*, $J_1 = 7.4$ Hz, $J_2 = 17.8$ Hz), 3.85–3.94 (1H, *m*), 4.05 (1H, *d*, $J = 6.4$ Hz), 4.18–4.26 (6H, *m*), 7.49 (2H, *d*, $J = 8.4$ Hz), 7.96 (2H, *d*, $J = 8.4$ Hz). ^{13}C -NMR (100 MHz, $CDCl_3$, δ / ppm): 13.96, 13.98, 37.3, 39.5, 52.2, 61.4, 61.78, 61.81, 128.9, 129.5, 134.8, 139.7, 168.0, 172.0, 196.1.

2-Benzyl-1,1-diethyl 4-oxo-4-(4-phenoxyphenyl)butane-1,1,2-tricarboxylate (3i). New compound. Yield: 81 %; oil; Anal. Calcd. for C₃₀H₃₀O₈: C, 69.49; H, 5.83 %. Found: C, 69.33; H, 5.85 %. IR (film, cm⁻¹): 3066, 2982, 2936, 1731, 1681, 1584, 1489, 1369, 1245, 1030. MS (*m/z*): 518 (M⁺). ¹H-NMR (400 MHz, CDCl₃, δ / ppm): 1.22–1.26 (6H, *m*), 3.31 (1H, *dd*, *J*₁ = 4.8, *J*₂ = 18.0 Hz), 3.61 (1H, *dd*, *J*₁ = 6.8, *J*₂ = 18.0 Hz), 3.93 (1H, *m*), 4.03–4.17 (5H, *m*), 5.11 (2H, *d*, *J* = 4.0 Hz), 6.95 (2H, *d*, *J* = 8.8 Hz), 7.03 (2H, *d*, *J* = 8.0 Hz), 7.16 (1H, *t*, *J* = 7.6 Hz), 7.25–7.28 (5H, *m*), 7.36 (2H, *t*, *J* = 7.6 Hz), 7.91 (2H, *d*, *J* = 8.8 Hz). ¹³C-NMR (100 MHz, CDCl₃, δ / ppm): 13.91, 13.95, 37.2, 39.7, 52.3, 61.70, 61.73, 67.1, 117.3, 120.2, 124.7, 128.2, 128.3, 128.4, 130.1, 130.4, 131.1, 135.5, 155.4, 162.1, 167.9, 168.0, 172.0, 195.6.

Triethyl 4-(3,4-dimethylphenyl)-4-oxobutane-1,1,2-tricarboxylate (3j). New compound. Yield: 85 %; oil; Anal. Calcd. for C₂₁H₂₈O₇: C, 64.27; H, 7.19 %. Found: C, 64.43; H, 7.16 %. IR (film, cm⁻¹): 2982, 2935, 1725, 1679, 1608, 1573, 1409, 1261, 1034. MS (*m/z*): 392 (M⁺). ¹H-NMR (400 MHz, CDCl₃, δ / ppm): 1.19–1.28 (9H, *m*), 2.31 (6H, *s*), 3.31 (1H, *dd*, *J*₁ = 4.8, *J*₂ = 17.8 Hz), 3.59 (1H, *dd*, *J*₁ = 7.0, *J*₂ = 17.8 Hz), 3.83–3.84 (1H, *m*), 3.99 (1H, *d*, *J* = 6.4 Hz), 4.14–4.21 (6H, *m*), 7.21 (1H, *d*, *J* = 8.0 Hz), 7.69–7.73 (2H, *m*). ¹³C-NMR (100 MHz, CDCl₃, δ / ppm): 13.95, 13.96, 19.7, 20.0, 30.3, 37.3, 39.6, 52.4, 61.3, 61.68, 61.70, 125.8, 129.2, 129.8, 134.4, 136.9, 142.8, 168.06, 168.08, 172.2, 197.0.

Ethyl 2-(nitromethyl)-4-oxo-4-phenylbutanoate (5a).² Yield: 81 %; oil. IR (film, cm⁻¹): 3063, 2982, 2925, 1732, 1685, 1556, 1379. ¹H-NMR (400 MHz, CDCl₃, δ / ppm): 1.24 (3H, *t*, *J* = 6.4 Hz), 3.37 (1H, *dd*, *J*₁ = 6.8 Hz, *J*₂ = 18.4 Hz), 3.60 (1H, *dd*, *J*₁ = 5.2 Hz, *J*₂ = 18.4 Hz), 3.76–3.81 (1H, *m*), 4.18–4.24 (2H, *m*), 4.77 (1H, *dd*, *J*₁ = 5.6 Hz, *J*₂ = 14.4 Hz), 4.86 (1H, *dd*, *J*₁ = 6.0 Hz, *J*₂ = 14.4 Hz), 7.46–7.50 (2H, *m*), 7.58–7.60 (1H, *m*), 7.94–7.96 (2H, *m*). ¹³C-NMR (100 MHz, CDCl₃, δ / ppm): 14.0, 37.0, 38.4, 61.9, 74.8, 128.1, 128.8, 133.8, 135.9, 170.9, 196.5.

Ethyl 2-(nitromethyl)-4-oxo-4-p-tolylbutanoate (5b).² Yield: 80 %; oil. IR (film, cm⁻¹): 2983, 2925, 1734, 1682, 1557, 1379. ¹H-NMR (400 MHz, CDCl₃, δ / ppm): 1.24 (3H, *t*, *J* = 7.2 Hz), 2.41 (3H, *s*), 3.34 (1H, *dd*, *J*₁ = 7.2 Hz, *J*₂ = 18.4 Hz), 3.56 (1H, *dd*, *J*₁ = 5.2 Hz, *J*₂ = 18.4 Hz), 3.73–3.75 (1H, *m*), 4.17–4.23 (2H, *m*), 4.75 (1H, *dd*, *J*₁ = 5.2 Hz, *J*₂ = 14.4 Hz), 4.85 (1H, *dd*, *J*₁ = 6.4 Hz, *J*₂ = 14.4 Hz), 7.26–7.28 (2H, *m*), 7.83–7.86 (2H, *m*). ¹³C-NMR (100 MHz, CDCl₃, δ / ppm): 14.0, 21.7, 36.9, 38.4, 61.8, 74.8, 128.2, 129.4, 133.5, 144.7, 171.0, 196.1.

Ethyl 4-(4-bromophenyl)-2-(nitromethyl)-4-oxobutanoate (5c).² Yield: 86 %; oil. IR (film, cm⁻¹): 2982, 2925, 1731, 1685, 1556, 1380. ¹H-NMR (400 MHz, CDCl₃, δ / ppm): 1.23–1.27 (3H, *m*), 3.33 (1H, *dd*, *J*₁ = 6.8 Hz, *J*₂ = 18.4 Hz), 3.58 (1H, *dd*, *J*₁ = 5.2 Hz, *J*₂ = 18.4 Hz), 3.73–3.76 (1H, *m*), 4.18–4.24 (2H, *m*),

4.79 (1H, *dd*, $J_1 = 5.2$ Hz, $J_2 = 14.4$ Hz), 4.85 (1H, *dd*, $J_1 = 6.0$ Hz, $J_2 = 14.4$ Hz), 7.60–7.63 (2H, *m*), 7.80–7.83 (2H, *m*). $^{13}\text{C-NMR}$ (100 MHz, CDCl_3 , δ / ppm): 14.0, 37.0, 38.3, 61.9, 74.8, 129.0, 129.6, 132.1, 134.7, 170.7, 195.6.

Benzyl 2-(nitromethyl)-4-oxo-4-phenylbutanoate (5d).² Yield: 85 %; oil. IR (film, cm^{-1}): 3064, 3033, 2923, 1734, 1684, 1554, 1380. $^1\text{H-NMR}$ (400 MHz, CDCl_3 , δ / ppm): 3.40 (1H, *dd*, $J_1 = 6.8$ Hz, $J_2 = 18.4$ Hz), 3.62 (1H, *dd*, $J_1 = 5.2$ Hz, $J_2 = 18.4$ Hz), 3.80–3.85 (1H, *m*), 4.83 (1H, *dd*, $J_1 = 5.2$ Hz, $J_2 = 14.4$ Hz), 4.88 (1H, *dd*, $J_1 = 6.0$ Hz, $J_2 = 14.4$ Hz), 5.19 (2H, *s*), 7.29–7.36 (5H, *m*), 7.48 (2H, *t*, $J = 7.6$ Hz), 7.61 (1H, *t*, $J = 7.2$ Hz), 7.94 (2H, *d*, $J = 7.6$ Hz). $^{13}\text{C-NMR}$ (100 MHz, CDCl_3 , δ / ppm): 37.0, 38.4, 67.6, 74.7, 128.1, 128.3, 128.5, 128.7, 128.8, 133.9, 135.1, 135.9, 170.8, 196.4.

Benzyl 4-(4-chlorophenyl)-2-(nitromethyl)-4-oxobutanoate (5e). New compound. Yield: 87 %; oil; Anal. Calcd. for : $\text{C}_{18}\text{H}_{16}\text{ClNO}_5$: C, 59.76; H, 4.46; N, 3.87 %. Found: C, 59.60; H, 4.49; N, 3.79 %. IR (film, cm^{-1}): 3034, 2923, 1736, 1686, 1555, 1380. MS (m/z): 361 (^{35}Cl , M^+), 363 (^{37}Cl , M^+). $^1\text{H-NMR}$ (400 MHz, CDCl_3 , δ / ppm): 3.35 (1H, *dd*, $J_1 = 6.4$ Hz, $J_2 = 18.4$ Hz), 3.60 (1H, *dd*, $J_1 = 5.2$ Hz, $J_2 = 18.4$ Hz), 3.83 (1H, *t*, $J = 5.8$ Hz), 4.82 (1H, *dd*, $J = 5.2$, 14.4 Hz), 4.90 (1H, *dd*, $J_1 = 6.0$ Hz, $J_2 = 14.4$ Hz), 5.20 (2H, *s*), 7.31–7.38 (5H, *m*), 7.45 (2H, *d*, $J = 8.4$ Hz), 7.88 (2H, *d*, $J = 8.4$ Hz). $^{13}\text{C-NMR}$ (100 MHz, CDCl_3 , δ / ppm): 37.0, 38.4, 67.7, 74.7, 128.3, 128.6, 128.7, 129.1, 129.5, 134.2, 135.0, 140.3, 170.6, 195.3.

Benzyl 2-(1-nitroethyl)-4-oxo-4-phenylbutanoate (5f). New compound. Yield: 82 %; oil; Anal. Calcd. for $\text{C}_{19}\text{H}_{19}\text{NO}_5$: C, 66.85; H, 5.61; N, 4.10 %. Found: C, 66.70; H, 5.64; N, 4.06 %. IR (film, cm^{-1}): 3064, 2980, 2921, 1728, 1683, 1585, 1553, 1398, 1263, 1071. MS (m/z): 341 (M^+). $^1\text{H-NMR}$ (400 MHz, CDCl_3 , δ / ppm), major: 1.55 (3H, *d*, $J = 6.8$ Hz), 3.02–3.07 (1H, *m*), 3.54–3.72 (2H, *m*), 5.01–5.05 (1H, *m*), 5.11–5.19 (2H, *m*), 7.29–7.34 (5H, *m*), 7.45 (2H, *t*, $J = 7.6$ Hz), 7.57 (1H, *t*, $J = 7.2$ Hz), 7.92 (2H, *d*, $J = 8.0$ Hz). $^{13}\text{C-NMR}$ (100 MHz, CDCl_3 , δ / ppm), major: 16.9, 36.0, 44.4, 67.6, 82.7, 128.1, 128.2, 128.4, 128.6, 128.8, 133.7, 135.1, 136.0, 170.7, 196.5. $^1\text{H-NMR}$ (400 MHz, CDCl_3 , δ / ppm), minor: 1.55 (3H, *d*, $J = 6.8$ Hz), 3.23–3.28 (1H, *m*), 3.54–3.72 (2H, *m*), 5.01–5.05 (1H, *m*), 5.11–5.19 (2H, *m*), 7.29–7.34 (5H, *m*), 7.45 (2H, *t*, $J = 7.6$ Hz), 7.57 (1H, *t*, $J = 7.2$ Hz), 7.92 (2H, *d*, $J = 8.0$ Hz). $^{13}\text{C-NMR}$ (100 MHz, CDCl_3 , δ / ppm), minor: 16.5, 36.0, 43.8, 67.5, 82.2, 128.1, 128.2, 128.3, 128.5, 128.7, 133.7, 135.1, 136.0, 170.6, 196.5.

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