Supporting Information

Samarium Triflate Catalyzed Halogen-Promoted Friedel-Crafts Alkylation with Alkenes

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GENERAL

All reactions were conducted using oven-dried glassware under an atmosphere of Argon (Ar). Commercial grade reagents were used without further purification. Solvents were dried and distilled following usual protocols. Flash chromatography was carried out using Rankem Silica gel (230-400 mesh) purchased from Rankem, India. TLC was performed on aluminium-backed plates coated with Silica gel 60 with F₂₅₄ indicator (Merck).

The ¹H NMR spectra were measured with Bruker-200 (200 MHz), Bruker-400 (400 MHz) and ¹³C NMR spectra were measured with Bruker-200 (50 MHz), Bruker-400 (100 MHz) using CDCl₃ and. ¹H NMR chemical shifts are expressed in parts per million (δ) downfield to CHCl₃ (δ = 7.26), ¹³C NMR chemical shifts are expressed in parts per million (δ) relative to the central CDCl₃ resonance (δ = 77.0). Coupling constants in ¹H NMR are in Hz. Elemental analyses were carried out on a Perkin-Elmer 2400-II. Melting points were measured in Toshniwal (India) melting point apparatus.

General Procedure for the intermolecular F-C alkylation reaction:

To a well-stirred suspended solution of arene (1.2 equiv) and alkene (1.0 equiv) and 4Å MS in acetonitrile, Sm(OTf)₃ (0.05 equiv) and NBS (1.2 equiv) [or I₂ (1.2 equiv) and NaHCO₃ (1.2equiv)] were added and allowed to stir at specified temperature (-20 to 25 °C) under an argon atmosphere. Progress of the reaction was monitored by TLC. On completion, the reaction was quenched with water and extracted with Et₂O (3 times). The combined organic layer was washed with brine and dried over Na₂SO₄. After removal of the solvents under reduced pressure, the crude reaction mixture was subjected to purification by flash column chromatography using EtOAc/petroleum-ether (60-80° C) as an eluent.

Spectral Data of Friedel-Crafts Alkylated products ($\pm$)-**3** and ($\pm$)-**5**

1-(2-Bromo-1-phenyl-ethyl)-4-methyl-benzene (**3a**): gummy liquid. $^1\text{H-NMR}$ (CDCl_3 , 200 MHz): δ 7.38-7.14 (m, 5H), 7.12 (s, 4H), 4.35 (t, $J = 7.9$ Hz, 1H), 3.91 (d, $J = 7.9$ Hz, 2H), 2.31 (s, 3H). $^{13}\text{C-NMR}$ (CDCl_3 , 50 MHz): δ 141.9, 138.7, 136.6, 130.8 (2C), 128.6 (2C), 127.8 (2C), 127.7 (2C), 126.9, 53.3, 35.6, 21.0. Anal. Calcd for $\text{C}_{15}\text{H}_{15}\text{Br}$: C, 65.47; H, 5.49. Found: C, 65.40; H, 5.45%.

4-(2-Bromo-1-phenyl-ethyl)-1,2-dimethyl-benzene (**3b**): gummy liquid. $^1\text{H-NMR}$ (CDCl_3 , 200 MHz): δ 7.39-7.15 (m, 5H), 7.09 (d, $J = 9.3$ Hz, 2H), 7.0 (s, 1H), 4.31 (t, $J = 7.9$ Hz, 1H), 3.91 (d, $J = 7.9$ Hz, 2H), 2.22 (s, 6H). $^{13}\text{C-NMR}$ (CDCl_3 , 50 MHz): δ 142.0, 139.2, 136.8, 135.3, 129.9, 129.2, 128.6 (2C), 127.8 (2C), 126.9, 125.0, 53.4, 35.7, 19.8, 19.3. Anal. Calcd for $\text{C}_{16}\text{H}_{17}\text{Br}$: C, 66.45; H, 5.92. Found: C, 66.41; H, 5.90%.

1-(2-Iodo-1-phenyl-ethyl)-4-methoxy-benzene (**3c**): gummy liquid. $^1\text{H-NMR}$ (CDCl_3 , 200 MHz): δ 7.05-7.38 (m, 7H), 6.85 (d, $J = 8.6$ Hz, 2H), 4.30 (t, $J = 8.0$ Hz, 1H), 3.78 (s, 3H), 3.72 (d, $J = 8.0$ Hz, 2H). $^{13}\text{C-NMR}$ (CDCl_3 , 50 MHz): δ 158.4, 142.7, 134.6, 128.6 (2C), 128.6 (2C), 127.3, 127.2, 126.3, 114.0 (2C), 55.2, 53.4, 9.9. Anal. Calcd for $\text{C}_{15}\text{H}_{15}\text{IO}$: C, 53.27; H, 4.47. Found: C, 53.15; H, 4.39.

4-(2-Iodo-1-phenyl-ethyl)-1,2-dimethoxy-benzene (**3d**): gummy liquid. $^1\text{H-NMR}$ (CDCl_3 , 200 MHz): δ 7.39-7.18 (m, 5H), 6.95-6.65 (m, 3H), 4.28 (t, $J = 8.6$ Hz, 1H), 3.85 (s, 3H), 3.83 (s, 3H), 3.71 (d, $J = 8.6$ Hz, 2H). $^{13}\text{C-NMR}$ (CDCl_3 , 50 MHz): δ 148.9, 147.9, 142.5, 135.0, 128.5 (2C), 127.5 (2C), 126.9, 119.5, 111.2, 111.1, 55.8, 55.7, 53.7, 9.74. Anal. Calcd for $\text{C}_{16}\text{H}_{17}\text{IO}_2$: C, 52.19; H, 4.65. Found: C, 52.01; H, 4.60%.

4-[2-Bromo-1-(4-methoxy-phenyl)-propyl]-1,2-dimethoxy-benzene (**3e**): gummy liquid. $^1\text{H-NMR}$

(CDCl_3 , 400 MHz): δ 7.24 (d, $J = 8.8$ Hz, 2H), 6.9 (d, $J = 8.8$ Hz, 2H), 6.82-6.78 (m, 2H), 6.72 (s, 1H), 4.78-4.72 (m, 1H), 4.04 (d, $J = 10.4$ Hz, 1H), 3.84 (s, 3H), 3.82 (s, 3H), 3.77 (s, 3H), 1.65 (d, $J = 6.5$ Hz, 3H). $^{13}\text{C-NMR}$ (CDCl_3 , 50 MHz): δ 158.2, 149.0, 147.9, 135.3, 135.0, 128.7 (2C), 119.7, 113.7 (2C), 111.3, 111.1, 60.1, 55.9, 55.8, 55.1, 52.6, 25.5. Anal. Calcd for $\text{C}_{18}\text{H}_{21}\text{BrO}_3$: C,

59.19; H, 5.79. Found: C, 58.95; H, 5.71%.

4-[2-Bromo-1-(4-methoxy-phenyl)-pentyl]-1,2-dimethoxy-benzene (**3f**): gummy liquid. $^1\text{H-NMR}$

(CDCl_3 , 400 MHz): δ 7.24 (d, J = 8.8 Hz, 2H), 7.14 (d, J = 8.8 Hz, 2H), 6.85-6.80 (m, 4H), 4.71-4.65 (m, 1H), 4.13 (d, J = 10.4 Hz, 1H), 3.77 (s, 3H), 3.76 (s, 3H), 1.73-1.63 (m, 2H), 1.50-1.30 (m, 2H), 0.85 (t, J = 7.2 Hz, 3H). $^{13}\text{C-NMR}$ (CDCl_3 , 50 MHz): δ 158.3, 158.1, 135.5, 134.8, 128.8 (2C), 128.7 (2C), 113.7 (2C), 113.1, 113.0, 60.1, 58.0, 55.2, 55.1, 39.0, 20.75, 13.3. Anal. Calcd for $\text{C}_{19}\text{H}_{23}\text{BrO}_2$: C, 61.07; H, 6.41.

Found: C, 61.10; H, 6.38%

2-Bromo-1-(4-methoxy-phenyl)-1,2,3,4-tetrahydro-naphthalene (**3g**): gummy liquid. $^1\text{H-NMR}$ (CDCl_3 , 400 MHz): δ 7.17 (d, J = 4.0 Hz, 2H), 7.1-7.05 (m, 1H), 6.98 (d, J = 8.6 Hz, 2H), 6.90-6.78 (m, 3H), 4.58-4.50 (m, 1H), 4.45 (d, J = 5.6 Hz, 1H), 3.78 (s, 3H), 3.2-3.1 (m, 1H), 3.05-2.90 (m, 1H), 2.45-2.30 (m, 1H), 2.2-2.1 (m, 1H). $^{13}\text{C-NMR}$ (CDCl_3 , 50 MHz): δ 158.4, 136.6, 136.3, 135.1, 130.5, 130.1(2C), 128.6, 126.5, 126.2, 113.7, 113.5, 56.4, 55.2, 53.8, 29.3, 27.4. Anal. Calcd for $\text{C}_{17}\text{H}_{17}\text{BrO}$: C, 64.37; H, 5.40. Found: C, 64.20; H, 5.39%.

2-Bromo-1-(3,4-dimethoxy-phenyl)-1,2,3,4-tetrahydro-naphthalene (**3h**): white solid. mp 62-64°C.

$^1\text{H-NMR}$ (CDCl_3 , 200 MHz): δ 7.30-7.01 (m, 3H), 6.86 (d, J = 7.5 Hz, 1H), 6.77 (d, J = 8.1 Hz, 1H), 6.62 (s, 1H), 6.55 (dd, J = 8.1, 1.7 Hz, 1H), 4.64-4.50 (m, 1H), 4.44 (d, J = 5.69 Hz, 1H), 3.85 (s, 3H), 3.61 (s, 3H), 3.21-2.90 (m, 2H), 2.50-2.25 (m, 1H), 2.24-2.05 (m, 1H). $^{13}\text{C-NMR}$ (CDCl_3 , 50 MHz): δ 148.8, 147.8, 136.9, 136.0, 135.0, 130.4, 128.4, 126.4, 126.1, 121.4, 112.2, 110.9, 56.1, 55.8, 55.7, 54.2, 29.4, 27.3. Anal. Calcd for $\text{C}_{18}\text{H}_{19}\text{BrO}_2$: C, 62.26; H, 5.52. Found: C, 62.10; H, 5.49%.

2-Bromo-1-(2,3,4-trimethoxy-phenyl)-1,2,3,4-tetrahydro-naphthalene (**3i**): gummy liquid. $^1\text{H-NMR}$ (CDCl_3 , 400 MHz): δ 7.15 (m, 2H), 7.07 (m, 1H), 6.82 (d, J = 8.0 Hz, 1H), 6.54 (d, J = 8.8 Hz, 1H), 6.48 (d, J = 8.0 Hz, 1H), 4.70-4.50 (m, 2H), 3.93 (s, 3H), 3.82 (s, 3H), 3.73 (s, 3H), 3.15-3.0 (m, 1H), 3.0-2.92 (m, 1H), 2.42-2.31 (m, 1H), 2.30-2.15 (m, 1H).

1-Bromo-2,3,4-trimethoxy-benzene (**3i'**): gummy liquid. $^1\text{H-NMR}$ (CDCl_3 , 400 MHz): δ 7.20 (d, $J = 8.8$ Hz, 1H), 6.58 (d, $J = 8.8$ Hz, 1H), 3.90 (s, 3H), 3.88 (s, 3H), 3.84 (s, 3H).

2-Bromo-3,3-bis-(4-methoxy-phenyl)-propionic acid methyl ester (**5a**): gummy liquid. $^1\text{H-NMR}$

(CDCl_3 , 200 MHz): δ 7.22 (d, $J = 8.4$ Hz, 2H), 7.15 (d, $J = 8.5$ Hz, 2H), 6.85 (d, $J = 8.5$ Hz, 2H), 6.77 (d, $J = 8.4$ Hz, 2H), 4.84 (d, $J = 11.9$ Hz, 1H), 4.49 (d, $J = 11.9$ Hz, 1H), 3.75 (s, 3H), 3.72 (s, 3H), 3.58 (s, 3H). $^{13}\text{C-NMR}$ (CDCl_3 , 50 MHz): δ 169.5, 158.6, 158.5, 132.9, 132.5, 128.8 (2C), 128.7 (2C), 114.1 (2C), 113.9 (2C), 55.10 (2C), 53.7, 52.7, 48.6. Anal. Calcd for $\text{C}_{18}\text{H}_{19}\text{BrO}_4$: C, 57.01; H, 5.05 Found: C, 56.95; H, 5.01%.

2-Bromo-3-(3,4-dimethoxy-phenyl)-3-(4-methoxy-phenyl)-propionic acid methyl ester (**5b**): white solid. mp 127-129°C. $^1\text{H-NMR}$ (CDCl_3 , 200 MHz): δ 7.23 (d, $J = 7.0$ Hz, 2H), 6.85 (d, $J = 7.0$

Hz, 2H), 6.87-6.68 (m, 3H), 4.85 (d, $J = 11.8$ Hz, 1H), 4.48 (d, $J = 11.8$ Hz, 1H), 3.81 (s, 3H), 3.79 (s, 3H), 3.75 (s, 3H), 3.59 (s, 3H). $^{13}\text{C-NMR}$ (CDCl_3 , 50 MHz): δ 169.5, 158.5, 148.8, 148.0, 132.9, 132.7, 128.8 (2C), 119.4, 113.9 (2C), 111.2 (2C), 55.7, 55.6, 55.0, 54.0, 52.7, 48.5. Anal. Calcd for $\text{C}_{19}\text{H}_{21}\text{BrO}_5$: C, 55.76; H, 5.17 Found: C, 55.75; H, 5.16%.

2-Bromo-3-(4-methoxy-phenyl)-3-(3,4,5-trimethoxy-phenyl)-propionic acid methyl ester (**5c**): white solid. mp 79-81°C. $^1\text{H-NMR}$ (CDCl_3 , 200 MHz): δ 7.25 (d, $J = 8.6$ Hz, 2H), 6.93 (d, $J = 8.6$ Hz,

1H), 6.81 (d, $J = 8.6$ Hz, 2H), 6.57 (d, $J = 8.6$ Hz, 1H), 4.98 (d, $J = 12.0$ Hz, 1H), 4.81 (d, $J = 12.0$ Hz, 1H), 3.77 (s, 6H), 3.75 (s, 3H), 3.73 (s, 3H), 3.57 (s, 3H). $^{13}\text{C-NMR}$ (CDCl_3 , 50 MHz): δ 169.5, 158.3, 152.9, 151.2, 142.4, 132.8, 129.2 (2C), 127.0, 121.2, 113.8, 113.6, 107.0, 60.6, 60.4, 55.7, 55.0, 52.6, 48.8, 47.8. Anal. Calcd for $\text{C}_{20}\text{H}_{23}\text{BrO}_6$: C, 54.68; H, 5.28 Found: C, 54.55; H, 5.24%.

2-Bromo-3,3-bis-(3,4-dimethoxy-phenyl)-propionic acid methyl ester (**5d**): white solid. mp 41-43°C. $^1\text{H-NMR}$ (CDCl_3 , 200 MHz): δ 6.95-6.70 (m, 6H), 4.83 (d, $J = 11.8$ Hz, 1H), 4.46 (d, $J = 11.8$ Hz, 1H), 3.87 (s, 3H), 3.85 (s, 3H), 3.82 (s, 3H), 3.81 (s, 3H), 3.61 (s, 3H). $^{13}\text{C-NMR}$

(CDCl₃, 50 MHz): δ 169.5, 148.9, 148.2, 148.1, 133.2, 132.8, 119.7, 119.5, 111.6, 111.3(2C), 111.2, 111.1, 55.9, 55.8, 55.7, 54.3, 52.8 (2C), 48.5. Anal. Calcd for C₂₀H₂₃BrO₆: C, 54.68; H, 5.28 Found: C, 54.60; H, 5.25%.

2-Bromo-3-(3,4-dimethoxy-phenyl)-3-(3,4,5-trimethoxy-phenyl)-propionic acid methyl ester (**5e**): white solid. mp 95-97°C. ¹H-NMR (CDCl₃, 200 MHz): δ 6.92 (d, *J* = 8.5 Hz, 2H), 6.85 (s, 1H),

7.05-6.72 (m, 4H), 6.57 (d, *J* = 8.6 Hz, 1H), 4.97 (d, *J* = 12.0 Hz, 1H), 4.79 (d, *J* = 12.0 Hz, 1H), 3.84 (s, 3H), 3.81 (s, 3H), 3.78 (s, 3H), 3.77 (s, 3H), 3.76 (s, 3H), 3.58 (s, 3H). ¹³C-NMR (CDCl₃, 50 MHz): δ 169.3, 152.7, 151.0, 148.4, 147.6, 142.1, 133.1, 126.6, 121.0, 120.0, 111.7, 110.8, 106.8, 60.5, 60.2, 55.6, 55.56, 55.51, 52.4, 48.5, 47.9. Anal. Calcd for C₂₁H₂₅BrO₇: C, 53.74; H, 5.37 Found: C, 53.70; H, 5.35%.

2-Bromo-3-(3,4-dimethoxy-phenyl)-3-furan-2-yl-propionic acid methyl ester (**5f**): gummy liquid.

¹H-NMR (CDCl₃, 200 MHz): δ 6.90-6.77 (m, 4H), 6.24 (d, *J* = 1.9 Hz, 2H), 4.80 (d, *J* = 11.5 Hz, 1H), 4.49 (d, *J* = 11.5 Hz, 1H), 3.86 (s, 3H), 3.83 (s, 3H), 3.57 (s, 3H). ¹³C-NMR (CDCl₃, 50 MHz): δ 168.6, 154.8, 148.7, 148.6, 129.2, 120.8, 120.2, 111.7, 111.2, 111.0, 110.2, 55.7, 55.6, 52.7, 49.0, 46.2. Anal. Calcd for C₁₆H₁₇BrO₅: C, 52.05; H, 4.64. Found: C, 51.96; H, 4.61%.

2-Bromo-3,3-bis-(3,4-dimethoxy-phenyl)-1-phenyl-propan-1-one (**5g**): white solid. mp 75-77°C.

¹H-NMR (CDCl₃, 200 MHz): δ 7.93 (d, *J* = 8.6 Hz, 2H), 7.65-7.40 (m, 3H), 7.18-6.85 (m, 3H), 6.80-6.60 (m, 3H), 5.79 (d, *J* = 11.5 Hz, 1H), 4.79 (d, *J* = 11.5 Hz, 1H), 3.90 (s, 3H), 3.87 (s, 3H), 3.73 (s, 3H), 3.71 (s, 3H). ¹³C-NMR (CDCl₃, 50 MHz): δ 192.8, 148.7, 148.6, 147.9, 147.7, 134.8, 134.0, 133.5, 133.3, 128.6 (2C), 128.3 (2C), 120.0, 119.2, 112.0, 111.6, 111.1, 111.0, 55.8, 55.6, 55.5, 55.5, 52.7, 49.4. Anal Calcd for C₂₅H₂₅BrO₅: C, 61.86; H, 5.19 Found: C, 62.13; H, 5.27%.

2-Bromo-3-(3,4-dimethoxy-phenyl)-1-phenyl-3-(3,4,5-trimethoxy-phenyl)-propan-1-one (**5h**): white solid. mp 125-127°C. ¹H-NMR (CDCl₃, 200 MHz): δ 7.97 (dd, *J* = 8.1, 1.1 Hz, 2H), 7.61-7.40 (m, 3H), 7.00-6.97 (m, 2H), 6.83 (d, *J* = 8.7 Hz, 2H), 6.45 (d, *J* = 8.7 Hz, 1H), 5.99 (d, *J* = 11.6 Hz, 1H), 5.06 (d, *J* = 11.6 Hz, 1H), 3.90 (s, 3H), 3.85 (s, 3H),

3.73 (s, 3H), 3.72 (s, 3H), 3.71 (s, 3H). ^{13}C -NMR (CDCl_3 , 50 MHz): δ 192.7, 152.6, 151.0, 148.4, 147.7, 142.3, 134.9, 133.9, 133.3, 128.5 (2C), 128.3 (2C), 127.5, 121.1, 120.4, 112.4, 110.8, 106.8, 60.4, 60.2, 55.8, 55.6 (2C), 49.8, 47.4. Anal Calcd for $\text{C}_{26}\text{H}_{27}\text{BrO}_6$: C, 60.59; H, 5.28 Found: C, 61.01; H, 5.33%.

2-Bromo-3-(3,4-dimethoxy-phenyl)-3-(4-methoxy-phenyl)-1-(2-methoxy-phenyl)-propan-1-one (**5i**): white solid. mp 99-101°C. ^1H -NMR (CDCl_3 , 200 MHz): δ 7.58-7.40 (m, 2H), 7.30 (d, J = 8.5 Hz, 2H), 7.00-6.75 (m, 5H), 6.65 (d, J = 8.5 Hz, 2H), 6.17 (d, J = 11.5 Hz, 1H), 4.75 (d, J = 11.5 Hz, 1H), 3.93 (s, 3H), 3.78 (s, 3H), 3.74 (s, 3H), 3.73 (s, 3H). ^{13}C -NMR (CDCl_3 , 50 MHz): δ 194.8, 158.3, 158.2, 148.6, 147.8, 134.2, 134.1 (2C), 131.6, 129.0 (2C), 126.0, 120.9, 119.8, 113.8 (2C), 111.8, 111.7, 111.1, 55.8, 55.6 (2C), 55.0, 54.8, 53.0. Anal Calcd for $\text{C}_{25}\text{H}_{25}\text{BrO}_5$: C, 61.86; H, 5.19 Found: C, 62.02; H, 5.22%.

2-Bromo-3-(4-methoxy-phenyl)-1-(2-methoxy-phenyl)-3-(3,4,5-trimethoxy-phenyl)-propan-1-one (**5j**): white solid. mp 93-95°C. ^1H -NMR (CDCl_3 , 200 MHz): δ 7.60-7.20 (m, 4H), 7.10-6.73 (m, 5H), 6.47 (d, J = 8.6 Hz, 1H), 6.30 (d, J = 11.7 Hz, 1H), 5.07 (d, J = 11.7 Hz, 1H), 3.99 (s, 3H), 3.77 (s, 6H), 3.73 (s, 3H), 3.72 (s, 3H).

^{13}C -NMR (CDCl_3 , 50 MHz): δ 194.7, 158.0, 157.9, 152.4, 151.1, 142.3, 134.0, 133.8, 131.4 (2C), 129.3, 128.2, 126.0, 121.2, 120.8, 113.5, 113.4, 111.5, 106.7, 60.36, 60.30, 55.7, 55.6, 55.2, 54.9, 46.8. Anal. Calcd for $\text{C}_{26}\text{H}_{27}\text{BrO}_6$: C, 60.59; H, 5.28 Found: C, 60.69; H, 5.35%.

1-Methoxy-4-propenyl-benzene: Liquid. ^1H -NMR (CDCl_3 , 400 MHz): δ 7.25 (d, J = 8.8 Hz, 2H), 6.83 (d, J = 8.8 Hz, 2H), 6.34 (d, J = 16.8 Hz, 1H), 6.11-6.06 (m, 1H), 3.80 (s, 3H), 1.85 (dd, J = 6.8, 1.6 Hz, 3H).

1-Methoxy-4-pent-1-enyl-benzene: Liquid. ^1H -NMR (CDCl_3 , 400 MHz): δ 7.30-7.25 (m, 2H), 6.86-6.81 (m, 2H), 6.33 (d, J = 16.0 Hz, 1H), 6.08 (dt, J = 16.0, 6.8 Hz, 1H), 3.80 (s, 3H), 2.17 (ddd, J = 15.8, 7.0, 1.3 Hz, 2H), 1.48 (dq, J = 14.5, 7.2 Hz, 2H), 0.95 (t, J = 7.3 Hz, 3H).

¹H NMR of compound **3a** (200 MHz, CDCl₃).

¹³C NMR of compound **3a** (50 MHz, CDCl₃).

DEPT 135 of compound **3b** (100 MHz, CDCl_3).

^1H NMR of compound **3c** (200 MHz, CDCl_3).

^{13}C NMR of compound **3c** (50 MHz, CDCl_3).

DEPT 135 of compound **3c** (100 MHz, CDCl_3).

^1H NMR of compound **3d** (200 MHz, CDCl_3).

^{13}C NMR of compound **3d** (50 MHz, CDCl_3).

¹³C NMR of compound **3e** (50 MHz, CDCl₃).

¹H NMR of compound **3f** (400 MHz, CDCl₃).

¹³C NMR of compound **3f** (50 MHz, CDCl₃).

¹H NMR of compound **3g** (400 MHz, CDCl₃).

13C NMR of compound **3g** (50 MHz, CDCl₃).

1H NMR of compound **3h** (200 MHz, CDCl₃).

^{13}C NMR of compound **3h** (50 MHz, CDCl_3).

DEPT 135 of compound **3h** (100 MHz, CDCl_3).

^1H NMR of compound (**3i**+**3i'**) (400 MHz, CDCl_3).

^1H NMR of compound **3i'** (400 MHz, CDCl_3).

¹H NMR of compound **5a** (200 MHz, CDCl₃).

¹³C NMR of compound **5a** (50 MHz, CDCl₃).

^1H NMR of compound **5b** (200 MHz, CDCl_3).

^{13}C NMR of compound **5b** (50 MHz, CDCl_3).

DEPT 135 of compound **5b** (100 MHz, CDCl_3).

^1H NMR of compound **5c** (200 MHz, CDCl_3).

13C NMR of compound **5c** (50 MHz, CDCl₃).

DEPT 135 of compound **5c** (100 MHz, CDCl₃).

¹³C NMR of compound **5e** (50 MHz, CDCl₃).

DEPT 135 of compound **5e** (100 MHz, CDCl₃).

^1H NMR of compound **5f** (200 MHz, CDCl_3).

^{13}C NMR of compound **5f** (50 MHz, CDCl_3).

^1H NMR of compound **5g** (200 MHz, CDCl_3).

^1H NMR of compound **5h** (200 MHz, CDCl_3).

^{13}C NMR of compound **5h** (50 MHz, CDCl_3).

¹H NMR of compound **5i** (200 MHz, CDCl₃).

¹³C NMR of compound **5i** (50 MHz, CDCl₃).

DEPT 135 of compound **5i** (100 MHz, CDCl₃)

¹H NMR of compound **5j** (200 MHz, CDCl₃).

¹³C NMR of compound **5j** (50 MHz, CDCl₃).

DEPT 135 of compound **5j** (100 MHz, CDCl₃).

¹H NMR of compound 1-Methoxy-4-propenyl-benzene. (400 MHz, CDCl₃).

¹H NMR of compound 1-Methoxy-4-pent-1-enyl-benzene. (400 MHz, CDCl₃).