Supplementary Information (SI) for Organic & Biomolecular Chemistry.

Supporting Information 1

Development of a convenient and useful transesterification reaction using a catalytic amount of strontium alkoxide

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1. General Methods

All reagents were purchased from commercial sources (Tokyo Chemical Industry Co. Ltd., Tokyo, Japan, Kanto Chemical Co. Inc., Tokyo, Japan, or FUJIFILM Wako Pure Chemical Co. Ltd., Osaka, Japan, Nacalai tesque Co., Ltd., Kyoto, Japan), and further purified by standard methods if necessary. A commercially available metallic strontium ingot (Kanto Kagaku Co., Ltd., Japan) in liquid paraffin was cut into small pieces with a small chisel in preparation for the start of each reaction. Tetrahydrofuran (THF; super dehydrated grade, Kanto Kagaku Co., Ltd., Japan) was used as received. Molecular sieves (MS) (Nacalai tesque Co., Ltd., Japan) was used as received. All reactions were performed under an atmosphere of argon unless stated otherwise. For column chromatography, silica gel (Silica gel 60N, spherical neutral, particle size 63-210μn) from Kanto Kagaku Co., Ltd., was used. Preparative thin-layer chromatography (PTLC) was also carried out using Wakogel B-5F (FUJIFILM Wako Pure Chemical Co. Ltd., Osaka, Japan) was used for purification. Nuclear magnetic resonance (NMR) spectra were recorded on a JEOL JNM-ECS 400 spectrometer (JEOL Ltd., Tokyo, Japan), operating at 400 MHz for ^{1} H-NMR, 100 MHz for ^{13}C-NMR in $CDCl_3$ (Merck KGaA, Darmstadt, Germany) unless otherwise noted. Chloroform ($CHCl_3$) in minimum 99.8% $CDCl_3$ served as the internal standard ($\delta = 7.26$) for ^{1} H NMR and $CDCl_3$ was used as the internal standard ($\delta = 77.0$) for ^{13}C NMR. The infrared absorption (IR) spectrum was measured by the Attenuated Total Reflection (ATR) method using an FT/IR-4200 type A (JASCO, Tokyo, Japan).

2-1 The procedure for synthesis of Benzyl benzoate in Scheme 4

The two-necked 30 mL glass reaction vessel containing a stirring bar was charged with some chopped pieces of strontium metal (0.20 mmol, 17.7 mg) and was dried up under the reduced pressure by heating gun, and then replaced under argon atmosphere. To the vessel was successively added THF(5 mL), *tert*-butyl acetate (0.10 mmol, 11.9 mg), and iodomethane（0.22 mmol, 30.6 mg）and the reaction mixture was stirred 30 minutes at room temperature. Pellet-type molecular sieves (MS) 4A (1.0 g) were added to the vessel, and the vessel was again replaced with an argon atmosphere. Benzyl alcohol (1.49 mmol, 160.9 mg) was then added to the reaction mixture, and the mixture was allowed to react for 60 minutes. Methyl benzoate (0.98 mmol, 133.8 mg) was then added. After the reaction allowed stirring until 24 hours, the reaction was quenched by adding 1 mol/L HCl aqueous solution (10 mL). The organic materials were extracted with ethyl acetate (15 mL) three times, and the combined organic layers were washed successively with 5% $KHSO_3$ aqueous solution (20 mL) and brine (20 mL) and dried over anhydrous Na_2SO_4. After evaporation of the solvent, the residue was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding Benzyl benzoate (191.0 mg, 91 %).

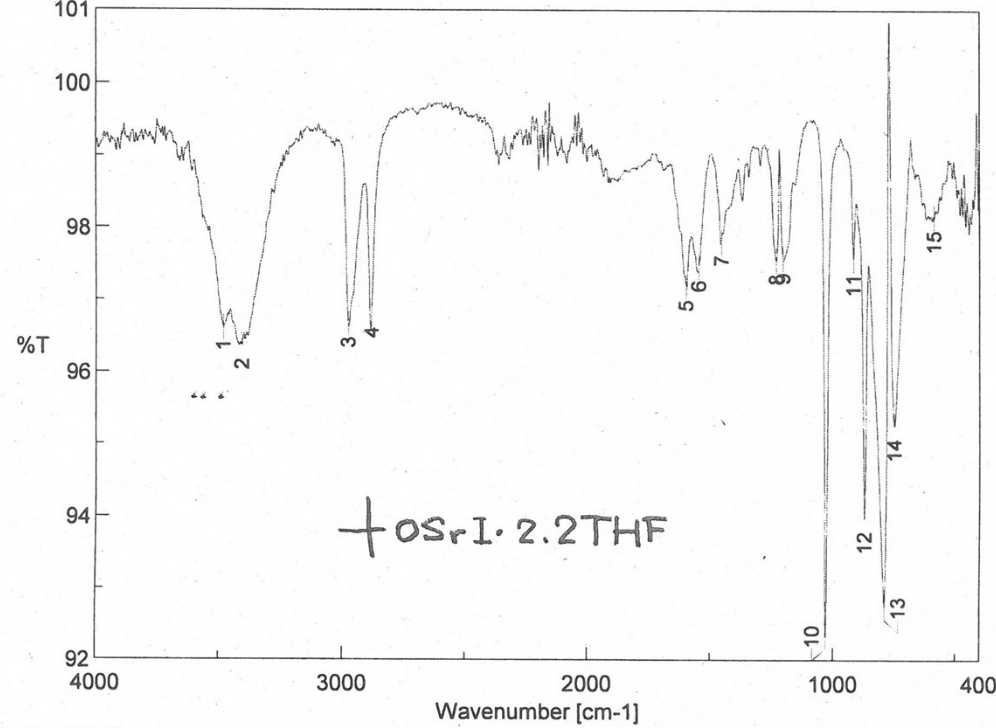
2-2 The procedures for the investigation for reaction conditions in Scheme 5: Synthesis of solid strontium *tert*-butoxide

The two-necked 100 mL glass reaction vessel containing a stirring bar was charged with some chopped pieces of strontium metal (4.02 mmol, 352.3 mg) and was dried up under the reduced pressure by heating gun, and then replaced under argon atmosphere. To the vessel was successively added THF(10 mL), *tert*-butyl acetate (2.00 mmol, 232.3 mg), and iodomethane（4.24 mmol, 602.0 mg）and the reaction mixture was stirred 60 minutes at room temperature. After evaporation of the solvent and unreacted *tert*-butyl acetate and iodomethane under reduced pressure, the strontium *tert*-butoxide was obtained with 800 mg as the white powder. NMR measurement of the obtained compound confirmed that it contained strontium *tert*-butoxide and the solvent. Calculation of the molar ratio of strontium alkoxide to THF and yield based on NMR measurements revealed that strontium *tert*-butoxide was produced with 93% yield at a THF ratio of 1:2 in this case. However, the signals were similar to those of free *tert*-butanol and THF, and no quaternary carbon signals derived from *tert*-butoxide were observed in ^{13}C NMR, although this strontium *tert*-butoxide acted as a good catalyst in transesterification reaction.

To obtain accurate NMR signals, measurements were performed again using a complex of *tert*-BuOSrI : THF=1 : 2.2 in DMSO-d_6. DMSO (CH_3SOCH_3; Kanto Kagaku Co., Ltd., Japan) in minimum 99.8% DMSO served as the internal standard ($\delta = 2.50$) for ^1H NMR and DMSO was used as the internal standard ($\delta = 39.50$) for ^{13}C NMR. The NMR signals were similar to those measured in $CDCl_3$, and again, no quaternary carbon signals derived from *tert*-butoxide were observed in ^{13}C NMR. The THF signal was a multiplet. When H_2O was added to the sample and NMR measurement was performed again, the signals of THF in ^1H NMR shifted slightly and changed to a pseudo-triplet, and the previously disappeared signal from the quaternary carbon derived from *tert*-butoxide was observed in ^{13}C NMR. Furthermore, even when the signal is magnified, it appears as a multiplet rather than a triplet overlap, which is why we now believe that THF is coordinated to strontium. Strontium has a large atomic radius and already has a 4f orbital, albeit empty, which is why we believe that multi-coordination is manifested.

The infrared absorption (IR) spectra were measured using attenuated total reflection (ATR) and showed both absorption due to *tert*-butoxide and THF. The absorption wavenumbers were slightly different from those of free *tert*-butanol and THF, suggesting that the strontium is coordinated.

The IR measurement chart for the complex of strontium *tert*-butoxide is shown on the next page



[コメント情報]

試料名	
コメント	
ユーザー名	
所属	
組織名	徳島文理大学薬学部

[データ情報]

作成日時	2026/03/11 15:56
データタイプ	等間隔データ
横軸	Wavenumber [cm-1]
縦軸	%T
スタート	399.193 cm-1
エンド	4000.6 cm-1
データ間隔	0.964233 cm-1
データ数	3736

[測定情報]

機種名	FT/IR-4200typeA
シリアル番号	C094361018
付属品名	ATR PRO ONE
付属品シリアルNo.	C181961809
入射角	45 度
測定日時	2026/03/11 15:55
光源	標準光源
検出器	TGS
積算回数	32
分解	4 cm-1
ゼロフィリング	On
アポダイゼーション	Cosine
ゲイン	Auto (8)
アパーチャー	Auto (7.1 mm)
スキャンスピード	Auto (2 mm/sec)
フィルター	Auto (30000 Hz)

[ピーク検出結果]

No.	位置	強度	No.	位置	強度
1	3481.85	96.6118	2	3406.64	96.3578
3	2976.55	96.6599	4	2881.13	96.7998
5	1598.7	97.1959	6	1546.63	97.465
7	1455.03	97.8184	8	1232.29	97.5591
9	1204.33	97.5723	10	1030.77	92.3357
11	917.95	97.5615	12	872.631	93.9825
13	790.671	92.7454	14	750.174	95.2675
15	587.218	98.1614			

2-3 The procedures for the investigation for reaction conditions in Entry 4 at Table 1

The two-necked 30 mL glass reaction vessel containing MS4A powder (1200 mg) and a stirring bar was dried up under the reduced pressure by heating gun, and replaced under argon atmosphere after the addition of strontium *tert*-butoxide (0.18 mmol, 77.5 mg). To the vessel was successively added THF (5 mL) and benzyl alcohol (1.53 mmol, 165.2 mg) for 60 minutes. To the addition of methyl benzoate (1.04 mmol, □141.1 mg), after the reaction allowed stirring until 24 hours, the reaction was quenched by adding 1 mol/L HCl aqueous solution (10 mL). The organic materials were extracted with ethyl acetate (15 mL) three times, and the combined organic layers were washed successively with 5% $KHSO_3$ aqueous solution (20 mL) and brine (20 mL) and dried over anhydrous Na_2SO_4. After evaporation of the solvent, the residue was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding Benzyl benzoate (220.8 mg, 99 %).

3 General procedure of transesterification reaction using strontium *tert*-butoxide as a catalyst (entry 10 at Table 2)

The two-necked 30 mL glass reaction vessel containing MS4A powder (400 mg) and a stirring bar was dried up under the reduced pressure by heating gun, and replaced under argon atmosphere after the addition of strontium *tert*-butoxide (0.052 mmol, 23.4 mg; *t*-BuOSrI-2.2THF MW'=446). To the vessel was successively added benzyl alcohol (1.57 mmol, 169.8 mg) and methyl benzoate (1.03 mmol, 140.8 mg) and the reaction mixture was stirred 1 hour at room temperature. The reaction was quenched by adding 1 mol/L HCl aqueous solution (10 mL). The organic materials were extracted with ethyl acetate three times (15 mLx3), and the combined organic layers were washed successively with 5% $KHSO_3$ aqueous solution (20 mL) and brine (20 mL) and dried over anhydrous Na_2SO_4. After evaporation of the solvent, the residue was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding benzyl benzoate (219.3 mg, 99 %).

4□The procedures for the investigation using another reagent as base catalyst

t-BuOK (Entry 2 at Table 3)

The two-necked 30 mL glass reaction vessel containing MS4A powder (400 mg) and a stirring bar was dried up under the reduced pressure by heating gun, and replaced under argon atmosphere after the addition of potasium *tert*-butoxide (0.068 mmol, 7.58 mg). To the vessel was successively added benzyl alcohol (2.00 mmol, 216.3 mg) and methyl benzoate (1.32 mmol, 179.7 mg) and the reaction mixture was stirred 1 hour at room temperature, and an above similar work-up was carried out. After evaporation of the solvent, the residue was measured by NMR to obtain the corresponding benzyl benzoate with about 69 % yield.

t-BuONa (Entry 3 at Table 3)

tert-Butanol (0.16 mmol, 11.8 mg) was added to a reaction vessel by dried-up containing and 55% sodium hydride in oil suspension (0.05 mmol, 2.2 mg) and 0.5 mL of THF under argon atmosphere and allowed to react for 30 minutes. After removed the solvents, MS4A powder (404mg), benzyl alcohol (1.50 mmol, 161.8 mg) and methyl benzoate (1.01 mmol, 137.4 mg) was successively added to the vessel and the reaction mixture was stirred 1 hour at room temperature. The reaction was quenched by adding 1 mol/L HCl aqueous solution (10 mL). The organic materials were extracted with ethyl acetate (15 mL) three times, and the combined organic layers were washed with brine (20 mL) and dried over anhydrous Na_2SO_4. After evaporation of the solvent, the residue was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding benzyl benzoate (206.7 mg, 96 %).

t-BuONa (Entry 4 at Table 3)

The two-necked 30 mL glass reaction vessel containing MS4A powder (400 mg) and a stirring bar was dried up under the reduced pressure by heating gun, and replaced under argon atmosphere after the addition of freshly purchased, unopened sodium *tert*-butoxide (0.049 mmol, 4.7 mg). To the vessel was successively added benzyl alcohol (1.48 mmol, 160.5 mg) and methyl benzoate (0.96 mmol, 131.1 mg) and the reaction mixture was stirred 1 hour at room temperature, and an above similar work-up was carried out. After evaporation of the solvent, After evaporation of the solvent, the residue was measured by NMR to obtain the corresponding benzyl benzoate with about 89 % yield and methyl benzoate with 10 % yield.

t-BuOLi (Entry 5 at Table 3)

The two-necked 30 mL glass reaction vessel a stirring bar was dried up under the reduced pressure by heating gum. 1.54 mol/L *n*-butyl lithium (32 μL, 0.05 mmol) was added to a reaction vessel containing 0.5 mL of THF and *tert*-butanol (0.072 mmol, 5.3 mg) under argon atmosphere and allowed to react for 30 minutes. After removed the solvents, MS4A powder (408 mg), benzyl alcohol (1.49 mmol, 160.9 mg) and methyl benzoate (1.03 mmol, 140.7 mg) was successively added to the vessel and the reaction mixture was stirred 1 hour at room temperature, and an above similar work-up was carried out. After evaporation of the solvent, The residue was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding benzyl benzoate (205.1 mg, 93 %).

t-BuOMgCl (Entry 6 at Table 3)

The two-necked 30 mL glass reaction vessel a stirring bar was dried up under the reduced pressure by heating gum. 1.0 mol/L methylmagnesium chloride (43 μL, 0.043 mmol) was added to a reaction vessel containing 5 mL of THF and *tert*-butanol (0.043 mmol, 3.2 mg) under argon atmosphere and allowed to react for 30 minutes. After removed the solvents, MS4A powder (350 mg), benzyl alcohol (1.30 mmol, 143.5 mg) and methyl benzoate (0.86 mmol, 117.1 mg) was successively added to the vessel. After the reaction allowed stirring for 1 hour, the reaction was quenched by adding 1 mol/L HCl aqueous solution (10 mL). The organic materials were extracted with ethyl acetate (15 mL) three times, and the combined organic layers were washed with brine (20 mL) and dried over anhydrous Na_2SO_4. After evaporation of the solvent, the residue was measured by NMR not to obtain the corresponding benzyl benzoate.□The residue was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to recover benzyl alcohol (96%) and methyl benzoate (98 %).

t-BuOMgI (Entry 7 at Table 3)

The two-necked 30 mL glass reaction vessel a stirring bar was dried up under the reduced pressure by heating gum.□1.1 mol/L methylmagnesium chloride (45 μL, 0.05 mmol) was added to a reaction vessel containing 0.5 mL of THF and *tert*-butanol (0.067 mmol, 5.0 mg) under argon atmosphere and allowed to react for 30 minutes. After removed the solvents, MS4A powder (404mg), benzyl alcohol (1.49 mmol, 160.8 mg) and methyl benzoate (0.99 mmol, 135.4 mg) was successively added to the vessel. After the reaction allowed stirring for 1 hour, and an above similar work-up was carried out. After evaporation of the solvent, the residue was measured by NMR to obtain the corresponding benzyl benzoate only with about 1 % yield.

Et_3N (Entry 8 at Table 3)

The two-necked 30 mL glass reaction vessel containing MS4A powder (400 mg) and a stirring bar was dried up under the reduced pressure by heating gun, and replaced under argon atmosphere after the addition of triethylamine (0.014 mmol, 14.1 mg). To the vessel was successively added benzyl alcohol (01.15 mmol, 448.4 mg) and methyl benzoate (2.74 mmol, 372.8 mg) and the reaction mixture was stirred 1 hour at room temperature, and an above similar work-up was carried out. After evaporation of the solvent, the residue was measured by NMR not to obtain the corresponding benzyl benzoate.

DBU (Entry 9 at Table 3)

The two-necked 30 mL glass reaction vessel containing MS4A powder (400 mg) and a stirring bar was dried up under the reduced pressure by heating gun, and replaced under argon atmosphere after the addition of 1,8-

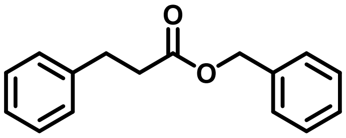
diazabicyclo[5,4,0]undecene (0.010 mmol, 15.2 mg). To the vessel was successively added benzyl alcohol (2.96 mmol, 320.6 mg) and methyl benzoate (1.99 mmol, 271.0 mg) and the reaction mixture was stirred 1 hour at room temperature, and an above similar work-up was carried out. After evaporation of the solvent, the residue was measured by MMR to obtain the corresponding benzyl benzoate only with about 1 % yield

Initially, we predicted that the reactivity would depend on the atomic radius as follows; *tert*-BuOK> *tert*-BuONa,> *tert*-BuOLi, and that the reactivity would depend on the degree of association and the size of the counter anion as follows; *tert* -BuOSrI>> *tert* -BuOMgI> *tert* -BuOMgCl. However, completely different results were obtained. From the above, it can be seen that highly basic alkoxides can act as catalysts for transesterification. However, alkali metal *tert*-butoxides are highly hygroscopic, and while the yield of sodium *tert*-butoxide prepared in situ was 96 %, even freshly purchased, unopened sodium *tert*-butoxide yielded only 89 %, a decrease of nearly 10 %. On the other hand, *tert*-BuOSrI does not lose its activity even after two years under an argon atmosphere, and is thought to be significantly superior to alkali metal *tert*-butoxides.

5□Using 2 years stored strontium *tert*-butoxide as a catalyst (entry 5 at Table 4)

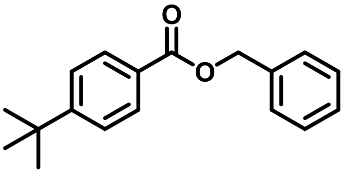
The strontium *tert*-butoxide that had been stored for two years was dried overnight under reduced pressure before use. The two-necked 30 mL glass reaction vessel containing MS4A powder (414.9 mg) and a stirring bar was dried up under the reduced pressure by heating gun, and replaced under argon atmosphere after the addition of strontium *tert*-butoxide (0.046 mmol, 20.4 mg; *t*-BuOSrI-2.2THF MW'=446). To the vessel was successively added benzyl alcohol (1.45 mmol, 157.3 mg) and methyl benzoate (0.962 mmol, 131.0 mg) and the reaction mixture was stirred 1 hour at room temperature. The reaction was quenched by adding 1 mol/L HCl aqueous solution (10 mL). The organic materials were extracted with ethyl acetate three times (15 mLx3), and the combined organic layers were washed successively with 5% $KHSO_3$ aqueous solution (20 mL) and brine (20 mL) and dried over anhydrous Na_2SO_4. After evaporation of the solvent, the residue was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding benzyl benzoate (198.9 mg, 97 %).

6□The procedures for the investigation for scope and limitation of methyl esters (Table 5)



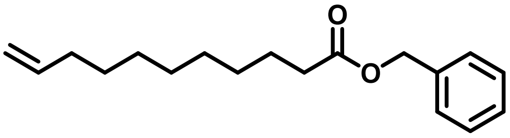
Benzyl 3-phenylpropanoate; CAS RN 22767-96-0[3)]

According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.050 mmol, 23.0 mg; *t*-BuOSrI-2.2THF MW'=446), benzyl alcohol (1.50 mmol, 162.6 mg) and methyl 3-phenylpropanate (0.98 mmol, 160.2 mg) were reacted for 1 hour, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding ester (233.1 mg, quant.).



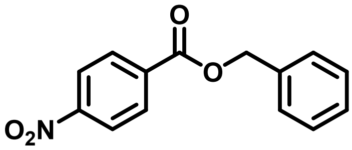
Benzyl 4-(*tert*-butyl)benzoate; CAS RN 479378-80-8[2)]

According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.050 mmol, 22.9 mg; *t*-BuOSrI-2.2THF MW'=446), benzyl alcohol (1.51 mmol, 163.3 mg) and methyl 4-tert-butylbenzoate (0.99 mmol, 190.8 mg) were reacted for 1 hour, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding ester (255.1 mg, 96 %).



Benzyl undec-10-enoate; CAS RN 106262-52-6[4)]

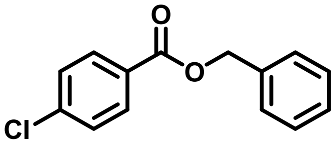
According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.046 mmol, 22.3 mg; *t*-BuOSrI-2.2THF MW'=446), benzyl alcohol (1.42 mmol, 154.5 mg) and methyl undec-10-enoate (0.93 mmol, 183.8 mg) were reacted for 1 hour, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding ester (240.8 mg, 95 %).



Benzyl 4-nitrobenzoate; CAS RN 4786-27-7[2, 9)]

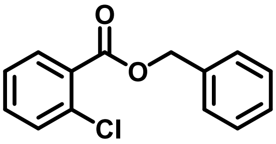
According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.052 mmol, 28.2 mg; *t*-BuOSrI-2.2THF MW'=446), benzyl alcohol (1.61 mmol, 174.2 mg) and methyl 4-nitrobenzoate (1.04 mmol, 189.3

mg) were reacted for 24 hours, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding ester (261.1 mg, 97 %).



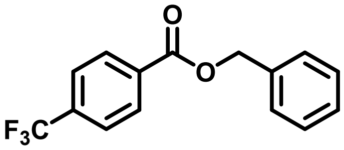
Benzyl 4-chlorobenzoate; CAS RN 67483-73-2[2)]

According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.047 mmol, 22.7 mg; *t*-BuOSrI-2.2THF MW'=446), benzyl alcohol (1.40 mmol, 152.3 mg) and methyl 4-chlorobenzoate (0.95 mmol, 162.1 mg) were reacted for 1 hour, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding ester (223.6 mg, 95 %).



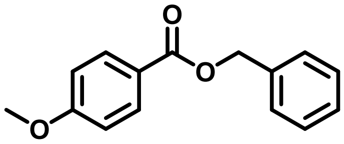
Benzyl 2-chlorobenzoate; CAS RN 7579-40-0[2)]

According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.048 mmol, 22.0 mg; *t*-BuOSrI-2.2THF MW'=446), benzyl alcohol (1.45 mmol, 157.0 mg) and methyl 2-chlorobenzoate (0.97 mmol, 164.7 mg) were reacted for 1 hour, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding ester (227.8 mg, 96 %).



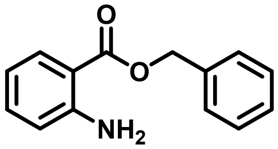
Benzyl 4-(trifluoromethyl)benzoate; CAS RN 474308-35-5[2)]

According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.058 mmol, 26.2 mg; *t*-BuOSrI-2.2THF MW'=446), benzyl alcohol (1.71 mmol, 185.4 mg) and methyl 4-trifluoromethylbenzoate (1.15 mmol, 234.3 mg) were reacted for 1 hour, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding ester (305.4 mg, 95 %).



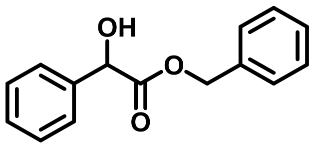
Benzyl 4-methoxybenzoate; CAS RN 32122-11-5[2)]

According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.052 mmol, 23.5 mg; *t*-BuOSrI-2.2THF MW'=446), benzyl alcohol (1.42 mmol, 153.1 mg) and methyl 4-methoxybenzoate (0.93 mmol, 154.8 mg) were reacted for 1 hour, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 10:1) to give the corresponding ester (193.5 mg, 86 %).



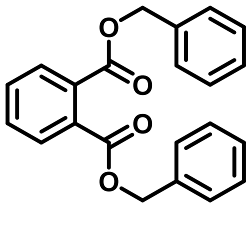
Benzyl 2-aminobenzoate; CAS RN 82185-41-9[5, 6)]

According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.050 mmol, 22.9 mg; *t*-BuOSrI-2.2THF MW'=446), benzyl alcohol (1.52 mmol, 164.4 mg) and methyl 2-aminobenzoate (1.01 mmol, 152.9 mg) were reacted for 1 hour, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 20:1) to give the corresponding ester (189.3 mg, 82 %).



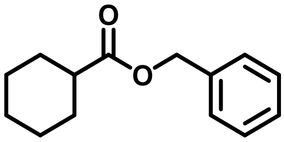
Benzyl mandelate; CAS RN 890-98-2[7)]

According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.052 mmol, 23.5 mg; *t*-BuOSrI-2.2THF MW'=446), benzyl alcohol (1.53 mmol, 166.0 mg) and methyl benzoate (0.96 mmol, 130.3 mg) were reacted for 4 hours, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 20:1) to give the corresponding ester (245.1 mg, 98 %).



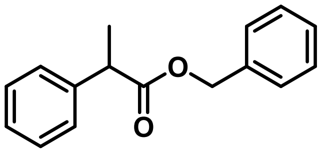
Dibenzyl phthalate; CAS RN 523-31-9[2)]

According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.052 mmol, 23.5 mg; *t*-BuOSrI-2.2THF MW'=446), benzyl alcohol (1.53 mmol, 165.6 mg) and dimethyl phthalate (0.51 mmol, 99.4 mg) were reacted for 2 hours, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 50:1) to give the corresponding ester (156.6 mg, 88 %).



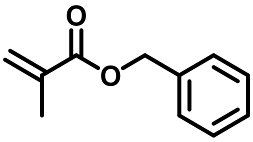
Benzyl cyclohexanecarboxylate; CAS RN 22733-94-4[2)]

According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.046 mmol, 20.3 mg; *t*-BuOSrI-2.2THF MW'=446), benzyl alcohol (1.49 mmol, 161.3 mg) and methyl 2-cyclohexancarbnate (0.93 mmol, 132.1 mg) were reacted for 1 hour, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding ester (199.4 mg, 98 %).



Benzyl 2-phenylpropanoate; CAS RN 97479-87-3[14)]

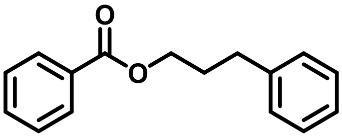
According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.05 mmol, 22.4 mg; *t*-BuOSrI-2.2THF MW'=446), benzyl alcohol (1.48 mmol, 160.3 mg) and methyl 2-phenylpropanate (0.99 mmol, 162.6 mg) were reacted for 1 hour, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding ester (228.0 mg, 96 %).



Benzyl methacrylate; CAS RN 2495-37-6[15)]

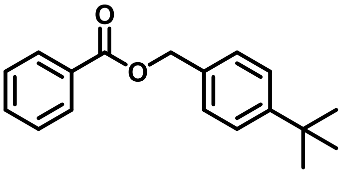
According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.049 mmol, 24.4 mg; *t*-BuOSrI-2.2THF MW'=446), benzyl alcohol (1.46 mmol, 158.2 mg) and methyl methacrylate (0.98 mmol, 97.8 mg) were reacted for 1 hour, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding ester (171.5 mg, 99 %).

7□The procedures for the investigation for scope and limitation (Table 6)



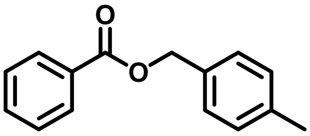
3-Phenylproryl benzoate; CAS RN 60045-26-3[8, 9)]

According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.050 mmol, 23.6 mg; *t*-BuOSrI-2.5THF MW’=468), 3-phenylpropan-1-ol (1.54 mmol, 1210.2 mg) and methyl benzoate (0.99 mmol, 134.4 mg) were reacted for 3 hours, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding ester (219.9 mg, 93 %).



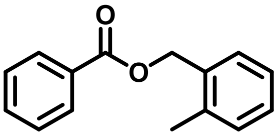
4-*tert*-Butylbenzyl benzoate; CAS RN 38612-06-5[10)]

According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.053 mmol, 26.8 mg; *t*-BuOSrI-3THF MW’=504), 4-*tert*-butylbenzyl alcohol (1.46 mmol, 240.4 mg) and methyl benzoate (0.99 mmol, 134.5 mg) were reacted for 1 hours, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding ester (265.1 mg, quant.).



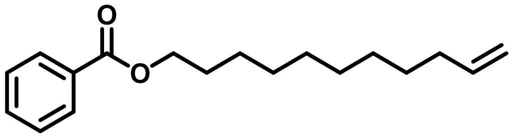
4-methylbenzyl benzoate; CAS RN 38418-10-9[2)]

According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.058 mmol, 29.3 mg; *t*-BuOSrI-3THF MW’=504), 4-methylbenzyl alcohol (1.65 mmol, 201.8 mg) and methyl benzoate (1.05 mmol, 143.5 mg) were reacted for 14 hours, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding ester (228.6 mg, 96 %).



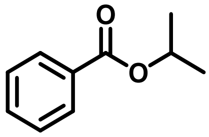
2-methylbenzylbenzoate; CAS RN 80716-36-5[2)]

According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.051 mmol, 23.9 mg; *t*-BuOSrI-2.5THF MW’=468), 2-methylbenzyl alcohol (1.51 mmol, 185.0 mg) and methyl benzoate (0.98 mmol, 134.1 mg) were reacted for 1 hour, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding ester (221.1 mg, 99 %).



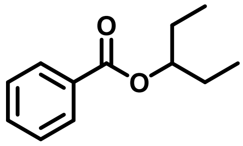
10-Undecenyl benzoate; CAS RN 96042-20-5[11)]

According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.053 mmol, 27.0 mg; *t*-BuOSrI-3THF MW'=504), undec-10-en-1-ol (1.48 mmol, 252.4 mg) and methyl benzoate (0.97 mmol, 132.5 mg) were reacted for 1 hour, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding ester (263.6 mg, 99 %).



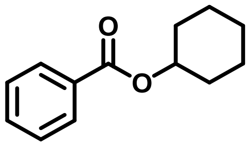
2-Propyl benzoate; CAS RN 939-48-0[12)]

According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.093 mmol, 43.5 mg; *t*-BuOSrI-2.5THF MW'=468), 2-propanol (1.88 mmol, 112.9 mg) and methyl benzoate (0.94 mmol, 128.6 mg) were reacted for 1 hour, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding ester (120.6 mg, 78 %).



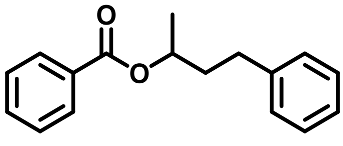
3-Pentyl benzoate; CAS RN 5436-54-4[8)]

According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.10 mmol, 49.4 mg; *t*-BuOSrI-2.5THF MW'=468), 3-pentanol (2.03 mmol, 178.7 mg) and methyl benzoate (0.99 mmol, 134.1 mg) were reacted for 1 hour, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 10:1) to give the corresponding ester (148.3 mg, 78 %).



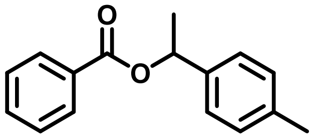
Cyclohexyl benzoate; CAS RN 2412-73-9[8)]

According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.097 mmol, 43.6 mg; *t*-BuOSrI-2.2THF MW'=446), cyclohexanol (1.93 mmol, 193.7 mg) and methyl benzoate (0.97 mmol, 132.0 mg) were reacted for 1 hour according to the general procedure (p. SI-5), and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 4:1) to give the corresponding ester (191.0 mg, 96 %).



4-Phenyl-2-butyl benzoate; CAS RN 150272-41-6[3, 8)]

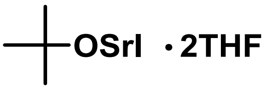
According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.095 mmol, 42.5 mg; *t*-BuOSrI-2.2THF MW'=446), 4-phenyl-2-butanol (1.87 mmol, 281.5 mg) and methyl benzoate (0.91 mmol, 123.8 mg) were reacted for 1 hour according to the general procedure (p. SI-5), and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 20:1) to give the corresponding ester (230.4 mg, 98 %).



1-(*p*-tolyl)-1-ethyl benzoate; CAS RN 19771-04-1[13)]

According to the general procedure (p. SI-5), strontium *tert*-butoxide (0.089 mmol, 39.8 mg; *t*-BuOSrI-2.2THF MW'=446), 1-(*p*-tolyl)-1-ethanol (1.73 mmol, 236.3 mg) and methyl benzoate (0.88 mmol, 119.3 mg) were reacted for 1 hour, and work-up was carried out. The crude was purified by column chromatography on silica gel (hexane / ethyl acetate = 10:1) to give the corresponding ester (202.4 mg, 99 %).

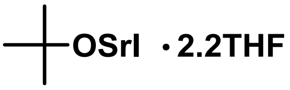
8□Signal data of ^{1}H and ^{13}C NMR Spectra



Strontium *tert*-Butoxide 2THF complex

^{1}H-NMR (400 MHz, $CDCl_3$) δ: 3.75-3.73 (4H, m), 1.87-1.84 (4H, m), 1.25 (4.8H, s).

^{13}C-NMR (100 MHz, $CDCl_3$) δ: 67.97, 31.22, 25.60.



Strontium *tert*-Butoxide 2.4THF complex

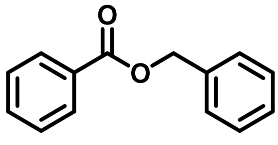
^{1}H-NMR (400 MHz, DMSO-d_6) δ: 3.62-3.58 (4H, m), 1.77-1.73 (4H, m), 1.11 (4H, s).

^{13}C-NMR (100 MHz, DMSO-d_6) δ: 67.02, 31.31, 25.12.

^{1}H-NMR (400 MHz, DMSO-d_6+H_2O) δ: 3.56 (4H, t, J = 6.4 Hz), 1.723 (4H, t, J = 6.4 Hz), 1.08 (4.2H, s).

^{13}C-NMR (100 MHz, DMSO-d_6+H_2O) δ: 68.33, 67.83, 31.60, 25.75.

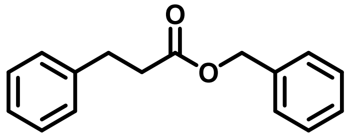
IR (ATR); 3482, 3407, 2977, 2881, 1599, 1547, 1455, 1232, 1204, 1031, 918, 873, 791, 750, 587 cm^{-1}.



Benzyl benzoate; CAS RN 120-51-4[1, 2, 9]

^{1}H-NMR (400 MHz, $CDCl_3$) δ: 8.08 (2H, d, J = 8.0 Hz), 7.56 (1H, t, J = 6.4 Hz), 7.46-7.33 (7H, m), 5.37 (2H, s).

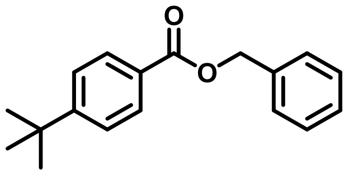
^{13}C-NMR (100 MHz, $CDCl_3$) δ: 166.4, 136.0, 133.0, 130.1, 129.7, 128.6, 128.4, 128.2, 128.2, 66.7.



Benzyl 3-phenylpropanoate; CAS RN 22767-96-0[3]

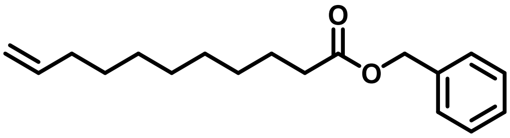
^{1}H-NMR (400 MHz, $CDCl_3$) δ: 7.38-7.26 (7H, m), 7.20 (3H, t, J = 7.6 Hz), 5.11 (2H, s), 2.97 (2H, t, J = 7.6 Hz), 2.69 (2H, t, J = 8.4 Hz).

^{13}C-NMR (100 MHz, $CDCl_3$) δ: 172.8, 140.4, 135.9, 128.5, 128.5, 128.3, 128.2, 126.3, 66.3, 35.9, 30.9.

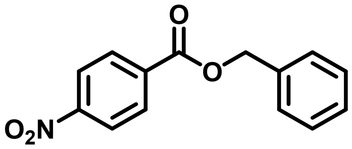


Benzyl 4-(*tert*-butyl)benzoate; CAS RN 479378-80-8[2]

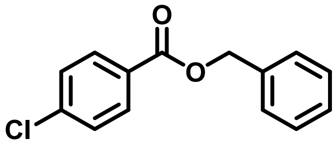
^{1}H-NMR (400 MHz, CDCl$_3$) δ: 8.01 (2H, d, J = 8.4 Hz), 7.45 (4H, d, J = 8.4 Hz), 7.40-7.33 (3H, m), 5.36 (2H, s), 1.33 (9H, s).
^{13}C-NMR (100 MHz, CDCl$_3$) δ: 166.5, 156.7, 136.2, 129.6, 128.5, 128.1, 128.1, 127.3, 125.4, 66.4, 35.1, 31.1.



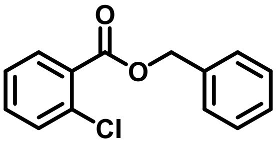
Benzyl undec-10-enoate; CAS RN 106262-52-6[4]
^{1}H-NMR (400 MHz, CDCl$_3$) δ: 7.36-7.33 (5H, m), 5.86-5.76 (1H, m), 5.12 (2H, s), 5.01-4.92 (2H, m), 2.35 (2H, t, J = 7.6 Hz), 2.06-2.01 (2H, m), 1.66-1.62 (2H, m), 1.36-1.28 (10H, m).
^{13}C-NMR (100 MHz, CDCl$_3$) δ: 173.7, 139.2, 136.1, 128.5, 128.2, 128.2, 114.1, 66.1, 34.3, 33.8, 29.3, 29.2, 29.1, 29.0, 28.9, 24.9.



Benzyl 4-nitrobenzoate; CAS RN 4786-27-7[2, 9]
^{1}H-NMR (400 MHz, CDCl$_3$) δ: 8.30-8.23 (4H, m), 7.45-7.40 (5H, m), 5.41 (2H, s).
^{13}C-NMR (100 MHz, CDCl$_3$) δ: 164.5, 135.5, 135.2, 130.8, 128.7, 128.7, 128.4, 128.4, 123.5, 67.7.



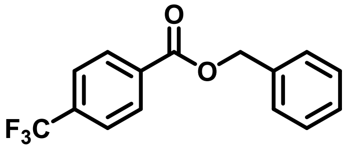
Benzyl 4-chlorobenzoate; CAS RN 67483-73-2[2]
^{1}H-NMR (400 MHz, CDCl$_3$) δ: 8.02 (1H, t, J = 2.4 Hz), 8.00 (1H, t, J = 2.0 Hz), 7.46-7.36 (7H, m), 5.36 (2H, s).
^{13}C-NMR (100 MHz, CDCl$_3$) δ: 165.6, 139.5, 135.7, 131.1, 128.7, 128.6, 128.5, 128.4, 128.2, 66.9.



Benzyl 2-chlorobenzoate; CAS RN 7579-40-02)

^{1}H-NMR (400 MHz, CDCl$_3$) δ: 7.85 (1H, d, J = 7.6 Hz), 7.47-7.28 (8H, m), 5.38 (2H, s).

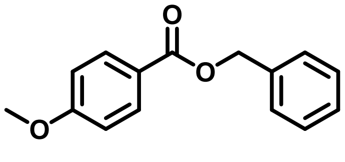
^{13}C-NMR (100 MHz, CDCl$_3$) δ: 165.5, 135.5, 133.9, 132.6, 131.5, 131.1, 129.9, 128.6, 128.4, 126.6, 67.3.



Benzyl 4-(trifluoromethyl)benzoate; CAS RN 474308-35-52)

^{1}H-NMR (400 MHz, CDCl$_3$) δ: 8.19 (2H, d, J = 8.0 Hz), 7.70 (2H, d, J = 8.4 Hz), 7.47-7.36 (5H, m), 5.40 (2H, s).

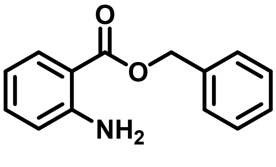
^{13}C-NMR (100 MHz, CDCl$_3$) δ: 165.2, 135.6, 134.5 (q, $J_{C\text{-}F}$=32.4 Hz), 133.3, 130.1, 128.7, 128.5, 128.3, 125.5, 125.4, 125.4, 125.4, 123.6 (d $J_{C\text{-}F}$=271.7Hz), 67.3



Benzyl 4-methoxybenzoate; CAS RN 32122-11-52)

^{1}H-NMR (400 MHz, CDCl$_3$) δ: 8.04 (2H, d, J = 9.2 Hz), 7.45-7.34 (5H, m), 6.92 (2H, d, J = 9.2 Hz), 5.34 (2H, s), 3.86 (3H, s).

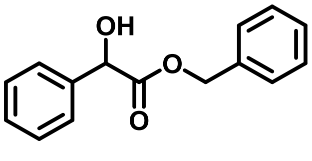
^{13}C-NMR (100 MHz, CDCl$_3$) δ: 166.2, 163.4, 136.2, 131.7, 128.5, 128.1, 128.1, 122.5, 113.6, 66.4, 55.4



Benzyl 2-aminobenzoate; CAS RN 82185-41-95, 6)

^{1}H-NMR (400 MHz, CDCl$_3$) δ: 7.92 (1H, d, J = 6.4 Hz), 7.45-7.25 (6H, m), 6.67-6.62 (2H, m), 5.73 (2H, s), 5.32 (2H, s).

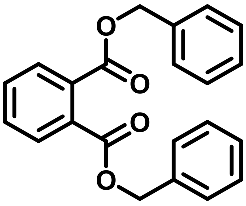
^{13}C-NMR (100 MHz, CDCl$_3$) δ: 167.9, 150.6, 136.3, 134.2, 131.3, 128.6, 128.1, 128.0, 116.7, 116.3, 110.6, 66.0



Benzyl mandelate; CAS RN 890-98-2[7)]

^{1}H-NMR (400 MHz, CDCl$_3$) δ: 7.43-7.30 (8H, m), 7.21-7.19 (2H, m), 5.26-5.22 (2H, m), 5.14 (1H, d, J = 12.4 Hz), 3.44 (1H, d, J = 5.6 Hz).

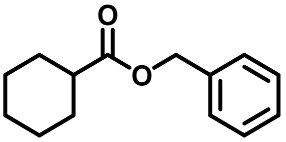
^{13}C-NMR (100 MHz, CDCl$_3$) δ: 173.5, 138.1, 134.9, 128.6, 128.5, 128.5, 128.4, 127.9, 126.5, 72.9, 67.6.



Dibenzyl phthalate; CAS RN 523-31-9[2)]

^{1}H-NMR (400 MHz, CDCl$_3$) δ: 7.77-7.72 (2H, m), 7.55-7.52 (2H, m), 7.36-7.32 (10H, m), 5.22 (4H, s).

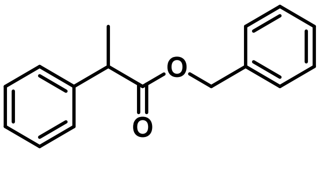
^{13}C-NMR (100 MHz, CDCl$_3$) δ: 167.4, 135.4, 131.9, 131.1, 129.0, 128.6, 128.4, 128.4, 67.4.



Benzyl cyclohexanecarboxylate; CAS RN 22733-94-4[2)]

^{1}H-NMR (400 MHz, CDCl$_3$) δ: 7.38-7.31 (5H, m), 5.11 (2H, s), 2.39-2.32 (1H, m), 1.93 (2H, d, J = 13.6 Hz), 1.75 (2H, d, J = 13.2 Hz), 1.65-1.58 (1H, m), 1.48-1.44 (2H, m), 1.29-1.26 (3H, m).

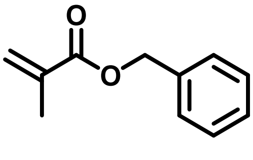
^{13}C-NMR (100 MHz, CDCl$_3$) δ: 175.9, 136.3, 128.5, 128.0, 127.9, 65.9, 43.2, 29.0, 25.7, 25.4.



Benzyl 2-phenylpropanoate; CAS RN 97479-87-3[14)]

^{1}H-NMR (400 MHz, CDCl$_3$) δ: 7.32-7.23 (10H, m), 5.10 (2H, q, J = 11.6 Hz), 3.78 (1H, d, J = 6.8 Hz), 1.52 (3H, d, J = 7.2 Hz).

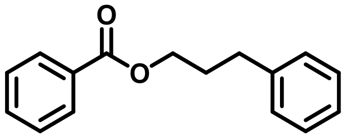
^{13}C-NMR (100 MHz, CDCl$_3$) δ: 174.3, 140.4, 136.0, 128.6, 128.4, 128.0, 127.8, 127.5, 127.1, 66.4, 45.5, 18.4.



Benzyl methacrylate; CAS RN 2495-37-6[15)]

^{1}H-NMR (400 MHz, CDCl$_3$) δ: 7.40-7.32 (4H, m), 6.16 (1H, s), 5.60-5.58 (1H, m), 5.20 (2H, s), 1.97 (3H, d, J = 1.6 Hz).

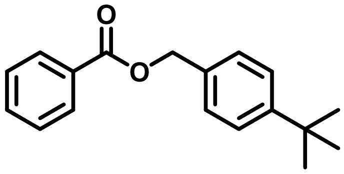
^{13}C-NMR (100 MHz, CDCl$_3$) δ: 167.2, 136.2, 136.1, 128.5, 128.1, 128.0, 125.8, 66.4, 18.3.



3-Phenylprorylbenzoate; CAS RN 60045-26-3[8, 9)]

^{1}H-NMR (400 MHz, CDCl$_3$) δ: 8.05-8.03 (2H, m), 7.58-7.54 (1H, m), 7.47-7.43 (2H, m), 7.32-7.21 (5H, m), 4.36-4.32 (2H, m), 2.81-2.77 (2H, m), 2.15-2.08 (2H, m).

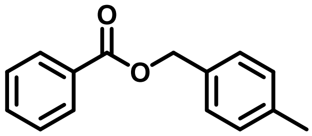
^{13}C-NMR (100 MHz, CDCl$_3$) δ: 166.6, 141.2, 132.9, 130.3, 129.5, 128.5, 128.4, 128.3, 126.0, 64.2, 32.3, 30.3.



4-*tert*-Butylbenzyl benzoate; CAS RN 38612-06-5[10)]

^{1}H-NMR (400 MHz, CDCl$_3$) δ: 8.08 (2H, d, J = 8.4 Hz), 7.56 (1H, t, J = 8.0 Hz), 7.45-7.41 (6H, m), 5.34 (2H, s), 1.33 (9H, s).

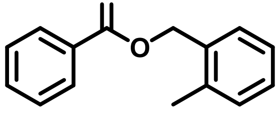
^{13}C-NMR (100 MHz, CDCl$_3$) δ: 166.5, 151.3, 133.0, 133.0, 130.2, 129.7, 128.3, 128.1, 125.5, 66.6, 34.6, 31.3.



4-methylbenzylbenzoate; CAS RN 38418-10-9[2)]

^{1}H-NMR (400 MHz, CDCl$_3$) δ: 8.07 (2H, d, J = 6.8 Hz), 7.55 (1H, t, J = 7.6 Hz), 7.44 (2H, t, J = 6.5 Hz), 7.35 (2H, d, J = 8.4 Hz), 7.20 (2H, d, J = 8.0 Hz), 5.33 (2H, s), 2.37 (3H, s).

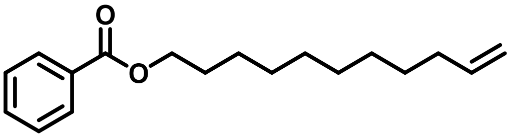
^{13}C-NMR (100 MHz, CDCl$_3$) δ: 166.5, 138.1, 133.0, 133.0, 129.7, 129.2, 128.3, 128.3, 66.6, 21.2.



2-methylbenzylbenzoate; CAS RN 80716-36-5[2)]

^{1}H-NMR (400 MHz, CDCl$_3$) δ: 8.07 (2H, d, J = 8.4 Hz), 7.56 (2H, t, J = 6.4 Hz), 7.44 (3H, t, J = 7.6 Hz), 7.30-7.23 (3H, m), 5.38 (2H, s), 2.42 (3H, s).

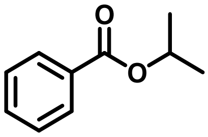
^{13}C-NMR (100 MHz, CDCl$_3$) δ: 166.4, 137.1, 133.9, 133.0, 130.4, 130.1, 129.7, 129.2, 128.5, 128.4, 126.0, 65.2, 19.0.



10-Undecenyl benzoate; CAS RN 96042-20-5[11)]

^{1}H-NMR (400 MHz, CDCl$_3$) δ: 8.06-8.03 (2H, m), 7.58-7.54 (1H, m), 7.44 (2H, t, J = 8.0 Hz), 5.86-5.76 (1H, m), 5.02-4.91 (2H, m), 4.32 (2H, t, J = 6.4 Hz), 2.04 (2H, q, J = 6.8 Hz), 1.80-1.73 (2H, m), 1.46-1.29 (12H, m).

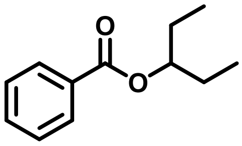
^{13}C-NMR (100 MHz, CDCl$_3$) δ: 166.7, 139.2, 132.8, 129.5, 128.3, 114.1, 65.1, 33.8, 29.5, 29.4, 29.3, 29.1, 28.9, 28.7, 26.0.



2-Propyl benzoate; CAS RN 939-48-0[12)]

^{1}H-NMR (400 MHz, CDCl$_3$) δ: 8.04 (2H, d, J = 7.6 Hz), 7.55 (1H, t, J = 7.6 Hz), 7.43 (2H, t, J = 8.0 Hz), 5.29-5.23 (1H, m), 1.37 (6H, d, J = 6.4 Hz).

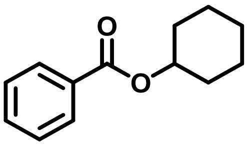
^{13}C-NMR (100 MHz, CDCl$_3$) δ: 166.1, 132.7, 130.9, 129.5, 128.2, 68.3, 21.9.



3-Pentylbenzoate; CAS RN 5436-54-4[8)]

^{1}H-NMR (400 MHz, CDCl$_3$) δ: 8.08-8.05 (2H, m), 7.57-7.53 (1H, m), 7.46-7.43 (2H, m), 5.05-4.99 (1H, m), 1.75-1.67 (4H, m), 0.95 (6H, t, J = 7.2 Hz).

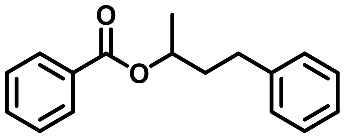
^{13}C-NMR (100 MHz, CDCl$_3$) δ: 166.4, 132.7, 130.8, 129.5, 128.3, 128.2, 26.5, 9.7.



Cyclohexyl benzoate; CAS RN 2412-73-9[8)]

^{1}H-NMR (400 MHz, CDCl$_3$) δ: 8.06-8.04 (2H, m), 7.57-7.53 (1H, m), 7.46-7.42 (2H, m), 5.07-5.00 (1H, m), 1.94-1.93 (2H, m), 1.81-1.78 (2H, m), 1.64-1.55 (3H, m), 1.50-1.31 (3H, m).

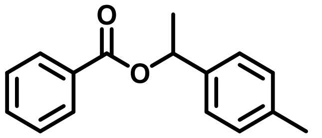
^{13}C-NMR (100 MHz, CDCl$_3$) δ: 166.0, 132.7, 130.9, 129.5, 128.2, 73.0, 31.6, 25.4, 23.6.



4-Phenyl-2-butyl benzoate; CAS RN 150272-41-6[3, 8)]

^{1}H-NMR (400 MHz, CDCl$_3$) δ: 8.06-8.03 (2H, m), 7.59-7.54 (1H, m), 7.47-7.43 (2H, m), 7.30-7.16 (5H, m), 5.23-5.15 (1H, m), 2.81-2.66 (2H, m), 2.17-2.05 (1H, m), 1.99-1.90 (1H, m), 1.38 (3H, d, J = 6.0 Hz).

^{13}C-NMR (100 MHz, CDCl$_3$) δ: 166.2, 141.5, 132.8, 130.7, 129.5, 128.4, 128.3, 128.3, 125.9, 71.1, 37.7, 31.8, 20.1.



1-(*p*-tolyl)ethyl benzoate; CAS RN 19771-04-1[13)]

^{1}H-NMR (400 MHz, CDCl$_3$) δ: 8.09-8.06 (2H, m), 7.57-7.53 (1H, m), 7.45-7.41 (2H, m), 7.35 (2H, d, J = 8.0 Hz), 7.18 (2H, d, J = 8.0 Hz), 6.10 (1H, q, J = 6.4 Hz), 2.34 (3H, s), 1.66 (3H, d, J = 5.6 Hz).

^{13}C-NMR (100 MHz, CDCl$_3$) δ: 165.8, 138.8, 137.6, 132.8, 130.5, 129.6, 129.2, 128.3, 126.0, 72.8, 22.3, 21.1.

9 Acknowledgment

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10 References

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