

Supporting Information of

**Ureas as Safe Carbonyl Sources for the Synthesis of
Carbamates with Deep Eutectic Solvents (DESs) as Efficient
and Recyclable Solvent/Catalyst Systems**

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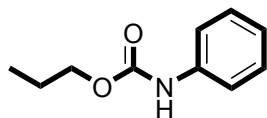
A. Instruments and Materials

All chemicals were purchased from the Merck, Fluka and Aldrich Chemical companies in high purity. The products were characterized by their spectral and physical data such as NMR, FT-IR, MS, CHNS and melting point. ^1H and ^{13}C NMR spectra were recorded with Bruker Avance DPX 250MHz instruments with Me_4Si or solvent resonance as the internal standard. Fourier transform infrared (FTIR) spectra were obtained using a Shimadzu FT-IR 8300 spectrophotometer.

Elemental analysis was done on a 2400 series PerkinElmer analyzer. The mass spectra were recorded on a Shimadzu GC-MS QP 1000 EX instrument. Melting points were determined on a Mel-Temp apparatus and were uncorrected. Determination of the purity of the substrate and monitoring of the reaction were accomplished by thin-layer chromatography (TLC) on a silica-gel polygram SILG/UV 254 plates. The Hielscher ultrasonics UP200H (Hielscher Ultrasonics GmbH, Stuttgart, Germany) with a frequency of 40 kHz and a nominal power 200 W was used to produce ultrasonic irradiation.

B. Analytical Data of Compounds Synthesized

1-Propyl phenylcarbamate (C1):



White crystal; yield 83%; mp 50-51 °C.

IR (KBr); 3317 (s), 3138 (m), 3058 (m), 3019 (vw), 2974 (s), 2985 (s), 1704 (vs), 1597 (s), 1544 (s), 1447 (s), 1376 (m), 1317 (vs), 1304 (m), 1238 (vs), 1177 (m), 1159 (w), 1121 (s), 1080 (m), 1054 (s), 1027 (m), 995 (vw), 966 (w), 905 (s), 855 (vw), 845 (vw), 823 (w), 761 (s), 747 (s), 690 (s), 508 (m) cm^{-1} .

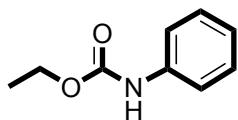
^1H -NMR (250 MHz, CDCl_3): δ = 7.32-7.18 (m, 4H), 7.00-6.94 (m, 1H), 6.64 (s, br, 1H, NH), 4.05 (t, J = 7.5 Hz, 2H), 1.62 (sex, J = 7.5 Hz, 2H), 0.90 (t, J = 7.5 Hz, 3H) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 153.74, 137.98, 129.01, 123.30, 118.63, 66.83, 22.26, 10.34 ppm.

MS Calcd m/z 179.22, Found 179.

Anal. Calcd for $\text{C}_{10}\text{H}_{13}\text{NO}_2$: C, 67.02; H, 7.31; N, 7.82%. Found: C, 66.97; H, 7.32; N, 7.86%.

1-Ethyl phenylcarbamate (C2):



White crystal; yield 81%; mp 49-50 °C.

IR (KBr); 3320 (s), 3140 (m), 3059 (m), 3020 (vw), 2974 (s), 2984 (s), 1701 (vs), 1598 (s), 1543 (s), 1444 (s), 1376 (m), 1318 (vs), 1304 (m), 1237 (vs), 1177 (m), 1158 (w), 1120 (s), 1059 (m), 1054 (s), 1029 (m), 997 (vw), 967 (w), 904 (s), 859 (vw), 846 (vw), 823 (w), 762 (s), 746 (s), 696 (s), 509 (m) cm^{-1} .

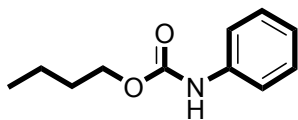
^1H -NMR (250 MHz, CDCl_3): δ = 7.32-7.18 (m, 4H), 6.99-6.94 (m, 1H), 6.64 (s, br, 1H, NH), 4.15 (q, J = 7.0 Hz, 2H), 1.23 (t, J = 7.0 Hz, 3H) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 158.40, 137.98, 129.01, 123.32, 118.66, 61.19, 14.55 ppm.

MS Calcd m/z 165.19, Found 165.

Anal. Calcd for $\text{C}_9\text{H}_{11}\text{NO}_2$: C, 65.44; H, 6.71; N, 8.48%. Found: C, 65.41; H, 6.72; N, 8.50%.

1-Butyl phenylcarbamate (C3):



White crystal; yield 85%; mp 60-62 °C.

IR (KBr); 3318 (s), 3059 (w), 3019 (vw), 2966 (s), 2934 (m), 2897 (vw), 2875 (m), 1702 (vs), 1602 (s), 1534 (s), 1474 (vw), 1438 (m), 1357 (vw), 1318 (s), 1311 (s), 1272 (vw), 1228 (s), 1131 (w), 1085 (w), 1060 (s), 1030 (m), 996 (vw), 976 (vw), 908 (s), 842 (vs), 774 (vw), 747 (s), 694 (s), 621 (w), 509 (vs), 447 (m), 434 (m) cm^{-1} .

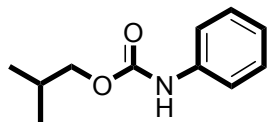
^1H -NMR (250 MHz, CDCl_3): δ = 7.33-7.20 (m, 4H), 7.01-6.95 (m, 1H), 6.58 (s, br, 1H, NH), 4.01 (t, J = 7.5 Hz, 2H), 1.59 (m, 2H), 1.30 (m, 2H), 0.88 (t, J = 7.5 Hz, 3H) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 153.82, 138.03, 129.00, 123.28, 118.66, 65.10, 30.96, 19.07, 13.72 ppm.

MS Calcd m/z 193.25, Found 193.

Anal. Calcd for $\text{C}_{11}\text{H}_{15}\text{NO}_2$: C, 68.37; H, 7.82; N, 7.25%. Found: C, 68.34; H, 7.83; N, 7.26%.

iso-Butyl phenylcarbamate (C4):



White crystal; yield 80%; mp 84-86 °C.

IR (KBr); 3311 (s), 3138 (m), 3057 (m), 2974 (s), 2960 (s), 2875 (m), 1705 (vs), 1601 (s), 1542 (s), 1444 (m), 1318 (s), 1304 (m), 1283 (w), 1233 (vs), 1132 (w), 1086 (m), 1063 (s), 1029 (m), 998 (vw), 965 (w), 925 (vw), 904 (s), 850 (vw), 841 (vw), 760 (s), 745 (s), 696 (s), 509 (m) cm^{-1} .

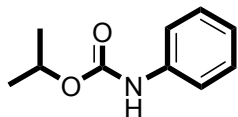
$^1\text{H-NMR}$ (250 MHz, CDCl_3): δ = 7.32-7.21 (m, 4H), 7.00-6.96 (m, 1H), 6.68 (s, br, 1H, NH), 3.87 (d, J = 7.5 Hz, 2H), 1.89 (hep, J = 7.5 Hz, 1H), 0.88 (d, J = 7.5 Hz, 6H) ppm.

$^{13}\text{C-NMR}$ (63 MHz, CDCl_3): δ = 153.83, 138.02, 129.00, 123.30, 118.69, 71.35, 27.96, 19.06 ppm.

MS Calcd m/z 193.25, Found 193.

Anal. Calcd for $\text{C}_{11}\text{H}_{15}\text{NO}_2$: C, 68.37; H, 7.82; N, 7.25%. Found: C, 68.33; H, 7.82; N, 7.28%.

2-Propyl phenylcarbamate (C5):



White crystal; yield 72%; mp 83-85 °C.

IR (KBr); 3323 (s), 3132 (m), 3062 (m), 3018 (vw), 2981 (s), 2988 (m), 1702 (vs), 1597 (s), 1534 (s), 1501 (m), 1490 (m), 1468 (w), 1443 (m), 1370 (s), 1340 (w), 1306 (s), 1240 (vs), 1180 (m), 1144 (m), 1108 (s), 1084 (m), 1048 (s), 1027 (m), 960 (w), 926 (w), 908 (w), 878 (vw), 829 (vw), 803 (s), 766 (s), 746 (vs), 701 (s), 692 (s), 670 (vw), 525 (m), 508 (s), 418 (m) cm^{-1} .

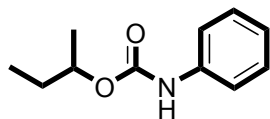
$^1\text{H-NMR}$ (250 MHz, CDCl_3): δ = 7.24-7.13 (m, 4H), 6.99-6.94 (m, 1H), 6.55 (s, br, 1H, NH), 4.96 (q, J = 7.5 Hz, 1H), 1.22 (d, J = 7.5 Hz, 6H) ppm.

$^{13}\text{C-NMR}$ (63 MHz, CDCl_3): δ = 153.19, 138.09, 129.00, 123.20, 118.55, 68.70, 22.01 ppm.

MS Calcd m/z 179.22, Found 179.

Anal. Calcd for $\text{C}_{10}\text{H}_{13}\text{NO}_2$: C, 67.02; H, 7.31; N, 7.82%. Found: C, 66.98; H, 7.32; N, 7.85%.

2-Butyl phenylcarbamate (C6):



White crystal; yield 73%; mp 64-66 °C.

IR (KBr); 3320 (s), 3139 (m), 3058 (m), 3019 (vw), 2974 (s), 2984 (s), 2882 (m), 1701 (vs), 1599 (s), 1543 (s), 1466 (vw), 1444 (s), 1376 (m), 1318 (vs), 1304 (m), 1237 (vs), 1177 (m), 1158 (w), 1120 (s), 1059 (m), 1054 (s), 1029 (m), 997 (vw), 967 (w), 904 (s), 859 (vw), 846 (vw), 823 (w), 761 (s), 745 (s), 696 (s), 509 (m), 419 (m) cm^{-1} .

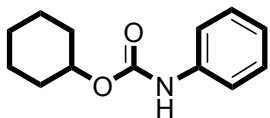
$^1\text{H-NMR}$ (250 MHz, CDCl_3): δ = 7.32-7.17 (m, 4H), 6.98-6.92 (m, 1H), 6.62 (s, br, 1H, NH), 4.66 (sex, J = 3.75 Hz, 1H), 1.85-1.83 (m, 2H), 1.67 (d, J = 7.5 Hz, 3H), 1.32 (t, J = 7.5 Hz, 3H) ppm.

$^{13}\text{C-NMR}$ (63 MHz, CDCl_3): δ = 153.25, 138.17, 129.00, 123.16, 118.57, 73.60, 31.92, 25.38, 23.78 ppm.

MS Calcd m/z 193.25, Found 193.

Anal. Calcd for $\text{C}_{11}\text{H}_{15}\text{NO}_2$: C, 68.37; H, 7.82; N, 7.25%. Found: C, 68.33; H, 7.83; N, 7.27%.

Cyclohexyl phenylcarbamate (C7):



White crystal; yield 76%; mp 79-80 °C.

IR (KBr); 3358 (vs), 3124 (m), 3058 (m), 2928 (vs), 2860 (s), 1706 (vs), 1603 (s), 1578 (vw), 1528 (vs), 1466 (vw), 1444 (vs), 1353 (w), 1329 (m), 1320 (m), 1301 (m), 1233 (s), 1196 (vw), 1083 (m), 1057 (s), 1029 (m), 1017 (m), 951 (m), 900 (m), 892 (m), 854 (vw), 838 (m), 801 (vw), 758 (s), 769 (m), 737 (s), 691 (vs), 670 (vw), 602 (s), 504 (s), 442 (w) cm^{-1} .

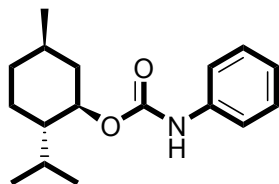
$^1\text{H-NMR}$ (250 MHz, CDCl_3): δ = 7.23-7.18 (m, 4H), 6.99-6.93 (m, 1H), 6.62 (s, br, 1H, NH), 4.77 (qunt, J = 5.5 Hz, 1H), 1.41-1.66 (m, 2H), 1.20-1.17 (m, 4H), 0.89-0.82 (m, 4H) ppm.

$^{13}\text{C-NMR}$ (63 MHz, CDCl_3): δ = 153.49, 138.16, 129.00, 123.17, 118.57, 73.25, 29.01, 19.71, 9.70 ppm.

MS Calcd m/z 199.29, Found 199.

Anal. Calcd for $\text{C}_{11}\text{H}_{21}\text{NO}_2$: C, 66.29; H, 10.62; N, 7.03%. Found: C, 66.25; H, 10.63; N, 7.07%.

(-)-Menthyl phenylcarbamate (C8):



White crystal; yield 70%; mp 105-107 °C. $[\alpha]_{D}^{25} -120^{\circ}$ (0.05, CDCl_3).

IR (KBr); 3365 (vs), 3109 (w), 3058 (m), 3043 (m), 2954 (vs), 2925 (s), 2869 (m), 1701 (vs), 1598 (s), 1578 (vw), 1522 (s), 1492 (w), 1466 (w), 1443 (s), 1406 (w), 1388 (m), 1372 (m), 1342 (w), 1315 (s), 1300 (s), 1228 (vs), 1181 (s), 1098 (w), 1082 (m), 1062 (w), 1050 (s), 1029 (m), 999 (vw), 984 (m), 923 (m), 898 (s), 880 (m), 862 (w), 833 (s), 768 (vw), 757 (s), 734 (vs), 702 (vw), 689 (s), 670 (vw), 626 (s), 503 (s), 474 (m) cm^{-1} .

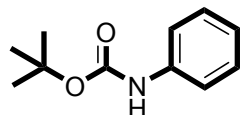
$^1\text{H-NMR}$ (250 MHz, CDCl_3): δ = 7.33-7.18 (m, 4H), 6.98-6.93 (m, 1H), 6.55 (s, br, 1H, NH), 4.64-4.54 (m, 1H), 2.05-1.87 (m, 2H), 1.63-1.57 (m, 2H), 1.35-1.23 (m, 2H), 0.72-1.00 (m, 12H) ppm.

$^{13}\text{C-NMR}$ (63 MHz, CDCl_3): δ = 153.13, 138.16, 129.01, 123.14, 118.43, 75.08, 47.32, 41.34, 34.24, 31.39, 26.24, 23.46, 22.04, 20.81, 16.42 ppm.

MS Calcd m/z 275.39, Found 275.

Anal. Calcd for $\text{C}_{17}\text{H}_{25}\text{NO}_2$: C, 74.14; H, 9.15; N, 5.09%. Found: C, 74.10; H, 9.11; N, 5.17%.

***tert*-Butyl phenylcarbamate (C9):**



White crystal; yield 64%; mp 134-135 °C.

IR (KBr); 3312 (s), 3127 (m), 3042 (m), 3006 (m), 2985 (s), 2932 (s), 1698 (vs), 1598 (s), 1524 (s), 1502 (w), 1478 (w), 1444 (m), 1392 (s), 1368 (s), 1315 (m), 1248 (s), 1163 (vs), 1083 (m), 1054 (s), 1022 (m), 910 (s), 896 (m), 851 (vw), 822 (s), 775 (vs), 746 (vs), 692 (vs), 526 (vw), 511 (vs), 459 (m), 416 (w) cm^{-1} .

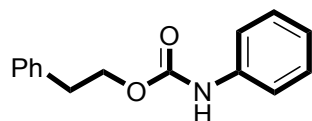
$^1\text{H-NMR}$ (250 MHz, CDCl_3): δ = 7.29-7.17 (m, 4H), 6.97-6.92 (m, 1H), 6.42 (s, br, 1H, NH), 1.45 (s, 9H) ppm.

$^{13}\text{C-NMR}$ (63 MHz, CDCl_3): δ = 156.00, 134.38, 128.96, 123.00, 118.50, 68.98, 28.33 ppm.

MS Calcd m/z 193.25, Found 193.

Anal. Calcd for $\text{C}_{11}\text{H}_{15}\text{NO}_2$: C, 68.37; H, 7.82; N, 7.25%. Found: C, 68.34; H, 7.83; N, 7.26%.

Phenethyl phenylcarbamate (C10):



White crystal; yield 85%; mp 78-80 °C.

IR (KBr); 3339 (m), 3254 (w), 3116 (w), 3070 (vw), 1706 (vs), 1417 (m), 1321 (s), 1246 (s), 1182 (m), 1138 (vw), 1110 (vs), 1059 (vw), 1048 (vs), 995 (vw), 936 (w), 903 (m), 824 (m), 793 (s), 763 (vw), 710 (m), 604 (vs), 463 (m), 411 (m) cm^{-1} .

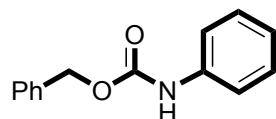
^1H -NMR (250 MHz, CDCl_3): δ = 7.55-7.50 (m, 5H), 7.10-7.32 (m, 4H), 6.99-6.96 (m, 1H), 6.55 (s, br, 1H, NH), 4.01 (t, J = 7.5 Hz, 2H), 2.83 (t, J = 7.5 Hz, 3H) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 156.65, 140.34, 138.26, 130.61, 128.77, 126.17, 124.09, 121.48, 63.90, 34.88 ppm.

MS Calcd m/z 241.29, Found 241.

Anal. Calcd for $\text{C}_{15}\text{H}_{15}\text{NO}_2$: C, 64.67; H, 6.27; N, 5.81%. Found: C, 64.64; H, 6.25; N, 5.87%.

Benzyl phenylcarbamate (C11):



White crystal; yield 23%; mp 70-72 °C.

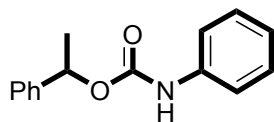
IR (KBr); 3305 (vs), 3105 (w), 3036 (w), 2971 (vs), 2934 (s), 2901 (m), 2876 (s), 1706 (vs), 1592 (s), 1560 (vw), 1515 (s), 1496 (s), 1405 (m), 1350 (m), 1306 (vs), 1286 (s), 1262 (m), 1245 (vs), 1180 (vw), 1116 (w), 1102 (m), 1078 (s), 1013 (vs), 977 (s), 968 (s), 918 (w), 893 (w), 815 (s), 788 (m), 771 (m), 758 (m), 749 (m), 724 (vw), 628 (s), 532 (m), 518 (vw), 508 (m), 445 (vw) cm^{-1} .

^1H -NMR (250 MHz, CDCl_3): δ = 7.09-7.38 (m, 9H), 7.06-7.00 (m, 1H), 6.84 (s, br, 1H, NH), 5.16 (s, 2H) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 153.43, 137.82, 136.05, 128.97, 128.55, 128.24, 126.94, 123.43, 118.77, 66.91 ppm.

MS Calcd m/z 227.26, Found 227.

Anal. Calcd for $\text{C}_{14}\text{H}_{13}\text{NO}_2$: C, 73.99; H, 5.77; N, 6.16%. Found: C, 73.93; H, 5.74; N, 6.22%.

1-Phenylethyl phenylcarbamate (C12):

White crystal; yield 18%; mp 90-92 °C.

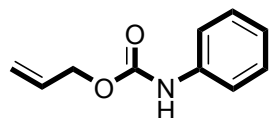
IR (KBr); 3338 (s), 3220 (m), 3130 (w), 3042 (w), 2938 (w), 2881 (vw), 1702 (vs), 1598 (s), 1541 (vs), 1492 (w), 1459 (w), 1447 (m), 1409 (vw), 1371 (w), 1315 (s), 1299 (m), 1244 (vs), 1084 (m), 1068 (s), 1030 (w), 1016 (w), 899 (m), 845 (m), 809 (vs), 764 (vs), 742 (vs), 690 (vs), 670 (vw), 655 (w), 526 (vw), 497 (s), 453 (m), 418 (vw) cm^{-1} .

$^1\text{H-NMR}$ (250 MHz, CDCl_3): δ = 7.65-7.61 (m, 5H), 7.28-7.16 (m, 4H), 6.98-6.96 (m, 1H), 6.55 (s, br, 1H, NH), 4.62 (q, J = 7.5 Hz, 1H), 1.40 (d, J = 7.5 Hz, 3H) ppm.

$^{13}\text{C-NMR}$ (63 MHz, CDCl_3): δ = 156.09, 142.80, 133.24, 128.22, 127.90, 125.87, 125.56, 125.22, 70.73, 22.49 ppm.

MS Calcd m/z 241.29, Found 241.

Anal. Calcd for $\text{C}_{15}\text{H}_{15}\text{NO}_2$: C, 64.67; H, 6.27; N, 5.81%. Found: C, 64.63; H, 6.24; N, 5.89%.

Allyl phenylcarbamate (C13):

White crystal; yield 20%; mp 67-68 °C.

IR (KBr); 3340 (vs), 3094 (s), 3046 (m), 2930 (w), 2882 (vw), 1706 (vs), 1598 (s), 1538 (vs), 1492 (w), 1459 (vw), 1447 (s), 1409 (w), 1371 (vw), 1315 (s), 1299 (m), 1242 (vs), 1084 (m), 1068 (s), 1030 (vw), 1016 (vw), 899 (w), 845 (m), 810 (vs), 764 (m), 742 (m), 690 (m), 656 (w), 608 (vw), 467 (s), 453 (w), 418 (vw) cm^{-1} .

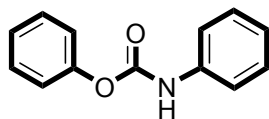
$^1\text{H-NMR}$ (250 MHz, CDCl_3): δ = 7.31-7.21 (m, 4H), 6.95-6.91 (m, 1H), 6.45 (s, br, 1H, NH), 5.86-5.74 (m, 1H), 5.15 (d, J = 8 Hz, 1H), 5.01 (d, J = 8 Hz, 1H), 3.40 (d, J = 7.5 Hz, 2H) ppm.

$^{13}\text{C-NMR}$ (63 MHz, CDCl_3): δ = 154.68, 138.42, 134.94, 128.68, 127.99, 121.82, 116.74, 31.52 ppm.

MS Calcd m/z 177.20, Found 177.

Anal. Calcd for $\text{C}_{10}\text{H}_{11}\text{NO}_2$: C, 67.78; H, 6.26; N, 7.90%. Found: C, 67.75; H, 6.23; N, 7.94%.

Phenyl phenylcarbamate (C14):



White crystal; yield 40%; mp 122-124 °C.

IR (KBr); 3334 (vs), 3172 (s), 3071 (m), 3019 (w), 1707 (vs), 1614 (m), 1600 (w), 1500 (w), 1486 (m), 1372 (vs), 1307 (vw), 1274 (vw), 1201 (vs), 1163 (m), 1069 (m), 1022 (m), 1003 (w), 973 (vs), 915 (m), 838 (m), 807 (w), 796 (m), 762 (vs), 696 (vs), 684 (w), 585 (s), 547 (m) cm^{-1} .

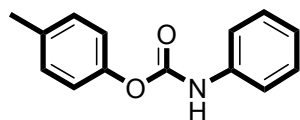
$^1\text{H-NMR}$ (250 MHz, CDCl_3): δ = 7.42-7.38 (m, 5H), 7.16-7.09 (m, 4H), 6.87-6.84 (m, 1H), 6.32 (s, br, 1H, NH) ppm.

$^{13}\text{C-NMR}$ (63 MHz, CDCl_3): δ = 154.42, 150.68, 139.31, 130.43, 128.77, 124.43, 123.25, 121.54, 117.44 ppm.

MS Calcd m/z 213.24, Found 213.

Anal. Calcd for $\text{C}_{13}\text{H}_{11}\text{NO}_2$: C, 73.23; H, 5.20; N, 6.57%. Found: C, 73.19; H, 5.17; N, 6.62%.

4-Methylphenyl phenylcarbamate (C15):



White crystal; yield 43%; mp 110-112 °C.

IR (KBr); 3335 (vs), 3189 (s), 3071 (m), 3012 (w), 2930 (w), 2892 (vw), 1707 (vs), 1614 (s), 1601 (w), 1507 (w), 1486 (m), 1423 (vw), 1372 (vs), 1304 (vw), 1238 (vw), 1201 (vs), 1163 (m), 1069 (m), 1022 (s), 1003 (m), 973 (vs), 915 (w), 838 (m), 805 (vw), 785 (w), 762 (vs), 696 (vs), 661 (vw), 607 (vw), 585 (s), 508 (vw) cm^{-1} .

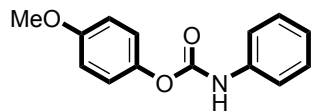
$^1\text{H-NMR}$ (250 MHz, CDCl_3): δ = 7.45 (d, J = 7.5 Hz, 2H), 7.35-7.22 (m, 7H), 7.06-7.00 (m, 1H), 6.84 (s, br, 1H, NH), 2.09 (s, 3H) ppm.

$^{13}\text{C-NMR}$ (63 MHz, CDCl_3): δ = 153.52, 137.82, 136.05, 128.97, 128.55, 128.26, 128.23, 123.43, 118.77, 27.59 ppm.

MS Calcd m/z 227.26, Found 227.

Anal. Calcd for $\text{C}_{14}\text{H}_{13}\text{NO}_2$: C, 73.99; H, 5.77; N, 6.16%. Found: C, 73.96; H, 5.74; N, 6.22%.

4-Methoxyphenyl phenylcarbamate (C16):



White crystal; yield 45%; mp 136-137 °C.

IR (KBr); 3330 (vs), 3277 (m), 3198 (m), 3061 (m), 2977 (m), 1702 (vs), 1608 (s), 1389 (vw), 1364 (vs), 1260 (s), 1227 (s), 1154 (m), 1115 (w), 1086 (vs), 1045 (m), 1013 (w), 974 (m), 962 (m), 903 (m), 873 (w), 861 (w), 805 (m), 778 (s), 750 (vw), 737 (vw), 573 (m), 556 (m) cm^{-1} .

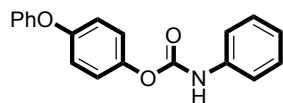
^1H -NMR (250 MHz, CDCl_3): δ = 7.33-7.22 (m, 7H), 7.05 (d, J = 7.5 Hz, 2H), 6.79 (s, br, 1H, NH), 3.71 (s, 3H) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 152.71, 135.32, 134.38, 132.15, 128.65, 127.72, 127.42, 122.39, 118.04, 66.03 ppm.

MS Calcd m/z 243.26, Found 243.

Anal. Calcd for $\text{C}_{14}\text{H}_{13}\text{NO}_3$: C, 69.12; H, 5.39; N, 5.76%. Found: C, 69.07; H, 5.34; N, 5.82%.

4-Phenoxyphenyl phenylcarbamate (C17):



White crystal; yield 48%; mp 162-164 °C.

IR (KBr); 3320 (s), 3208 (vw), 3040 (m), 3058 (w), 3020 (vw), 1701 (vs), 1598 (s), 1543 (vs), 1444 (s), 1376 (w), 1318 (vs), 1304 (w), 1237 (vs), 1177 (m), 1158 (vw), 1120 (m), 1086 (m), 1054 (s), 1029 (m), 997 (vw), 967 (w), 904 (s), 859 (vw), 846 (vw), 823 (w), 762 (s), 746 (s), 696 (s), 617 (vw), 509 (m) cm^{-1} .

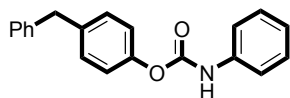
^1H -NMR (250 MHz, CDCl_3): δ = 7.75-7.71 (m, 5H), 7.54 (d, J = 7.5 Hz, 2H), 7.40-7.38 (m, 3H), 7.25 (d, J = 7.5 Hz, 2H), 7.05 (s, br, 1H, NH) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 153.22, 143.73, 138.60, 135.28, 134.34, 131.42, 128.74, 128.49, 126.86, 125.24, 121.67, 121.34, 117.73 ppm.

MS Calcd m/z 305.33, Found 305.

Anal. Calcd for $\text{C}_{19}\text{H}_{15}\text{NO}_3$: C, 74.74; H, 4.95; N, 4.59%. Found: C, 74.70; H, 4.89; N, 4.64%.

4-Benzylphenyl phenylcarbamate (C18):



White crystal; yield 39%; mp 168-170 °C.

IR (KBr); 3313 (vs), 3156 (s), 3073 (m), 2956 (vw), 2923 (vw), 1702 (vs), 1647 (vw), 1602 (w), 1501 (m), 1420 (vs), 1291 (s), 1220 (m), 1198 (vs), 1162 (m), 1104 (m), 1017 (vs), 980 (vw), 864 (vs), 833 (m), 816 (s), 782 (m), 712 (m), 643 (vw), 630 (w), 592 (m), 541 (s), 496 (m), 448 (vw) cm^{-1} .

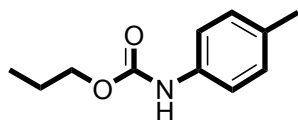
^1H -NMR (250 MHz, CDCl_3): δ = 8.19 (d, J = 7.5 Hz, 2H), 7.94-7.86 (m, 5H), 5.54 (d, J = 7.5 Hz, 2H), 7.41-7.37 (m, 4H), 7.07 (s, br, 1H, NH), 3.53 (s, 2H) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 152.59, 143.74, 135.28, 130.78, 128.74, 128.71, 128.49, 126.87, 125.24, 124.60, 121.65, 119.73, 117.74, 42.74 ppm.

MS Calcd m/z 305.33, Found 305.

Anal. Calcd for $\text{C}_{20}\text{H}_{17}\text{NO}_2$: C, 79.19; H, 5.65; N, 4.62%. Found: C, 79.16; H, 5.61; N, 4.68%.

1-Propyl (4-methylphenyl)carbamate (C21):



White crystal; yield 80%; mp 52-54 °C.

IR (KBr); 3316 (vs), 3134 (m), 3059 (m), 3020 (vw), 2974 (vs), 2983 (s), 2885 (m), 1703 (vs), 1598 (s), 1541 (s), 1445 (s), 1376 (m), 1318 (s), 1307 (w), 1237 (vs), 1175 (m), 1158 (w), 1120 (m), 1059 (m), 1057 (vs), 1027 (m), 997 (vw), 967 (vw), 904 (vs), 859 (vw), 846 (vw), 823 (w), 766 (m), 742 (s), 691 (s), 509 (m) cm^{-1} .

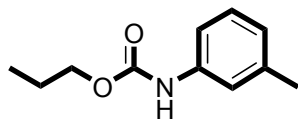
^1H -NMR (250 MHz, CDCl_3): δ = 7.18 (d, J = 7.5 Hz, 2H), 7.02 (d, J = 7.5 Hz, 2H), 6.62 (s, br, 1H, NH), 4.03 (t, J = 7.5 Hz, 2H), 2.21 (s, 3H), 1.61 (sex, J = 7.5 Hz, 2H), 0.88 (t, J = 7.5 Hz, 3H) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 153.94, 135.44, 129.49, 126.69, 118.83, 66.74, 22.30, 20.73, 10.36 ppm.

MS Calcd m/z 193.25, Found 193.

Anal. Calcd for $\text{C}_{11}\text{H}_{15}\text{NO}_2$: C, 68.37; H, 7.82; N, 7.25%. Found: C, 68.31; H, 7.78; N, 7.32%.

1-Propyl (3-methylphenyl)carbamate (C22):



White crystal; yield 82%; mp 46-47 °C.

IR (KBr): 3294 (vs), 3192 (w), 3118 (w), 3063 (w), 2963 (m), 2903 (vw), 1706 (vs), 1671 (s), 1593 (s), 1560 (vw), 1539 (m), 1447 (w), 1414 (s), 1364 (m), 1319 (s), 1275 (s), 1254 (m), 1221 (vs), 1190 (w), 1087 (m), 1048 (vs), 1025 (vw), 986 (w), 959 (m), 912 (vw), 842 (m), 829 (vw), 757 (m), 716 (w), 698 (m), 630 (vw), 608 (m), 592 (vw), 583 (vw), 498 (vw), 480 (w) cm^{-1} .

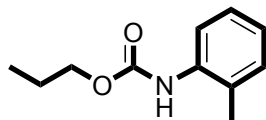
^1H -NMR (250 MHz, CDCl_3): δ = 7.23-7.08 (m, 3H), 6.99 (d, J = 7.5 Hz, 1H), 6.85 (s, br, 1H, NH), 4.10 (t, J = 7.5 Hz, 2H), 2.30 (s, 3H), 1.68 (sex, J = 7.5 Hz, 2H), 0.96 (t, J = 7.5 Hz, 3H) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 154.11, 143.47, 132.42, 130.92, 128.81, 66.83, 22.29, 14.06, 10.34 ppm.

MS Calcd m/z 193.25, Found 193.

Anal. Calcd for $\text{C}_{11}\text{H}_{15}\text{NO}_2$: C, 68.37; H, 7.82; N, 7.25%. Found: C, 68.32; H, 7.77; N, 7.32%.

1-Propyl (2-methylphenyl)carbamate (C23):



White crystal; yield 84%; mp 42-43 °C.

IR (KBr): 3322 (vs), 3198 (m), 3132 (m), 3032 (m), 2944 (m), 2920 (m), 2861 (vw), 1709 (vs), 1602 (s), 1578 (vw), 1541 (vs), 1454 (vw), 1407 (m), 1376 (vw), 1319 (s), 1300 (m), 1275 (w), 1232 (vs), 1211 (w), 1157 (vw), 1115 (m), 1082 (m), 1067 (vs), 959 (vw), 902 (w), 858 (m), 820 (vs), 764 (m), 740 (s), 708 (w), 695 (s), 610 (vw), 554 (w), 528 (vw), 511 (m), 462 (m), 426 (w) cm^{-1} .

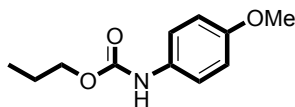
^1H -NMR (250 MHz, CDCl_3): δ = 7.26-7.20 (m, 1H), 7.00-6.97 (m, 1H), 6.88-6.84 (m, 2H), 6.59 (s, br, 1H, NH), 4.12 (t, J = 7.5 Hz, 2H), 2.40 (s, 3H), 1.68 (sex, J = 7.5 Hz, 2H), 0.96 (t, J = 7.5 Hz, 3H) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 155.11, 141.01, 131.12, 126.91, 126.00, 122.11, 66.34, 19.15, 16.02, 10.38 ppm.

MS Calcd m/z 193.25, Found 193.

Anal. Calcd for $\text{C}_{11}\text{H}_{15}\text{NO}_2$: C, 68.37; H, 7.82; N, 7.25%. Found: C, 68.33; H, 7.79; N, 7.29%.

1-Propyl (4-methoxyphenyl)carbamate (C24):



White crystal; yield 78%; mp 86-87 °C.

IR (KBr); 3340 (vs), 3216 (m), 3158 (vw), 3012 (m), 2969 (m), 2940 (m), 2858 (m), 2842 (m), 1704 (vs), 1553 (s), 1593 (s), 1517 (m), 1459 (m), 1380 (s), 1335 (m), 1292 (w), 1263 (vs), 1235 (vs), 1188 (w), 1158 (s), 1140 (s), 1024 (vs), 928 (m), 844 (m), 807 (s), 768 (s), 740 (vw), 691 (m), 624 (w), 574 (m), 559 (w), 532 (m), 478 (w) cm^{-1} .

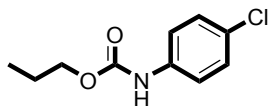
^1H -NMR (250 MHz, CDCl_3): δ = 7.88 (d, J = 7.5 Hz, 2H), 7.45 (d, J = 7.5 Hz, 2H), 7.08 (s, br, 1H, NH), 4.10 (t, J = 7.5 Hz, 2H), 2.52 (s, 3H), 1.65 (sex, J = 7.5 Hz, 2H), 0.93 (t, J = 7.5 Hz, 3H) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 155.71, 154.68, 143.98, 122.25, 113.58, 66.19, 54.80, 21.85, 10.93 ppm.

MS Calcd m/z 209.25, Found 209.

Anal. Calcd for $\text{C}_{11}\text{H}_{15}\text{NO}_3$: C, 63.14; H, 7.23; N, 6.69%. Found: C, 63.13; H, 7.20; N, 6.74%.

1-Propyl (4-chlorophenyl)carbamate (C25):



White crystal; yield 88%; mp 82-84 °C.

IR (KBr); 3323 (vs), 3102 (w), 3042 (m), 2977 (vs), 2988 (m), 2897 (m), 2879 (s), 2754 (m), 1699 (vs), 1604 (s), 1592 (s), 1541 (s), 1406 (s), 1386 (m), 1308 (s), 1285 (m), 1243 (vs), 1174 (m), 1138 (w), 1089 (s), 1067 (s), 1010 (s), 977 (m), 915 (m), 892 (vw), 857 (m), 820 (vs), 773 (m), 755 (s), 683 (m), 506 (s), 412 (m) cm^{-1} .

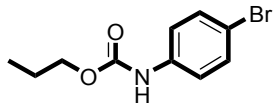
^1H -NMR (250 MHz, CDCl_3): δ = 7.26 (d, J = 9 Hz, 2H), 7.18 (d, J = 9 Hz, 2H), 6.63 (s, br, 1H, NH), 4.05 (t, J = 7.5 Hz, 2H), 1.62 (sex, J = 7.5 Hz, 2H), 0.90 (t, J = 7.5 Hz, 3H) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 153.60, 136.58, 129.00, 128.28, 119.82, 67.03, 22.22, 10.32 ppm.

MS Calcd m/z 213.66, Found 213.

Anal. Calcd for $\text{C}_{10}\text{H}_{12}\text{ClNO}_2$: C, 56.22; H, 5.66; N, 6.56%. Found: C, 56.17; H, 5.61; N, 6.63%.

1-Propyl (4-bromophenyl)carbamate (C26):



White crystal; yield 89%; mp 76-78 °C.

IR (KBr); 3308 (vs), 3108 (w), 3038 (m), 2971 (vs), 2938 (s), 2901 (w), 2880 (m), 1706 (vs), 1590 (s), 1560 (vw), 1518 (vs), 1492 (vs), 1403 (s), 1350 (m), 1310 (s), 1286 (m), 1242 (vs), 1180 (w), 1135 (w), 1116 (w), 1102 (m), 1076 (vs), 1013 (s), 974 (m), 968 (m), 913 (m), 893 (w), 856 (w), 842 (vw), 819 (vs), 790 (w), 772 (m), 758 (m), 749 (m), 724 (vw), 622 (s), 532 (m), 512 (w), 501 (m), 445 (w) cm^{-1} .

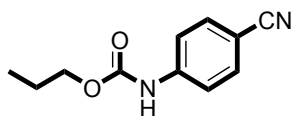
$^1\text{H-NMR}$ (250 MHz, CDCl_3): δ = 7.39 (d, J = 7.5 Hz, 2H), 7.28 (d, J = 7.5 Hz, 2H), 6.76 (s, br, 1H, NH), 4.12 (t, J = 7.5 Hz, 2H), 1.69 (sex, J = 7.5 Hz, 2H), 0.96 (t, J = 7.5 Hz, 3H) ppm.

$^{13}\text{C-NMR}$ (63 MHz, CDCl_3): δ = 153.59, 132.10, 131.92, 128.41, 120.19, 67.03, 22.23, 10.34 ppm.

MS Calcd m/z 258.12, Found 257.

Anal. Calcd for $\text{C}_{10}\text{H}_{12}\text{BrNO}_2$: C, 46.53; H, 4.69; N, 5.43%. Found: C, 46.50; H, 4.65; N, 5.49%.

1-Propyl (4-cyanophenyl)carbamate (C27):



White crystal; yield 86%; mp 88-90 °C.

IR (KBr); 3286 (vs), 3179 (m), 3108 (m), 2972 (vs), 2959 (s), 2880 (vw), 2224 (vs), 1736 (m), 1718 (vs), 1601 (vs), 1526 (vs), 1458 (vw), 1415 (s), 1352 (w), 1321 (vs), 1269 (m), 1205 (vs), 1178 (s), 1076 (s), 1055 (s), 951 (m), 894 (w), 851 (s), 838 (s), 768 (m), 722 (m), 556 (s), 546 (s), 514 (w) cm^{-1} .

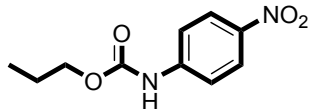
$^1\text{H-NMR}$ (250 MHz, CDCl_3): δ = 7.59 (d, J = 10 Hz, 2H), 7.50 (d, J = 10 Hz, 2H), 6.83 (s, br, 1H, NH), 4.15 (t, J = 7.5 Hz, 2H), 1.71 (sex, J = 7.5 Hz, 2H), 0.98 (t, J = 7.5 Hz, 3H) ppm.

$^{13}\text{C-NMR}$ (63 MHz, CDCl_3): δ = 158.66, 146.33, 133.36, 118.18, 115.52, 106.17, 67.44, 22.13, 10.28 ppm.

MS Calcd m/z 204.23, Found 204.

Anal. Calcd for $\text{C}_{11}\text{H}_{12}\text{N}_2\text{O}_2$: C, 64.69; H, 5.92; N, 13.72%. Found: C, 64.66; H, 5.87; N, 13.76%.

1-Propyl (4-nitrophenyl)carbamate (C28):



White crystal; yield 88%; mp 114-115 °C.

IR (KBr); 3340 (vs), 3115 (m), 2942 (vs), 2880 (s), 1736 (vs), 1600 (s), 1550 (vw), 1490 (w), 1413 (m), 1388 (w), 1330 (s), 1304 (m), 1276 (vw), 1216 (s), 1180 (s), 1123 (w), 1112 (m), 1055 (s), 974 (w), 959 (vw), 919 (w), 867 (m), 857 (s), 829 (w), 752 (s), 727 (vw), 696 (m), 670 (vs), 530 (m), 501 (s), 412 (m) cm^{-1} .

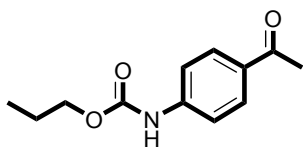
$^1\text{H-NMR}$ (250 MHz, CDCl_3): δ = 8.12 (d, J = 7.5 Hz, 2H), 7.50 (d, J = 7.5 Hz, 2H), 7.07 (s, br, 1H, NH), 4.09 (t, J = 7.5 Hz, 2H), 1.64 (sex, J = 7.5 Hz, 2H), 0.90 (t, J = 7.5 Hz, 3H) ppm.

$^{13}\text{C-NMR}$ (63 MHz, CDCl_3): δ = 153.02, 144.13, 130.94, 125.19, 117.66, 67.55, 22.12, 10.26 ppm.

MS Calcd m/z 224.22, Found 224.

Anal. Calcd for $\text{C}_{10}\text{H}_{12}\text{N}_2\text{O}_4$: C, 53.57; H, 5.39; N, 12.49%. Found: C, 53.52; H, 5.34; N, 12.54%.

1-Propyl (4-acetylphenyl)carbamate (C29):



White crystal; yield 87%; mp 112-114 °C.

IR (KBr); 3304 (vs), 3076 (w), 2973 (s), 2952 (s), 2882 (w), 1736 (vs), 1702 (vw), 1664 (s), 1594 (vs), 1530 (s), 1478 (w), 1413 (s), 1376 (w), 1360 (s), 1319 (s), 1278 (s), 1217 (s), 1185 (m), 1138 (w), 1080 (w), 1052 (s), 958 (m), 916 (w), 895 (vw), 849 (s), 824 (s), 762 (m), 713 (s), 630 (vw), 589 (s), 508 (m), 500 (m), 468 (w) cm^{-1} .

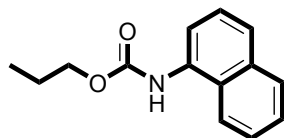
$^1\text{H-NMR}$ (250 MHz, CDCl_3): δ = 7.85 (d, J = 7.5 Hz, 2H), 7.43 (d, J = 7.5 Hz, 2H), 6.95 (s, br, 1H, NH), 4.08 (t, J = 7.5 Hz, 2H), 2.50 (s, 3H), 1.63 (sex, J = 7.5 Hz, 2H), 0.91 (t, J = 7.5 Hz, 3H) ppm.

$^{13}\text{C-NMR}$ (63 MHz, CDCl_3): δ = 200.49, 153.21, 142.51, 130.88, 129.87, 117.54, 67.22, 26.38, 22.18, 10.31 ppm.

MS Calcd m/z 221.26, Found 221.

Anal. Calcd for $\text{C}_{12}\text{H}_{15}\text{NO}_3$: C, 65.14; H, 6.83; N, 6.33%. Found: C, 65.10; H, 6.80; N, 6.39%.

1-Propyl naphthalen-1-ylcarbamate (C30):



White crystal; yield 77%; mp 73-75 °C.

IR (KBr): 3286 (vs), 3056 (vw), 3033 (vw), 3014 (w), 2965 (vs), 2985 (s), 2875 (s), 1696 (vs), 1534 (s), 1478 (vw), 1363 (w), 1346 (s), 1256 (s), 1248 (vs), 1174 (w), 1128 (vw), 1110 (s), 1072 (s), 1033 (m), 1011 (s), 962 (vw), 949 (m), 909 (vw), 899 (vw), 862 (vw), 784 (vs), 768 (vs), 670 (m), 632 (w), 558 (m), 528 (w), 444 (vw), 418 (m) cm^{-1} .

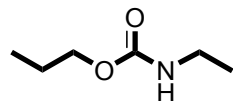
^1H -NMR (250 MHz, CDCl_3): δ = 7.34-7.81 (m, 7H), 6.90 (s, br, 1H, NH), 4.09 (t, J = 7.5 Hz, 2H), 1.63 (sex, J = 7.5 Hz, 2H), 0.90 (t, J = 7.5 Hz, 3H) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 154.64, 134.06, 132.60, 130.88, 128.79, 128.70, 126.16, 125.95, 125.80, 124.92, 120.50, 67.11, 22.31, 10.37 ppm.

MS Calcd m/z 229.28, Found 229.

Anal. Calcd for $\text{C}_{14}\text{H}_{15}\text{NO}_2$: C, 73.34; H, 6.59; N, 6.11%. Found: C, 73.31; H, 6.54; N, 6.19%.

1-Propyl ethylcarbamate (C31):



White crystal; yield 74%; mp 63-65°C.

IR (KBr): 3304 (vs), 2975 (s), 2899 (w), 2863 (vw), 1702 (vs), 1488 (s), 1445 (m), 1398 (vs), 1346 (w), 1319 (m), 1297 (s), 1243 (vs), 1176 (m), 1153 (m), 1115 (m), 1079 (w), 1052 (vw), 918 (m), 865 (m), 803 (w), 764 (vs), 700 (vs), 650 (m), 620 (vw), 593 (m), 535 (m) cm^{-1} .

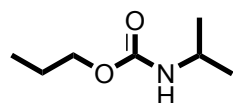
^1H -NMR (250 MHz, CDCl_3): δ = 5.52 (s, br, 1H, NH), 4.04 (t, J = 7.5 Hz, 2H), 2.70 (q, J = 7.5 Hz, 2H), 1.60 (sex, J = 7.5 Hz, 2H), 1.14 (t, J = 7.5 Hz, 3H), 0.89 (t, J = 7.5 Hz, 3H) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 153.94, 66.74, 43.72, 22.30, 14.06, 10.36 ppm.

MS Calcd m/z 131.18, Found 131

Anal. Calcd for $\text{C}_6\text{H}_{13}\text{NO}_2$: C, 54.94; H, 9.99; N, 10.68%. Found: C, 54.91; H, 9.95; N, 10.73%.

1-Propyl *iso*-propylcarbamate (C32):



White crystal; yield 78%; mp 53-54 °C.

IR (KBr); 3307 (vs), 2941 (s), 2864 (s), 1703 (vs), 1496 (m), 1369 (m), 1280 (m), 1206 (w), 1178 (s), 1104 (vw), 1073 (w), 1029 (vw), 972 (vw), 903 (vw), 870 (m), 755 (vs), 700 (s), 615 (m), 592 (w), 529 (m), 422 (m) cm^{-1} .

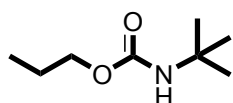
^1H -NMR (250 MHz, CDCl_3): δ = 5.01 (s, br, 1H, NH), 4.08 (t, J = 7.5 Hz, 2H), 2.81 (sept, J = 7.5 Hz, 1H), 1.62 (sex, J = 7.5 Hz, 2H), 1.24 (t, J = 7.5 Hz, 6H), 0.91 (t, J = 7.5 Hz, 3H) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 153.91, 67.92, 41.02, 22.88, 16.22, 11.01 ppm.

MS Calcd m/z 145.20, Found 145

Anal. Calcd for $\text{C}_7\text{H}_{15}\text{NO}_2$: C, 57.90; H, 10.41; N, 9.65%. Found: C, 57.87; H, 10.39; N, 9.69%.

1-Propyl *tert*-butylcarbamate (C33):



White crystal; yield 76%; mp 48-49 °C.

IR (KBr); 3324 (vs), 3067 (vw), 3032 (vw), 2962 (s), 2878 (m), 2813 (w), 1698 (vs), 1534 (s), 1364 (vw), 1345 (m), 1256 (s), 1239 (vs), 1174 (vw), 1105 (m), 1070 (m), 1029 (w), 1009 (m), 978 (w), 880 (vw), 846 (m), 78m (s), 776 (s), 767 (s), 746 (s), 696 (s), 578 (w), 530 (w), 492 (w), 419 (vw) cm^{-1} .

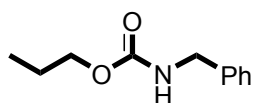
^1H -NMR (250 MHz, CDCl_3): δ = 4.95 (s, br, 1H, NH), 4.08 (t, J = 7.5 Hz, 2H), 1.64 (sex, J = 7.5 Hz, 2H), 1.11 (s, 9H), 0.88 (t, J = 7.5 Hz, 3H) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 155.06, 65.74, 44.19, 23.73, 21.00, 12.78 ppm.

MS Calcd m/z 159.23, Found 159

Anal. Calcd for $\text{C}_8\text{H}_{17}\text{NO}_2$: C, 60.35; H, 10.76; N, 8.80%. Found: C, 60.31; H, 10.72; N, 8.87%.

1-Propyl benzylcarbamate (C34):



White crystal; yield 60%; mp 123-125 °C.

IR (KBr); 3338 (s), 3053 (m), 3043 (m), 2978 (s), 2929 (m), 2874 (vw), 1702 (vs), 1598 (s), 1541 (vs), 1492 (m), 1459 (w), 1447 (s), 1409 (vw), 1371 (w), 1315 (s), 1299 (s), 1244 (vs), 1133 (vw), 1084 (s), 1068 (s), 1030 (w), 1016 (w), 899 (m), 845 (m), 809 (vs), 764 (s), 742 (s), 690 (vs), 670 (vw), 655 (vw), 526 (vw), 497 (s), 453 (s), 418 (vw) cm^{-1} .

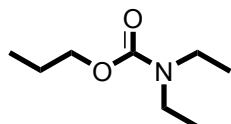
^1H -NMR (250 MHz, CDCl_3): δ = 7.29-7.26 (m, 5H), 5.13 (s, br, 1H, NH), 3.39 (s, 2H), 4.06 (t, J = 7.5 Hz, 2H), 1.61 (sex, J = 7.5 Hz, 2H), 0.89 (t, J = 7.5 Hz, 3H) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 156.79, 138.58, 128.51, 127.51, 127.19, 66.98, 45.52, 22.55, 10.31 ppm.

MS Calcd m/z 193.15, Found 193

Anal. Calcd for $\text{C}_{11}\text{H}_{15}\text{NO}_2$: C, 68.37; H, 7.82; N, 7.25%. Found: C, 68.34; H, 7.78; N, 7.29%.

1-Propyl diethylcarbamate (C35):



Colorless liquid; yield 63%.

IR (KBr): 2962 (s), 2935 (vw), 2898 (w), 2898 (s), 1696 (vs), 1435 (m), 1339 (m), 1254 (s), 1121 (s), 1080 (vs), 1018 (vw), 943 (s), 887 (w), 788 (s), 740 (m), 638 (vs), 556 (vs), 528 (vs), 457 (vw), 438 (m) cm^{-1} .

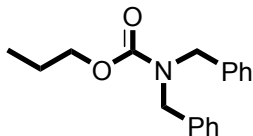
^1H -NMR (250 MHz, CDCl_3): δ = 4.10 (t, J = 7.5 Hz, 2H), 2.30 (q, J = 7.5 Hz, 4H), 1.64 (sex, J = 7.5 Hz, 2H), 1.20 (t, J = 7.5 Hz, 6H), 0.90 (t, J = 7.5 Hz, 3H) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 154.11, 67.10, 44.43, 22.31, 14.06, 10.37 ppm.

MS Calcd m/z 159.23, Found 159

Anal. Calcd for $\text{C}_8\text{H}_{17}\text{NO}_2$: C, 60.35; H, 10.76; N, 8.80%. Found: C, 60.30; H, 10.74; N, 8.83%.

1-Propyl dibenzylcarbamate (C36):



White crystal; yield 50%; mp 147-148 $^{\circ}\text{C}$.

IR (KBr): 3206 (vw), 3182 (s), 3052 (vw), 2965 (m), 2861 (s), 2771 (vw), 1700 (s), 1602 (s), 1588 (s), 1504 (vs), 1446 (m), 1376 (m), 1344 (m), 1294 (m), 1238 (s), 1211 (vs), 1094 (m), 1074 (m), 1010 (m), 978 (s), 875 (s), 850 (vs), 815 (vs), 752 (vs), 691 (s), 629 (m), 599 (vw), 561 (w), 501 (m) cm^{-1} .

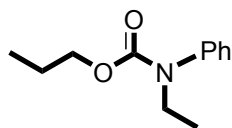
^1H -NMR (250 MHz, CDCl_3): δ = 7.26-7.20 (m, 10H), 4.10 (t, J = 7.5 Hz, 2H), 3.41 (s, 4H), 1.66 (sex, J = 7.5 Hz, 2H), 0.96 (t, J = 7.5 Hz, 3H) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 158.71, 140.82, 128.13, 126.93, 126.47, 66.37, 44.26, 21.47, 11.04 ppm.

MS Calcd m/z 283.37, Found 283.

Anal. Calcd for $\text{C}_{18}\text{H}_{21}\text{NO}_2$: C, 76.30; H, 7.47; N, 4.94%. Found: C, 76.28; H, 7.45; N, 4.98%.

1-Propyl ethyl(phenyl)carbamate (C37):



White crystal; yield 54%; mp 173-175 °C.

IR (KBr); 3156 (s), 3022 (vw), 2985 (s), 2882 (vw), 1698 (vs), 1405 (s), 1313 (m), 1241 (vs), 1206 (m), 1106 (m), 1058 (vs), 1034 (vs), 928 (w), 851 (m), 784 (w), 764 (m), 698 (vs), 595 (s), 558 (m), 478 (vw) cm^{-1} .

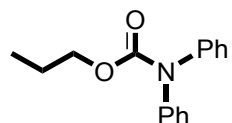
^1H -NMR (250 MHz, CDCl_3): δ = 7.41-7.36 (m, 5H), 4.10 (t, J = 7.5 Hz, 2H), 2.70 (q, J = 7.5 Hz, 2H), 1.67 (sex, J = 7.5 Hz, 2H), 1.15 (t, J = 7.5 Hz, 3H), 0.96 (t, J = 7.5 Hz, 3H) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 155.22, 137.93, 131.92, 126.79, 126.61, 66.51, 43.42, 21.96, 16.28, 10.02 ppm.

MS Calcd m/z 207.27, Found 207

Anal. Calcd for $\text{C}_{12}\text{H}_{17}\text{NO}_2$: C, 69.54; H, 8.27; N, 6.76%. Found: C, 69.51; H, 8.26; N, 6.79%.

1-Propyl diphenylcarbamate (C38):



White crystal; yield 51%; mp 210-212 °C.

IR (KBr); 3172 (s), 3044 (m), 2947 (m), 2919 (m), 2875 (w), 1709 (vs), 1614 (s), 1498 (vs), 1383 (vs), 1265 (m), 1187 (vs), 1118 (m), 1091 (s), 1028 (vw), 990 (vs), 921 (w), 893 (vw), 837 (m), 773 (vs), 724 (m), 709 (vw), 619 (vs), 551 (m), 472 (m) cm^{-1} .

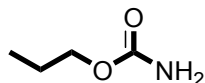
^1H -NMR (250 MHz, CDCl_3): δ = 7.38-7.34 (m, 4H), 7.22-7.15 (m, 4H), 6.89-6.83 (m, 2H), 4.05 (t, J = 7.5 Hz, 2H), 1.62 (sex, J = 7.5 Hz, 2H), 0.88 (t, J = 7.5 Hz, 3H) ppm.

^{13}C -NMR (63 MHz, CDCl_3): δ = 154.52, 139.04, 127.11, 119.56, 116.24, 66.83, 22.29, 10.34 ppm.

MS Calcd m/z 255.32, Found 255.

Anal. Calcd for $\text{C}_{16}\text{H}_{17}\text{NO}_2$: C, 75.27; H, 6.71; N, 5.49%. Found: C, 75.25; H, 6.68; N, 5.53%.

1-Propyl carbamate (C39):



White crystals (58% yield), mp =48-50 °C (lit.,¹ 58-59 °C).

IR (KBr), $\tilde{\nu}(\text{cm}^{-1})$: 3314 (s), 3256 (vs), 3152 (s), 2964 (s), 2928 (s), 2856 (m), 1710 (vs), 1611 (m), 1474 (m), 1448 (w), 1364 (vs), 1262 (m), 1217 (vs), 1142 (vw), 1111 (m), 1049 (m), 1027 (m), 966 (vs), 942 (vw), 904 (vw), 878 (vw), 831 (s), 762 (vs), 729 (m), 675 (m), 652 (m), 595 (m), 522 (w), 471 (vw), 446 (vw), 417 (vw).

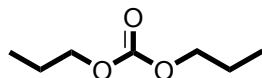
¹H-NMR (250 MHz, 298K, DMSO-*d*₆), δ (ppm): 5.94 (s, br, 2H, NH), 3.87 (t, *J* = 7.5 Hz, 2H), 1.24 (sext, *J* = 7.5 Hz, 2H), 0.86 (t, *J* = 7.5 Hz, 3H).

¹³C-NMR (63 MHz, 298K, DMSO-*d*₆), δ (ppm): 154.76, 68.01, 23.09, 15.94.

MS Calcd *m/z* 103.12, Found 103.

Anal. Calcd for C₄H₉NO₂: C, 46.59; H, 8.80; N, 13.58%. Found: C, 46.58; H, 8.78; N, 13.65%.

Dipropyl carbonate:



Colorless liquid.

IR (KBr); 2986 (s), 2898 (w), 1739 (vs), 1416 (s), 1322 (s), 1246 (vs), 1182 (m), 1110 (vs), 1048 (vs), 974 (w), 903 (m), 824 (m), 793 (s), 710 (m), 604 (vs), 462 (s), 411 (m) cm⁻¹.

¹H-NMR (250 MHz, CDCl₃): δ = 4.11 (t, *J* = 7.5 Hz, 4H), 1.66 (sex, *J* = 7.5 Hz, 4H), 0.95 (t, *J* = 7.5 Hz, 6H) ppm.

¹³C-NMR (63 MHz, CDCl₃): δ = 155.83, 66.98, 22.25, 10.31 ppm.

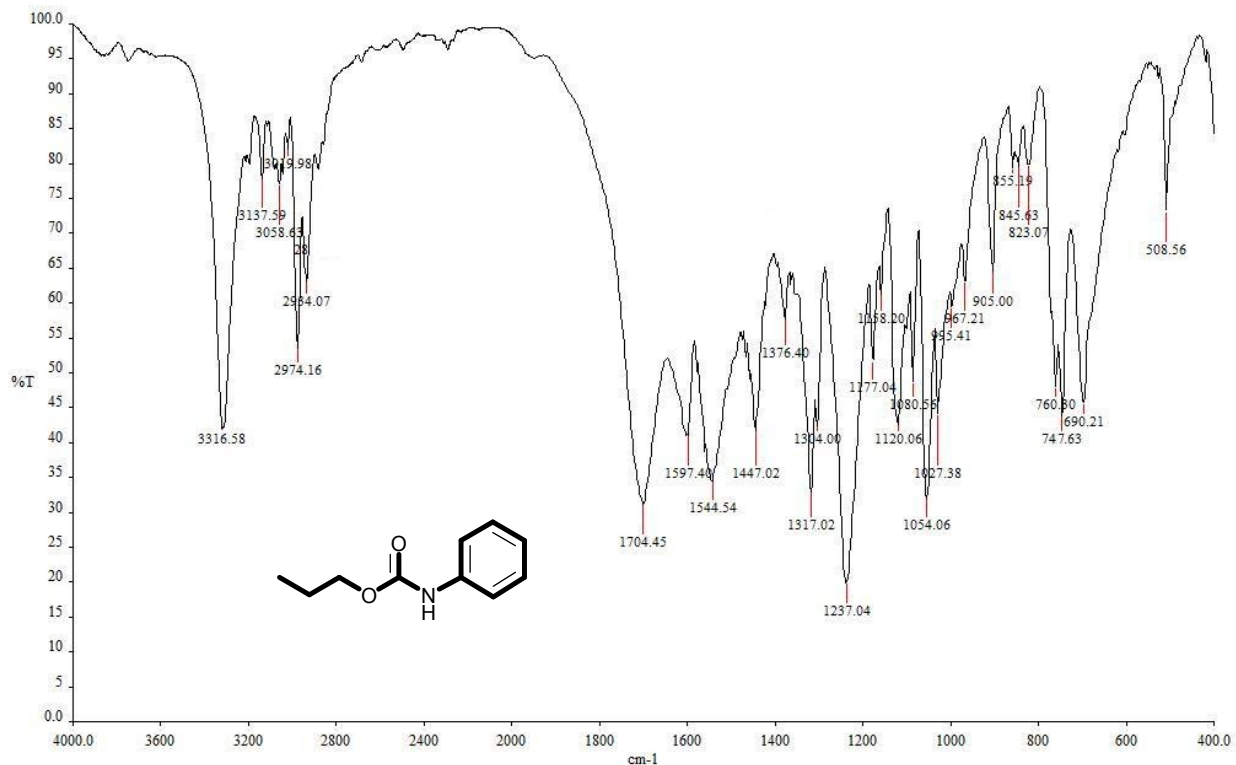
MS Calcd *m/z* 146.19, Found 146

Anal. Calcd for C₇H₁₄O₃: C, 57.51; H, 9.65%. Found: C, 57.53; H, 9.62%.

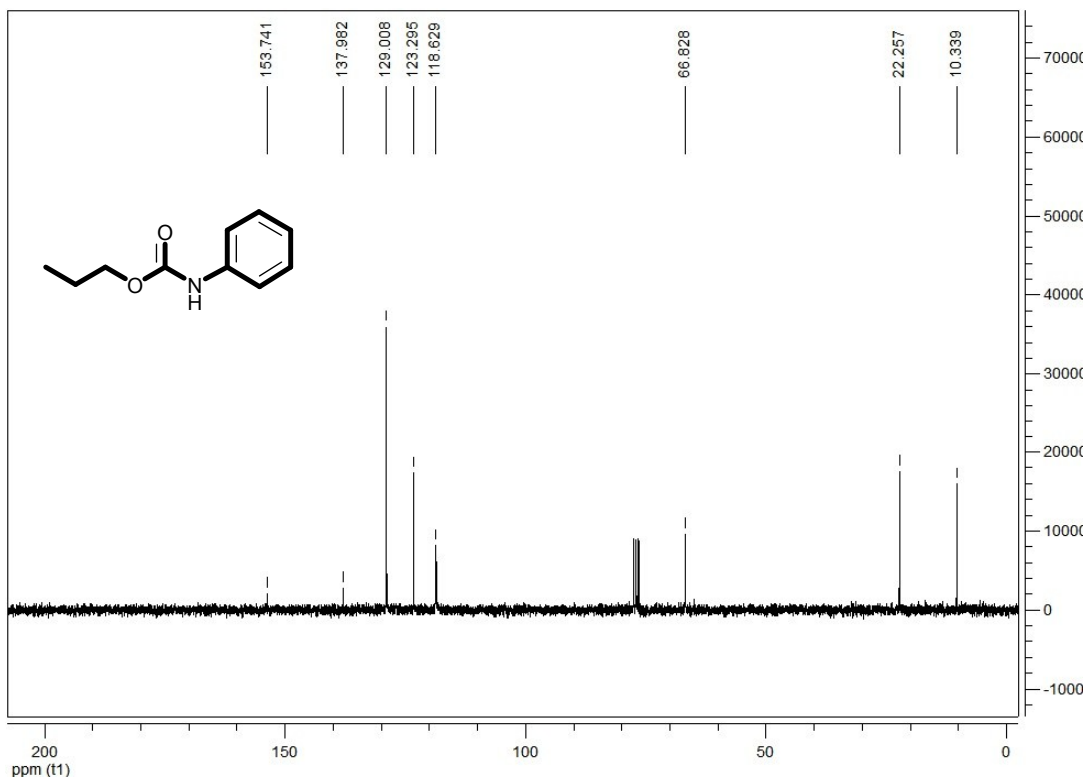
C. Notes and reference

1- (a) A. R. Sardarian, I. D. Inaloo, *RSC Adv.*, 2015, **5**, 76626-76641; (b) A. R. Sardarian, M. Zangiabadi, I. D. Inaloo, *RSC Adv.*, 2016, **6**, 92057-92064; (c) A. R. Sardarian, I. D. Inaloo, M. Zangiabadi, *Catalysis Lett.*, 2018, **148**, 642-652; (d) I. D. Inaloo, S. Majnooni, *ChemistrySelect*, 2018, **3**, 4095-4100.

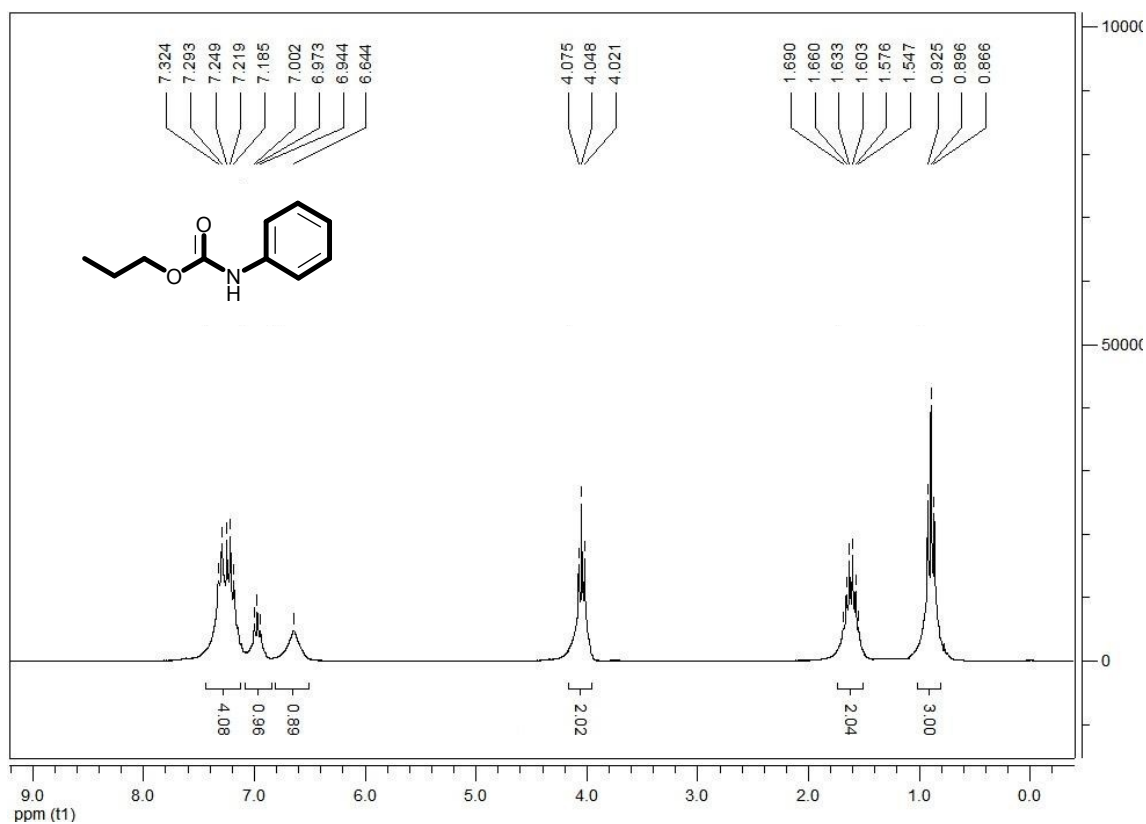
D. Scanned Spectra of Compounds:



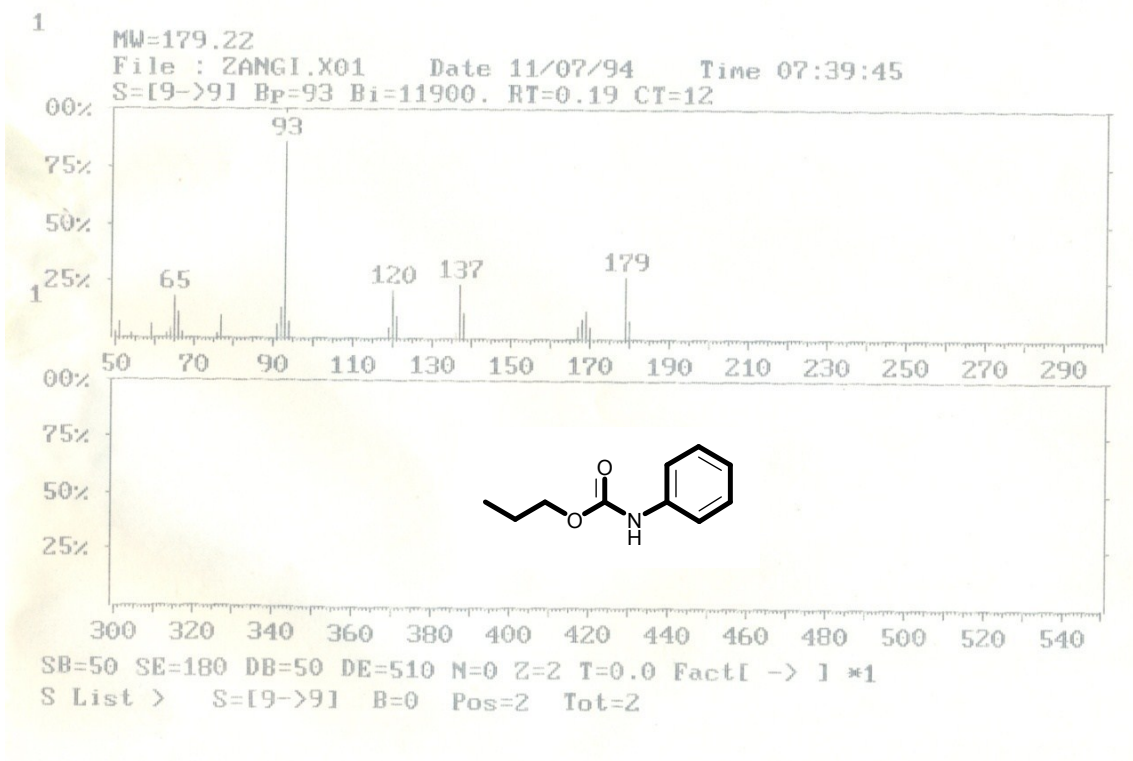
FT-IR spectra of 1-propyl phenylcarbamate (C1) in KBr .



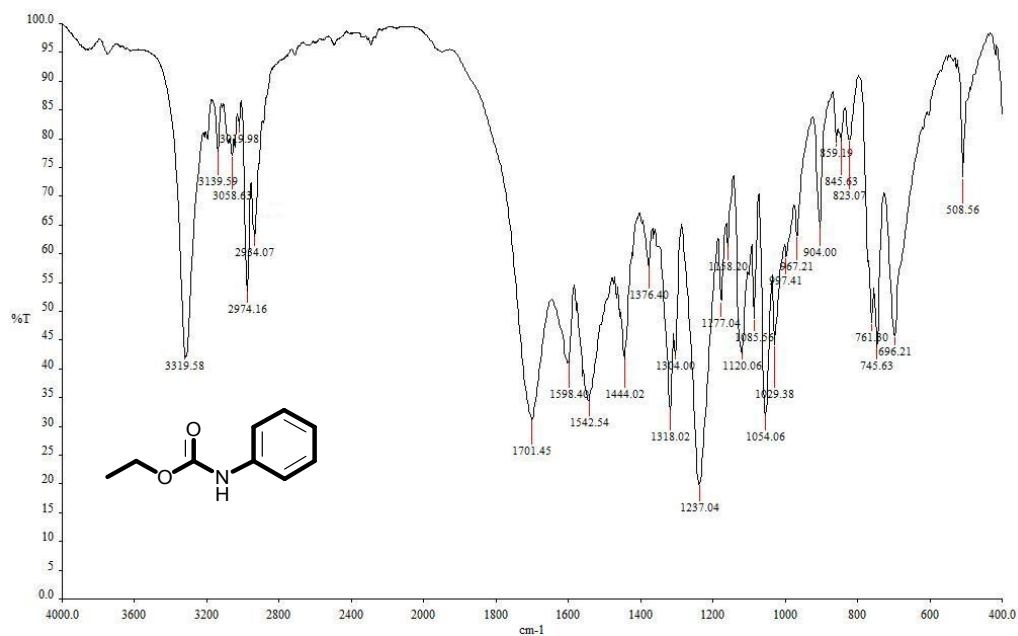
¹³C-NMR spectra (63 MHz) of 1-propyl phenylcarbamate (C1) in CDCl₃.



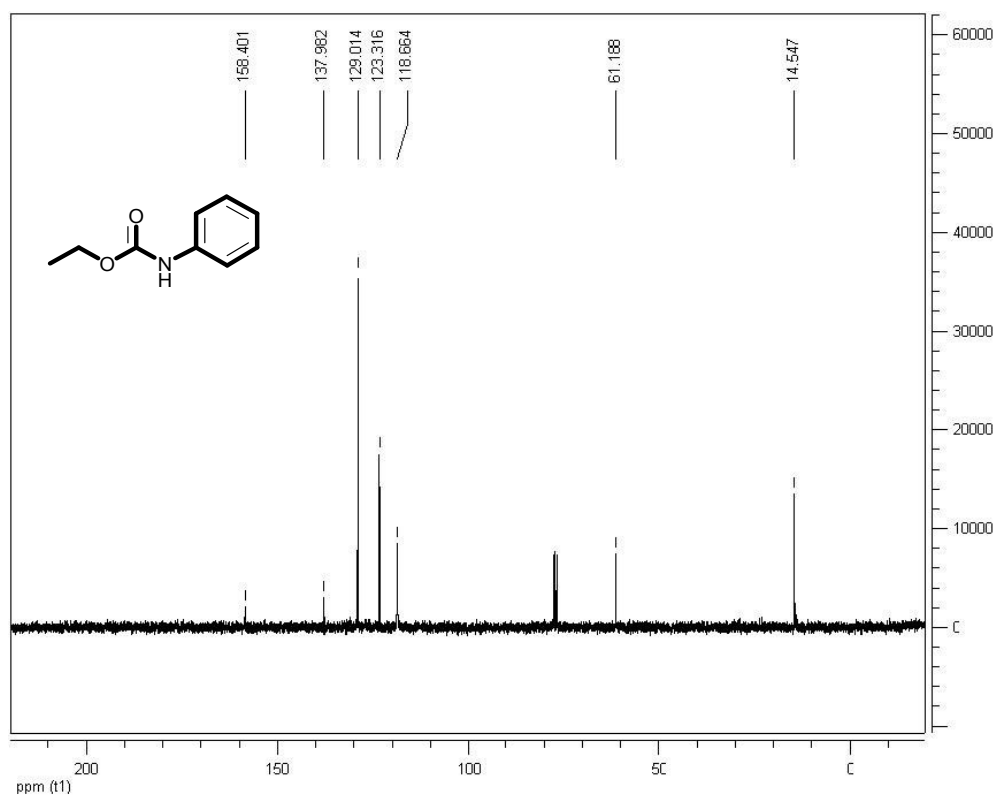
¹H-NMR spectra (250 MHz) of 1-propyl phenylcarbamate (C1) in CDCl₃.



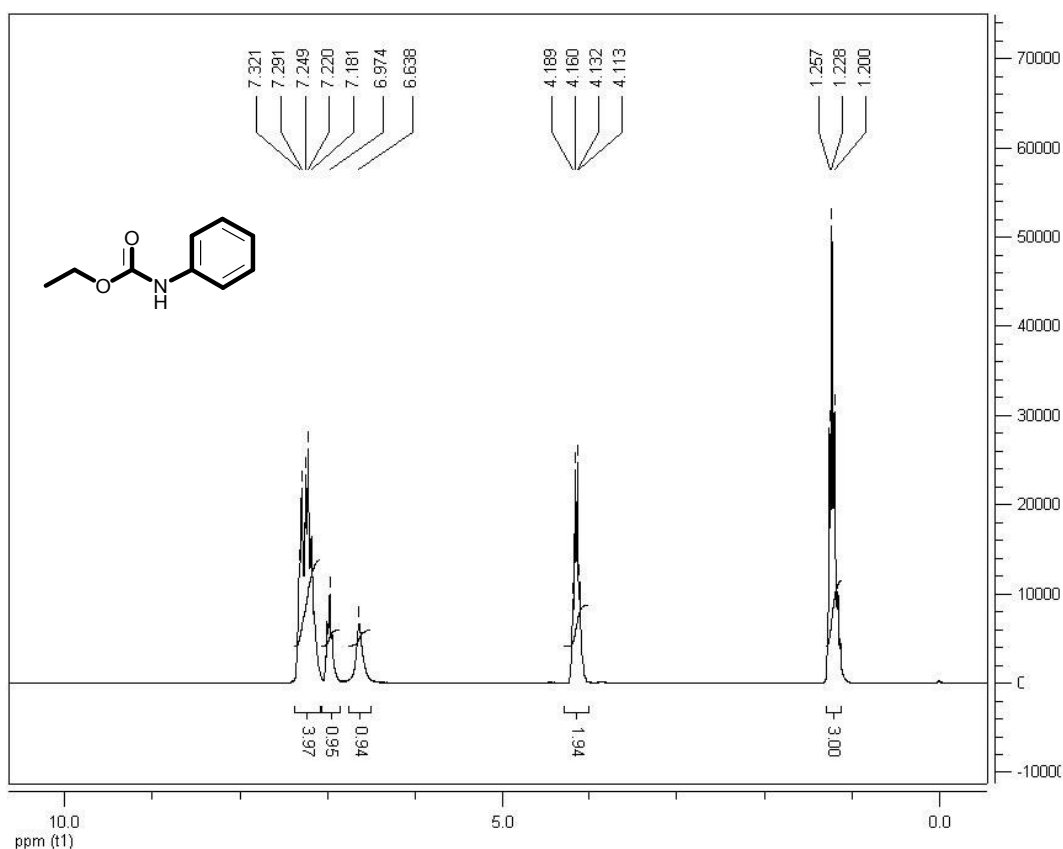
MS of 1-Propyl phenylcarbamate (C1).



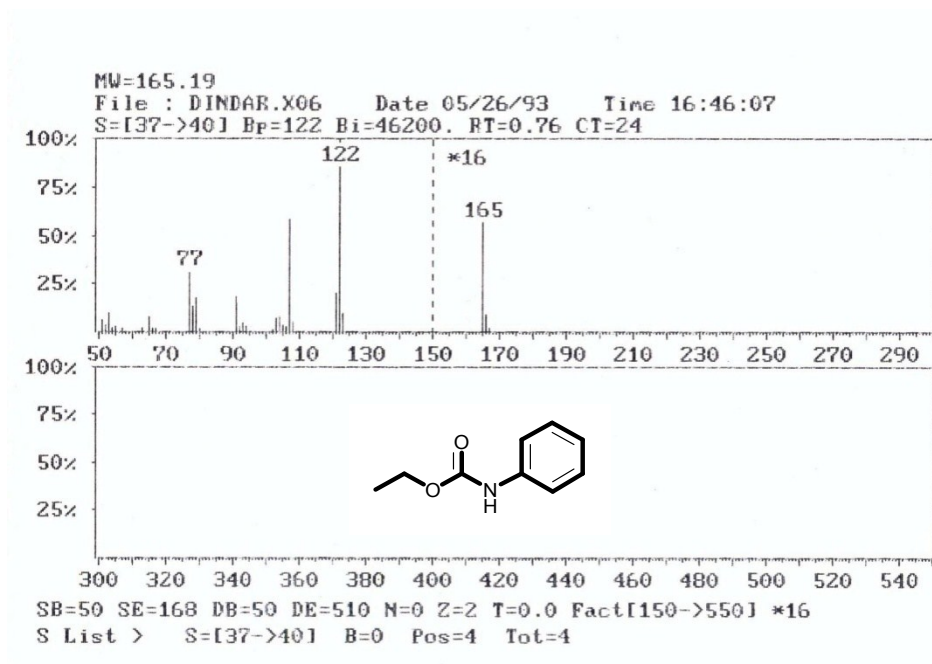
FT-IR spectra of 1-ethyl phenylcarbamate (C2) in KBr.



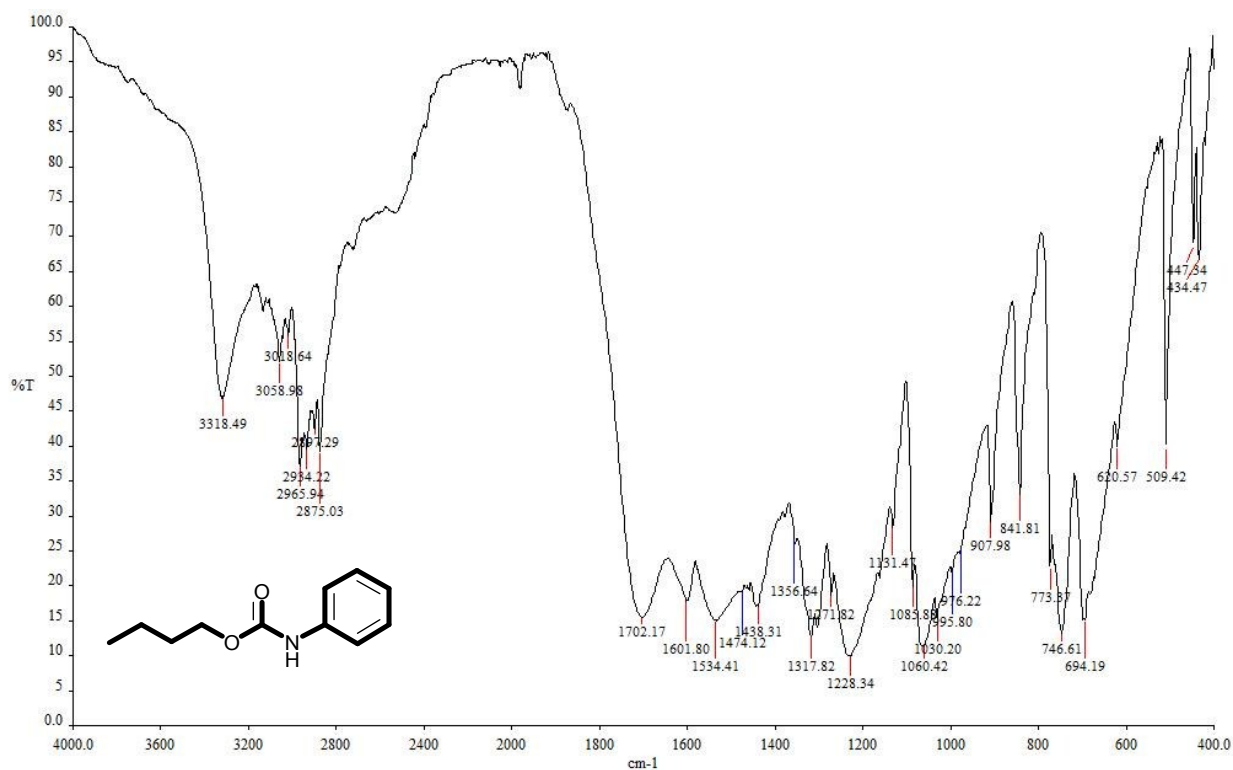
¹³C-NMR spectra (63 MHz) of 1-ethyl phenylcarbamate (C2) in CDCl₃.



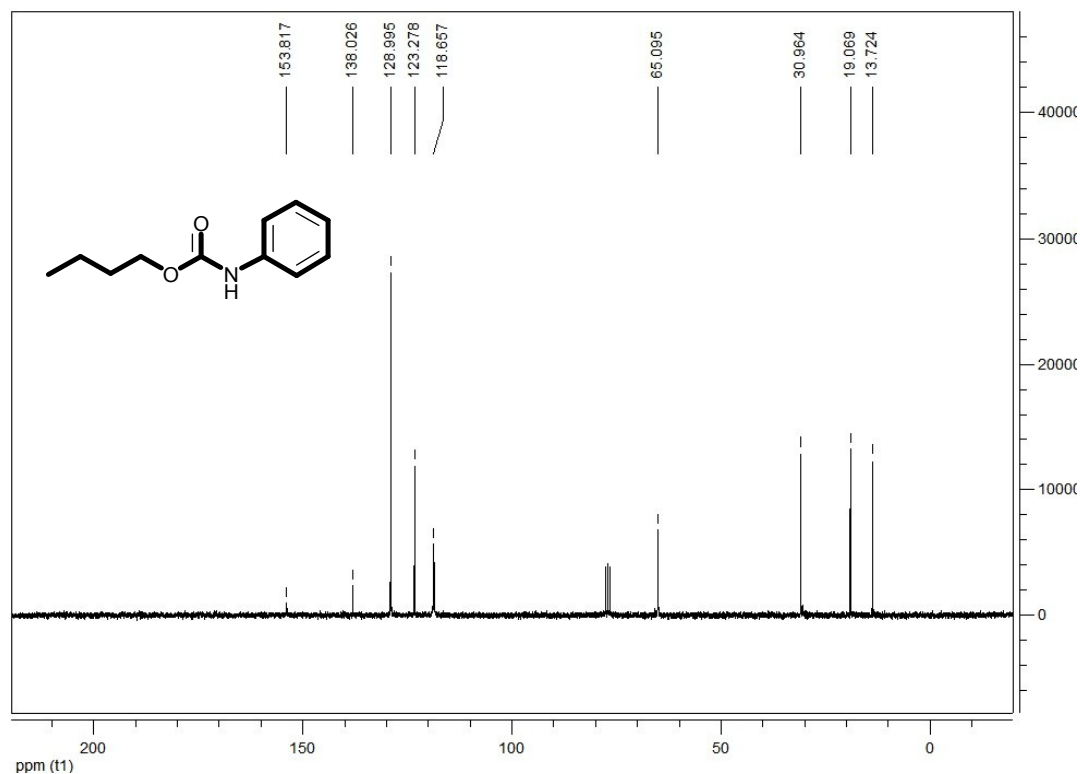
¹H-NMR spectra (250 MHz) of 1-ethyl phenylcarbamate (C2) in CDCl₃.



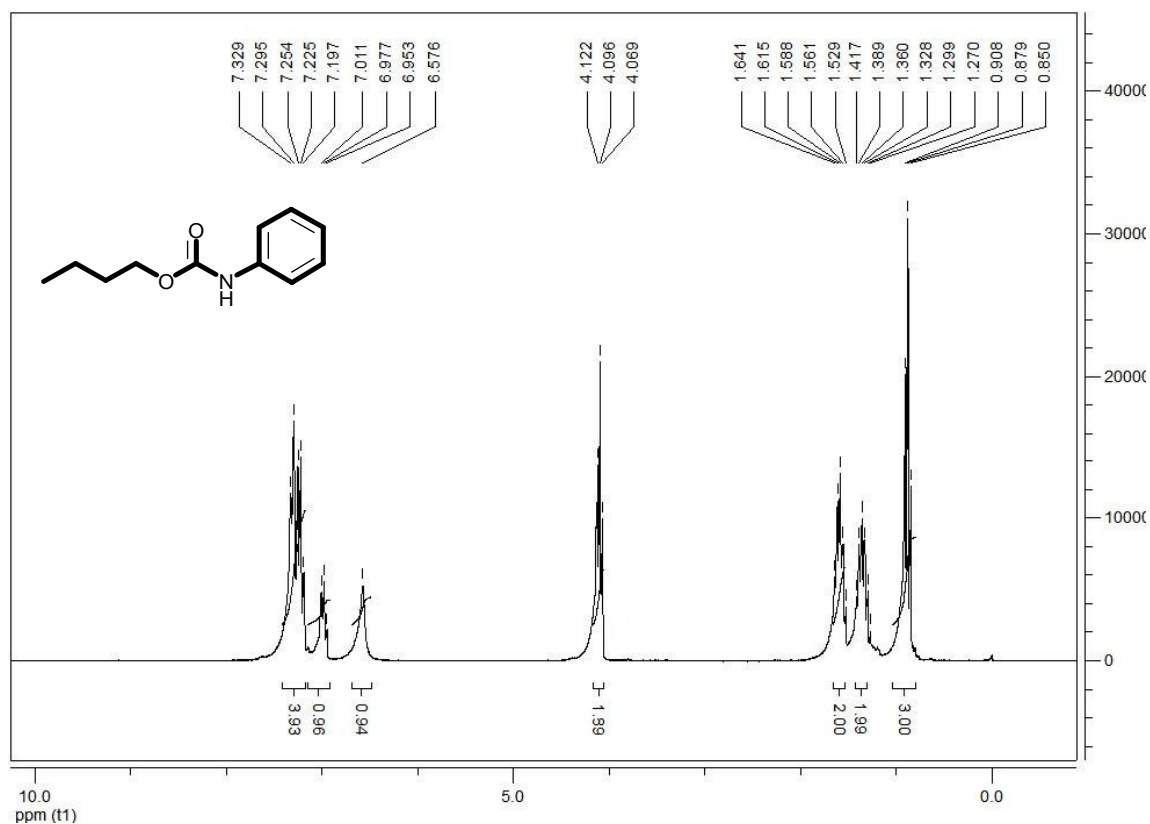
MS of 1-ethyl phenylcarbamate (C2).



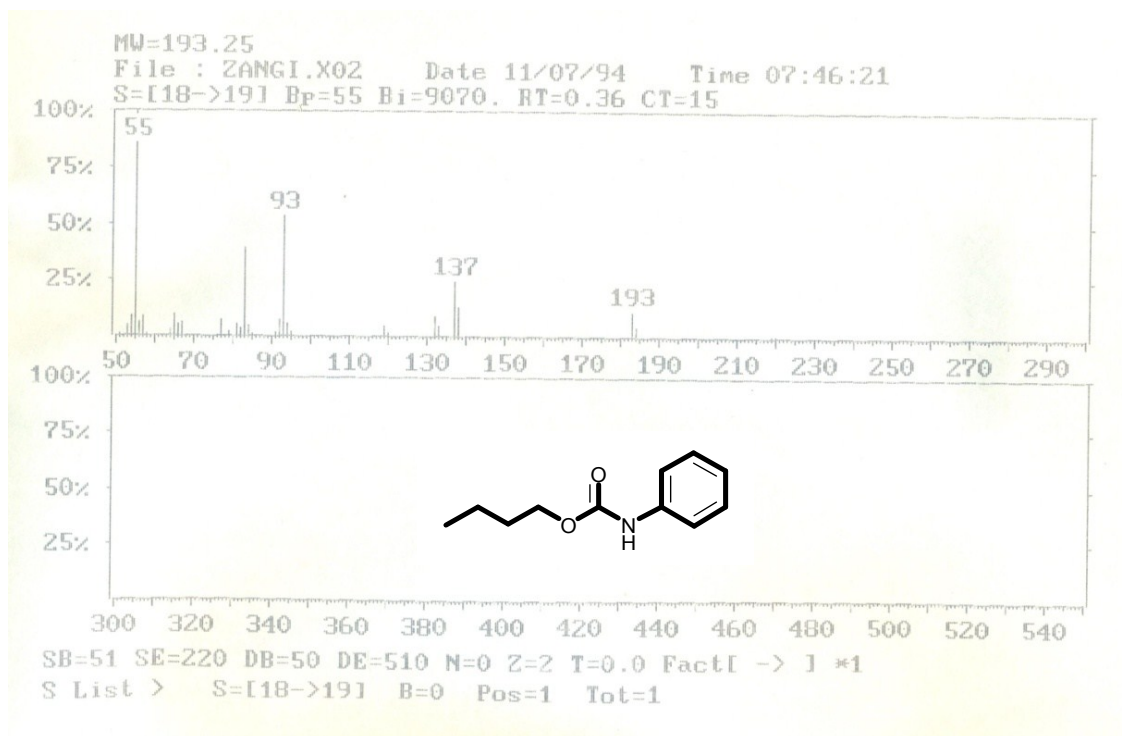
FT-IR spectra of 1-butyl phenylcarbamate (C3) in KBr .



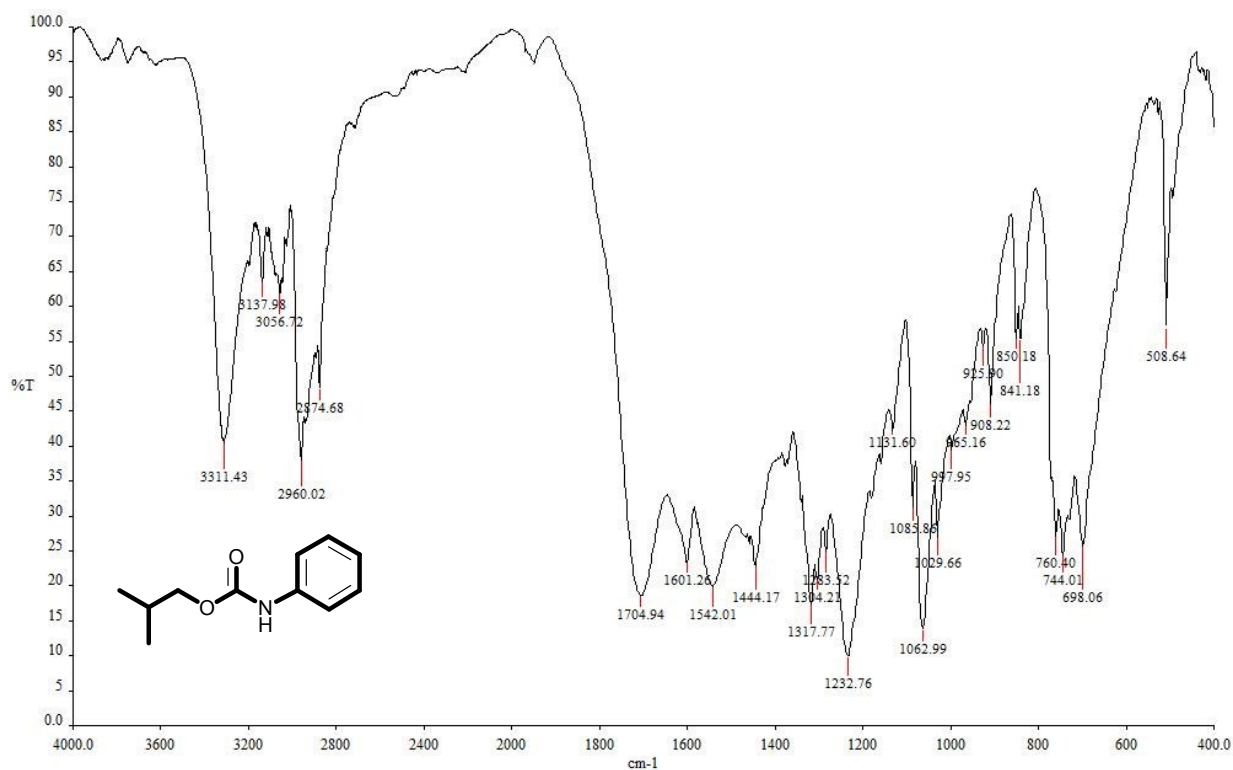
¹³C-NMR spectra (63 MHz) of 1-butyl phenylcarbamate (C3) in CDCl₃.



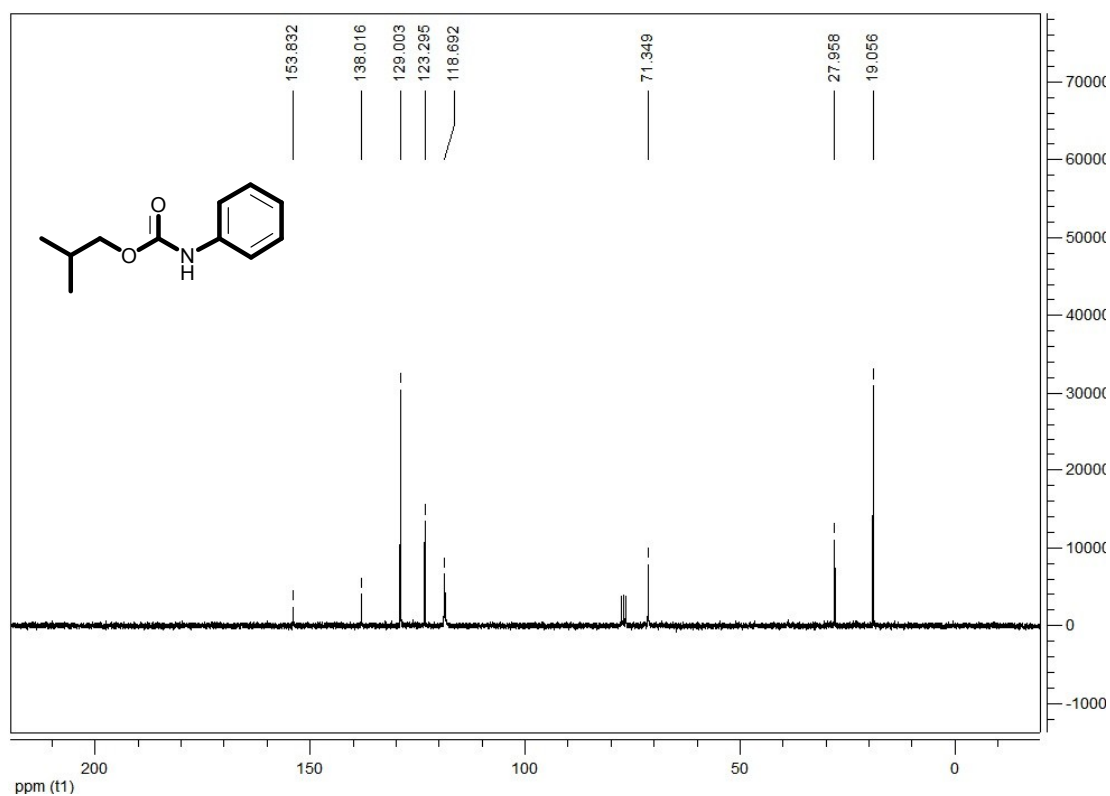
¹H-NMR spectra (250 MHz) of 1-butyl phenylcarbamate (C3) in CDCl₃.



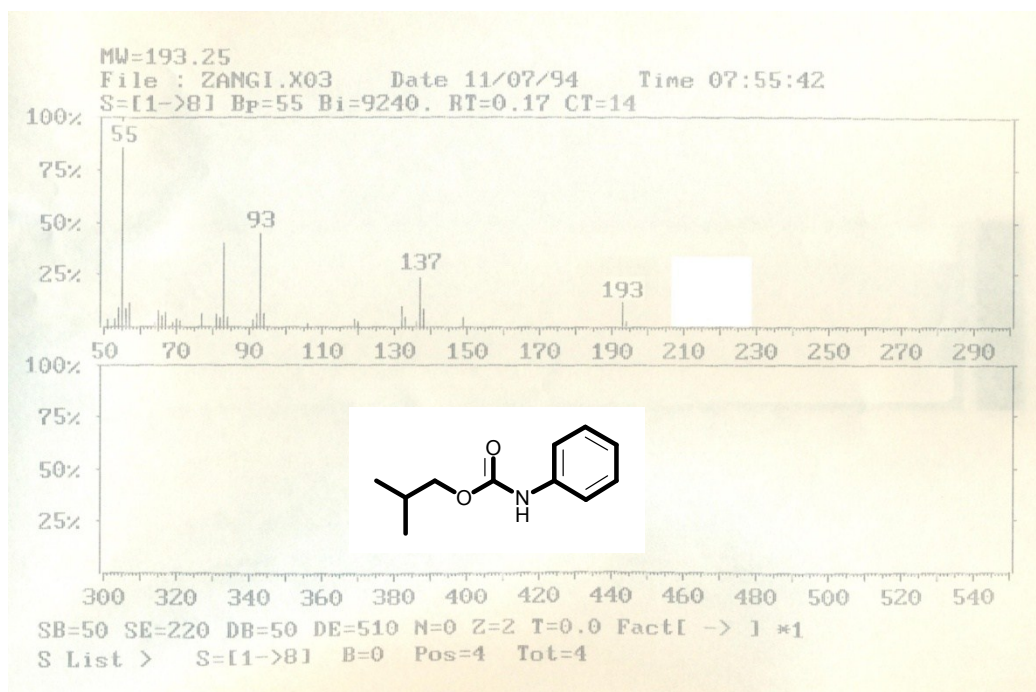
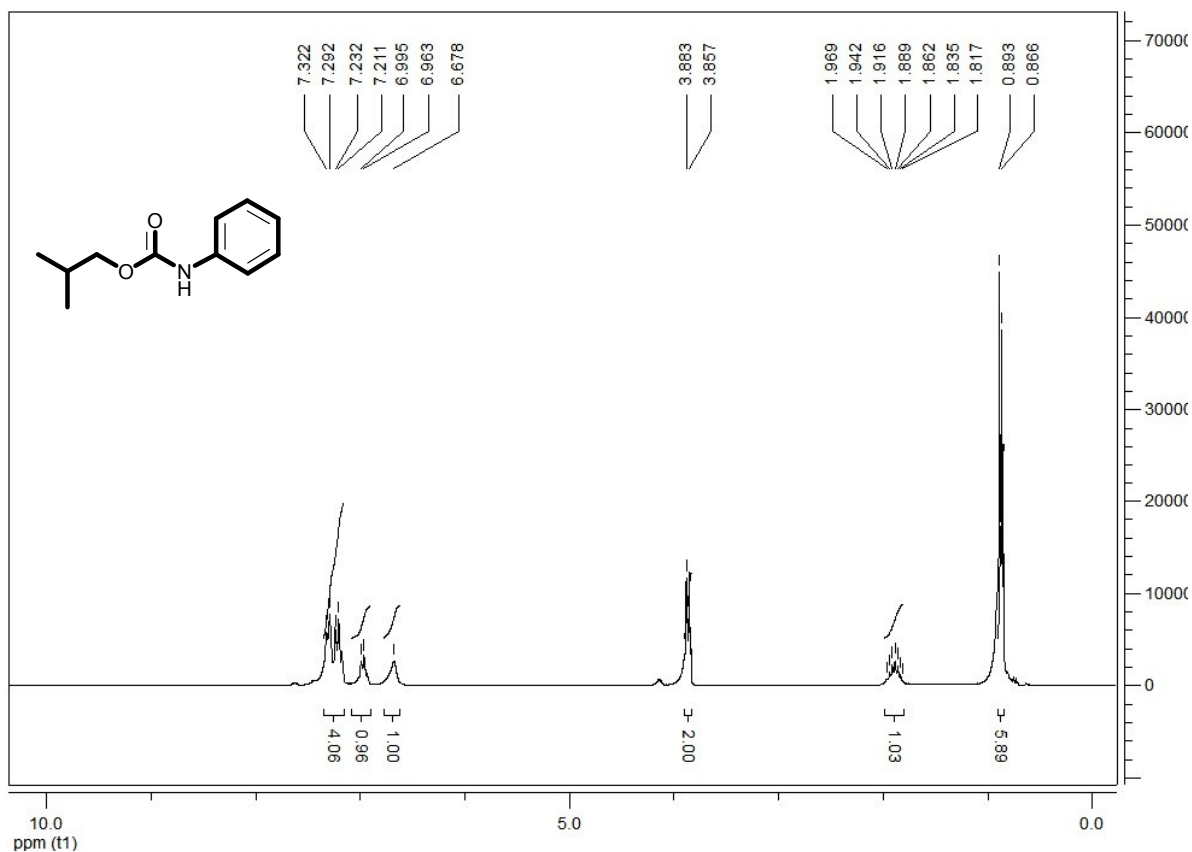
MS of 1-butyl phenylcarbamate (C3).



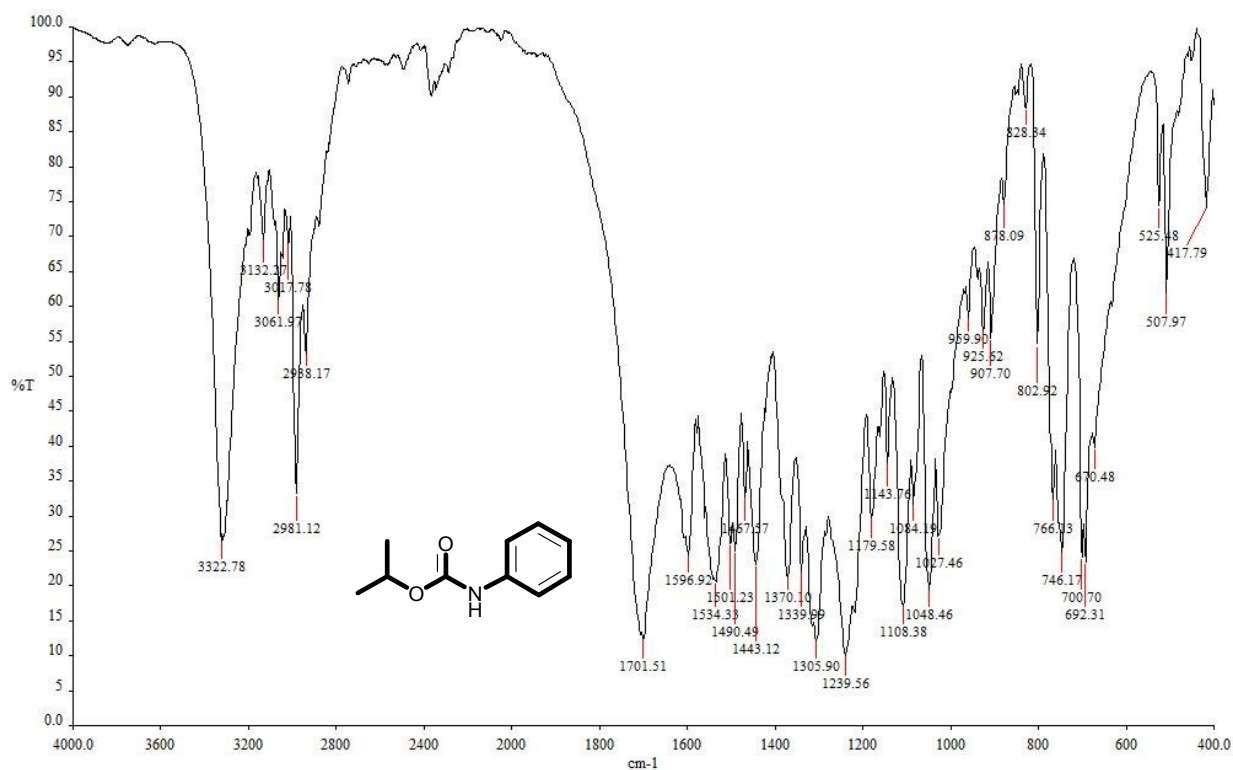
FT-IR spectra of *iso*-butyl phenylcarbamate (C4) in KBr .



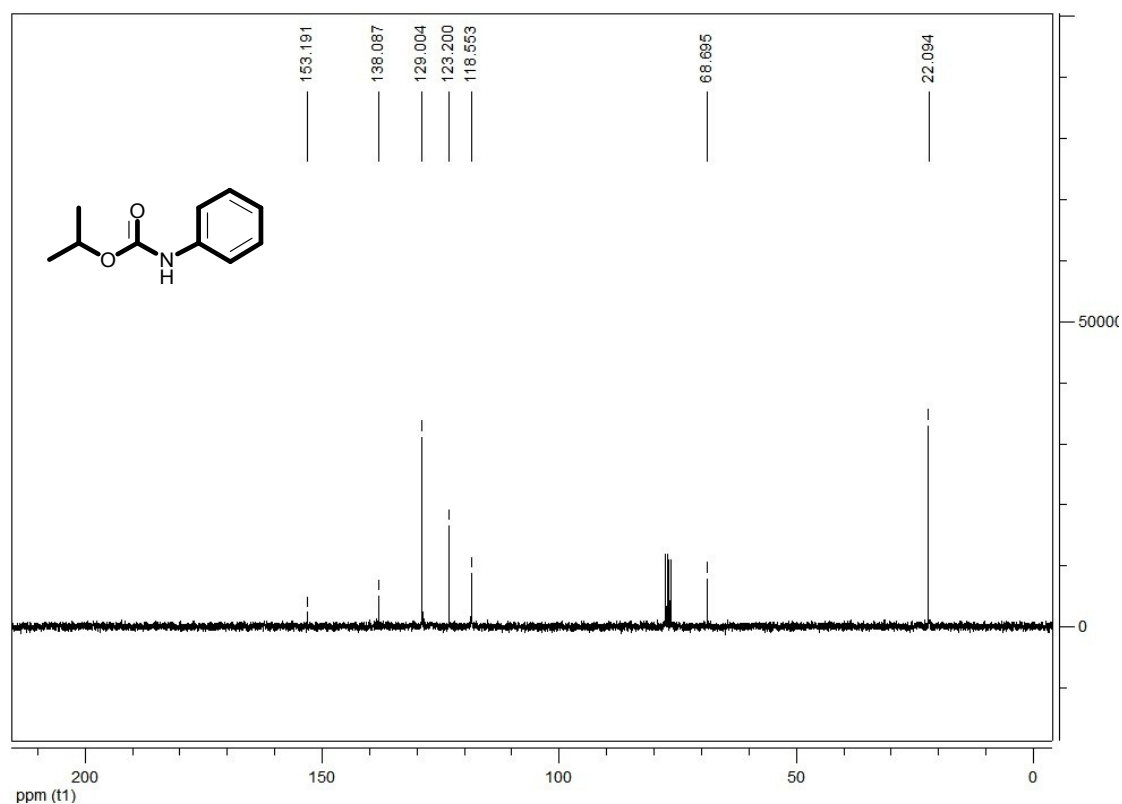
¹³C-NMR spectra (63 MHz) of *iso*-butyl phenylcarbamate (C4) in CDCl₃.



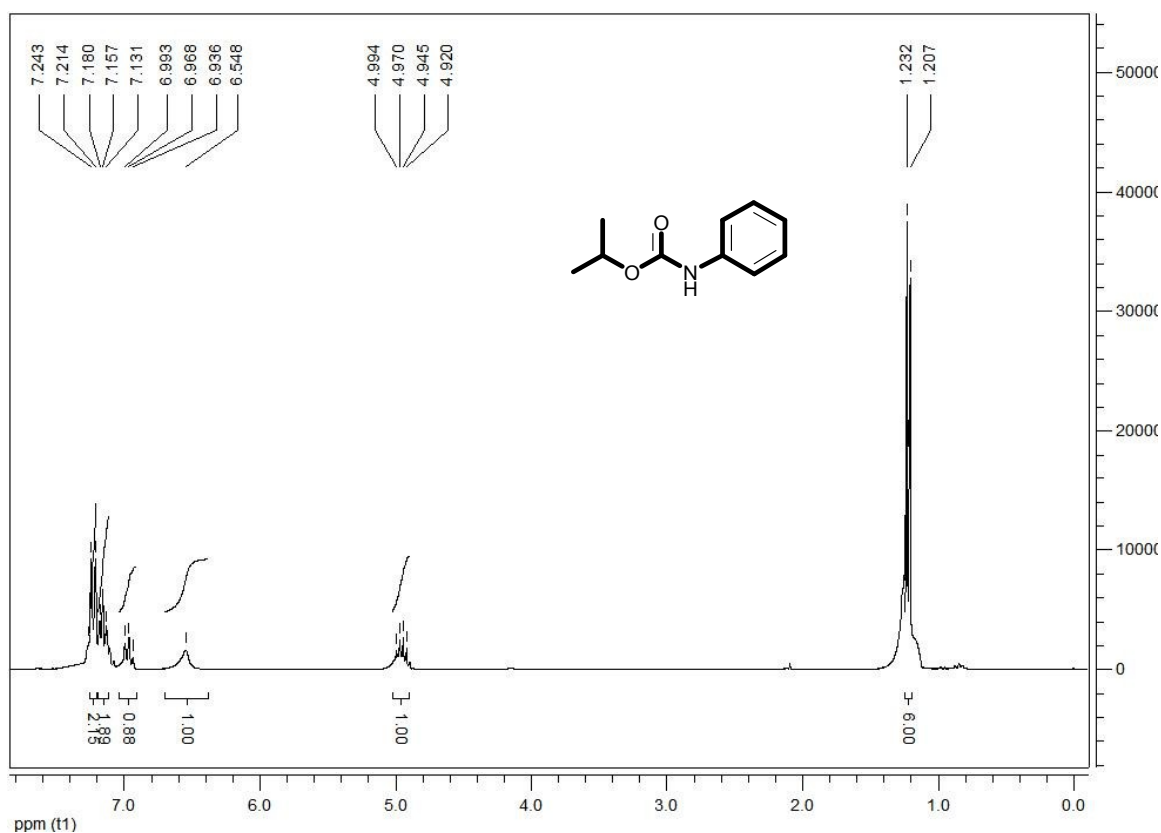
MS of *iso*-butyl phenylcarbamate (C4).



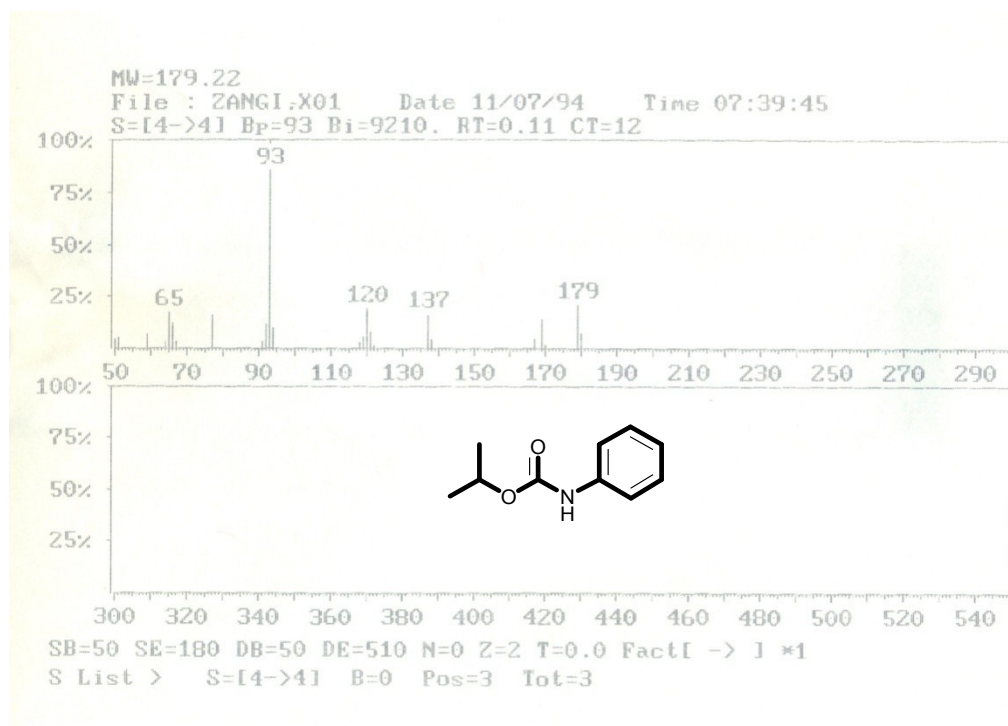
FT-IR spectra of 2-propyl phenylcarbamate (**C5**) in KBr .



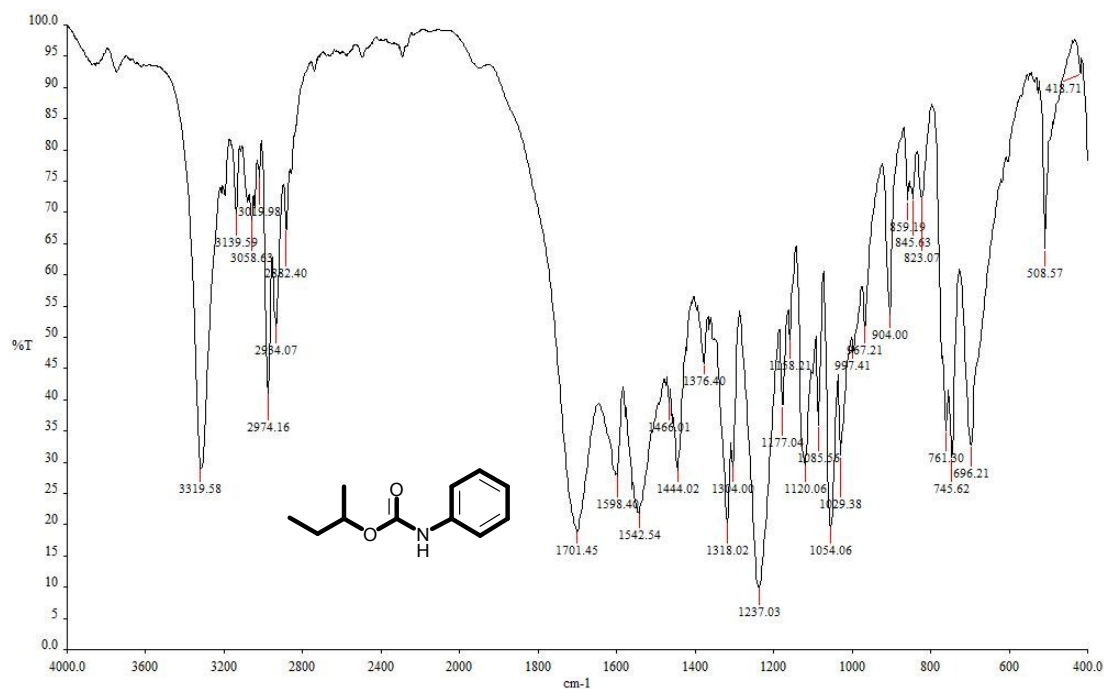
¹³C-NMR spectra (63 MHz) of 2-propyl phenylcarbamate (**C5**) in CDCl₃.



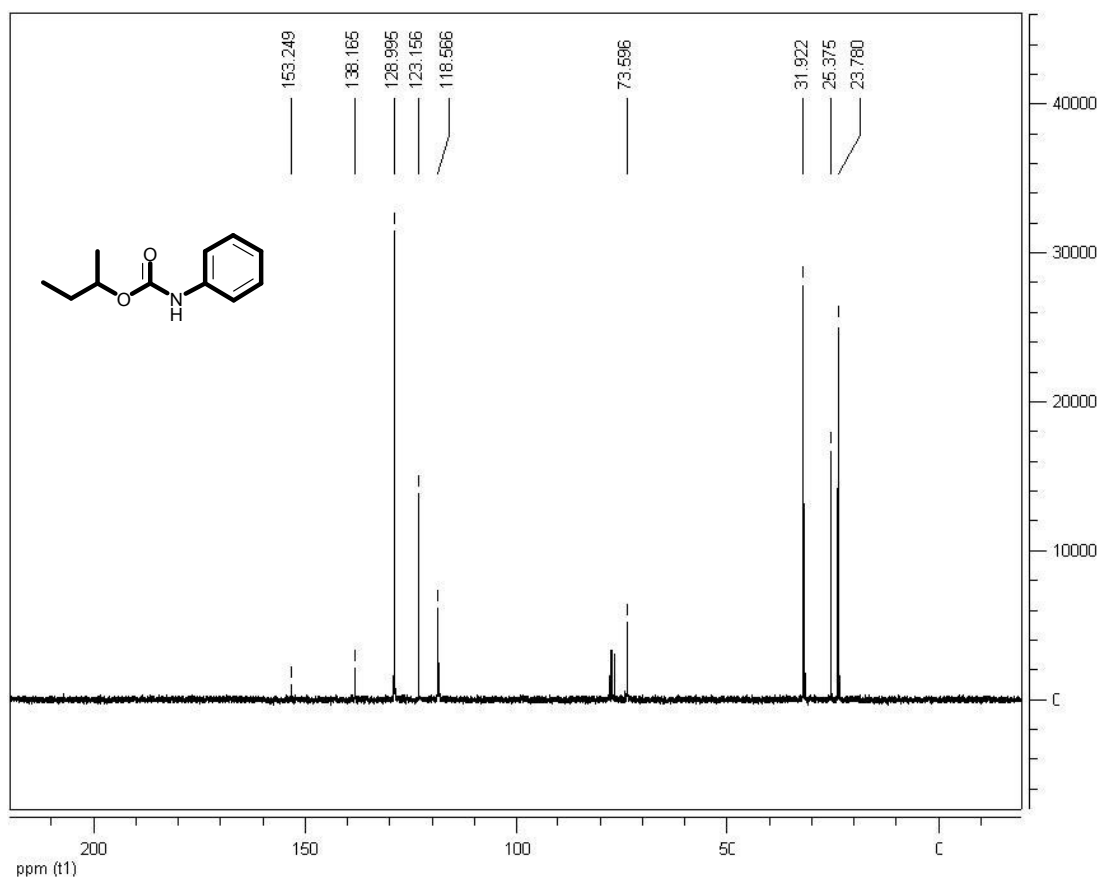
¹H-NMR spectra (250 MHz) of 2-propyl phenylcarbamate (**C5**) in CDCl₃.



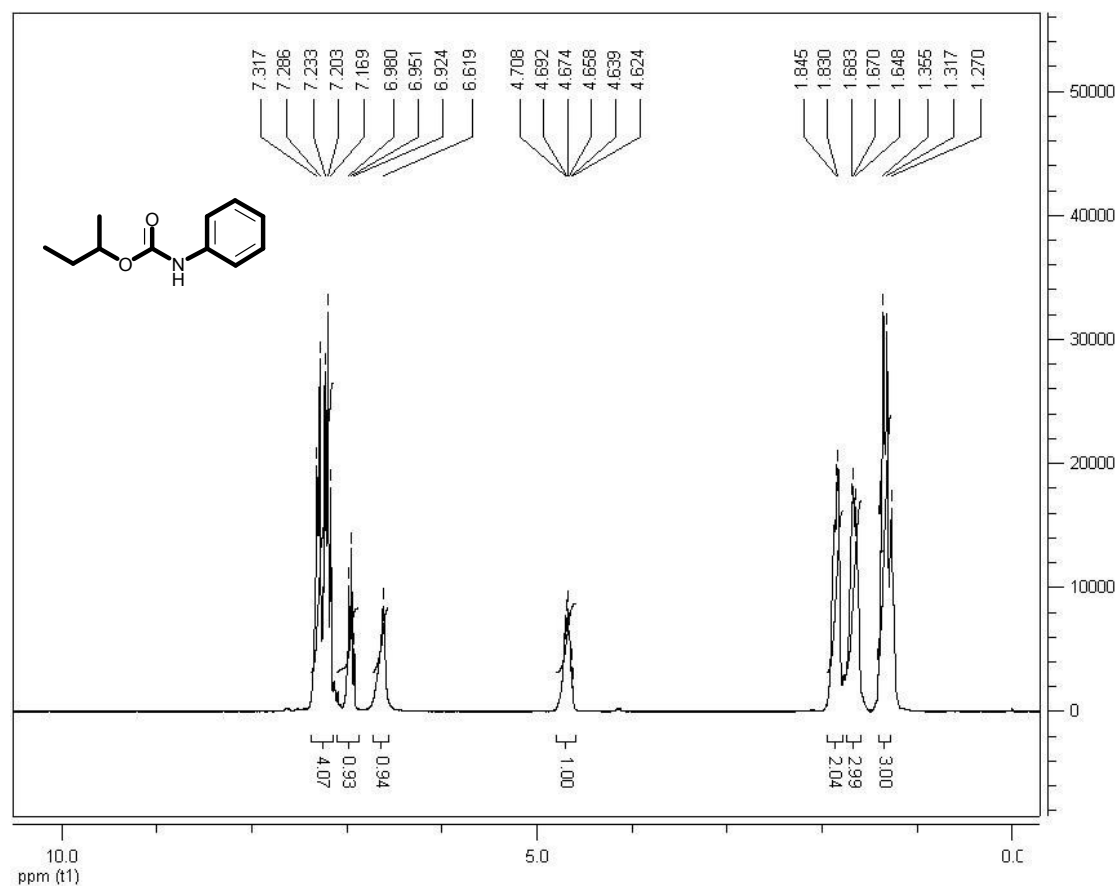
MS of 2-propyl phenylcarbamate (**C5**).



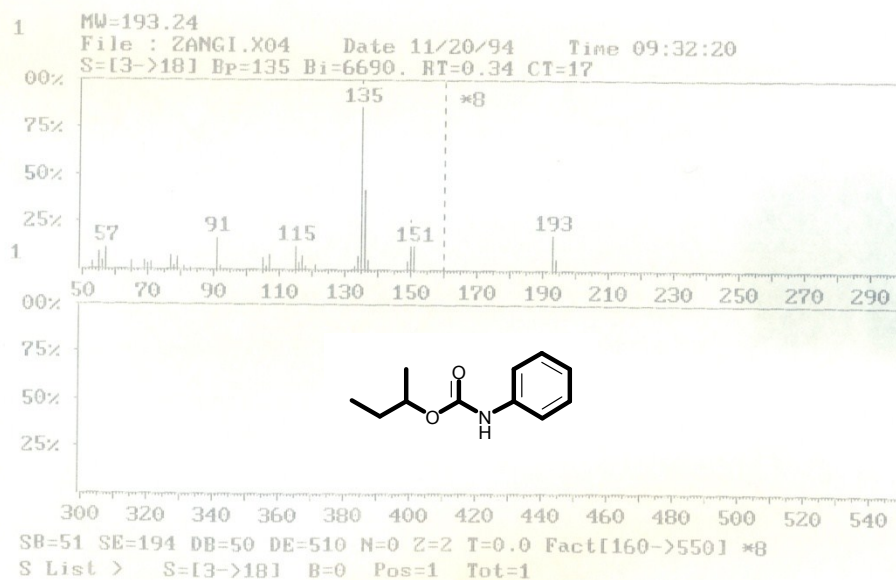
FT-IR spectra of 2-butyl phenylcarbamate (C6) in KBr .



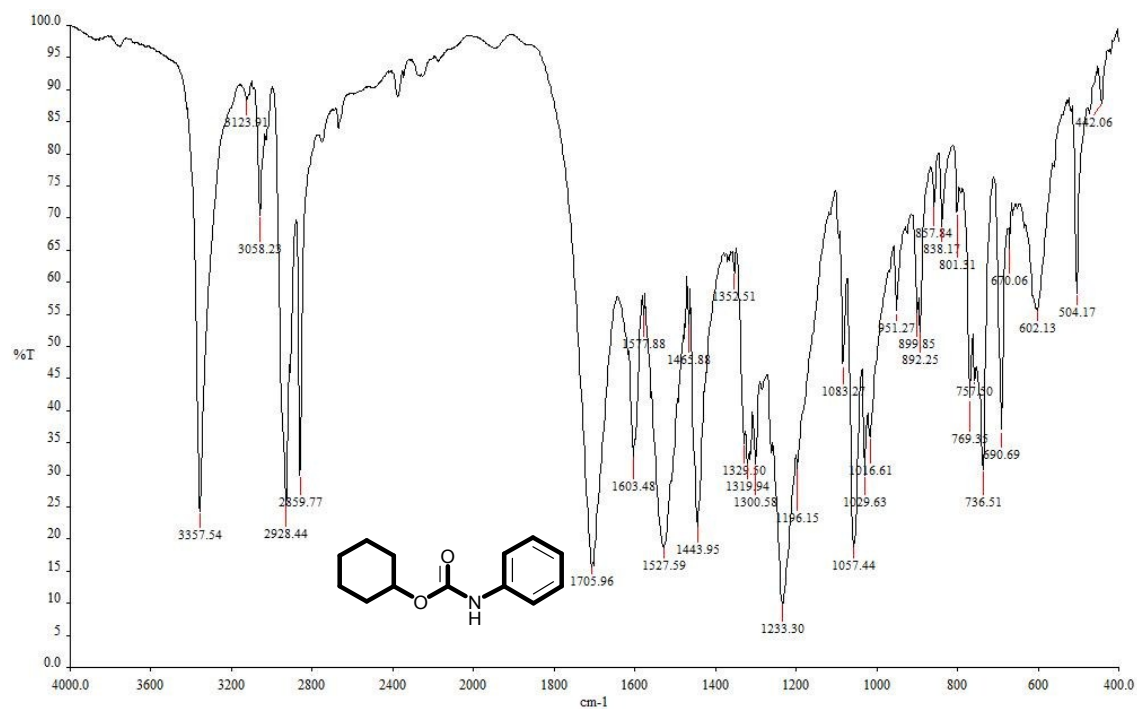
¹³C-NMR spectra (63 MHz) of 2-butyl phenylcarbamate (C6) in CDCl₃.



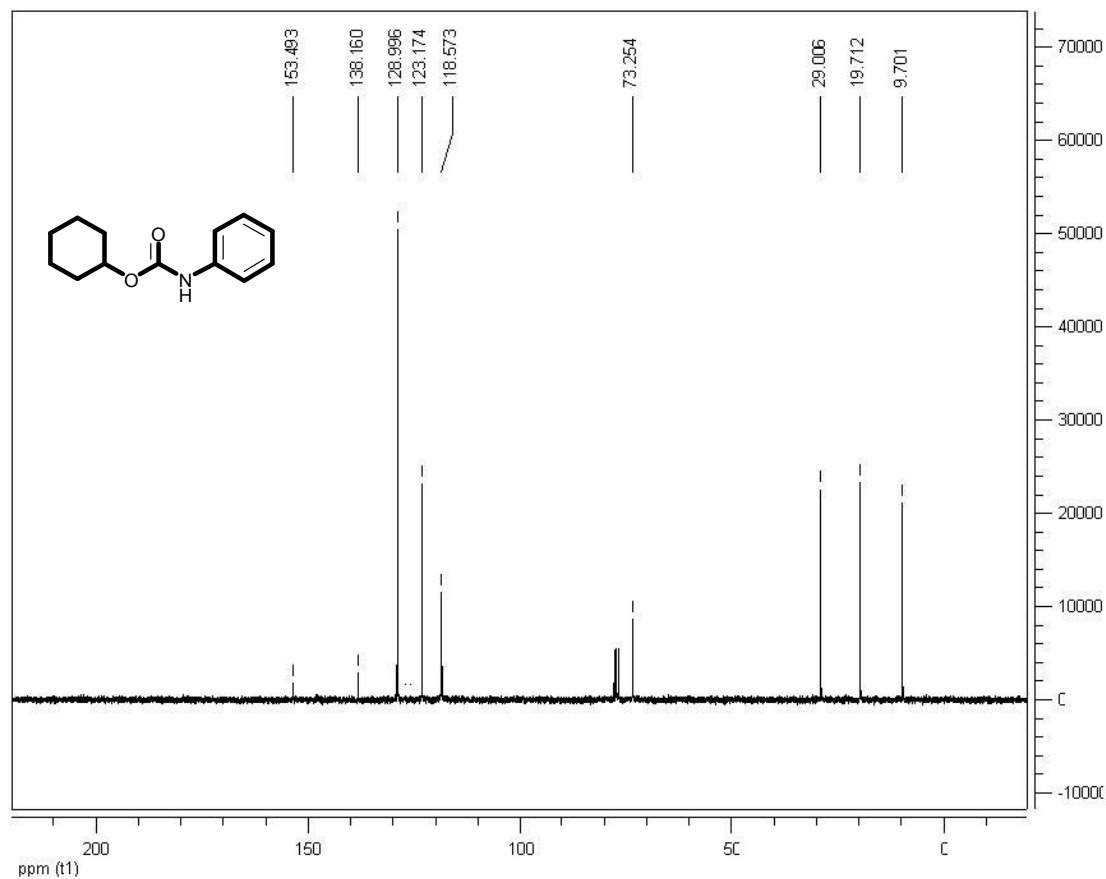
^1H -NMR spectra (250 MHz) of 2-butyl phenylcarbamate (C6) in CDCl_3 .



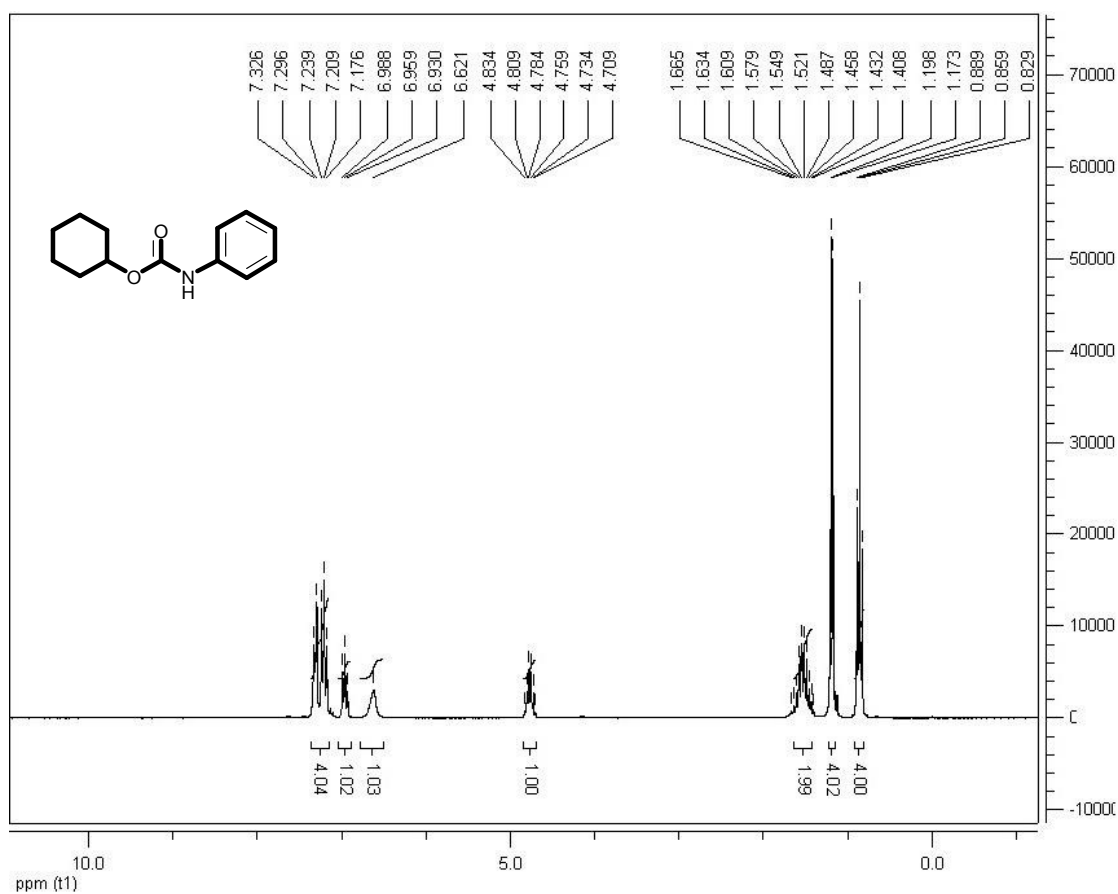
MS of 2-butyl phenylcarbamate (C6).



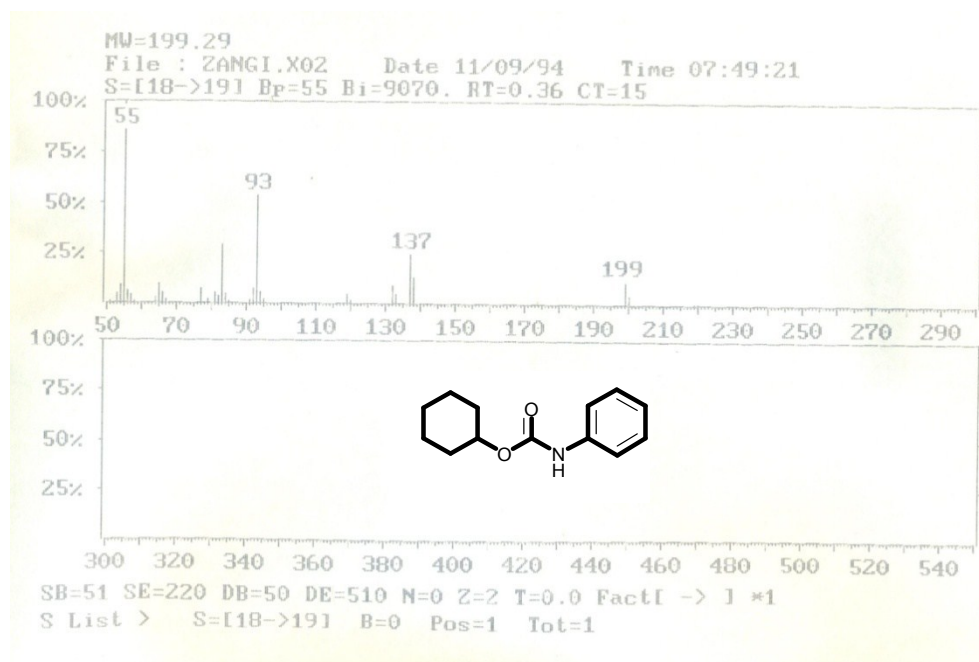
FT-IR spectra of cyclohexyl phenylcarbamate (C7) in KBr .



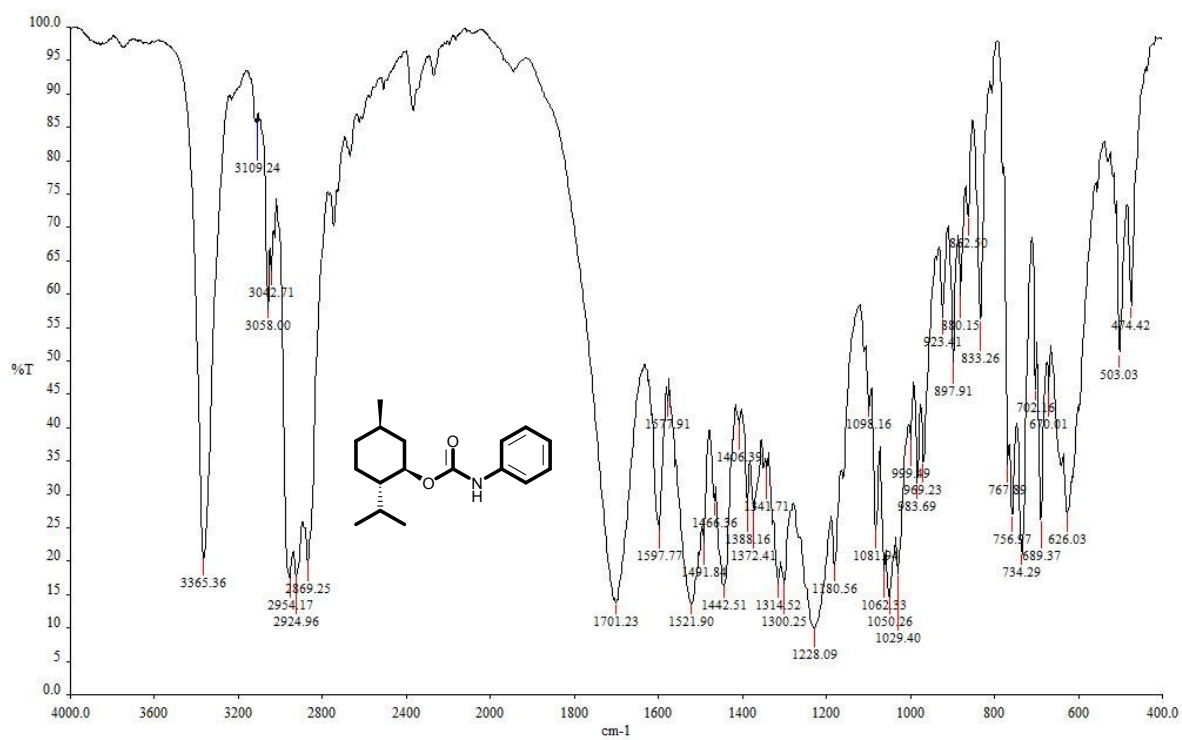
¹³C-NMR spectra (63 MHz) of cyclohexyl phenylcarbamate (C7) in CDCl₃.



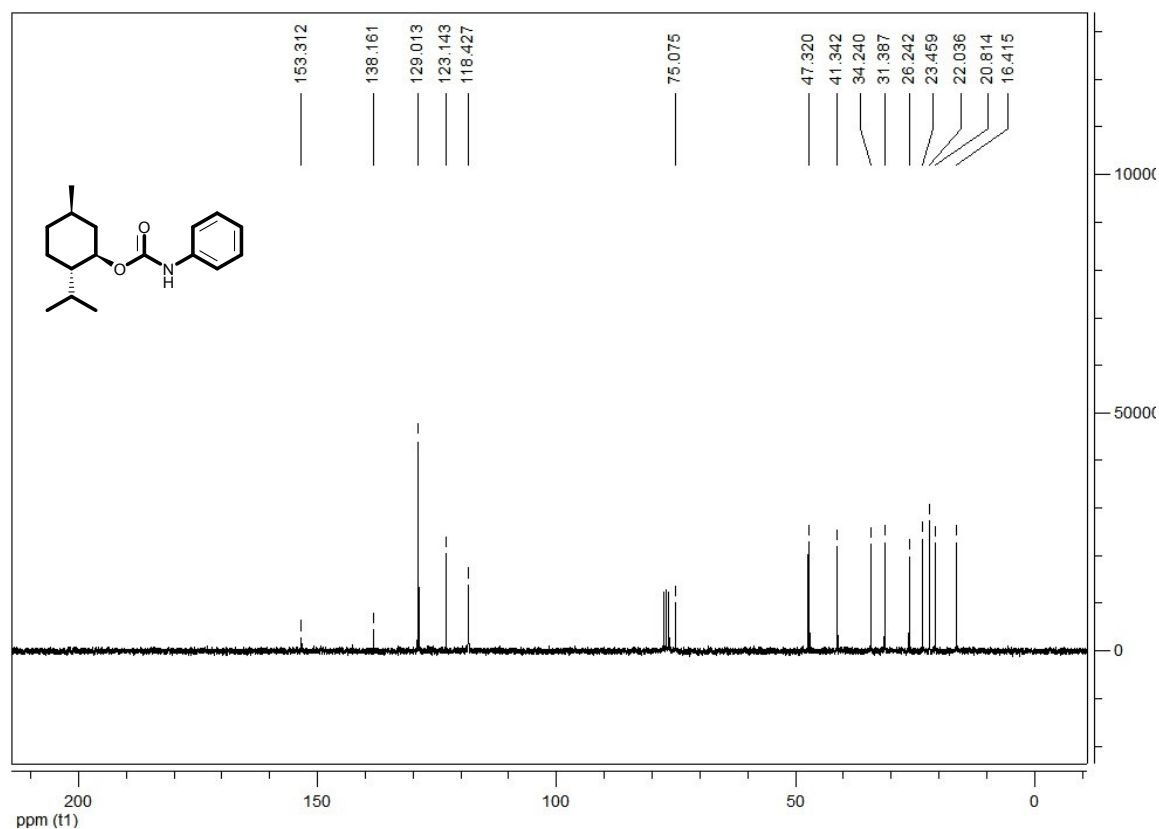
¹H-NMR spectra (250 MHz) of cyclohexyl phenylcarbamate (C7) in CDCl₃.



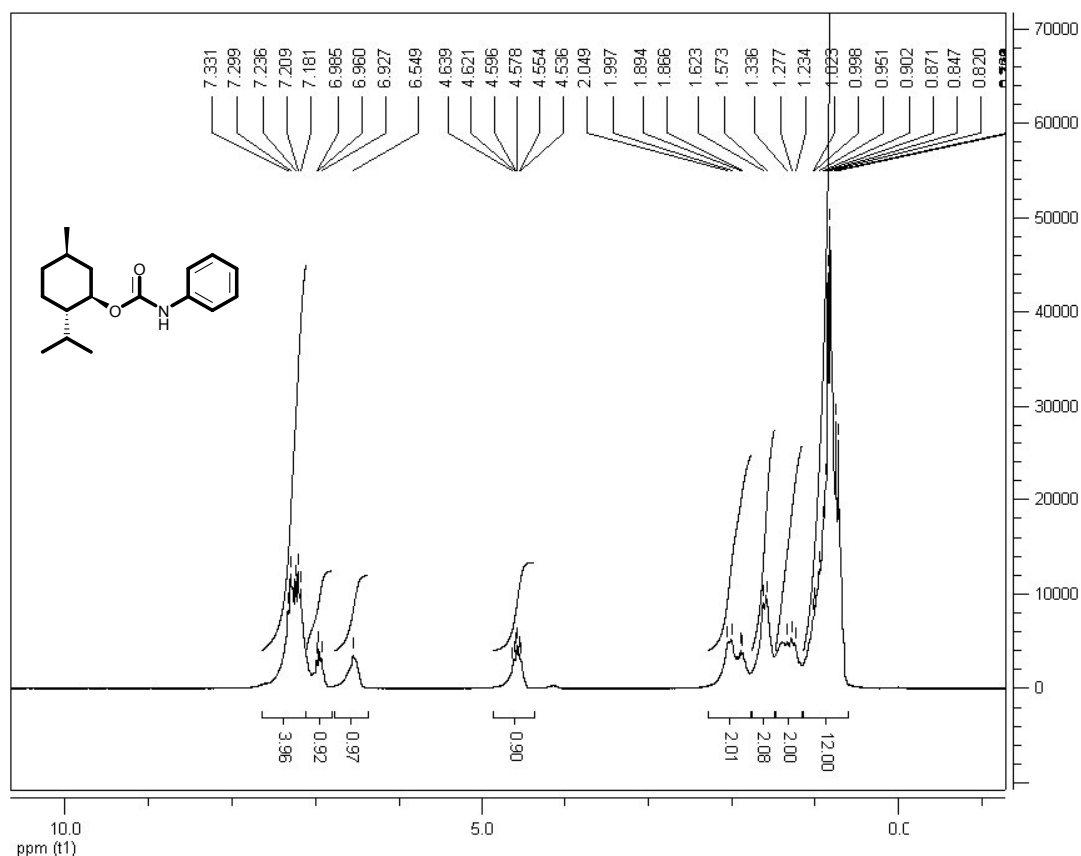
MS of cyclohexyl phenylcarbamate (C7).



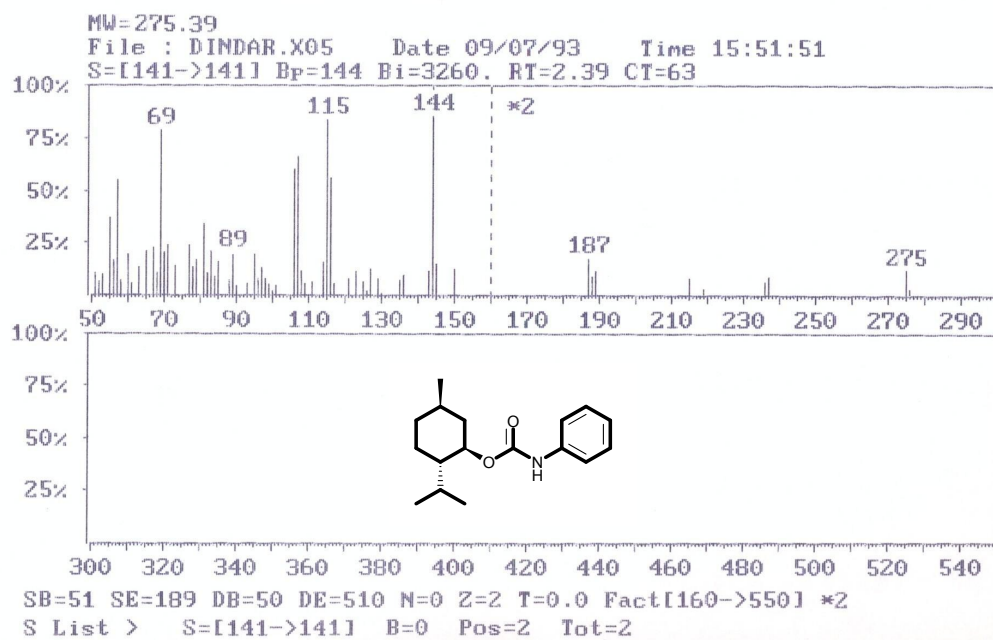
FT-IR spectra of (-)-menthyl phenylcarbamate (C8) in KBr .



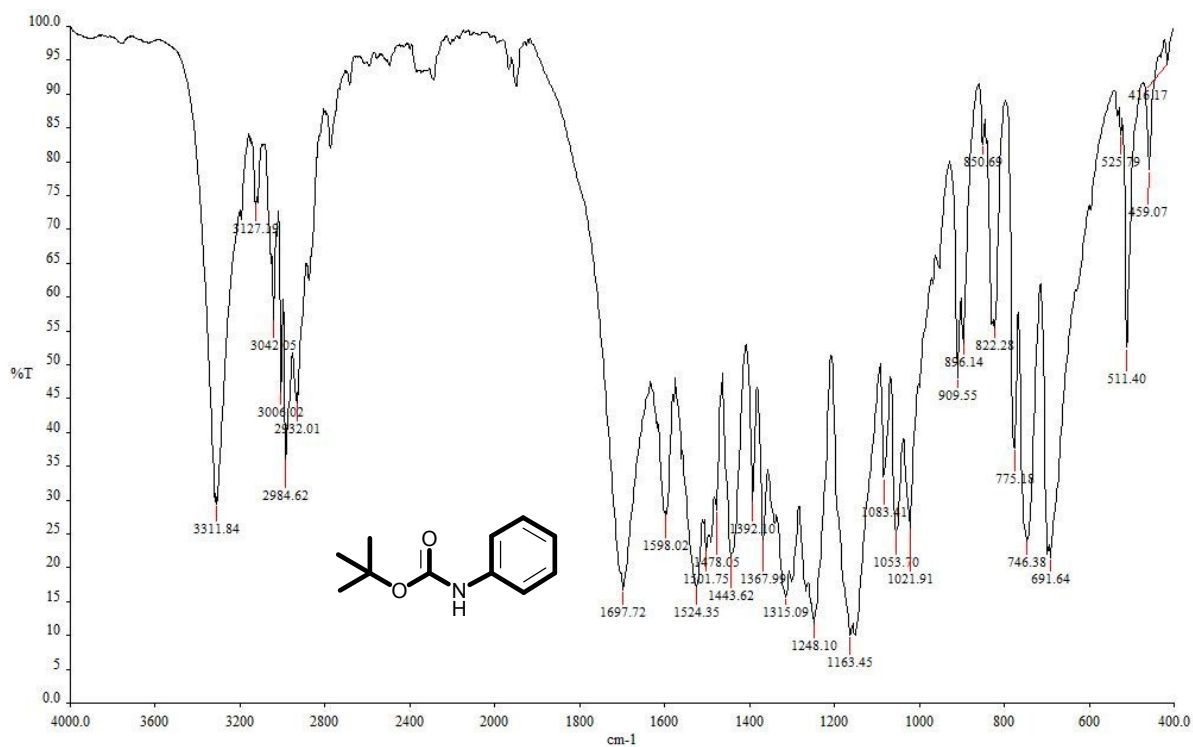
¹³C-NMR spectra (63 MHz) of (-)-menthyl phenylcarbamate (C8) in CDCl₃.



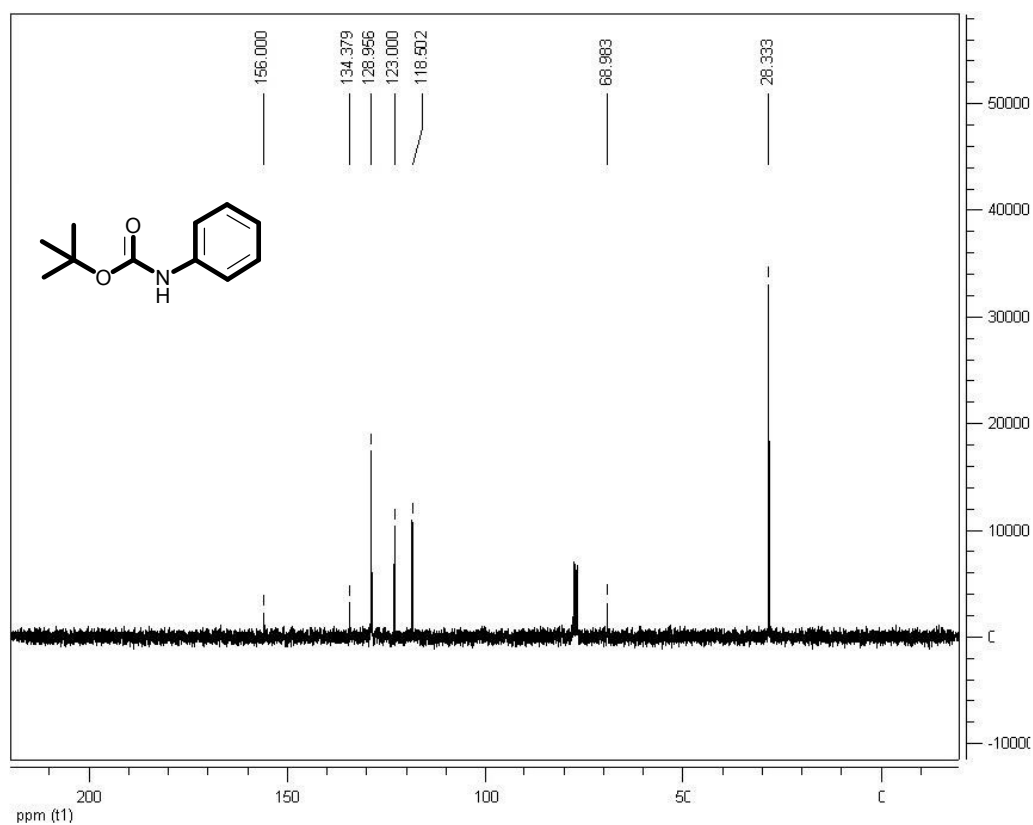
¹H-NMR spectra (250 MHz) of (-)-menthyl phenylcarbamate (C8) in CDCl₃.



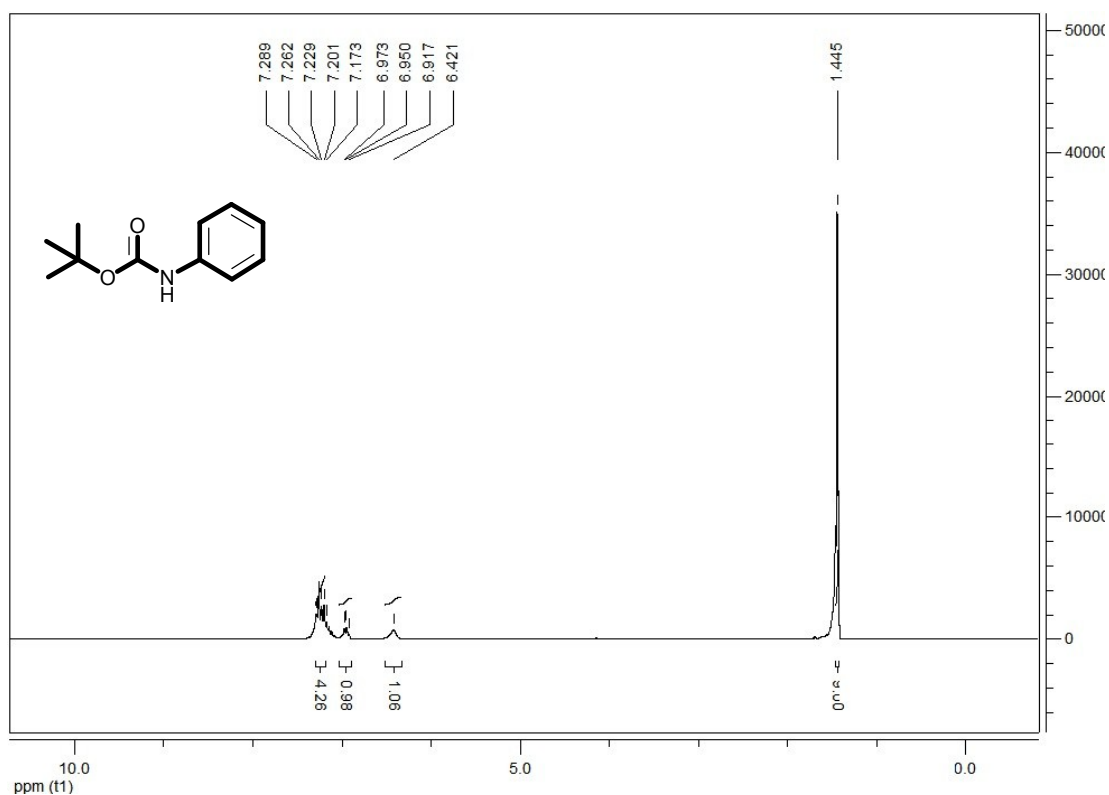
MS of (-)-menthyl phenylcarbamate (C8).



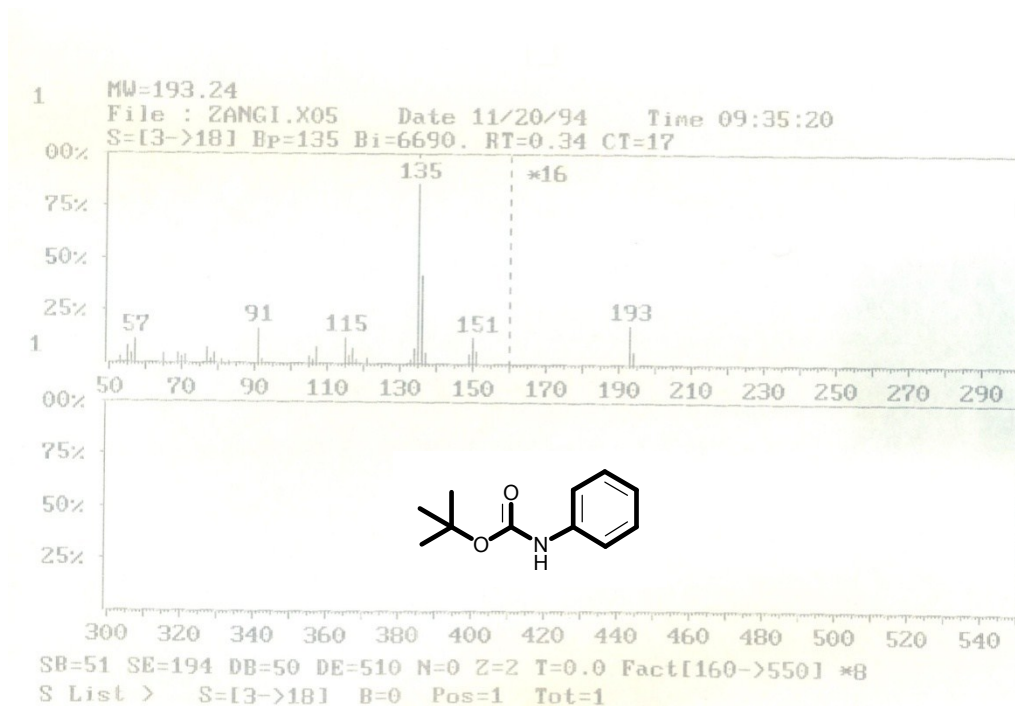
FT-IR spectra of *tert*-butyl phenylcarbamate (C9) in KBr .



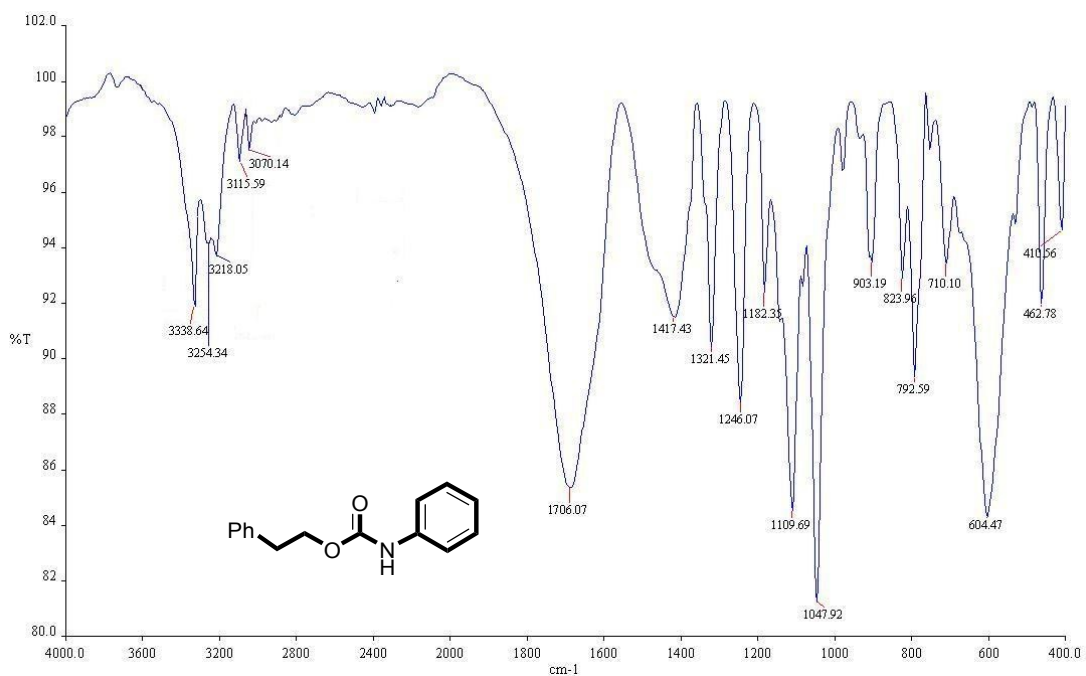
¹³C-NMR spectra (63 MHz) of *tert*-butyl phenylcarbamate (C9) in CDCl₃.



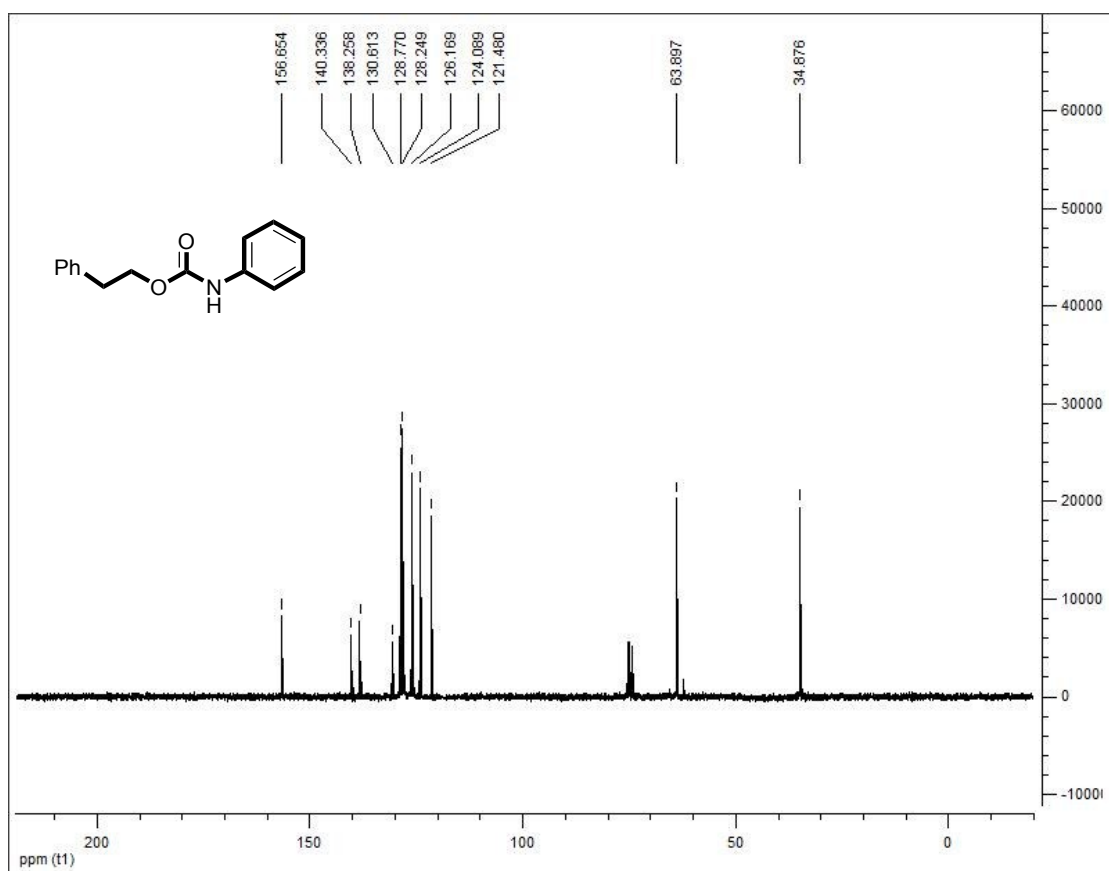
¹H-NMR spectra (250 MHz) of *tert*-butyl phenylcarbamate (C9) in CDCl₃.



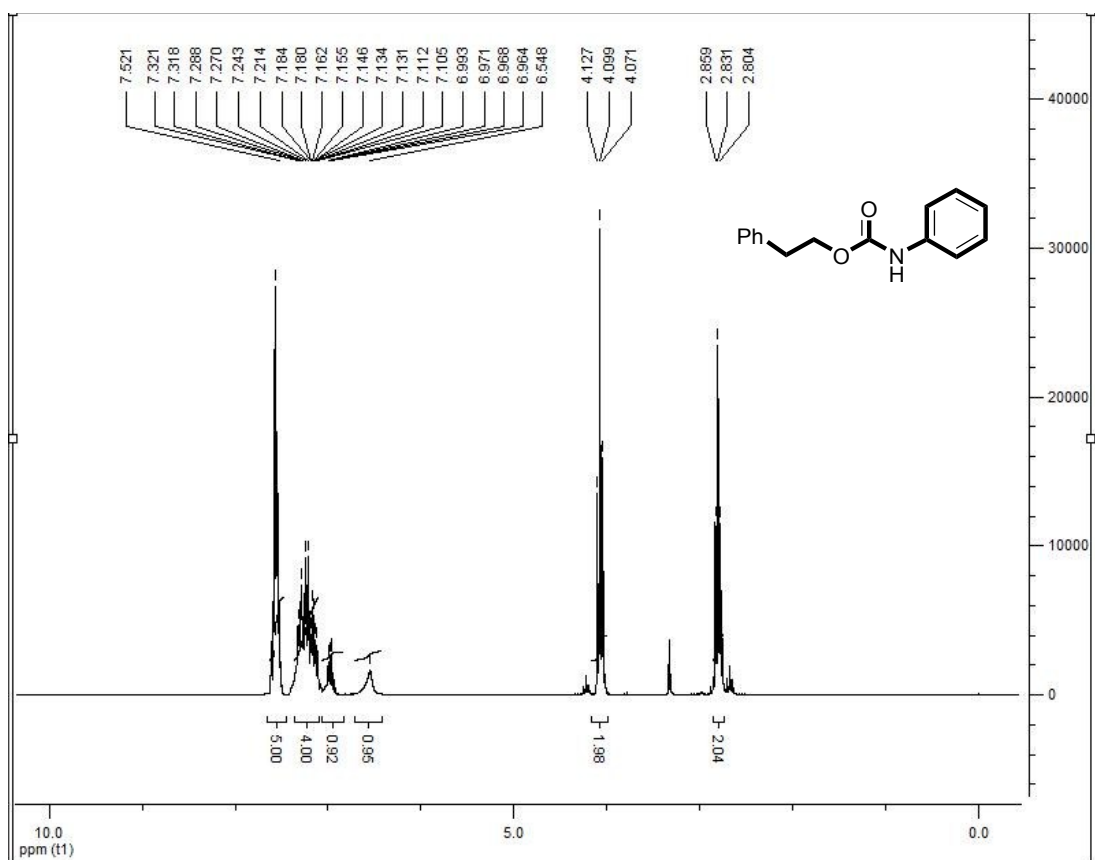
MS of *tert*-butyl phenylcarbamate (C9).



FT-IR spectra of phenethyl phenylcarbamate (C10) in KBr .

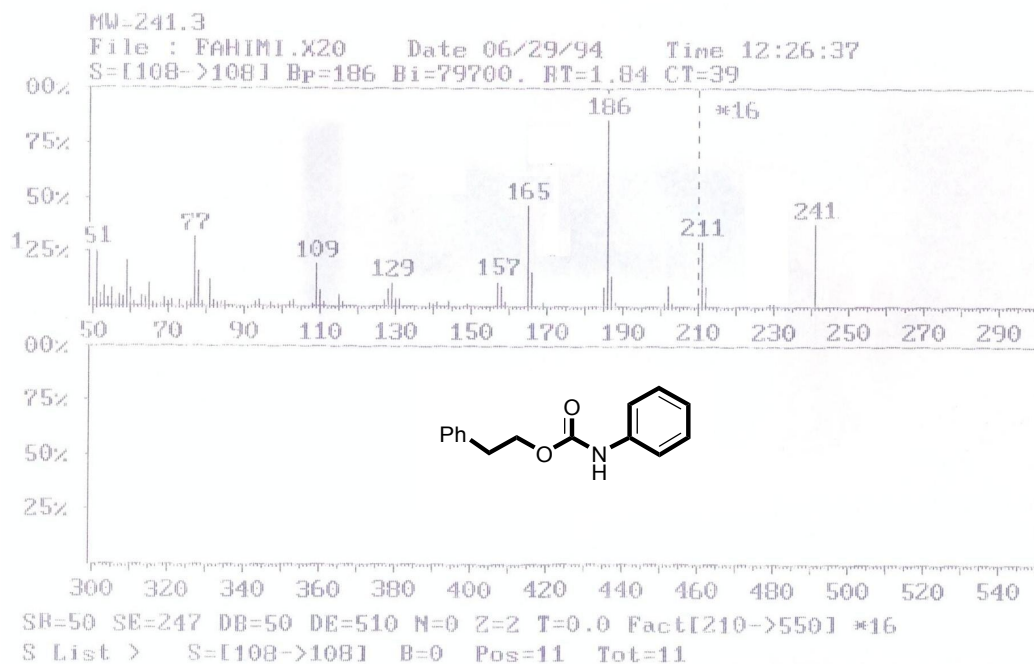


¹³C-NMR spectra (63 MHz) of phenethyl phenylcarbamate (C10) in CDCl₃.

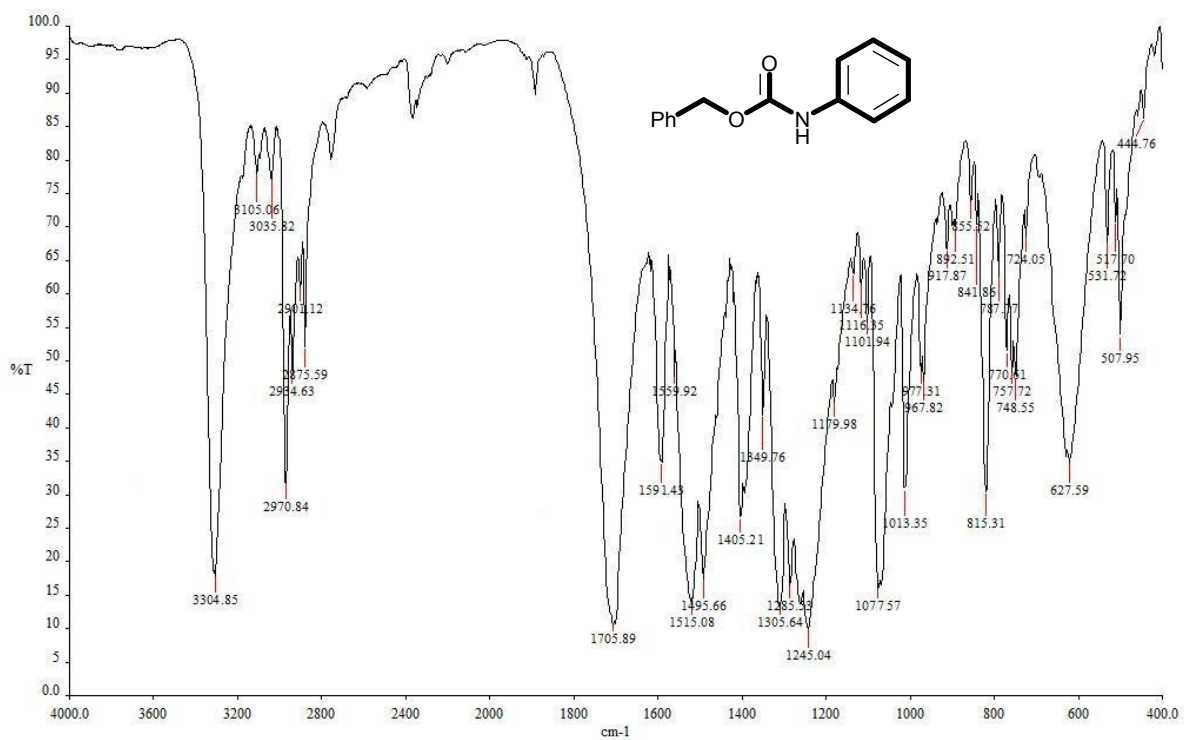


¹H-NMR spectra (250 MHz) of phenethyl phenylcarbamate (C10) in CDCl₃.

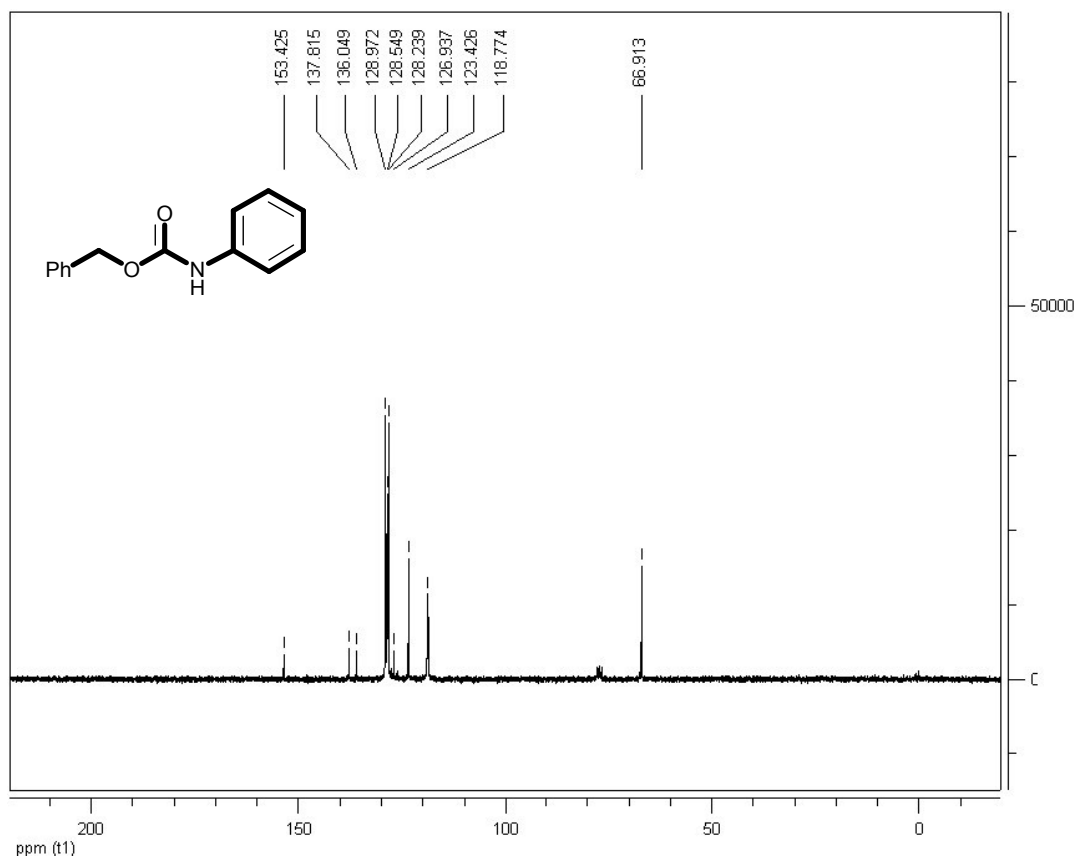
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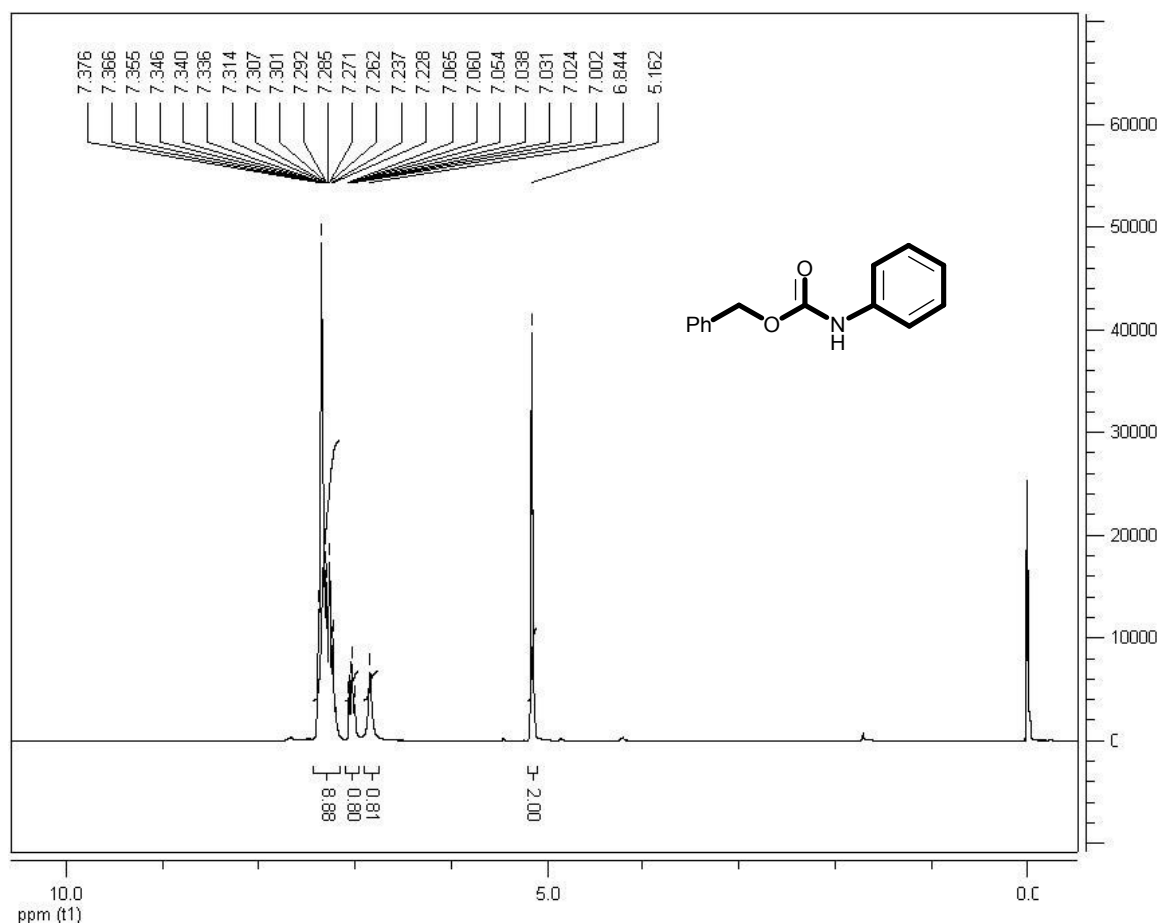
MS of phenethyl phenylcarbamate (C10).



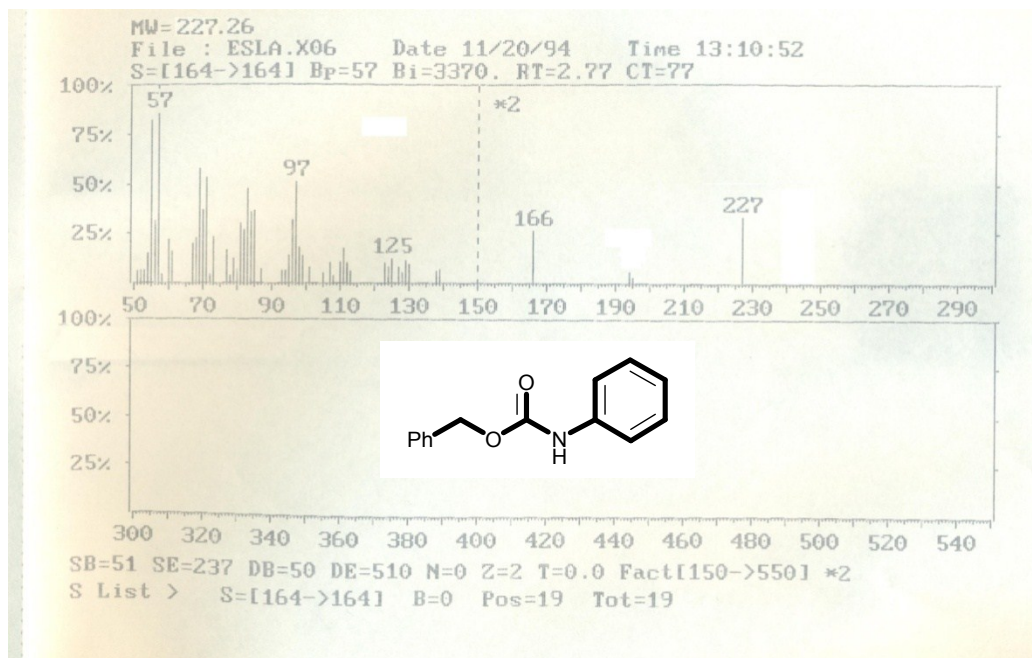
FT-IR spectra of benzyl phenylcarbamate (**C11**) in KBr .



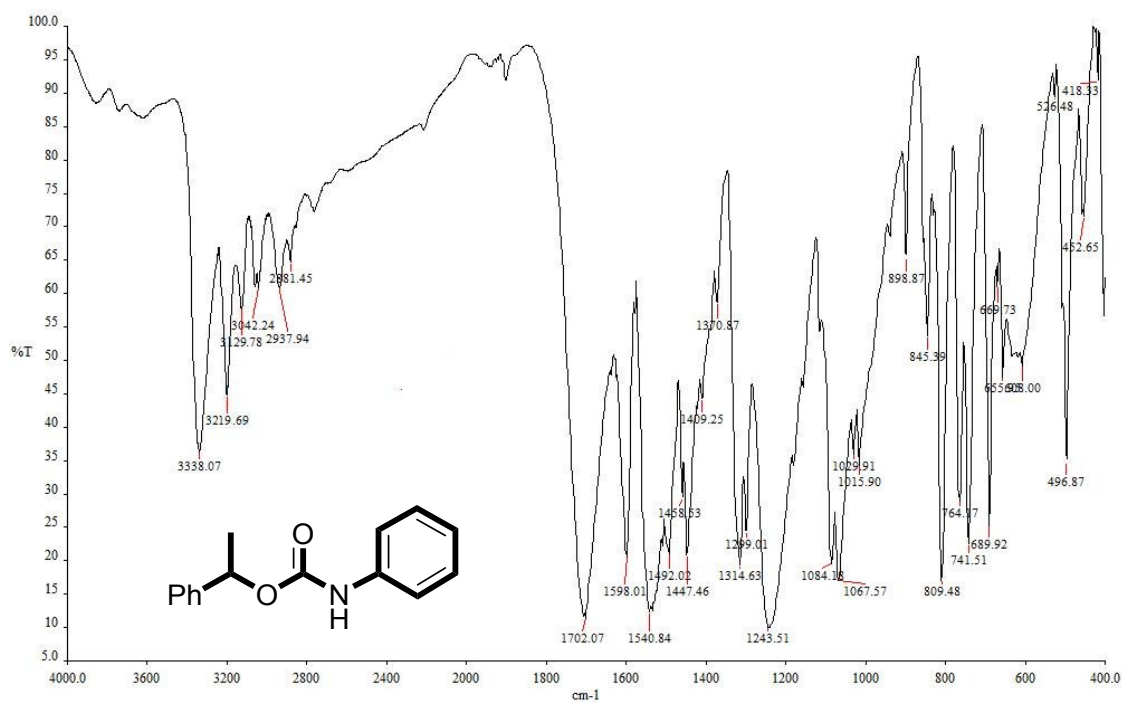
¹³C-NMR spectra (63 MHz) of benzyl phenylcarbamate (**C11**) in CDCl₃.



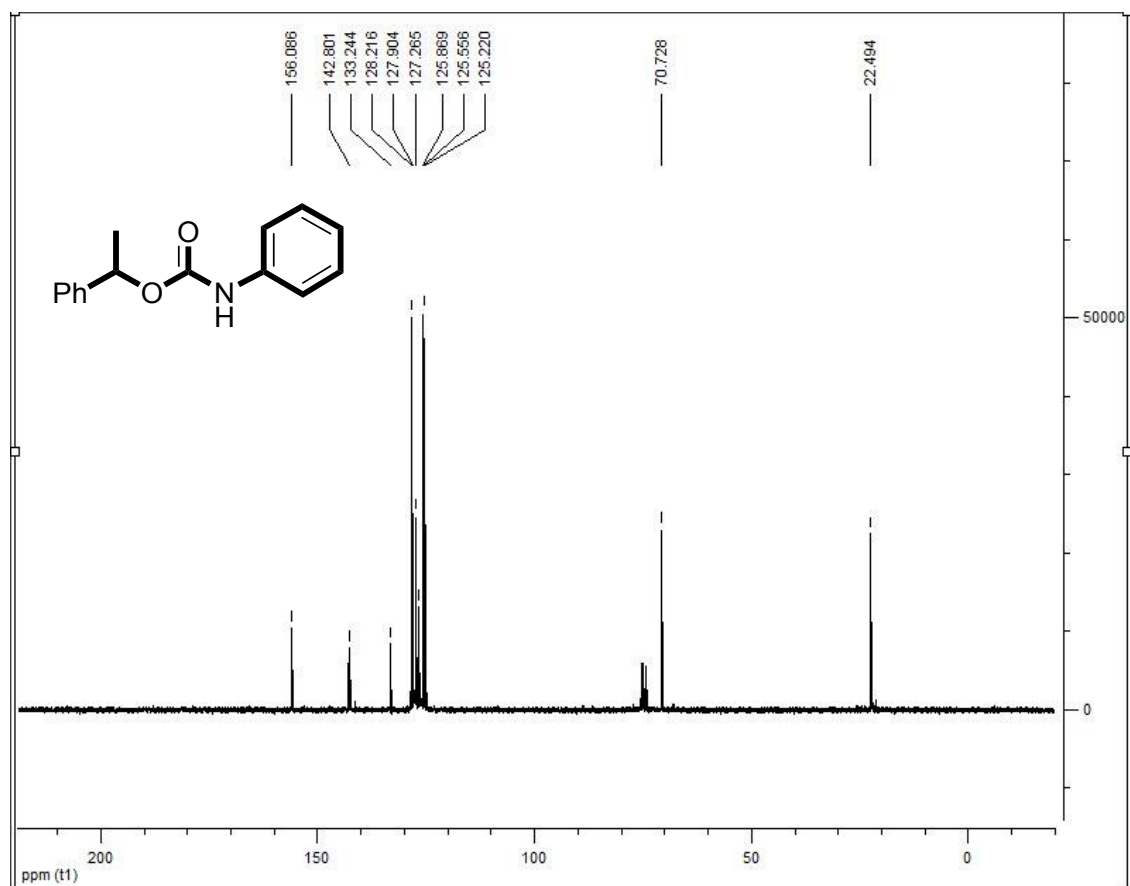
¹H-NMR spectra (250 MHz) of benzyl phenylcarbamate (C11) in CDCl₃.



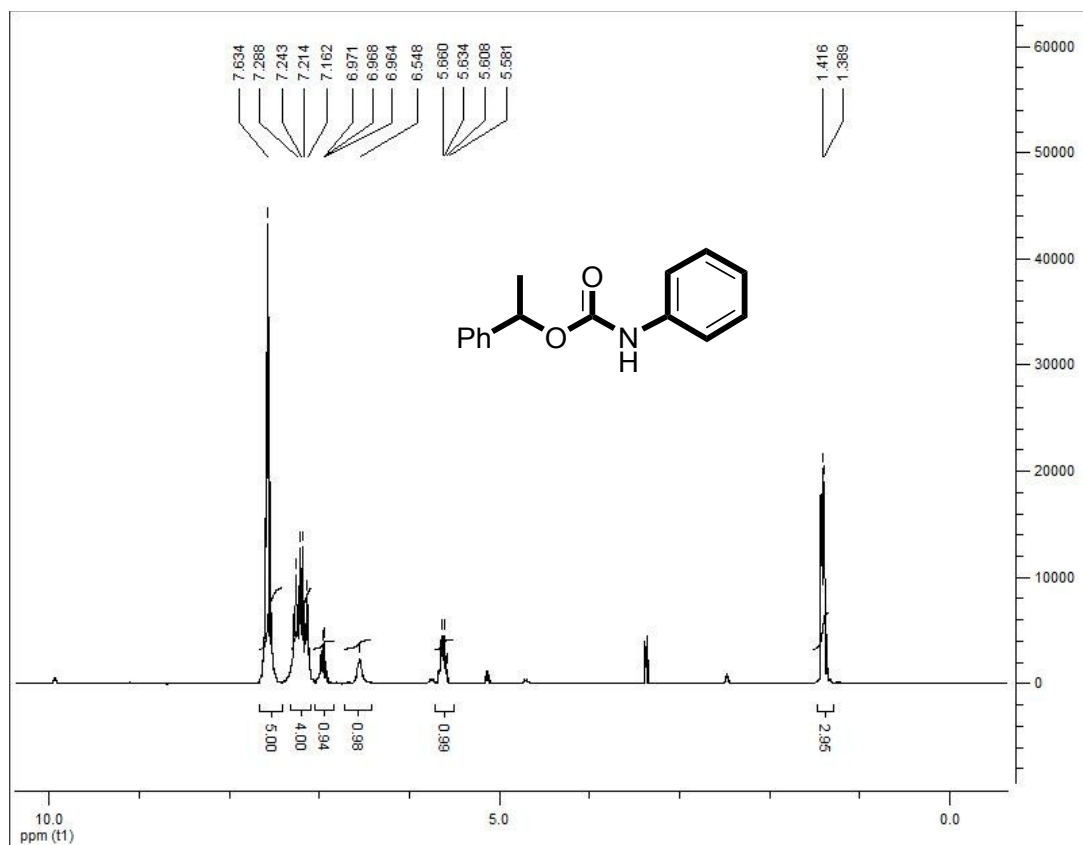
MS of benzyl phenylcarbamate (C11).



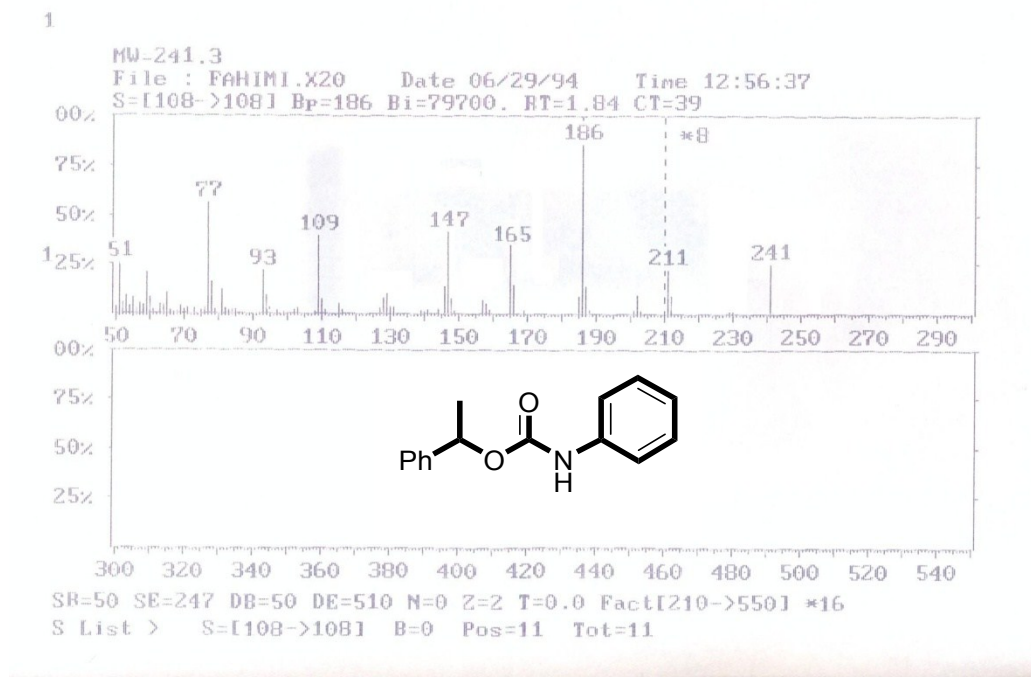
FT-IR spectra of 1-phenylethyl phenylcarbamate (C12) in KBr .



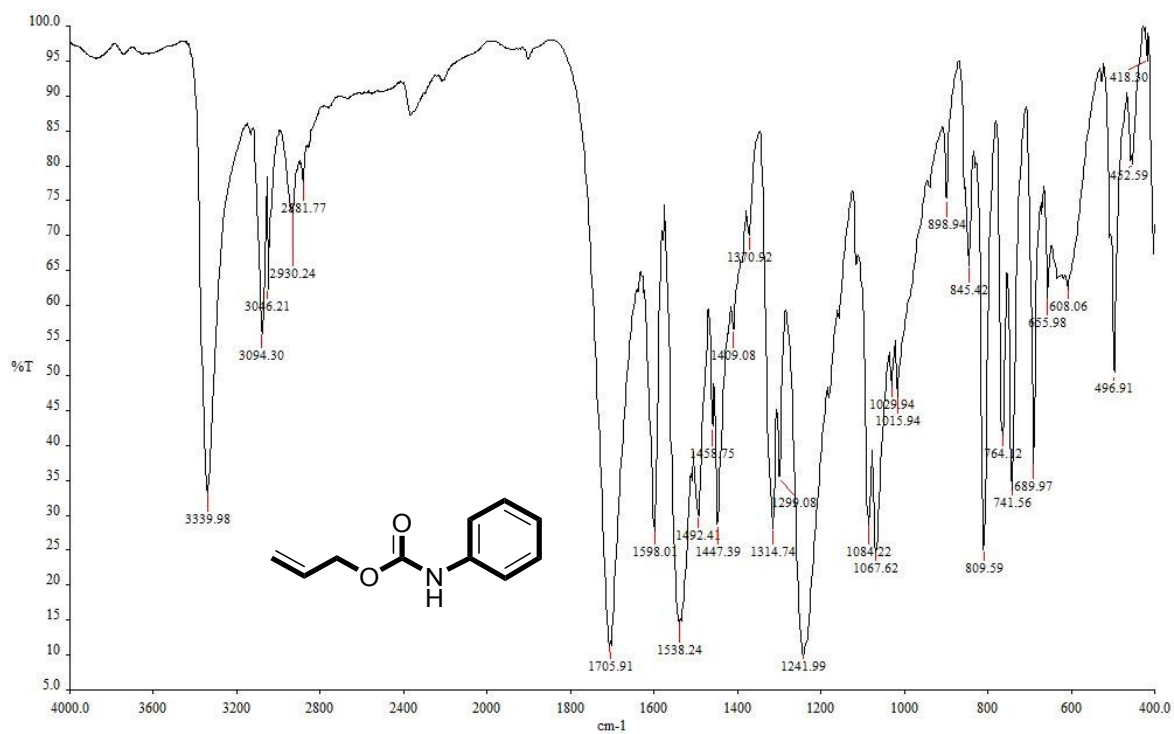
¹³C-NMR spectra (63 MHz) of 1-phenylethyl phenylcarbamate (C12) in CDCl₃.



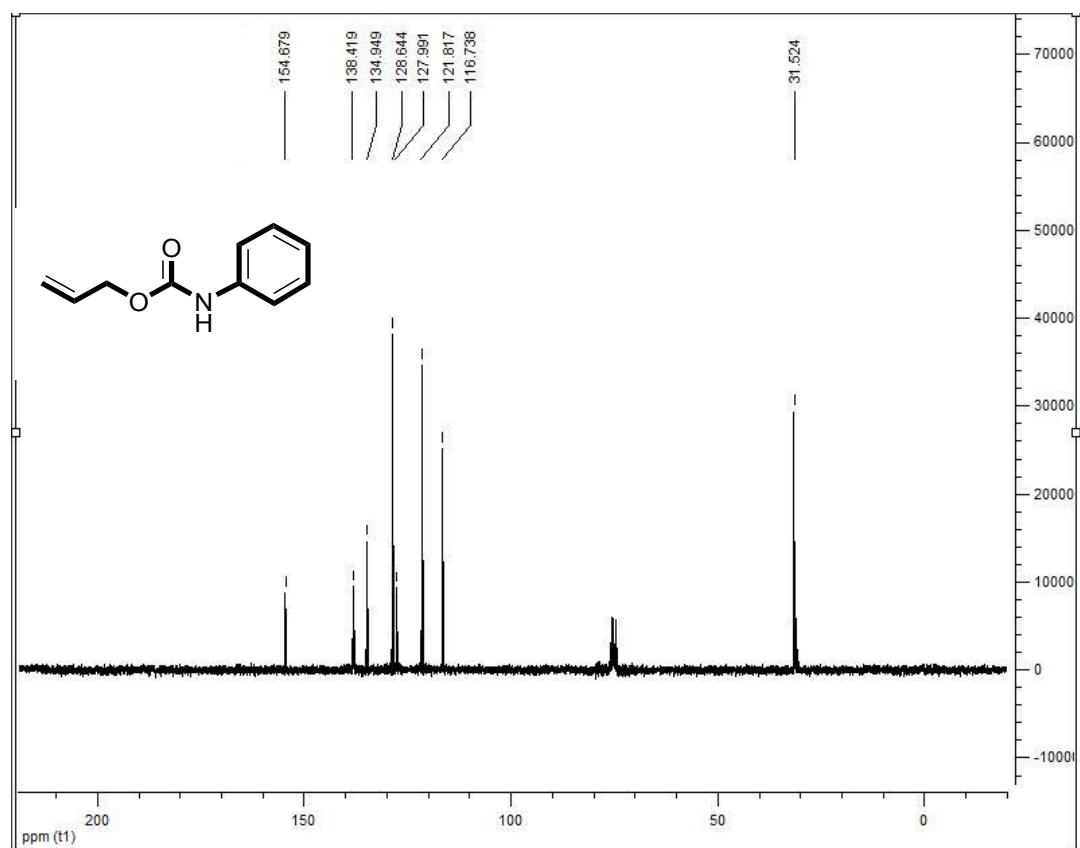
¹H-NMR spectra (250 MHz) of 1-phenylethyl phenylcarbamate (**C12**) in CDCl₃.



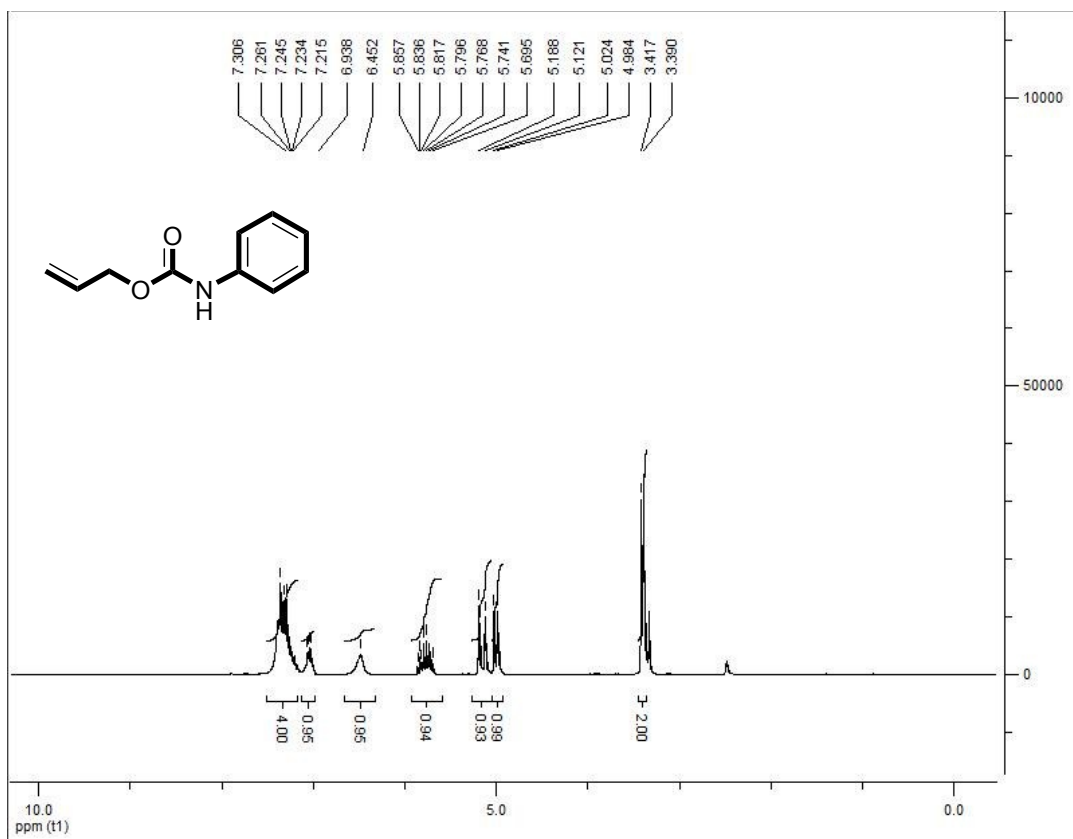
MS of 1-phenylethyl phenylcarbamate (**C12**).



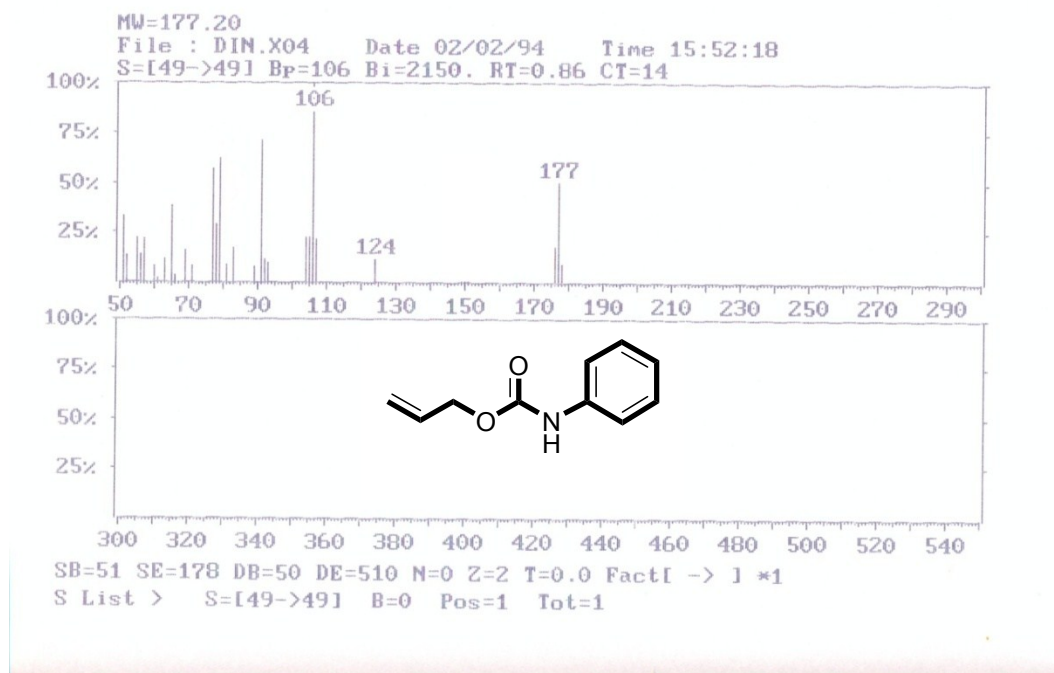
FT-IR spectra of allyl phenylcarbamate (C13) in KBr .



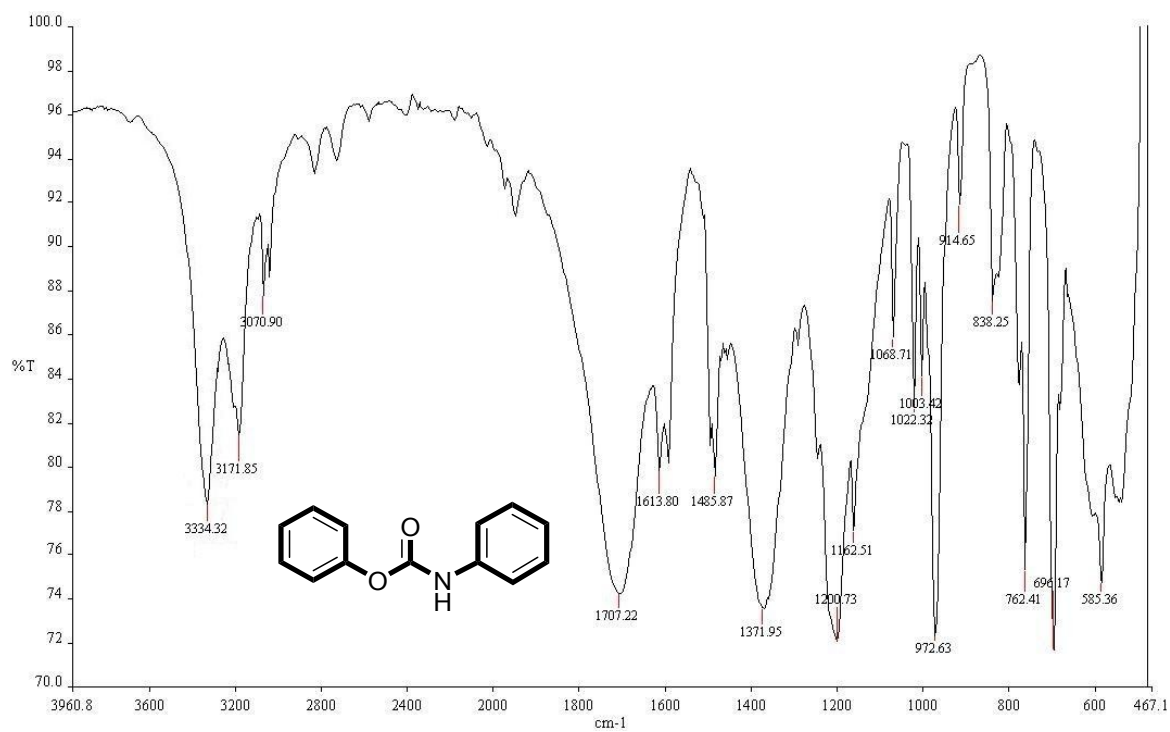
¹³C-NMR spectra (63 MHz) of allyl phenylcarbamate (C13) in CDCl₃.



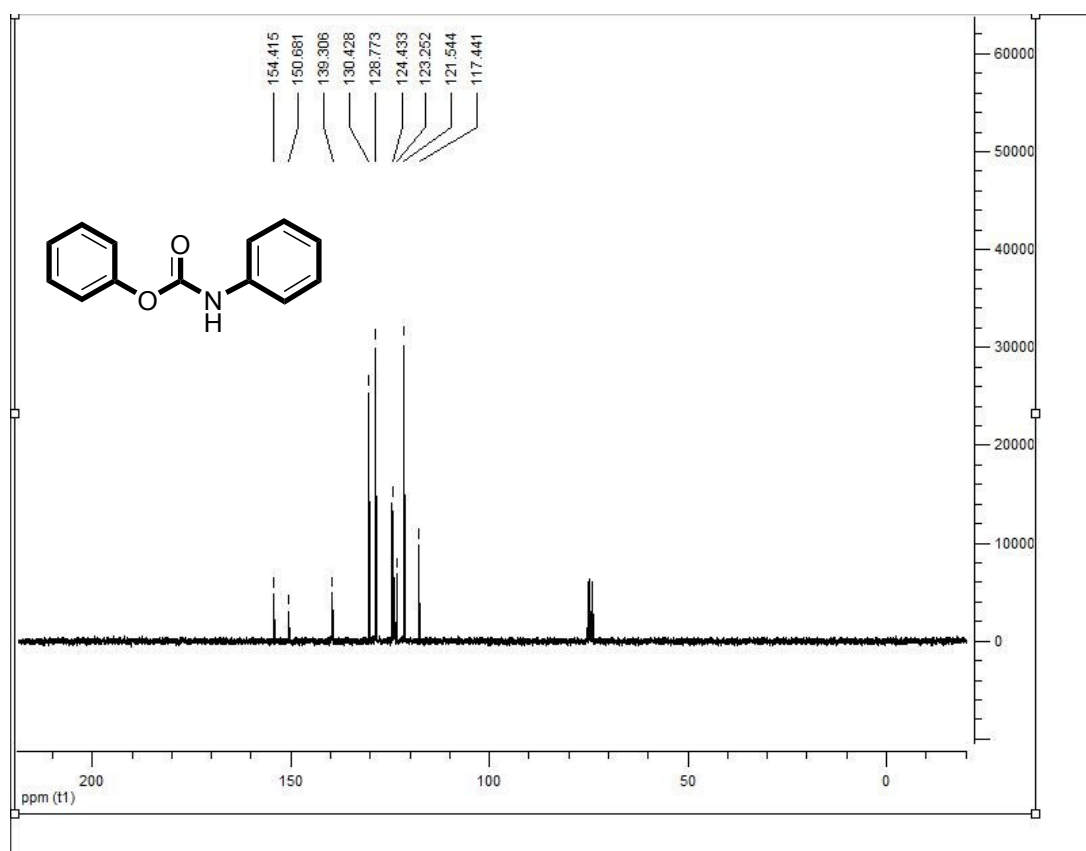
¹H-NMR spectra (250 MHz) of allyl phenylcarbamate (C13) in CDCl₃.



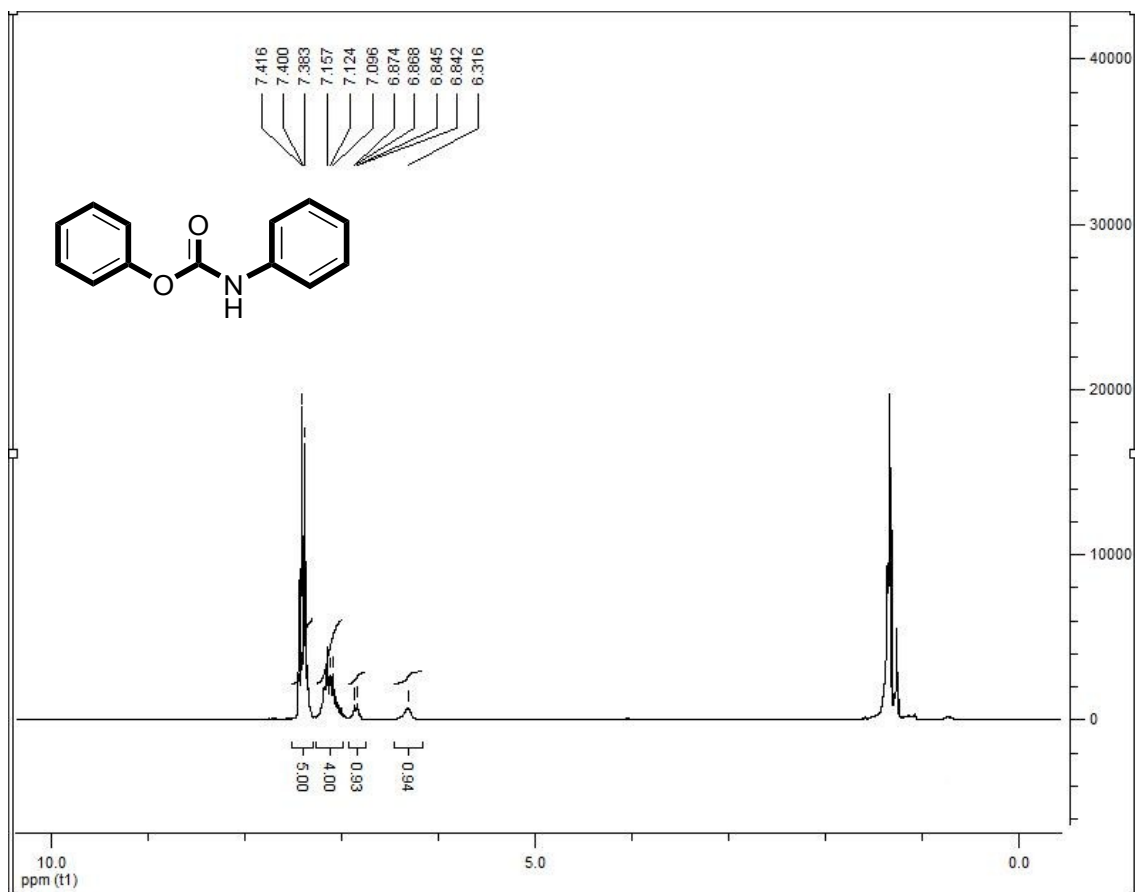
MS of allyl phenylcarbamate (C13).



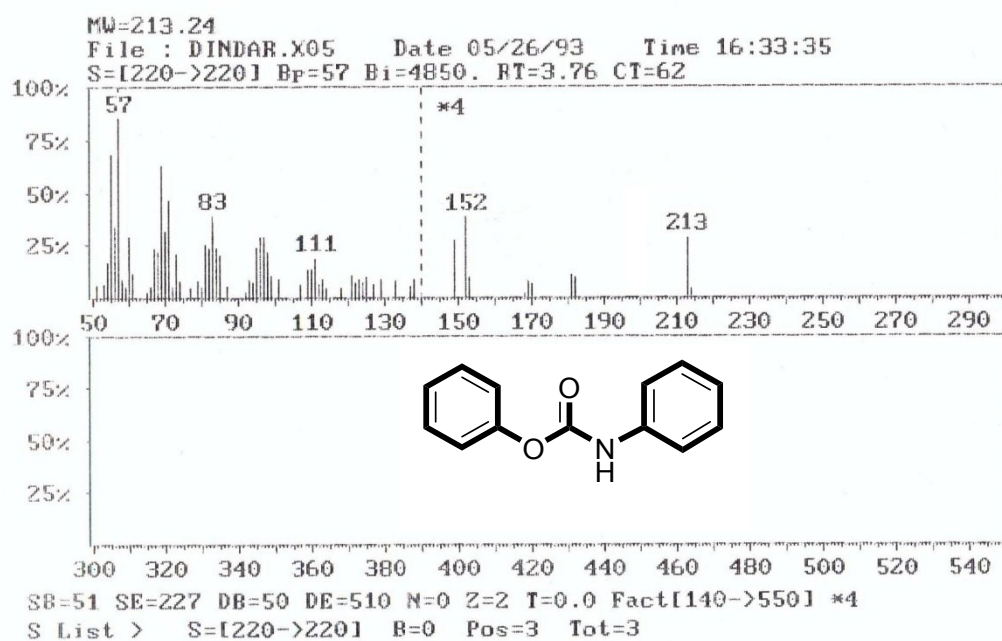
FT-IR spectra of phenyl phenylcarbamate (C14) in KBr .



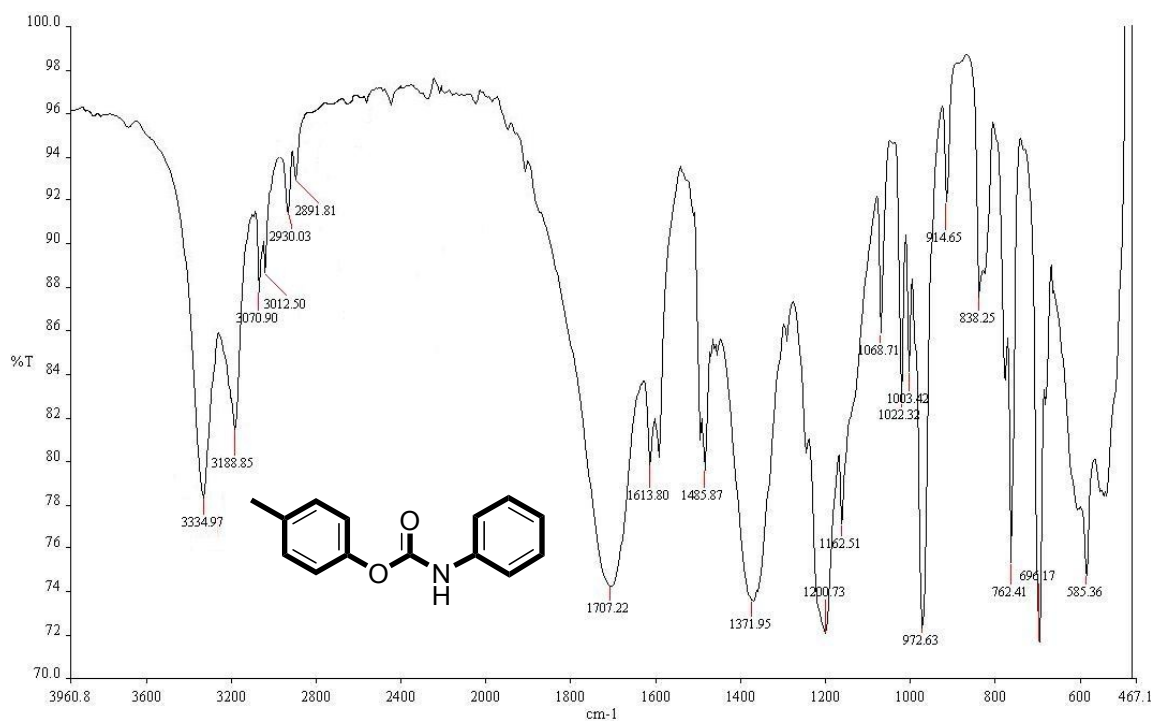
¹³C-NMR spectra (63 MHz) of phenyl phenylcarbamate (C14) in CDCl₃.



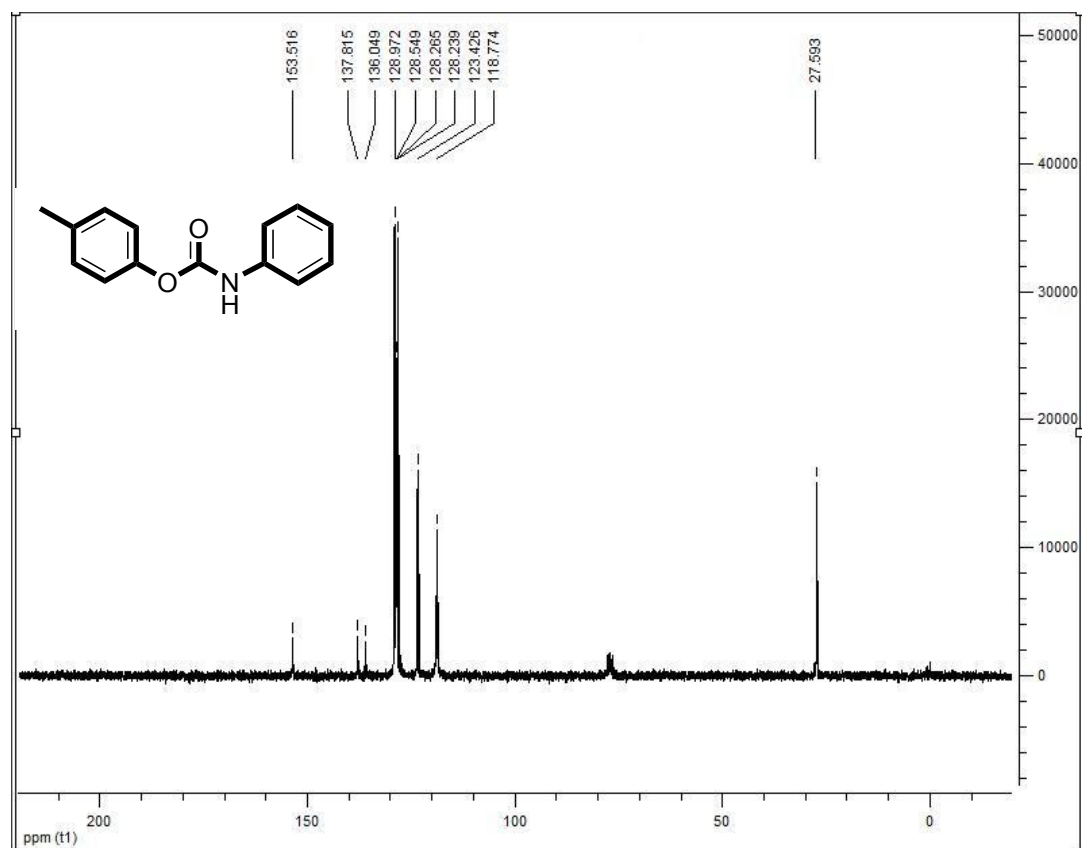
¹H-NMR spectra (250 MHz) of phenyl phenylcarbamate (C14) in CDCl₃.



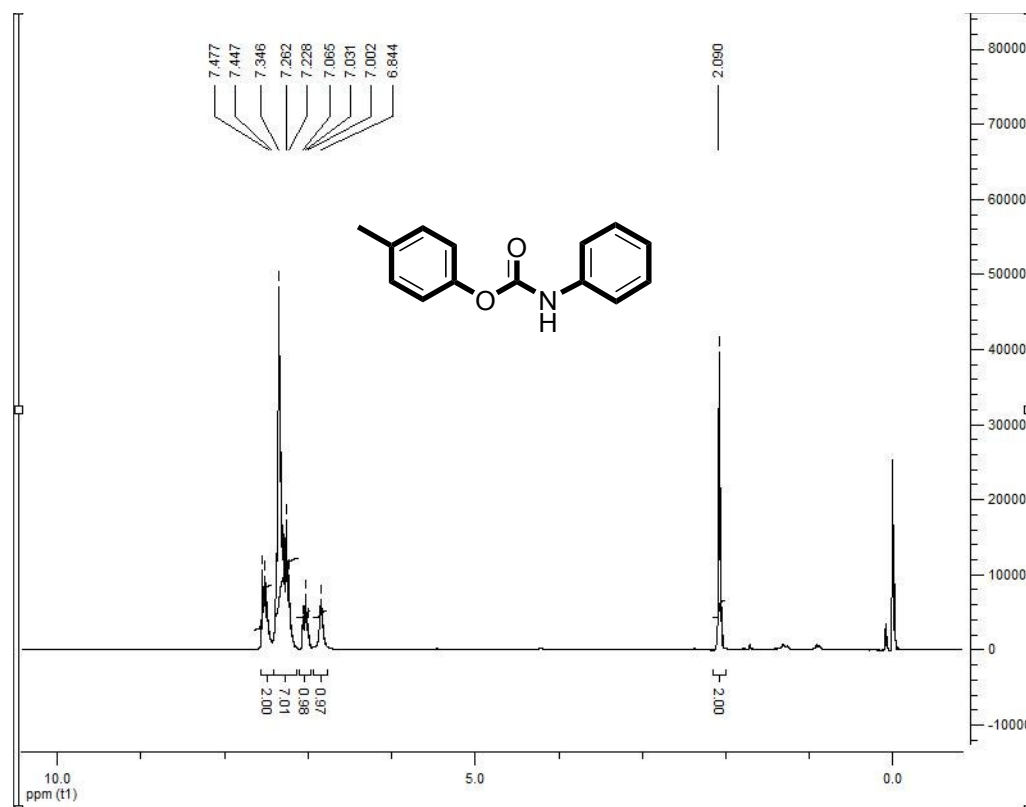
MS of phenyl phenylcarbamate (C14).



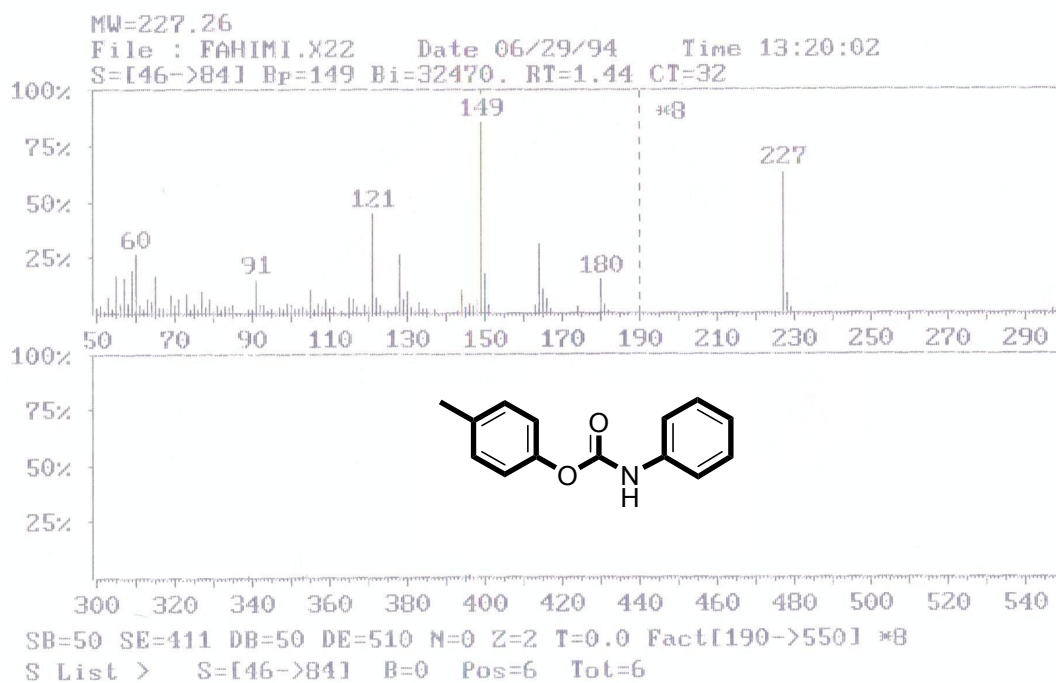
FT-IR spectra of 4-methylphenyl phenylcarbamate (C15) in KBr .



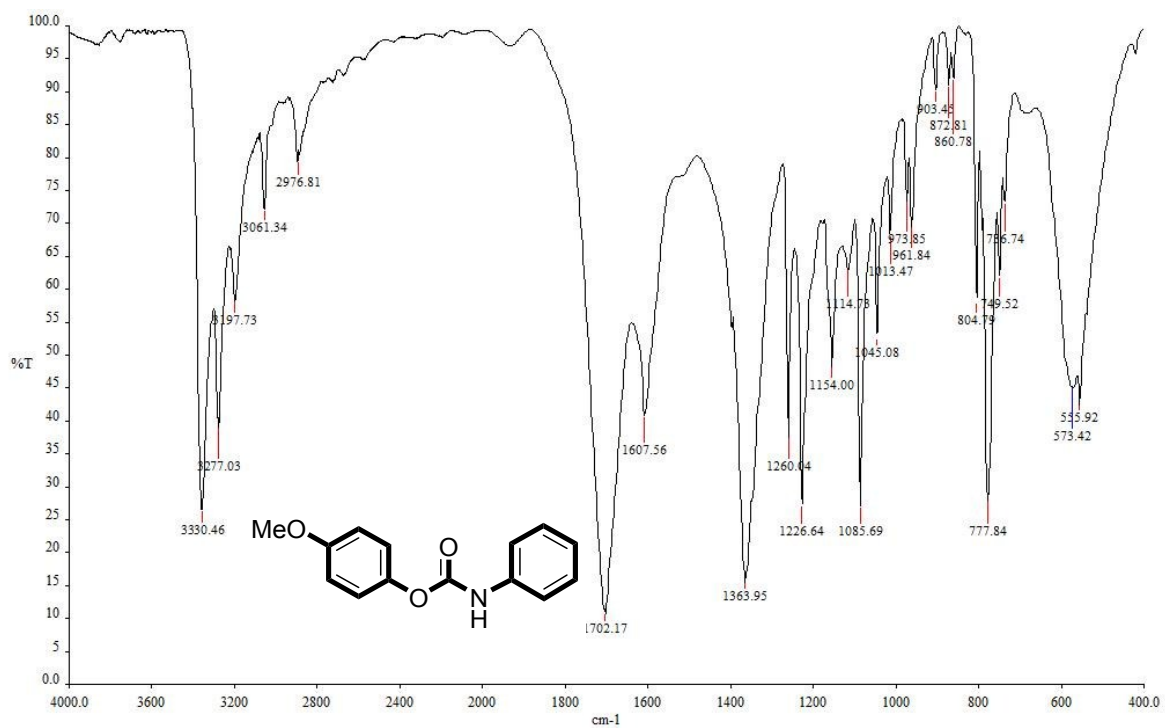
¹³C-NMR spectra (63 MHz) of 4-methylphenyl phenylcarbamate (C15) in CDCl₃.



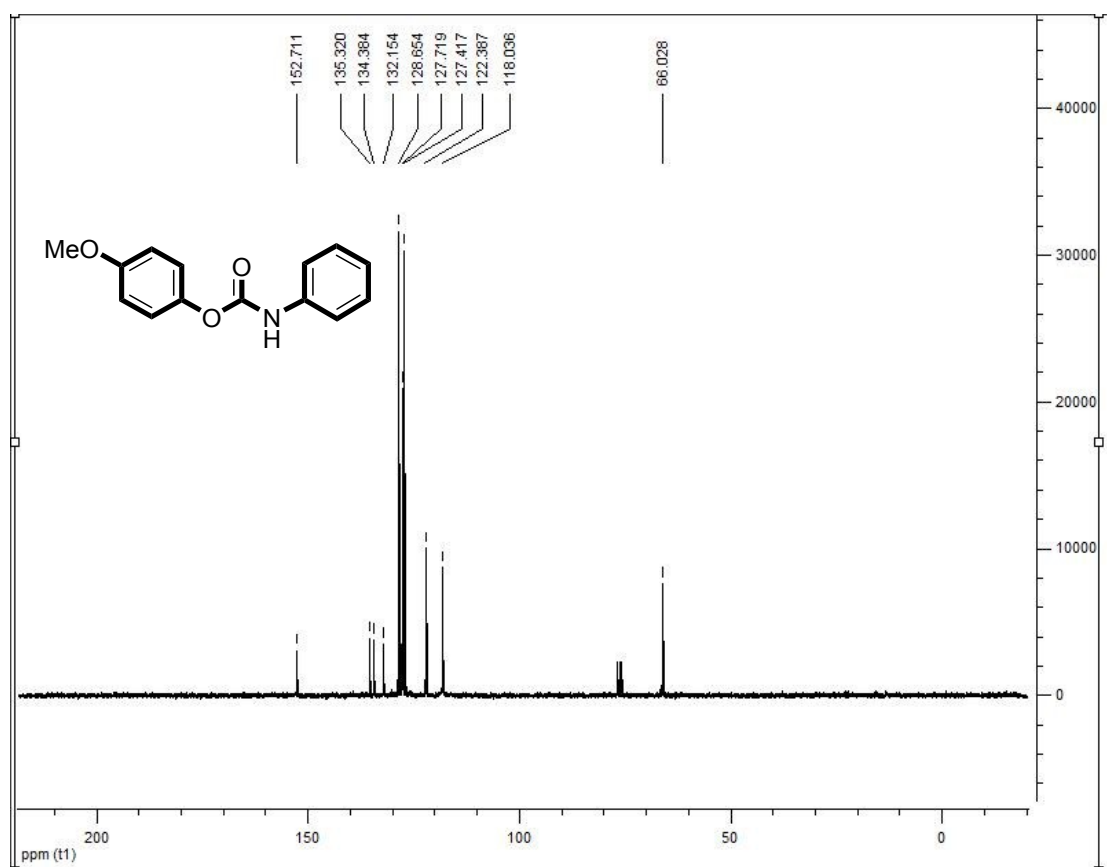
¹H-NMR spectra (250 MHz) of 4-methylphenyl phenylcarbamate (**C15**) in CDCl₃.



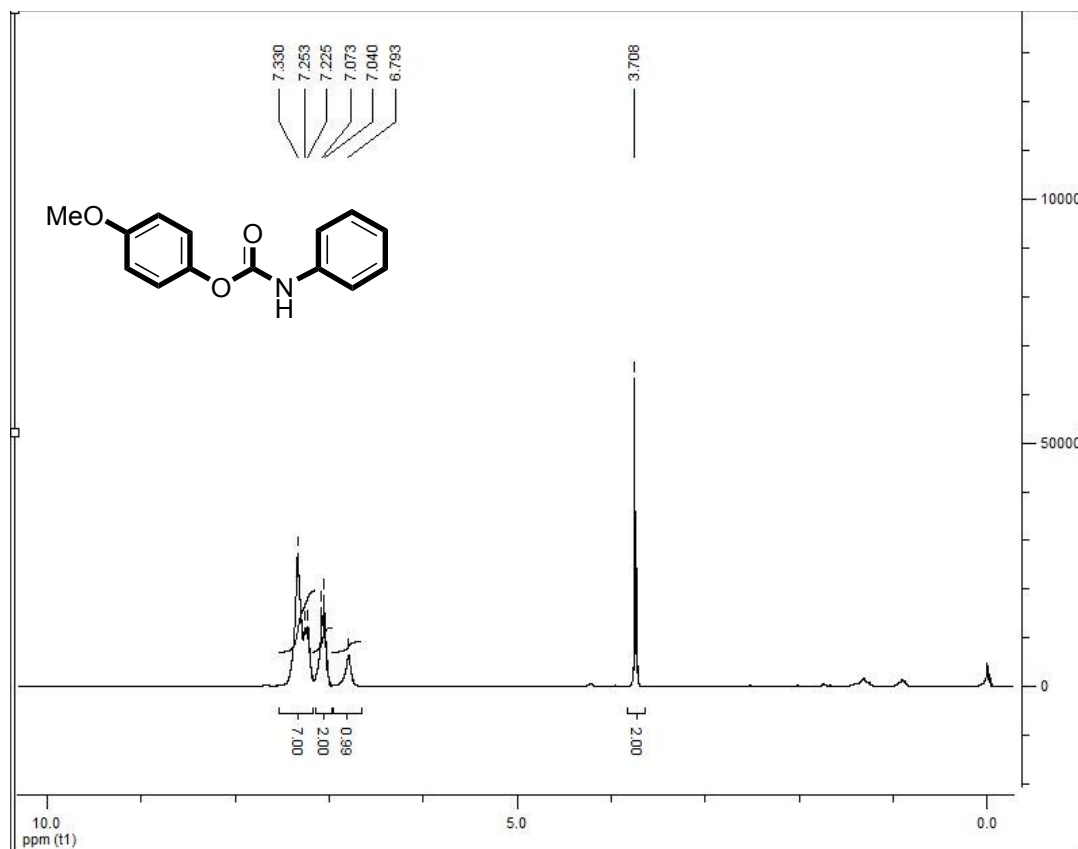
MS of 4-methylphenyl phenylcarbamate (**C15**).



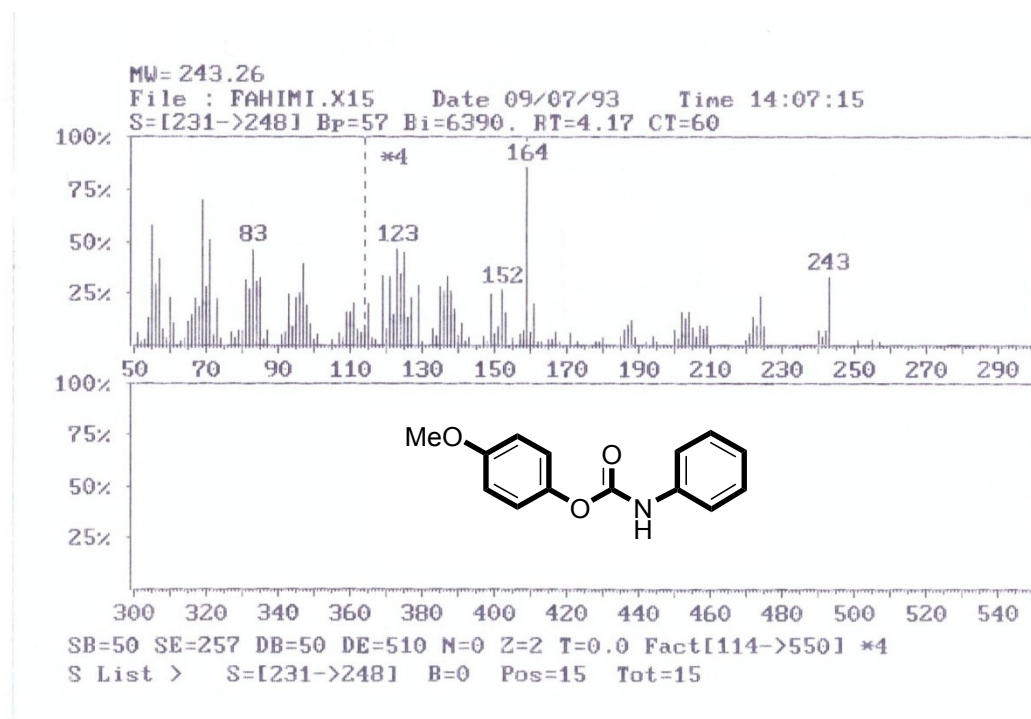
FT-IR spectra of 4-methoxyphenyl phenylcarbamate (**C16**) in KBr .



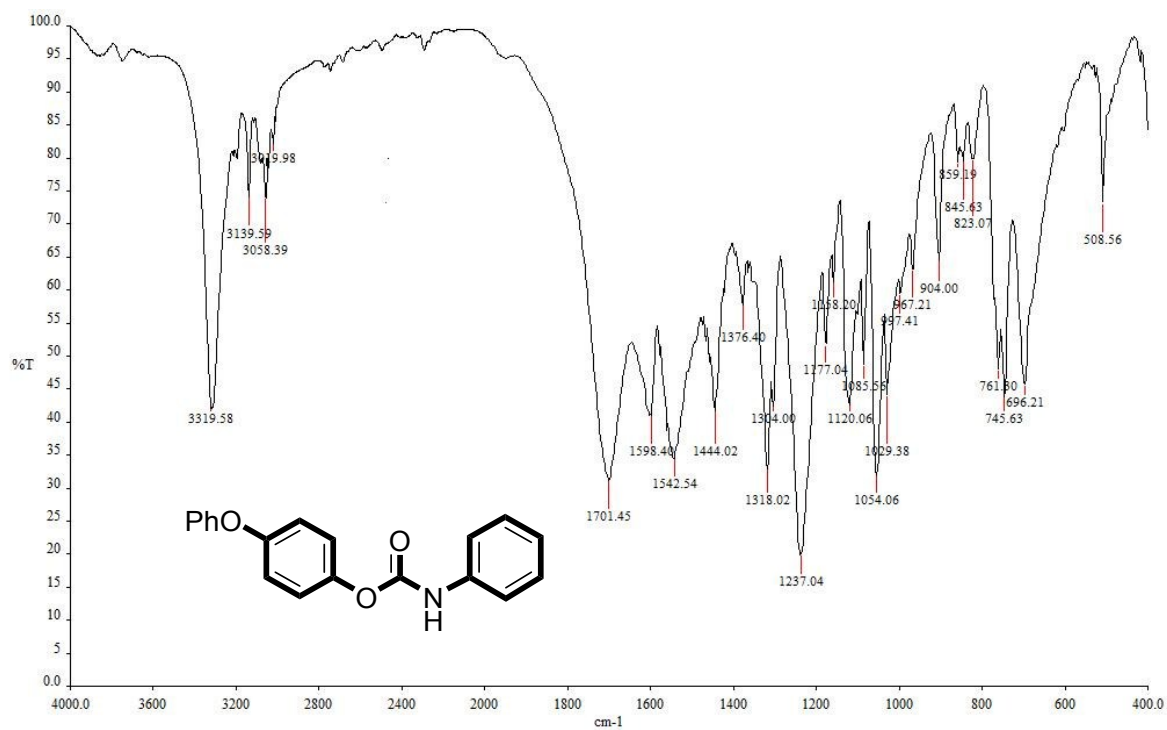
¹³C-NMR spectra (63 MHz) of 4-methoxyphenyl phenylcarbamate (**C16**) in CDCl₃.



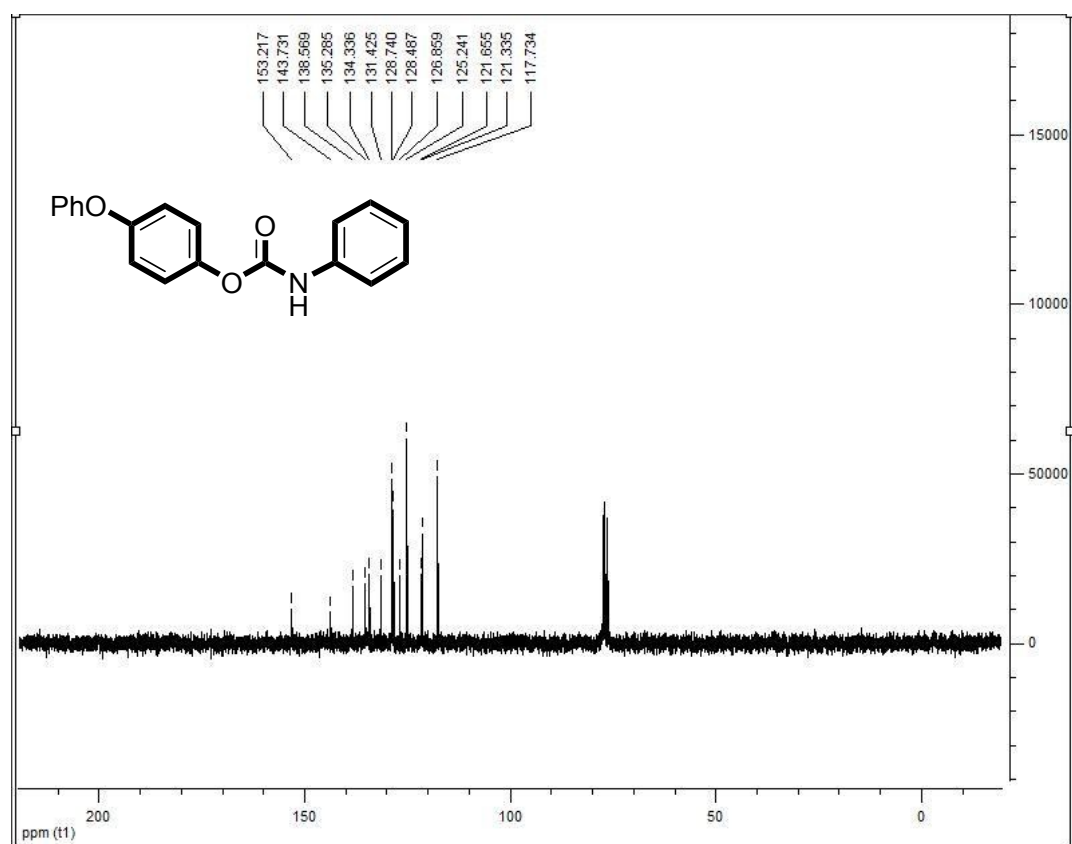
¹H-NMR spectra (250 MHz) of 4-methoxyphenyl phenylcarbamate (C16) in CDCl₃.



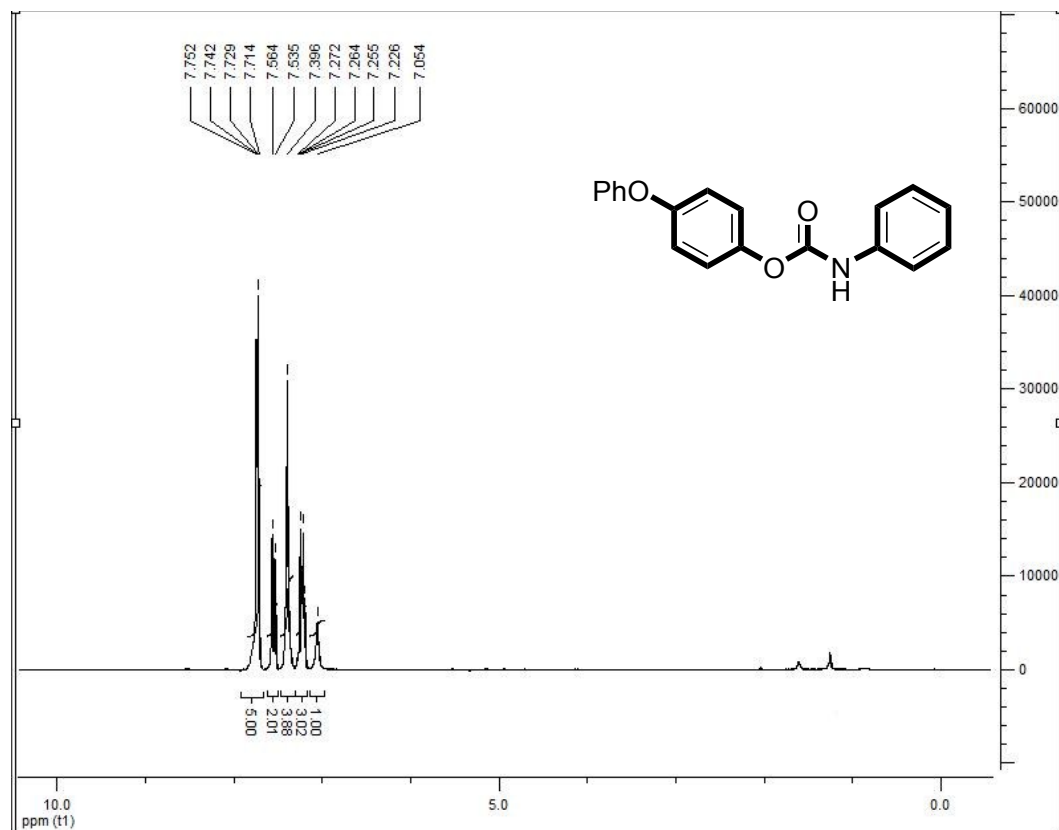
MS of 4-methoxyphenyl phenylcarbamate (C16).



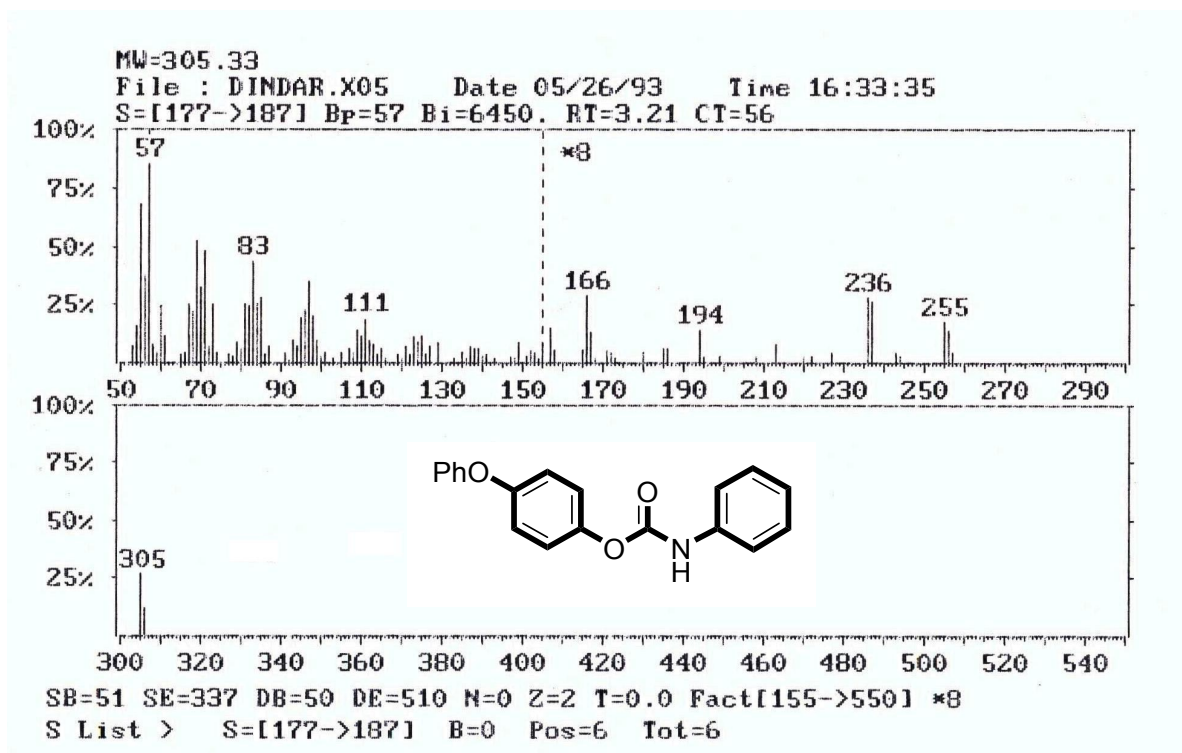
FT-IR spectra of 4-phenoxyphenyl phenylcarbamate (**C17**) in KBr .



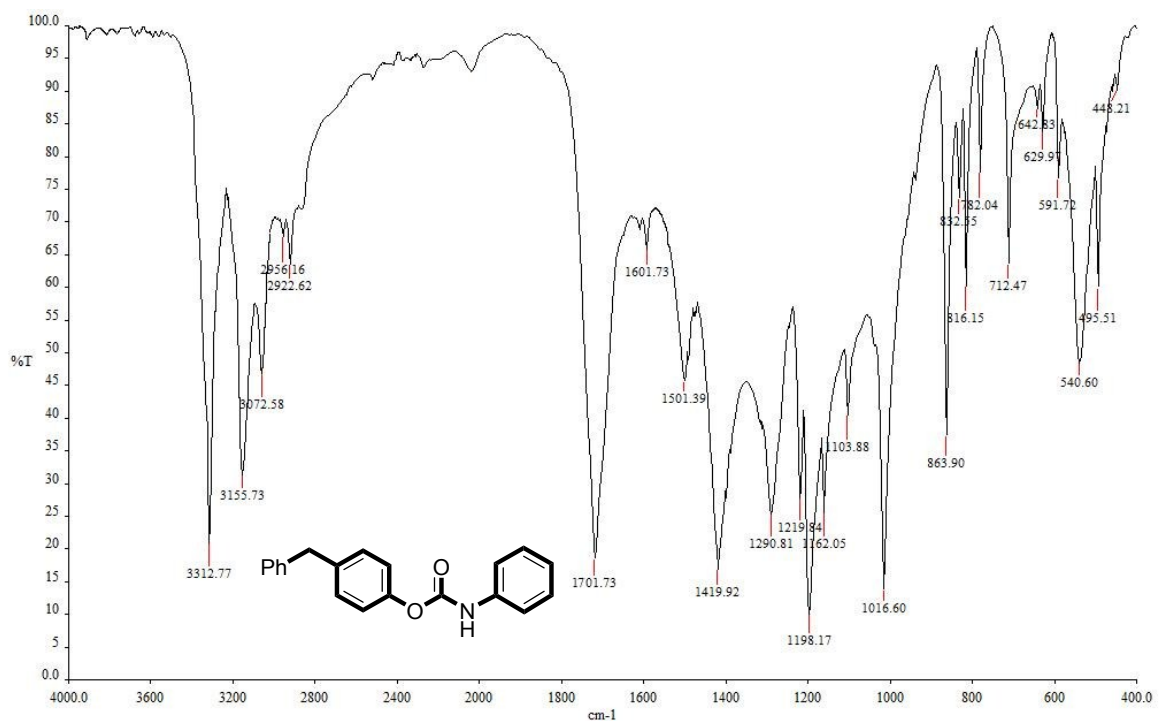
¹³C-NMR spectra (63 MHz) of 4-phenoxyphenyl phenylcarbamate (**C17**) in CDCl₃.



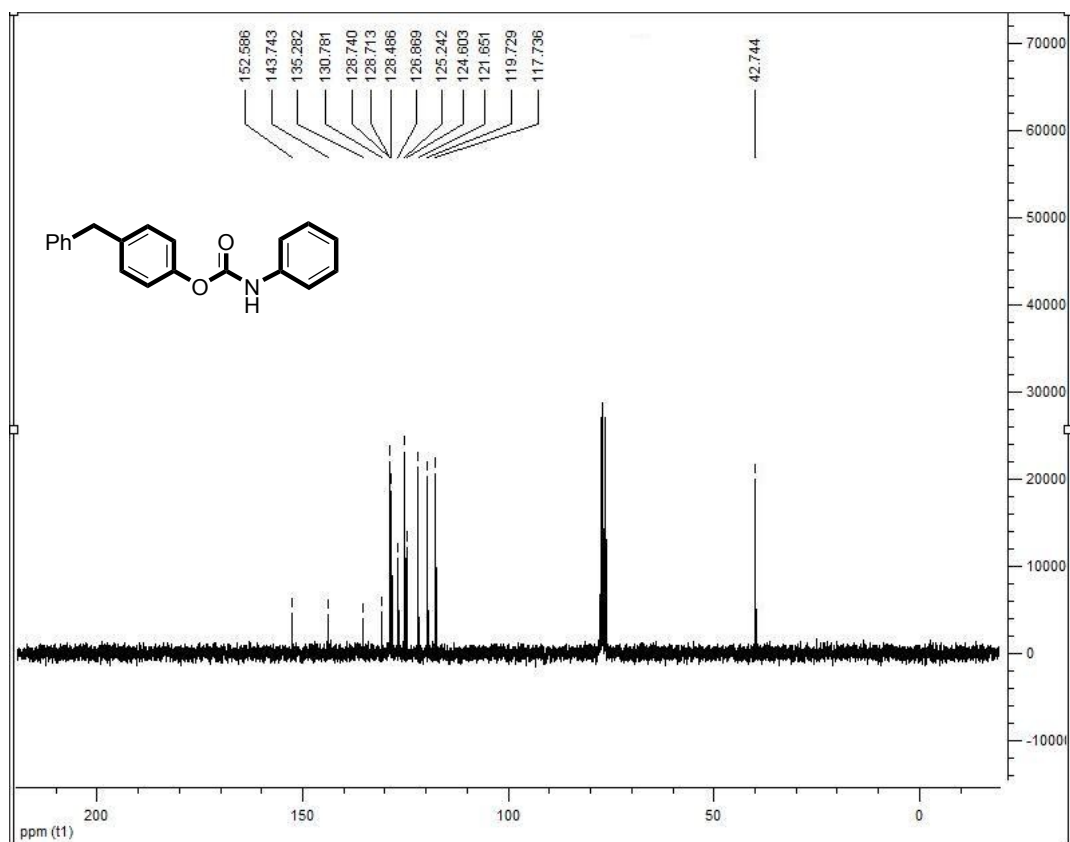
¹H-NMR spectra (250 MHz) of 4-phenoxyphenyl phenylcarbamate (C17) in CDCl₃.



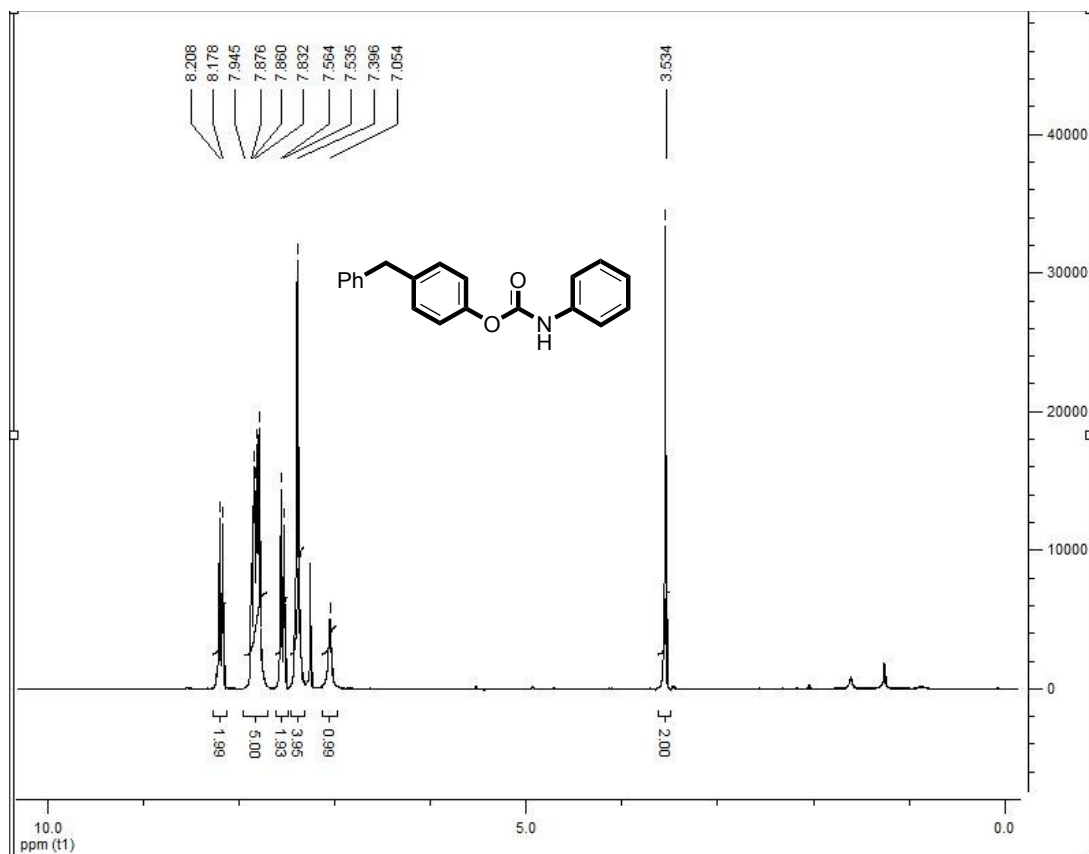
MS of 4-phenoxyphenyl phenylcarbamate (C17).



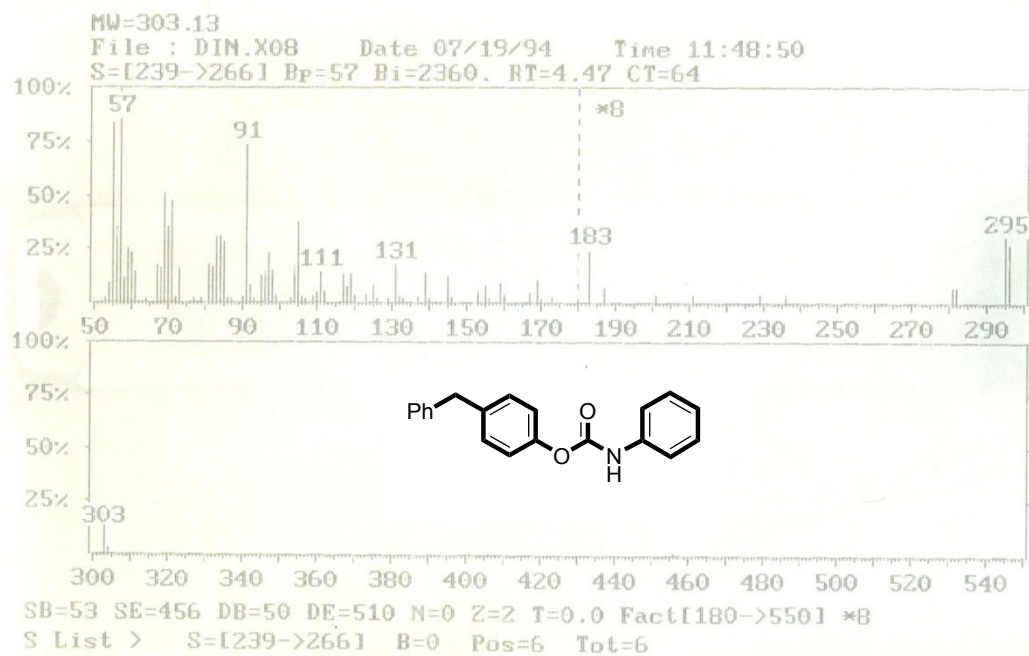
FT-IR spectra of 4-benzylphenyl phenylcarbamate (C18) in KBr .



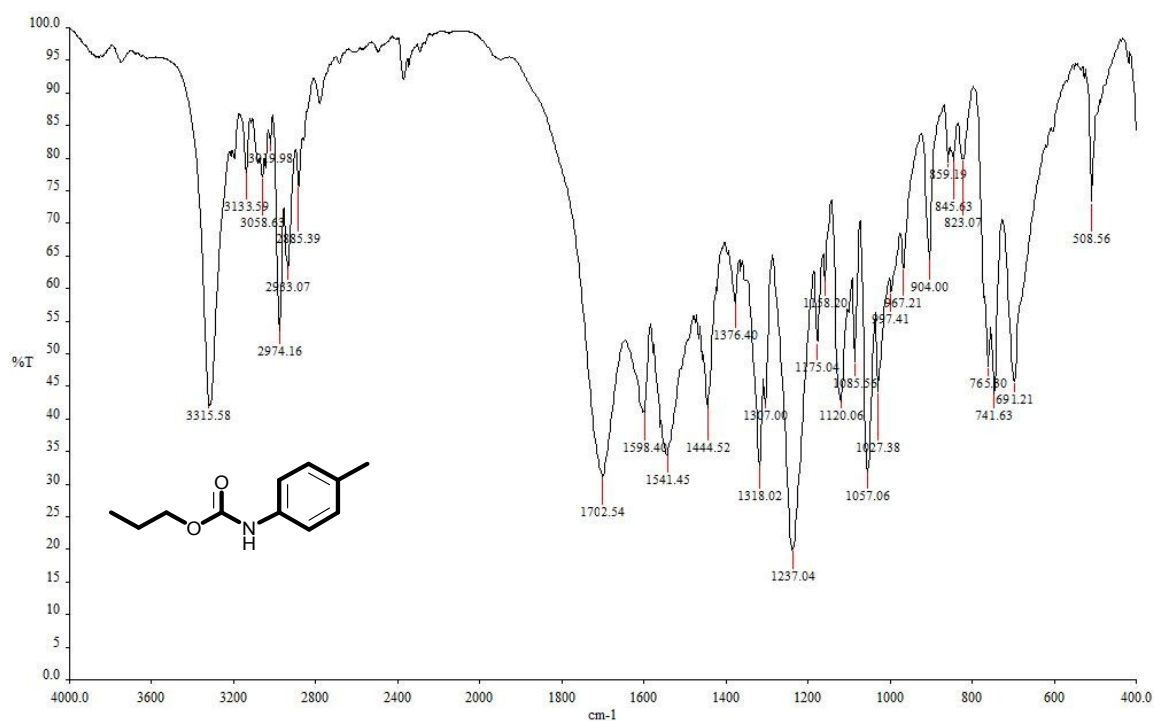
¹³C-NMR spectra (63 MHz) of 4-benzylphenyl phenylcarbamate (C18) in CDCl₃.



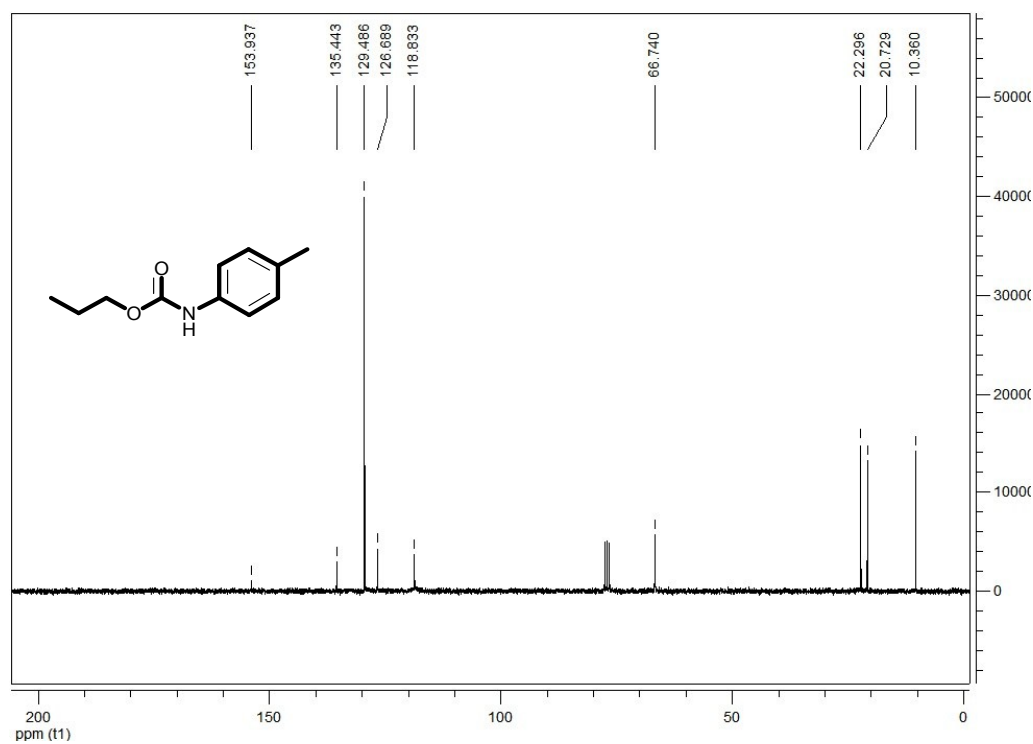
¹H-NMR spectra (250 MHz) of 4-benzylphenyl phenylcarbamate (C18) in CDCl₃.



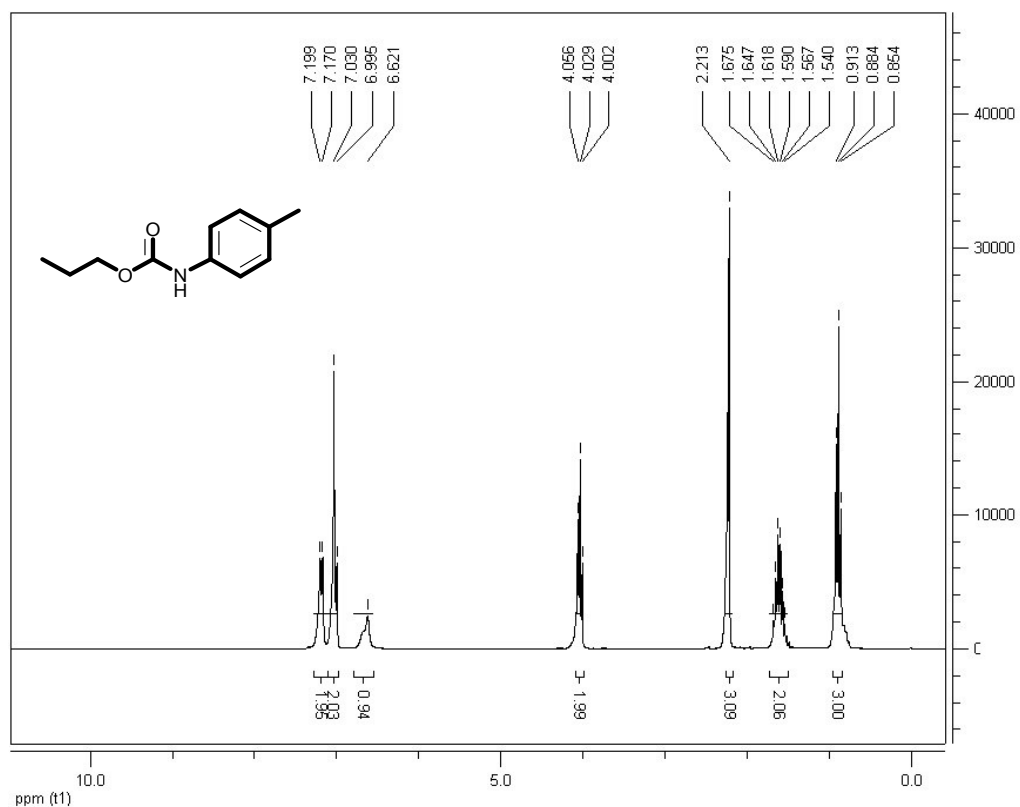
MS of 4-benzylphenyl phenylcarbamate (C18).



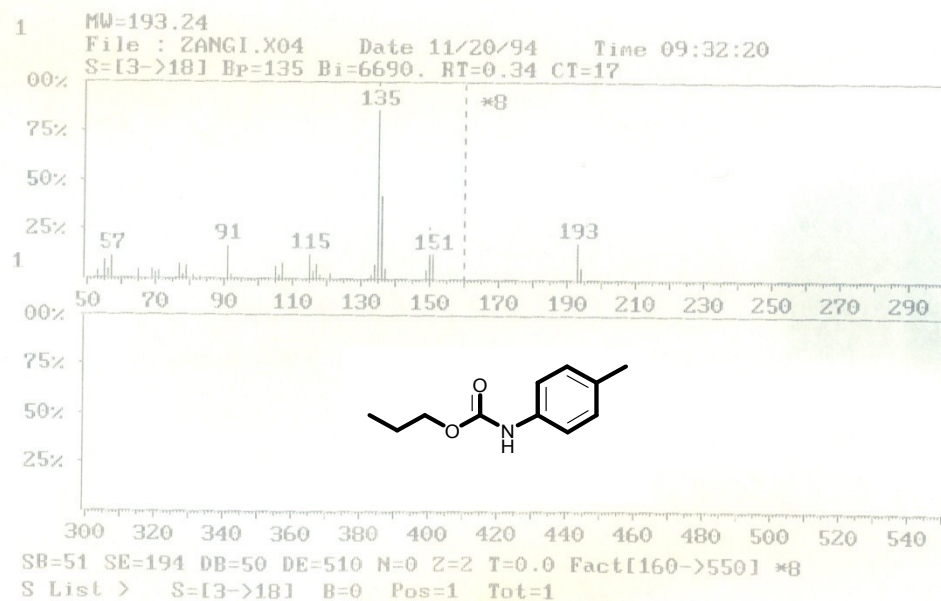
FT-IR spectra of 1-propyl (4-methylphenyl)carbamate (C21) in KBr .



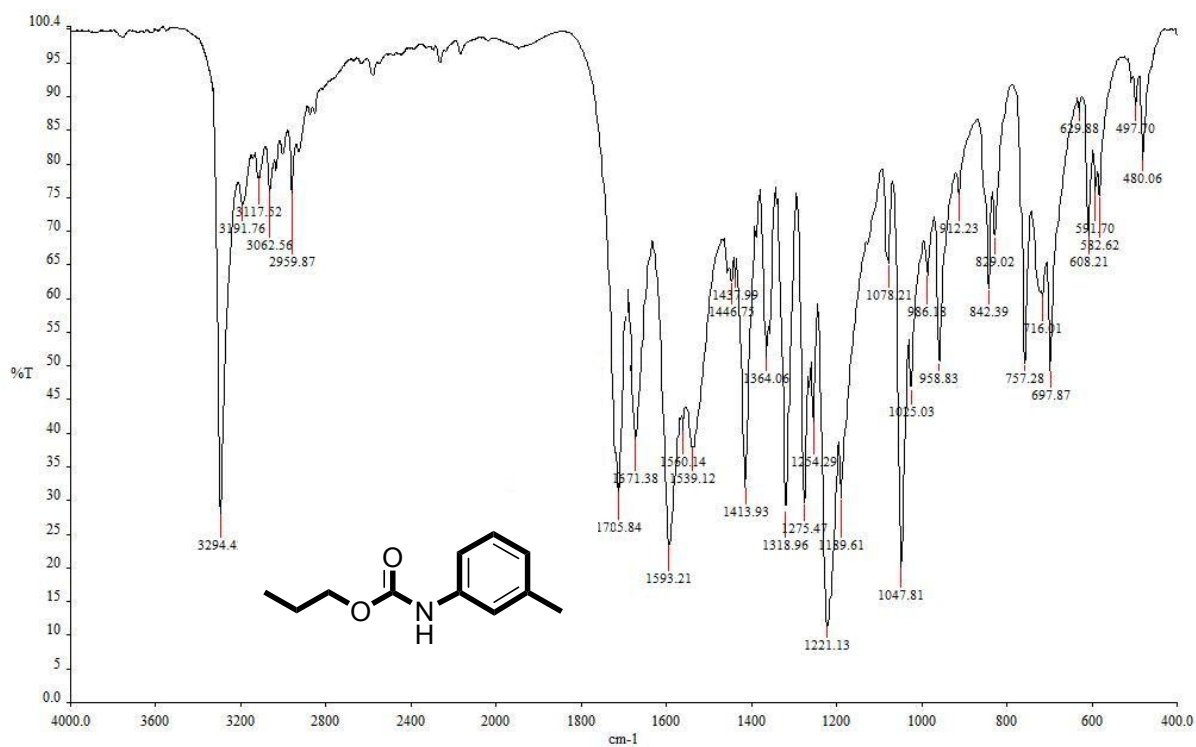
¹³C-NMR spectra (63 MHz) of 1-propyl (4-methylphenyl)carbamate (C21) in CDCl₃.



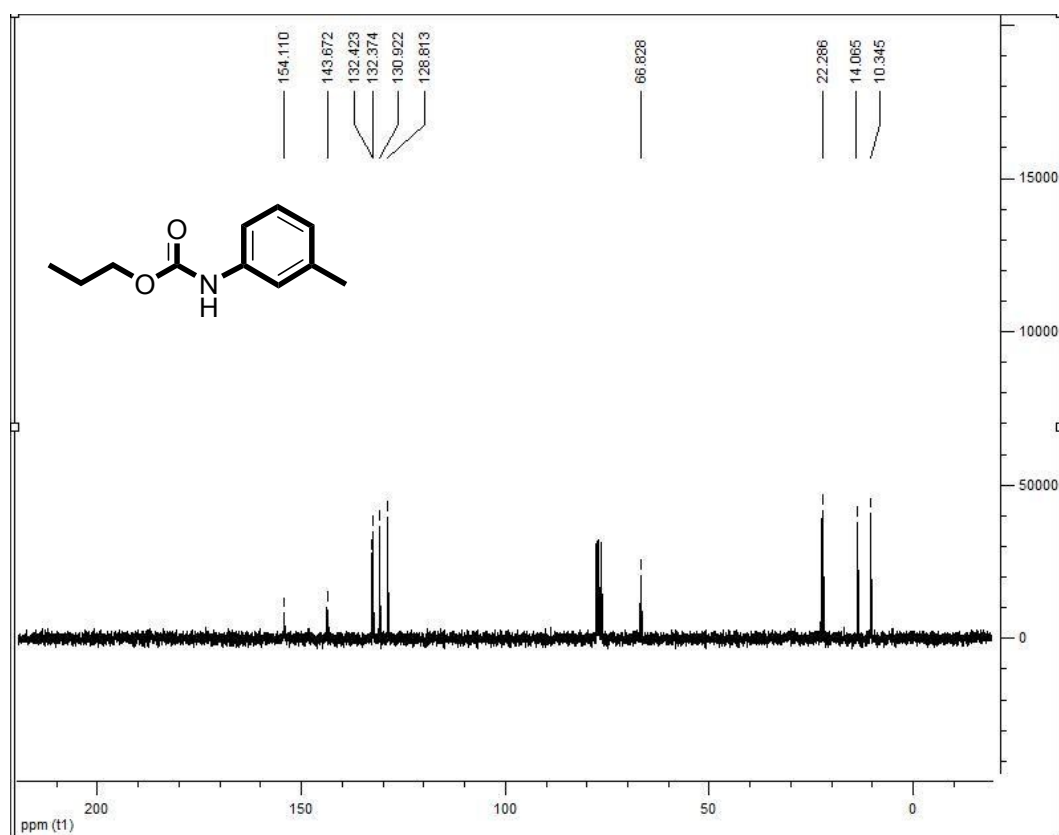
¹H-NMR spectra (250 MHz) of 1-propyl (4-methylphenyl)carbamate (C21) in CDCl₃.



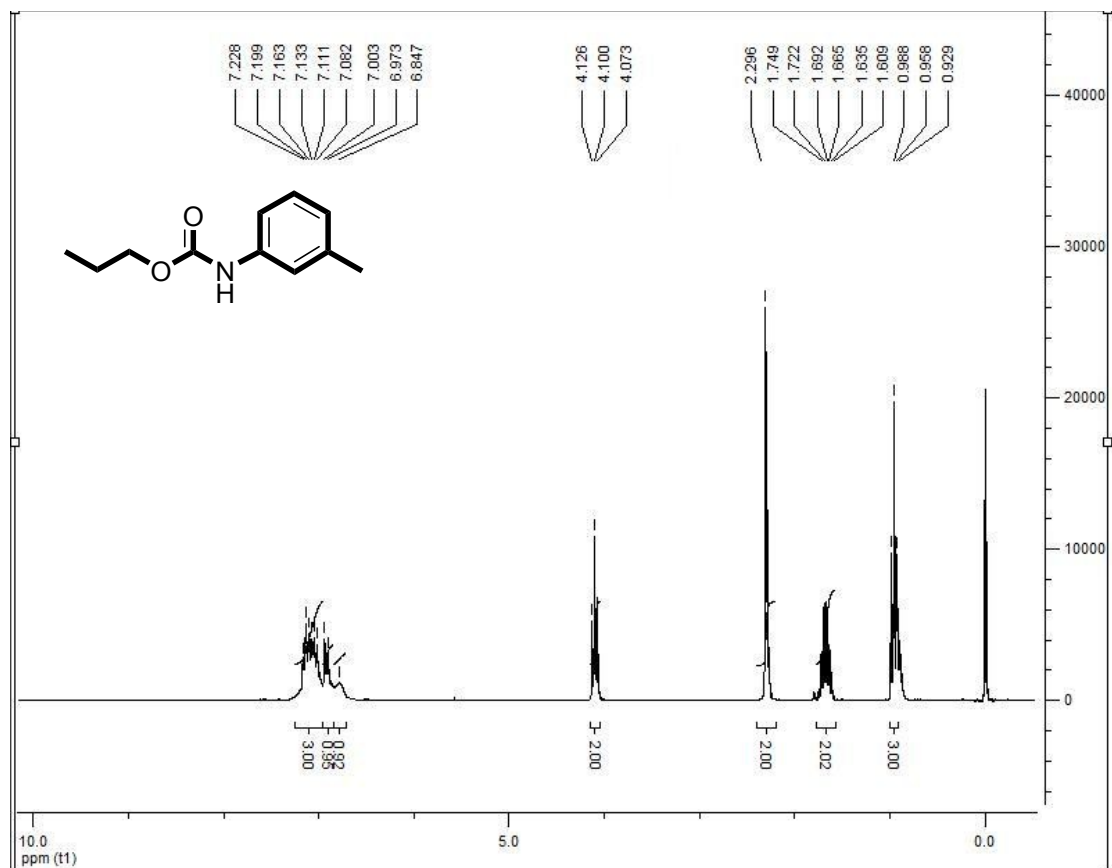
MS of 1-propyl (4-methylphenyl)carbamate (C21).



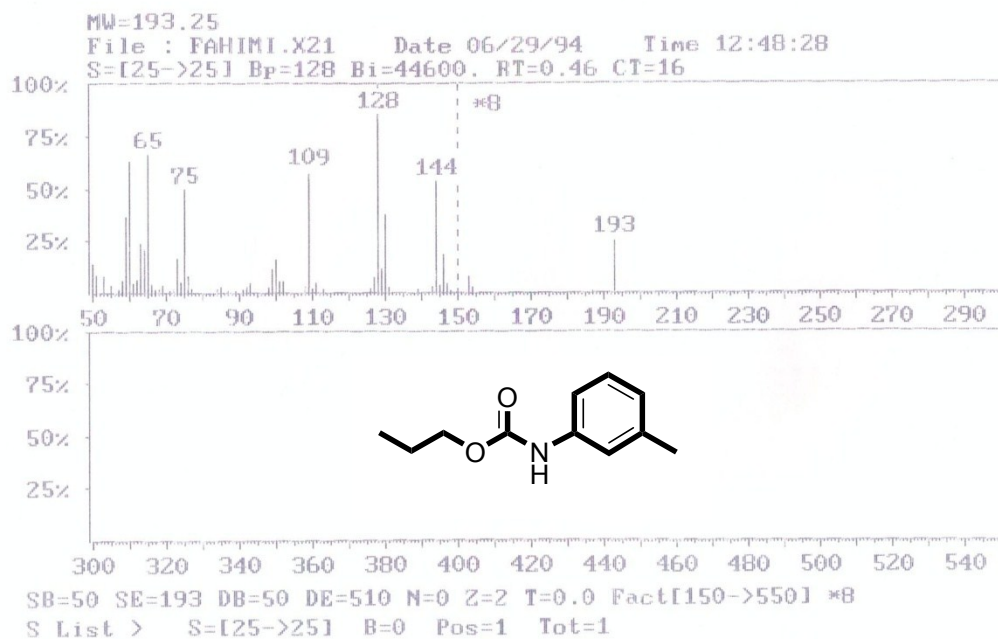
FT-IR spectra of 1-propyl (3-methylphenyl)carbamate (C22) in KBr .



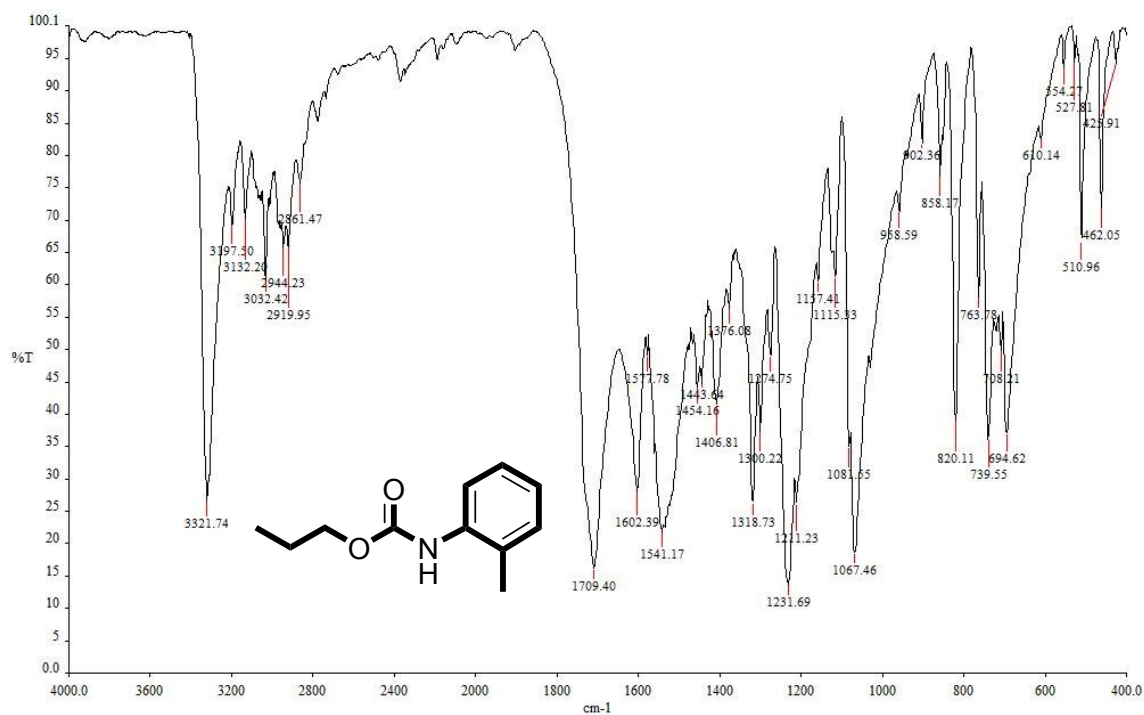
¹³C-NMR spectra (63 MHz) of 1-propyl (3-methylphenyl)carbamate (C22) in CDCl₃.



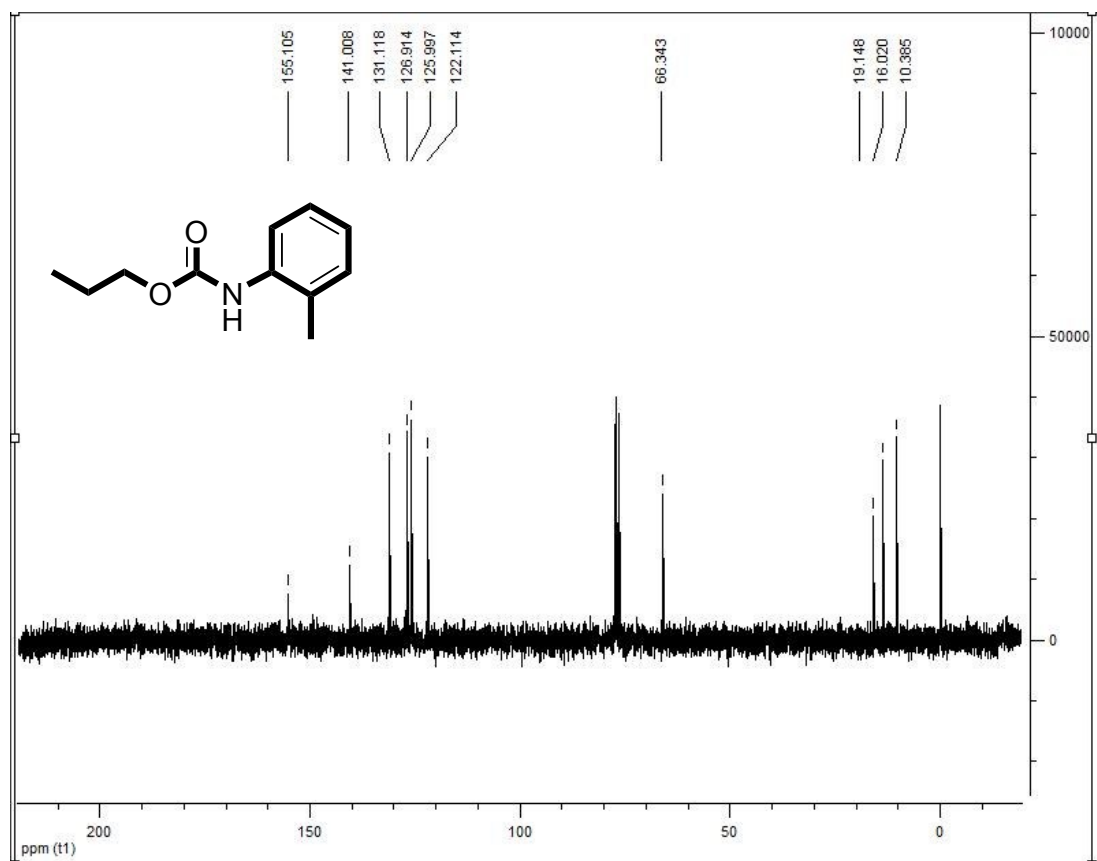
¹H-NMR spectra (250 MHz) of 1-propyl (3-methylphenyl)carbamate (**C22**) in CDCl₃.



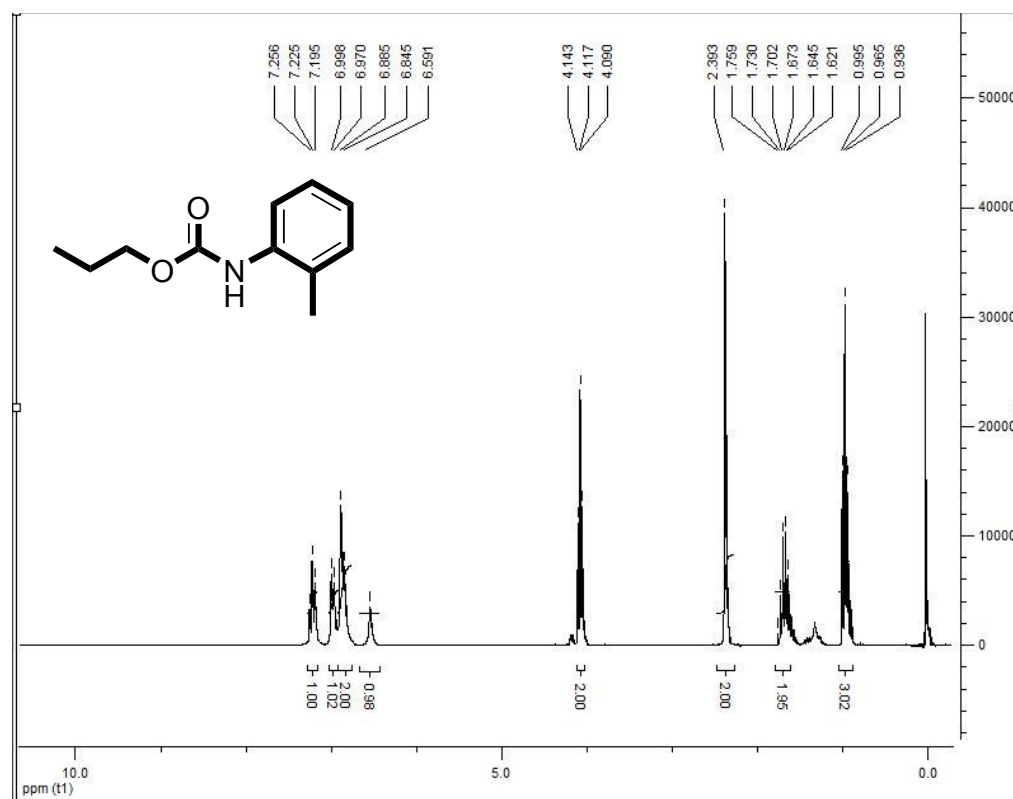
MS of 1-propyl (3-methylphenyl)carbamate (**C22**).



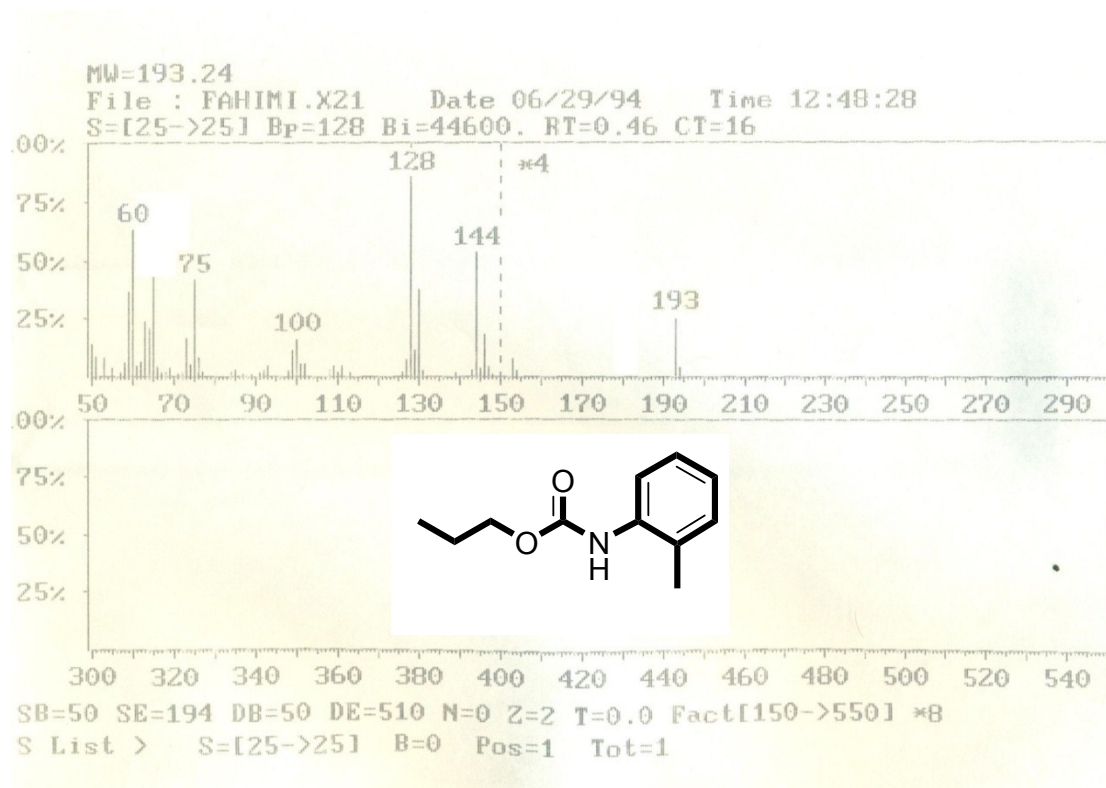
FT-IR spectra of 1-propyl (2-methylphenyl)carbamate (**C23**) in KBr .



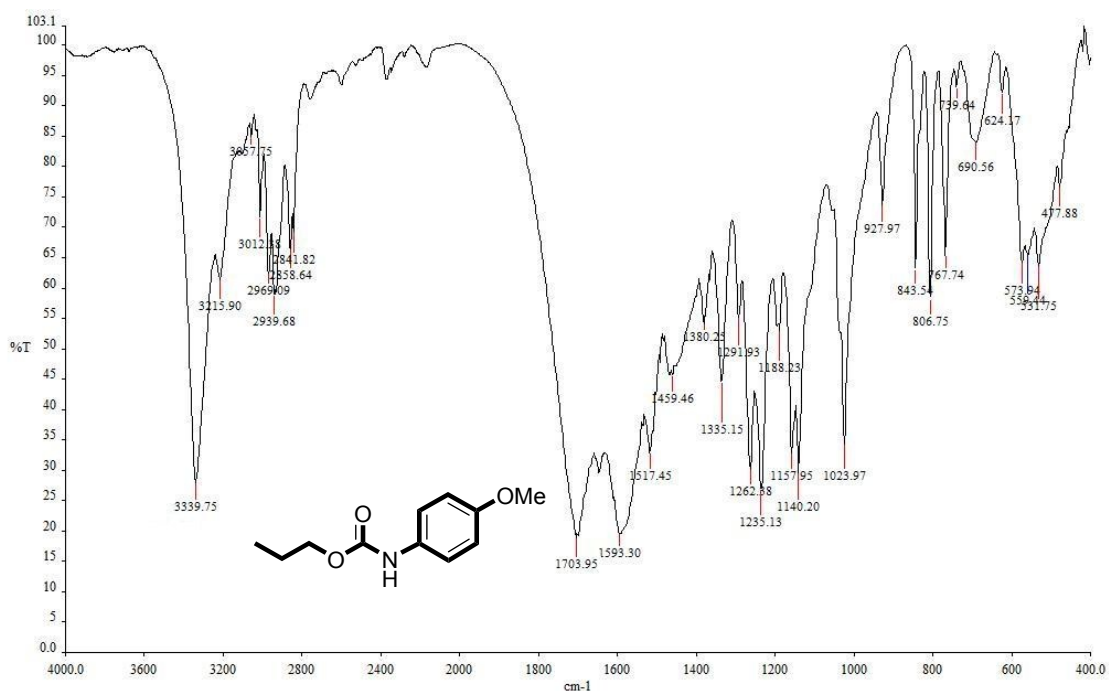
¹³C-NMR spectra (63 MHz) of 1-propyl (2-methylphenyl)carbamate (**C23**) in CDCl₃.



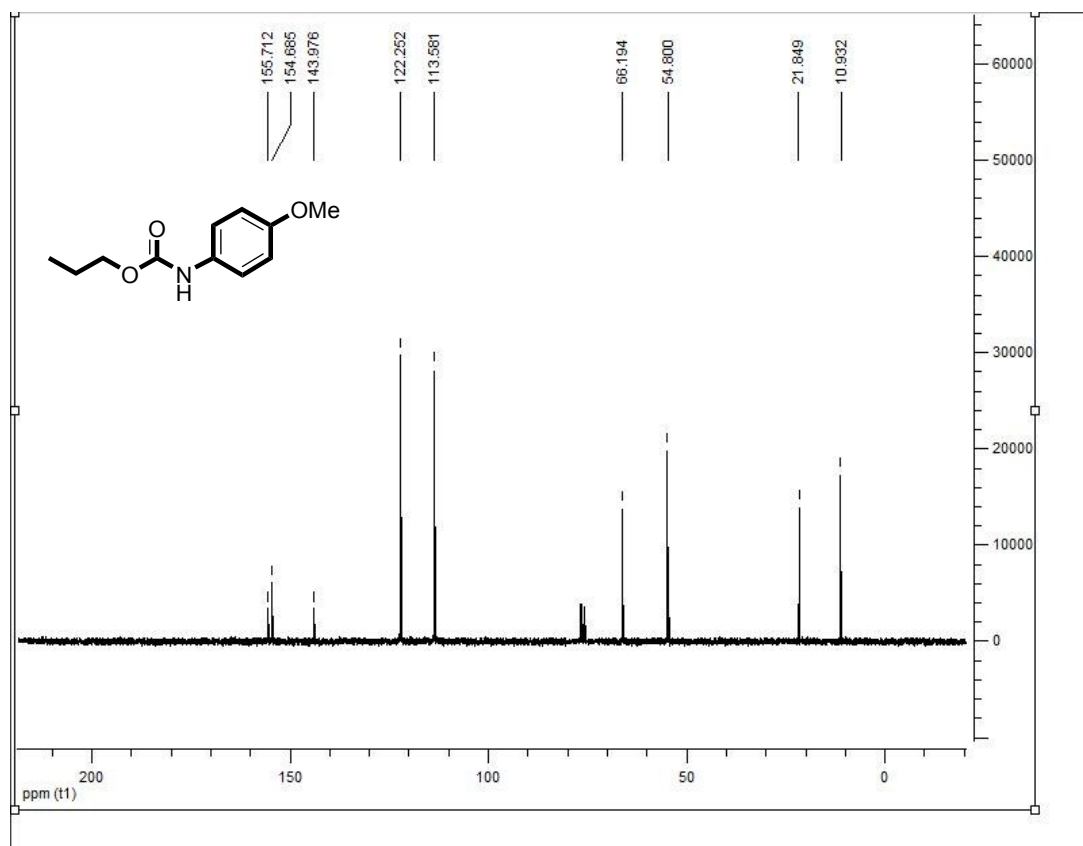
¹H-NMR spectra (250 MHz) of 1-propyl (2-methylphenyl)carbamate (**C23**) in CDCl₃.



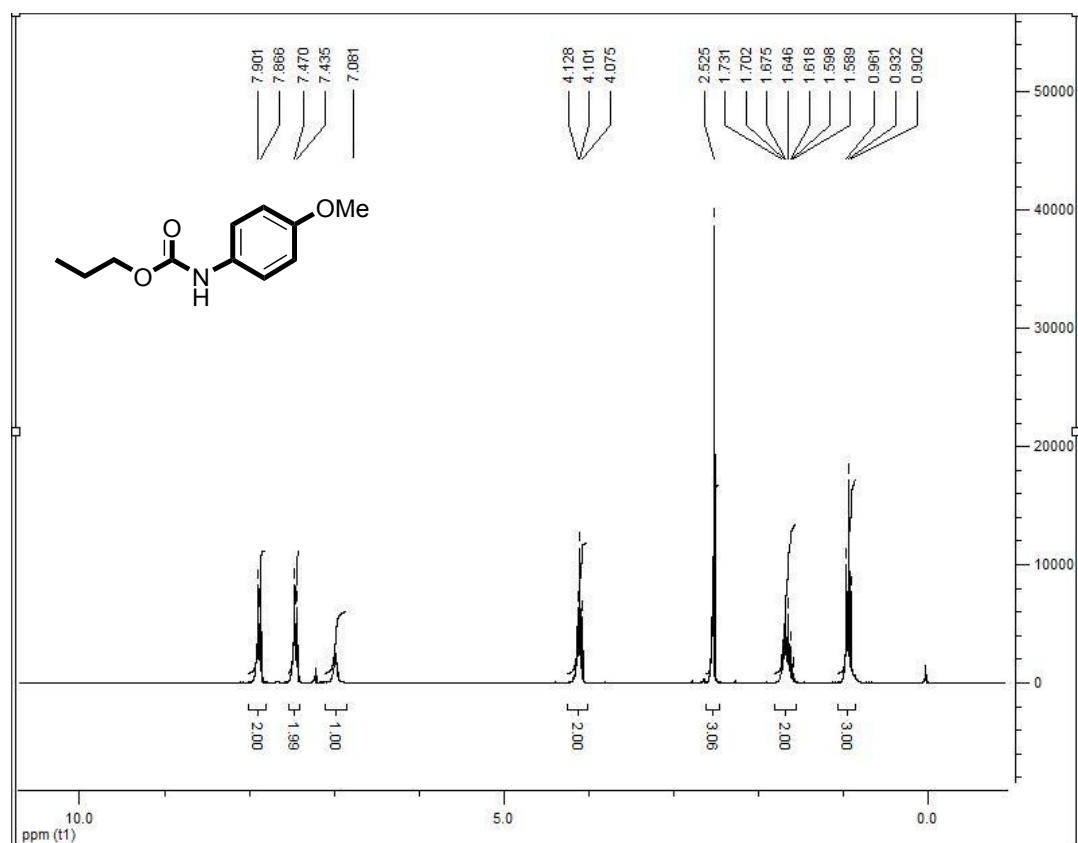
MS of 1-propyl (2-methylphenyl)carbamate (**C23**).



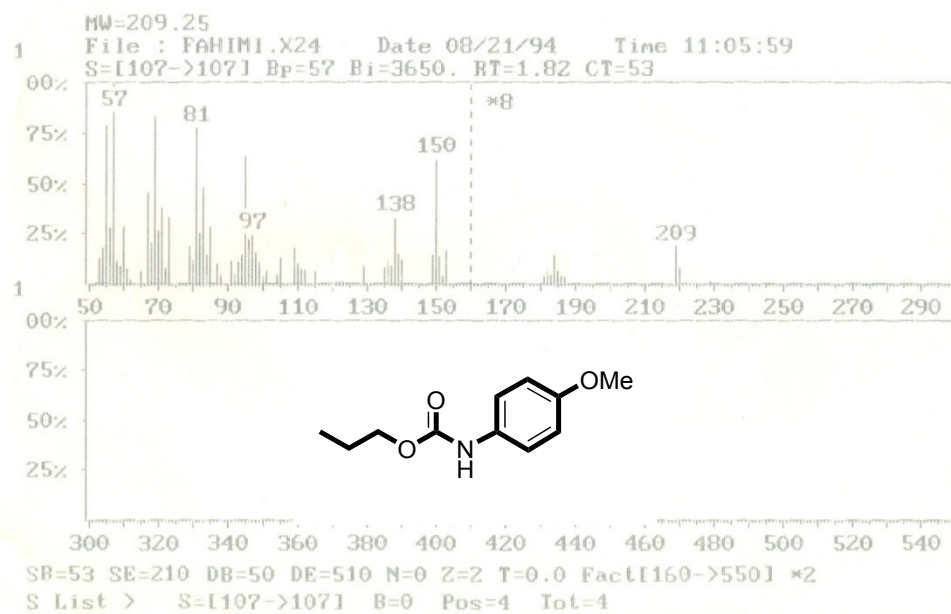
FT-IR spectra of 1-propyl (4-methoxyphenyl)carbamate (C24) in KBr .



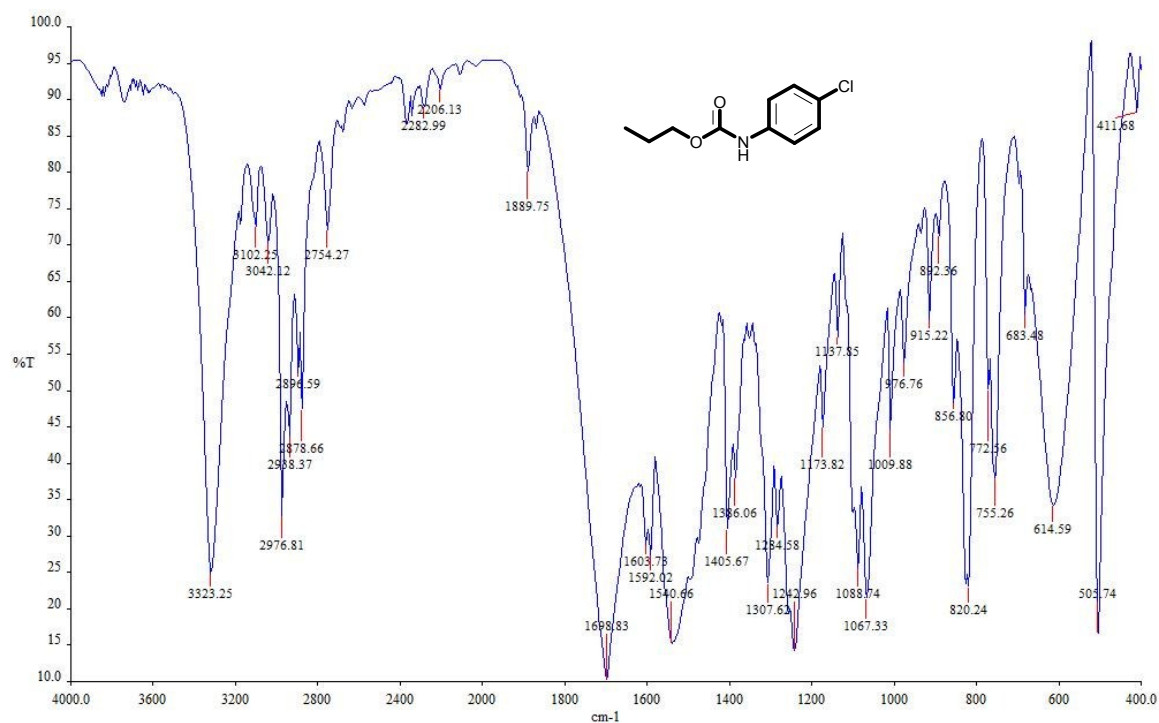
¹³C-NMR spectra (63 MHz) of 1-propyl (4-methoxyphenyl)carbamate (C24) in CDCl₃.



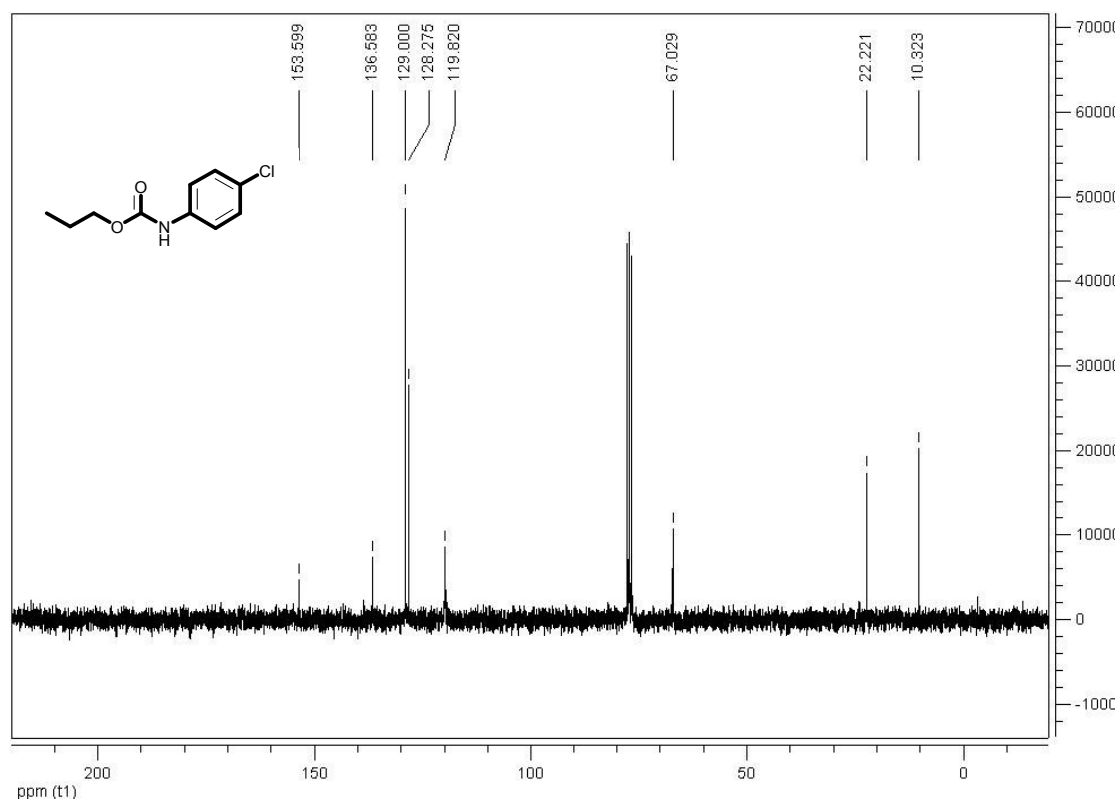
¹H-NMR spectra (250 MHz) of 1-propyl (4-methoxyphenyl)carbamate (C24) in CDCl₃.



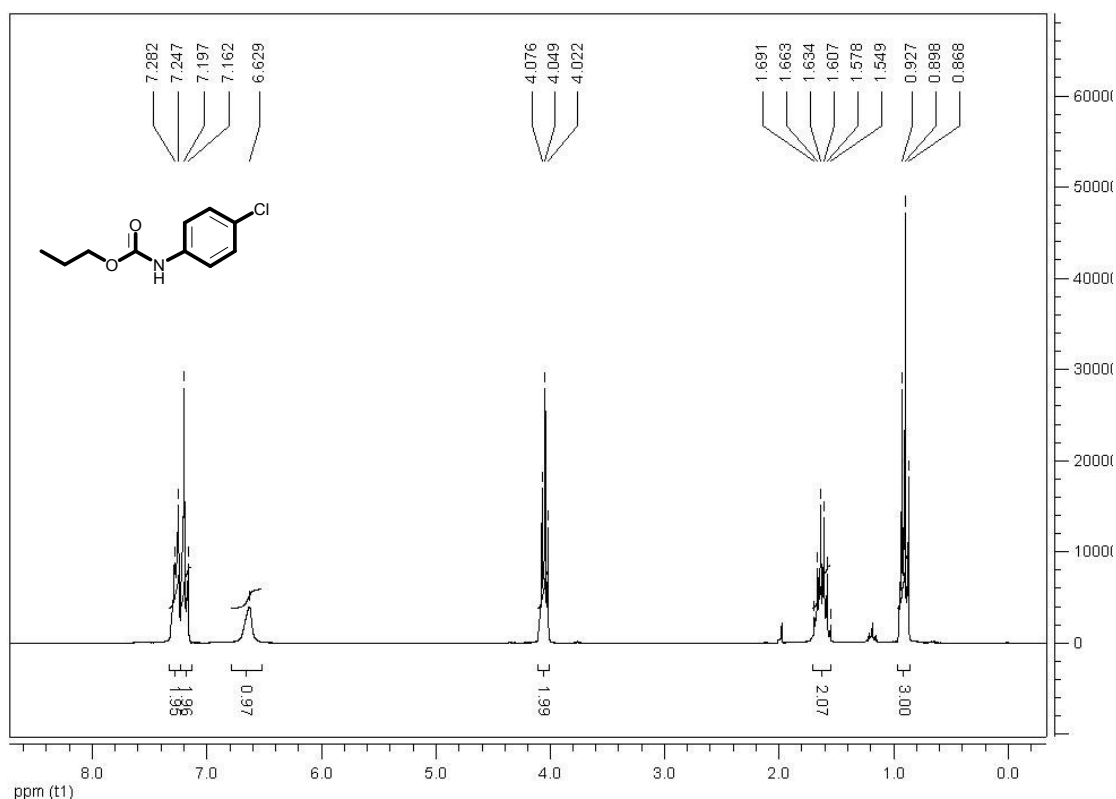
MS of 1-propyl (4-methoxyphenyl)carbamate (C24).



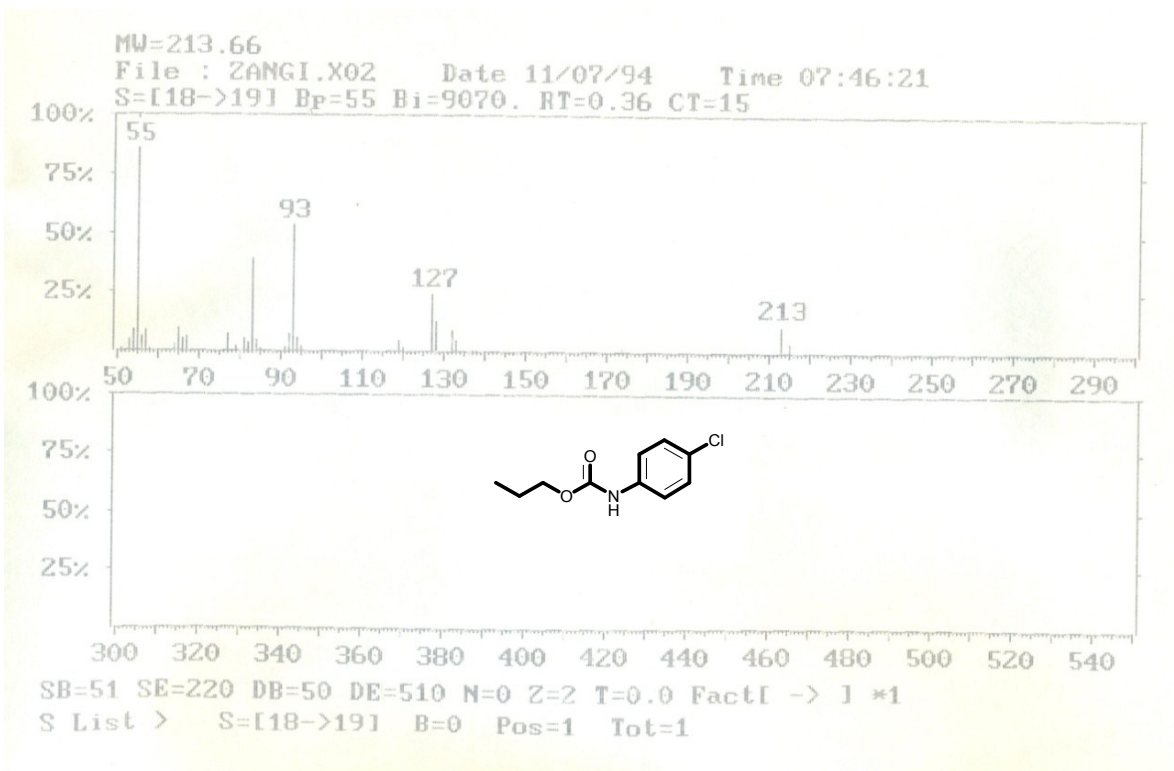
FT-IR spectra of 1-propyl (4-chlorophenyl)carbamate (**C25**) in KBr.



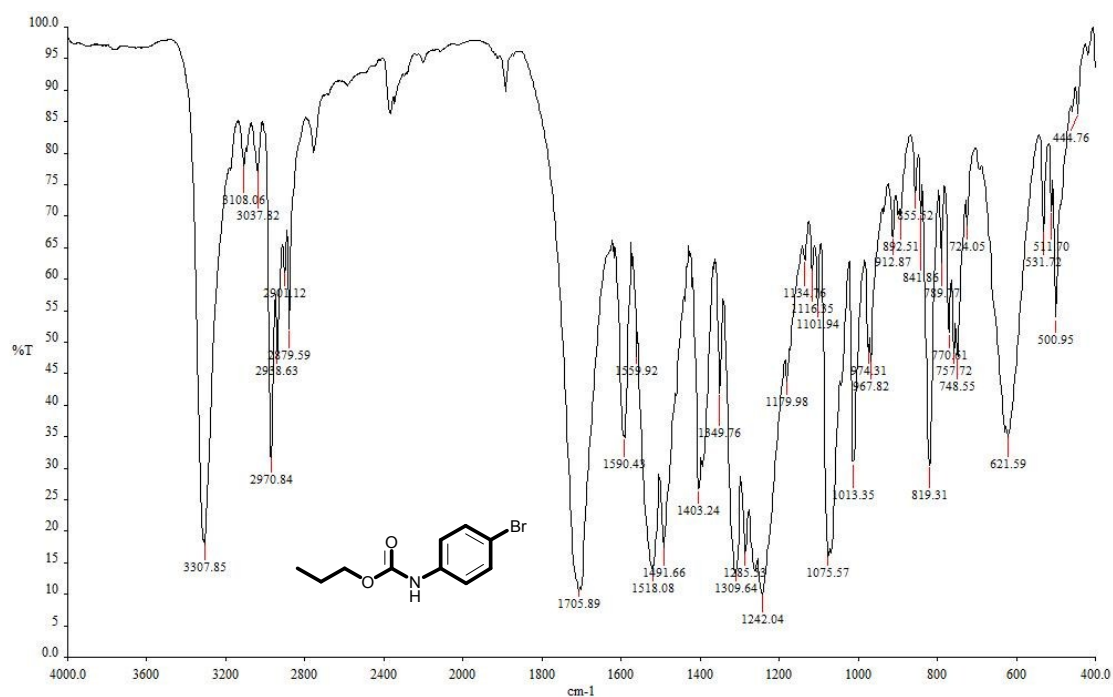
¹³C-NMR spectra (63 MHz) of 1-propyl (4-chlorophenyl)carbamate (**C25**) in CDCl₃



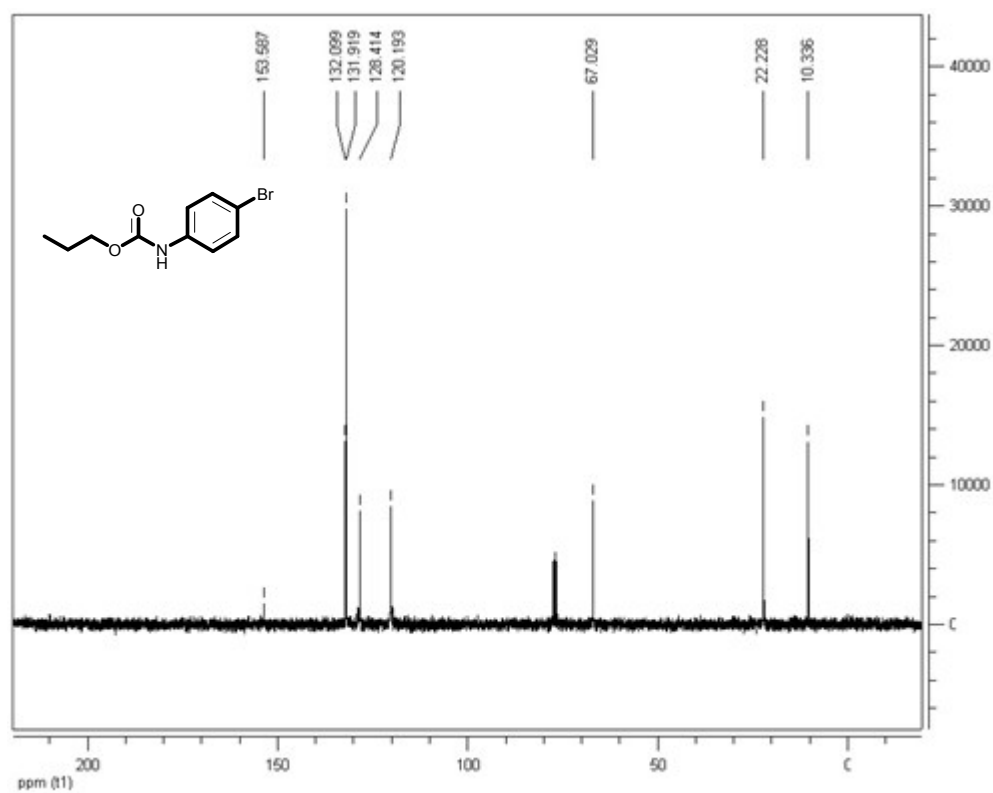
¹H-NMR spectra (250 MHz) of 1-propyl (4-chlorophenyl)carbamate (**C25**) in CDCl₃.



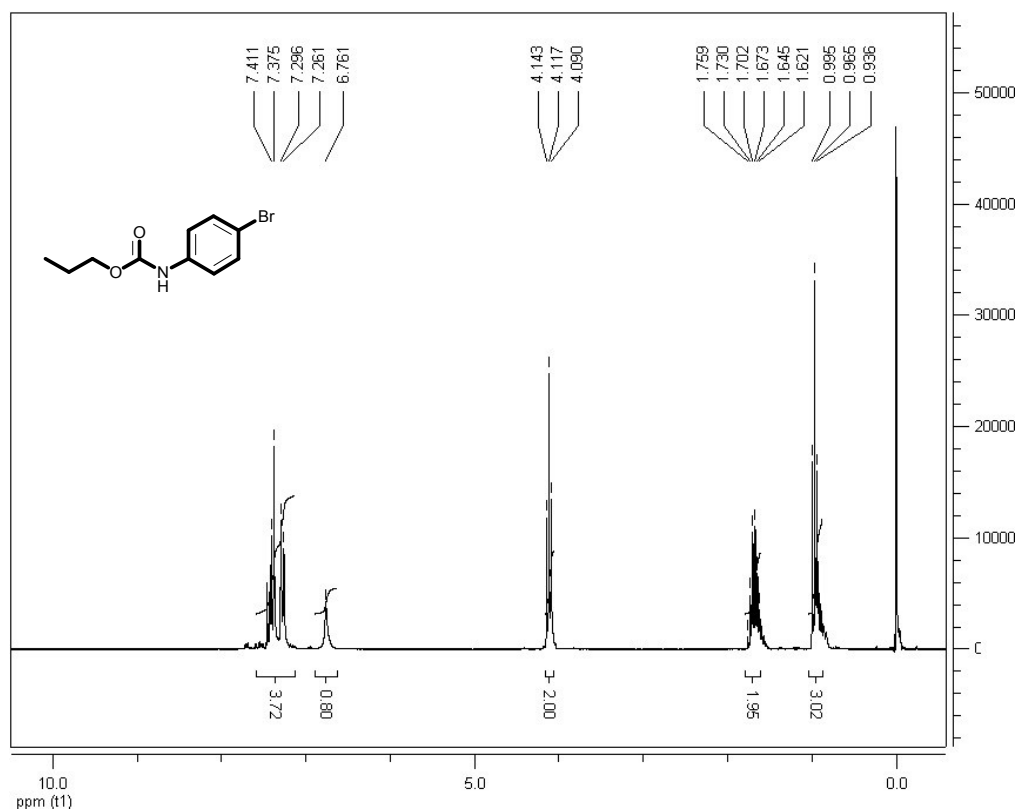
MS of 1-propyl (4-chlorophenyl)carbamate (**C25**).



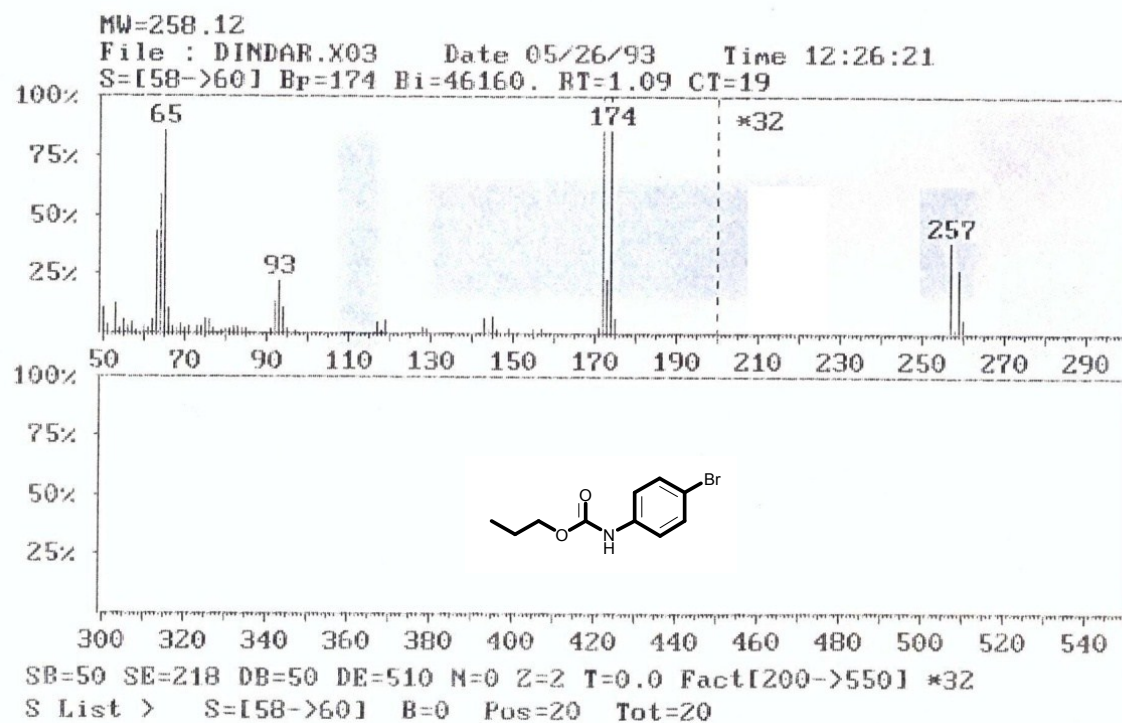
FT-IR spectra of 1-propyl (4-bromophenyl)carbamate (C26) in KBr .



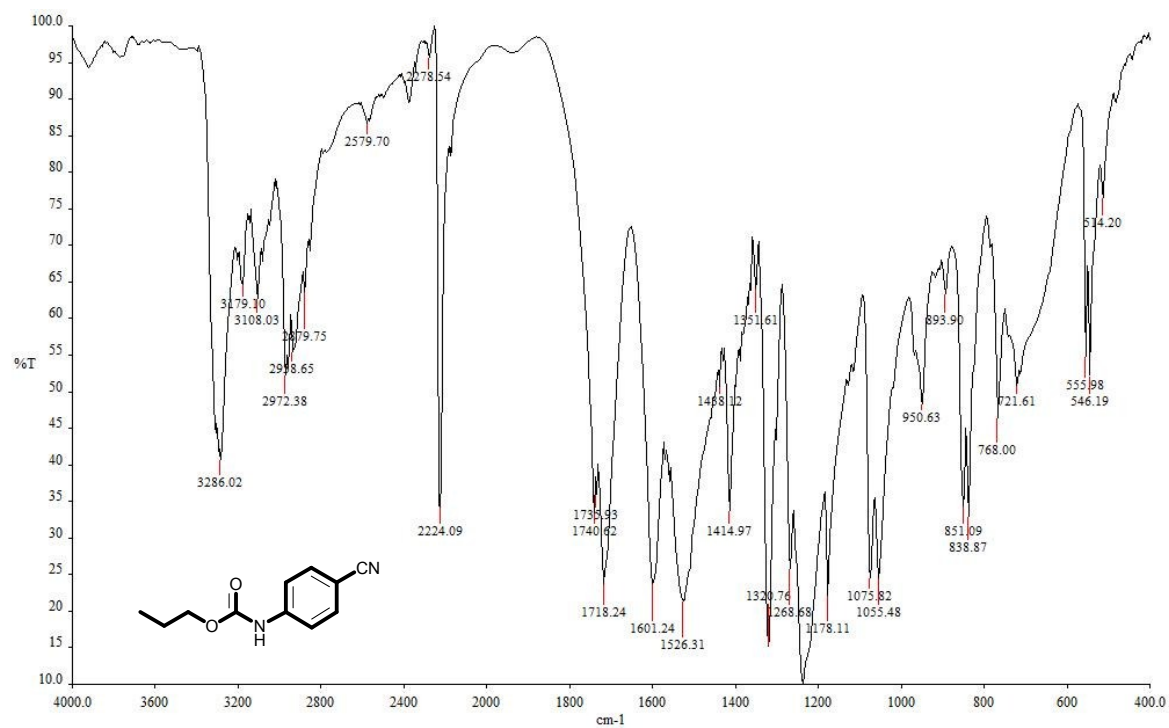
¹³C-NMR spectra (63 MHz) of 1-propyl (4-bromophenyl)carbamate (C26) in CDCl₃.



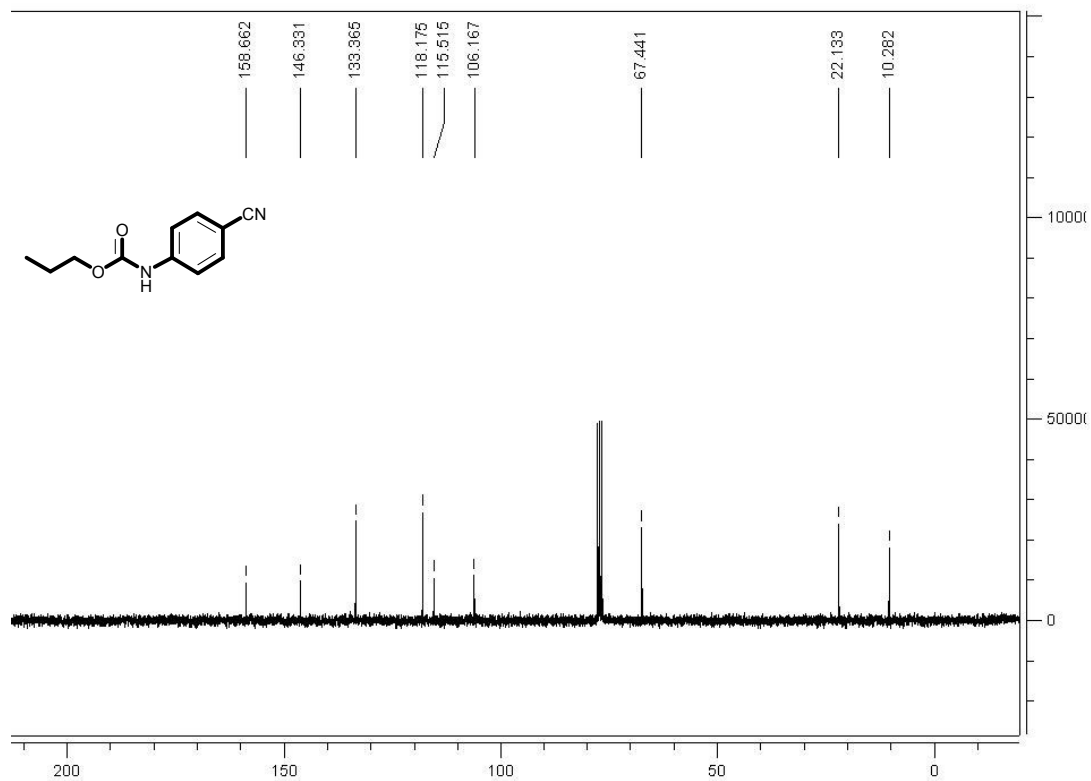
¹H-NMR spectra (250 MHz) of 1-propyl (4-bromophenyl)carbamate (C26) in CDCl₃.



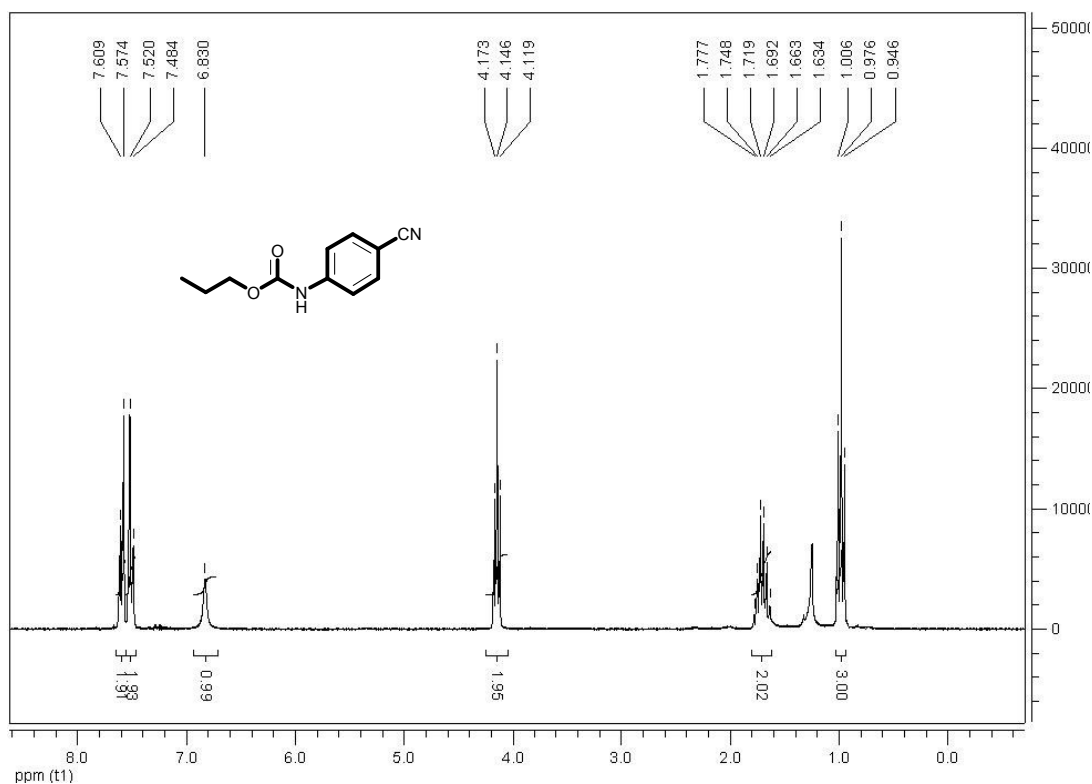
MS of 1-propyl (4-bromophenyl)carbamate (C26).



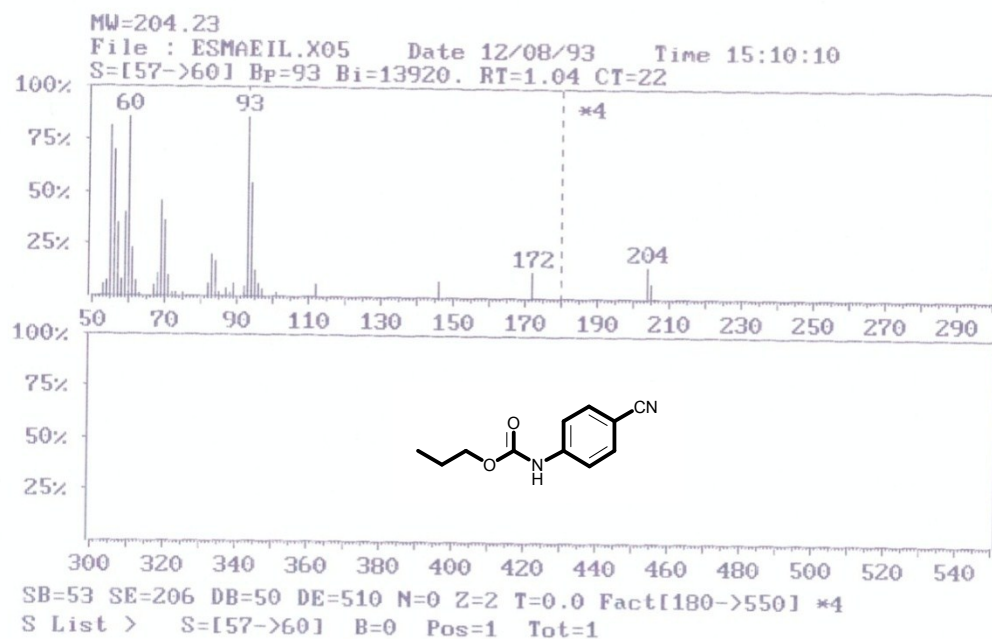
FT-IR spectra of 1-propyl (4-cyanophenyl)carbamate (C27) in KBr .



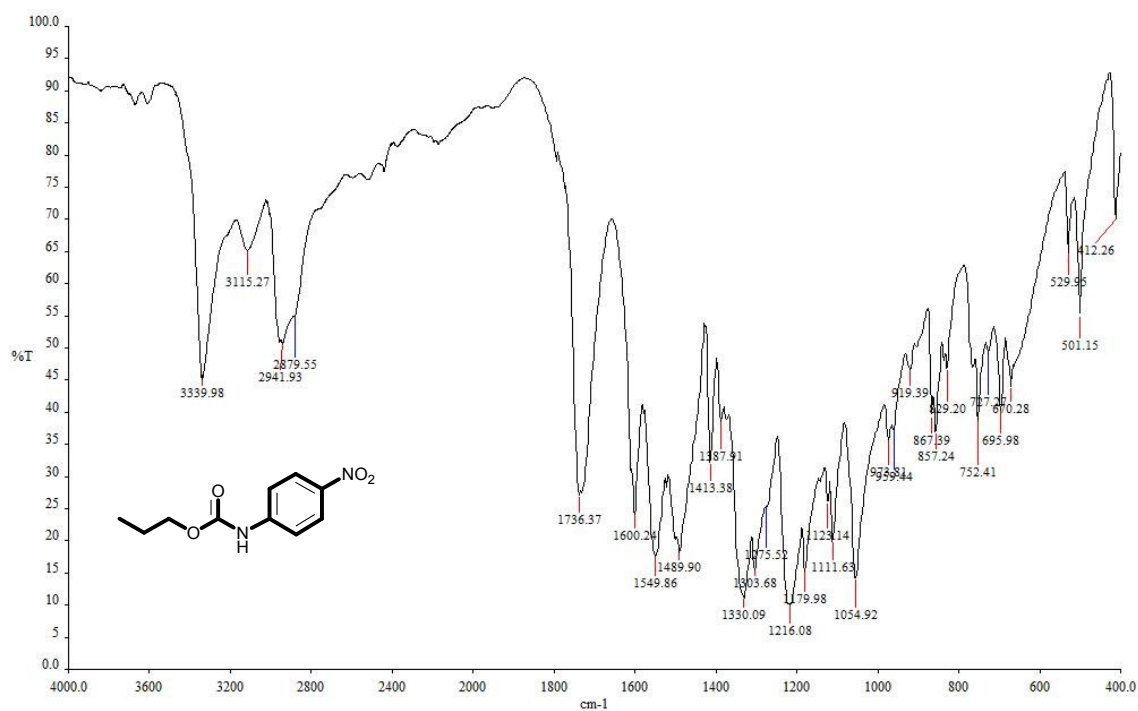
¹³C-NMR spectra (63 MHz) of 1-propyl (4-cyanophenyl)carbamate (C27) in CDCl₃.



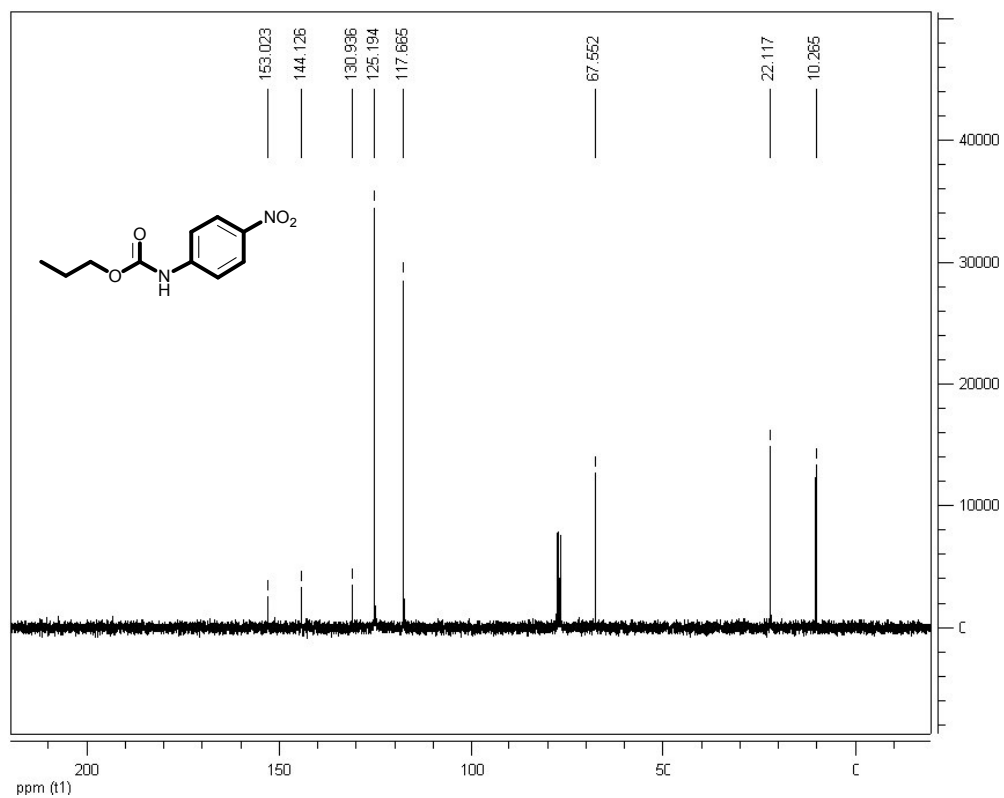
¹H-NMR spectra (250 MHz) of 1-propyl (4-cyanophenyl)carbamate (**C27**) in CDCl₃.



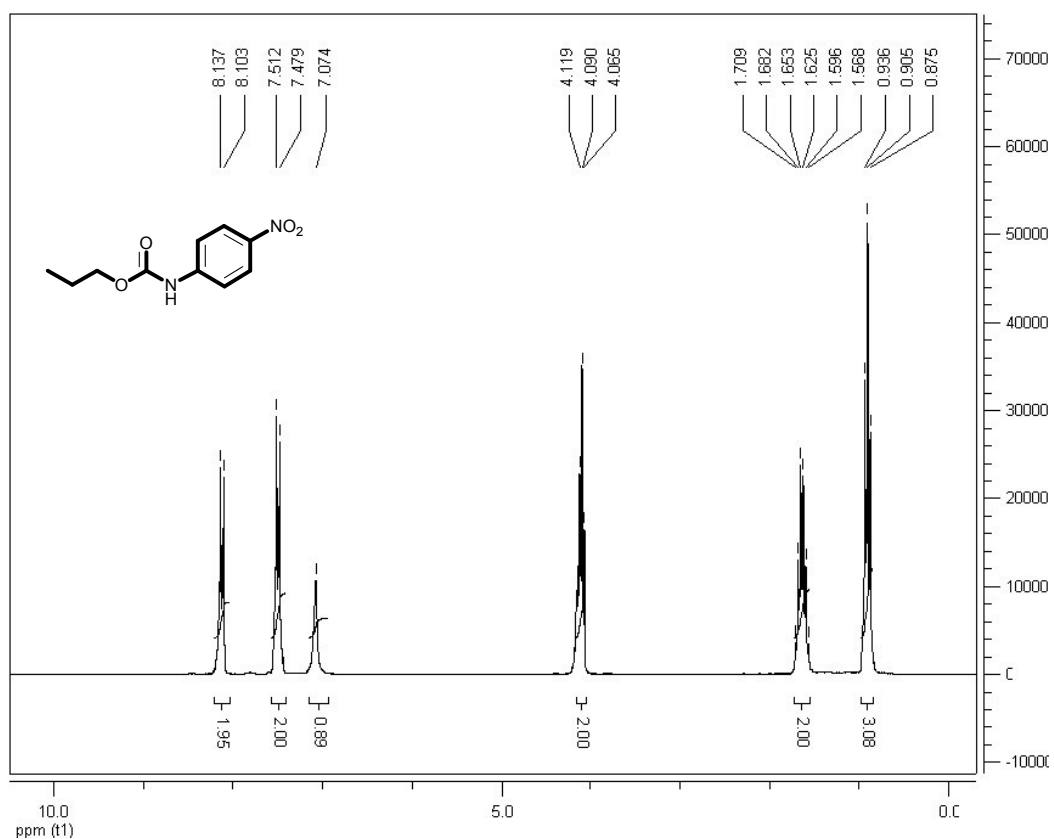
MS of 1-propyl (4-cyanophenyl)carbamate (**C27**).



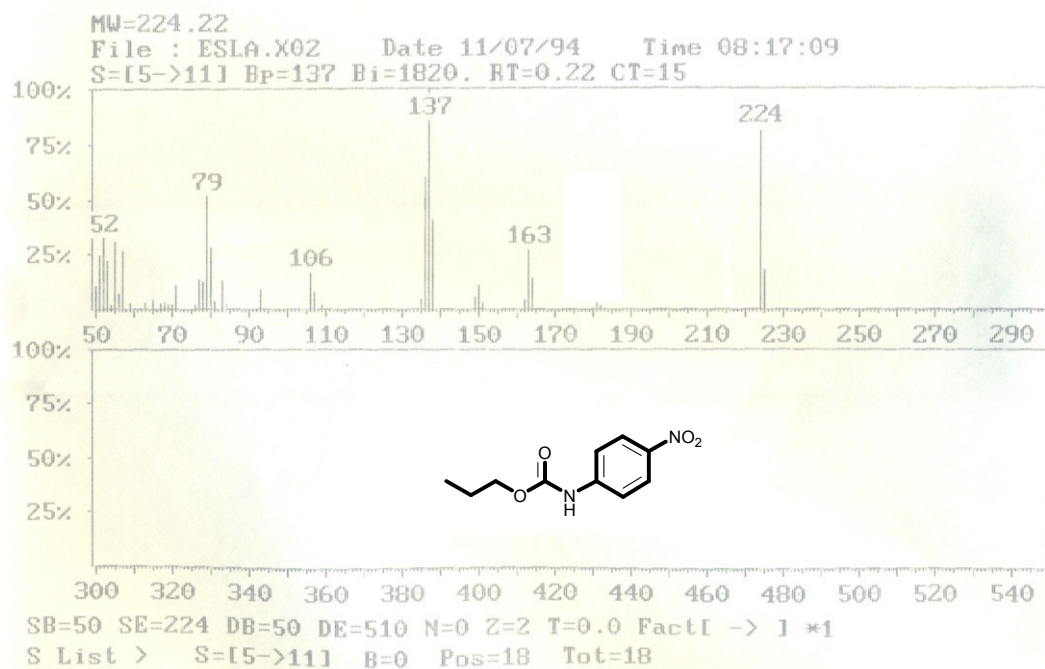
FT-IR spectra of 1-propyl (4-nitrophenyl)carbamate (**C28**) in KBr .



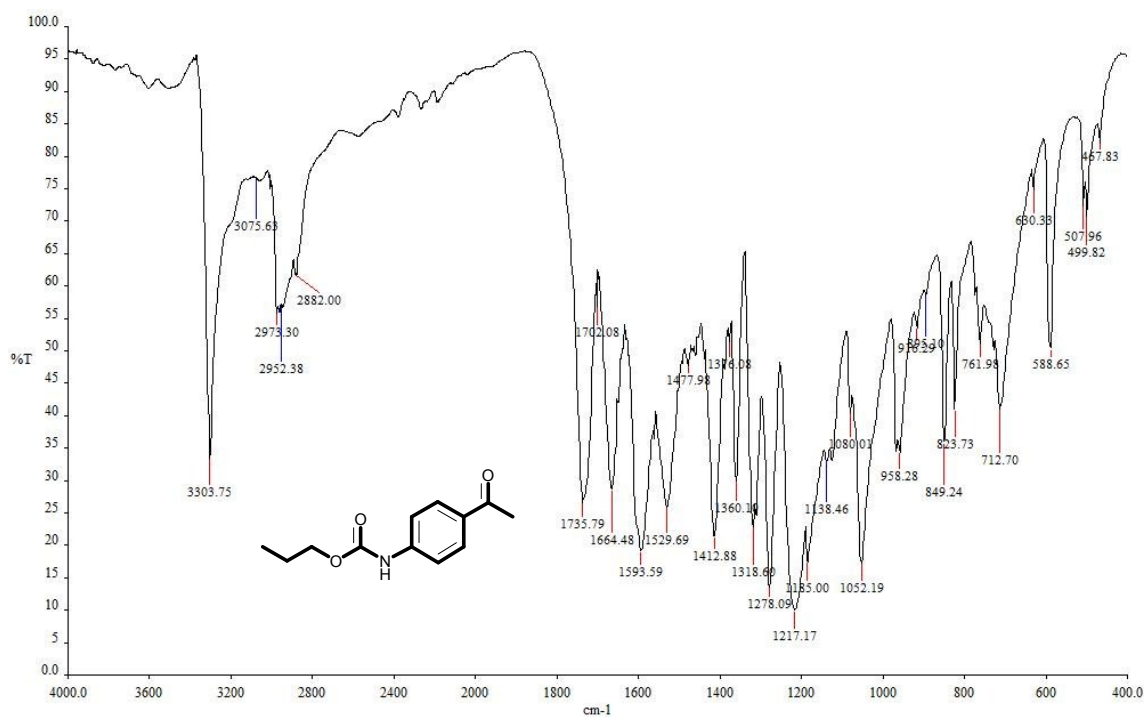
¹³C-NMR spectra (63 MHz) of 1-propyl (4-nitrophenyl)carbamate (**C28**) in CDCl₃.



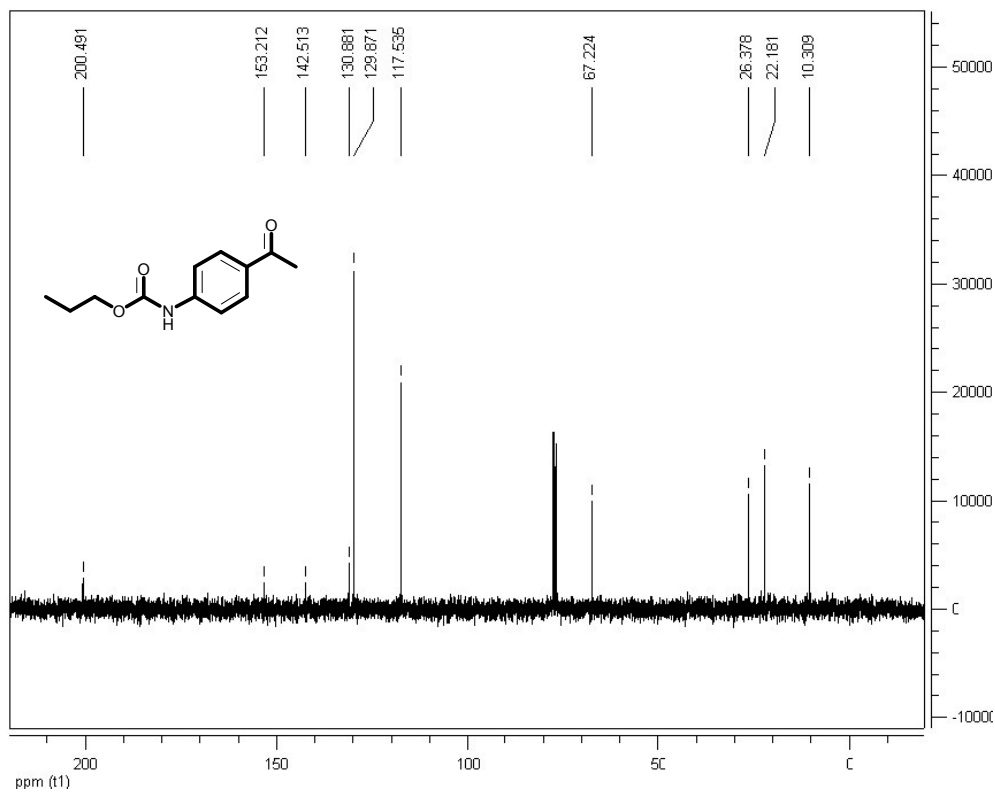
^1H -NMR spectra (250 MHz) of 1-propyl (4-nitrophenyl)carbamate (C28) in CDCl_3 .



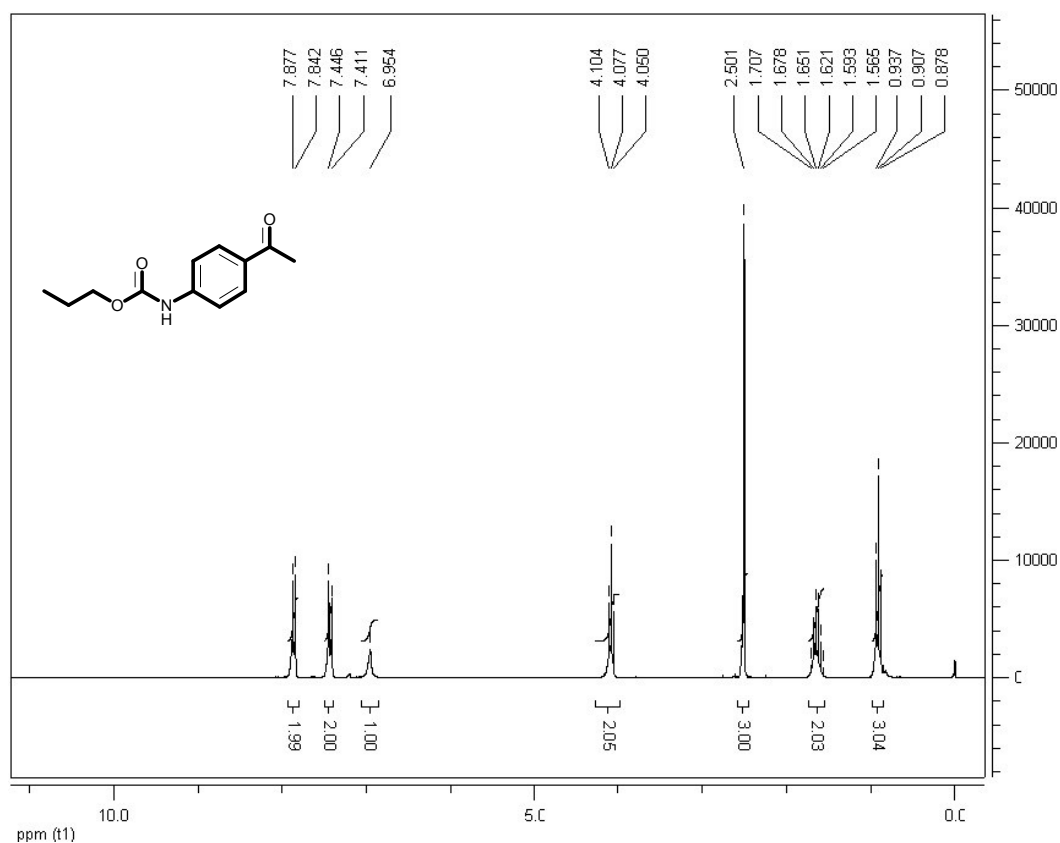
MS of 1-propyl (4-nitrophenyl)carbamate (C28).



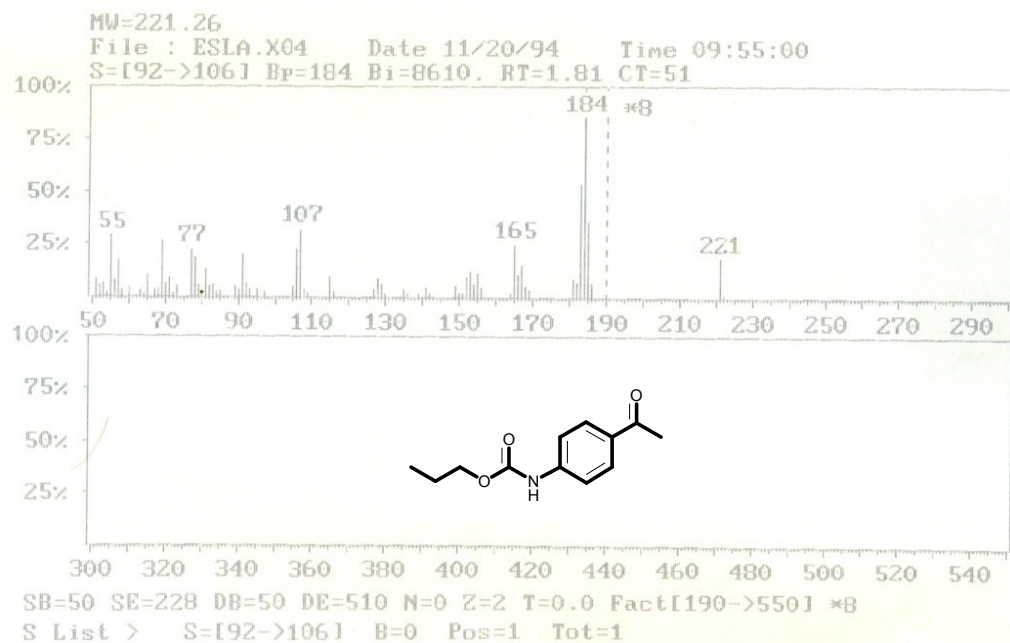
FT-IR spectra of 1-propyl (4-acetylphenyl)carbamate (C29) in KBr .



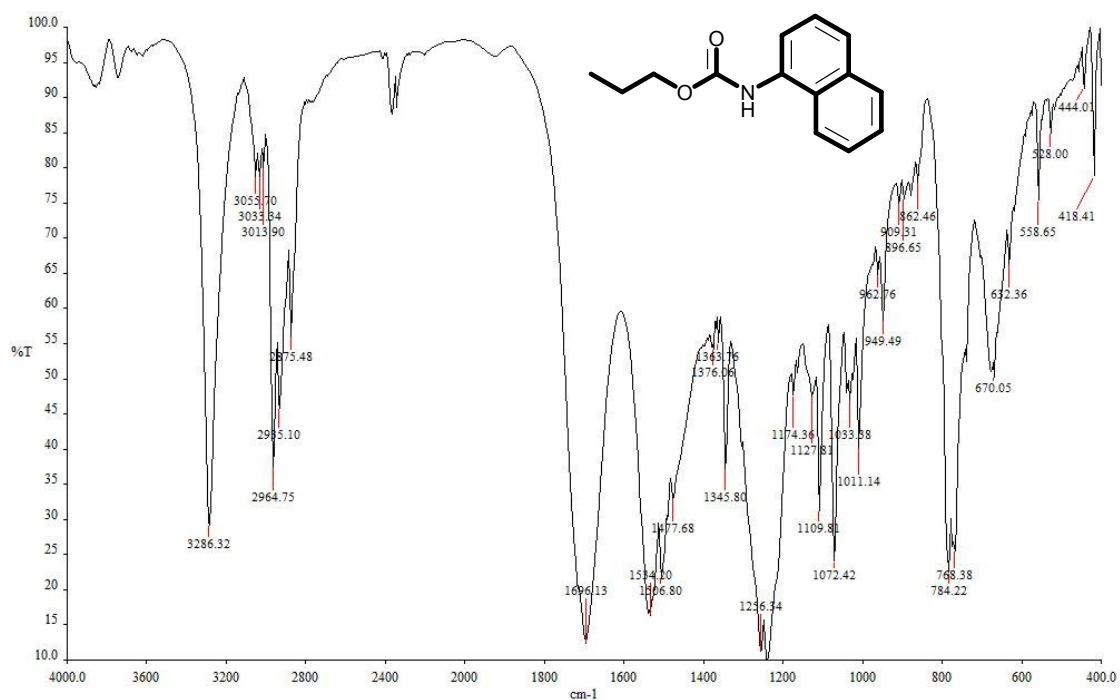
¹³C-NMR spectra (63 MHz) of 1-propyl (4-acetylphenyl)carbamate (C29) in CDCl₃.



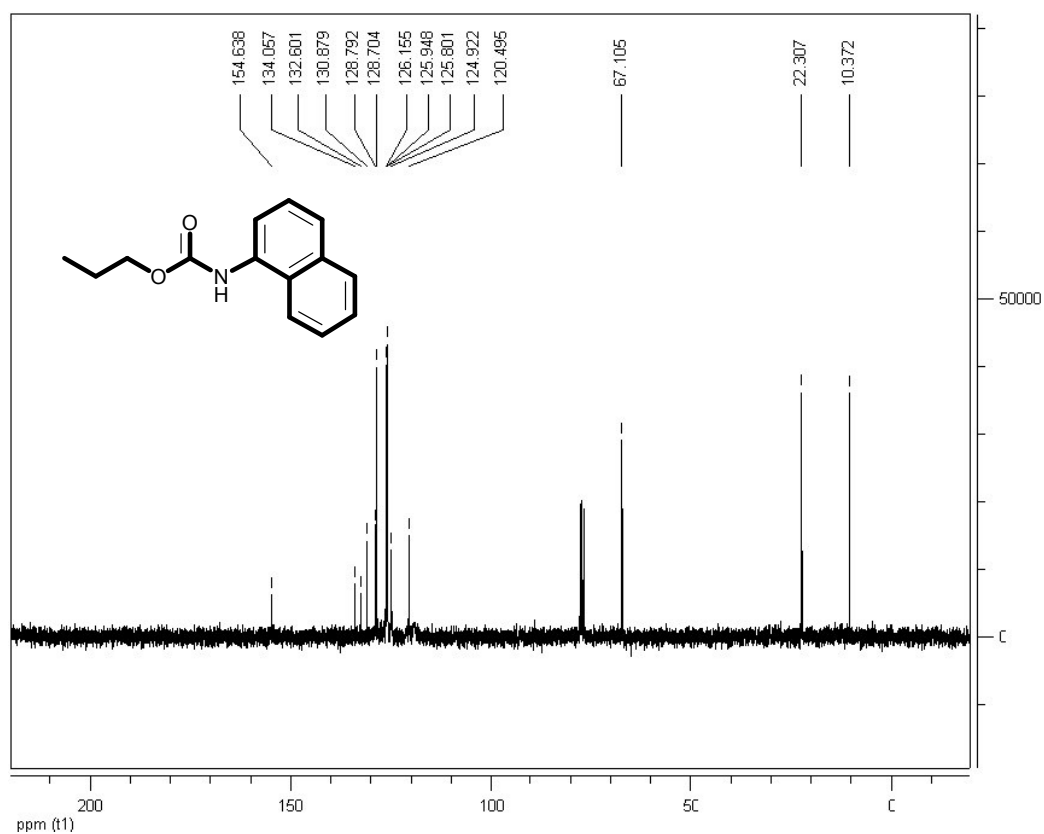
¹H-NMR spectra (250 MHz) of 1-propyl (4-acetylphenyl)carbamate (C29) in CDCl₃.



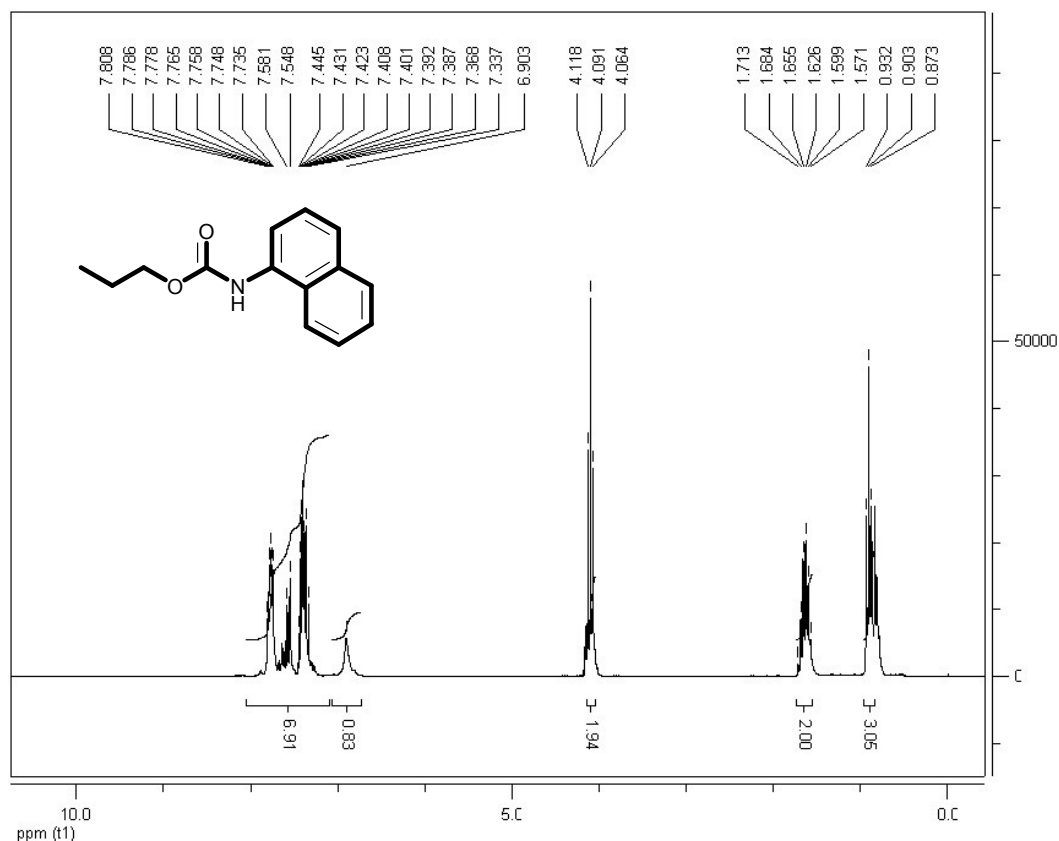
MS of 1-propyl (4-acetylphenyl)carbamate (C29).



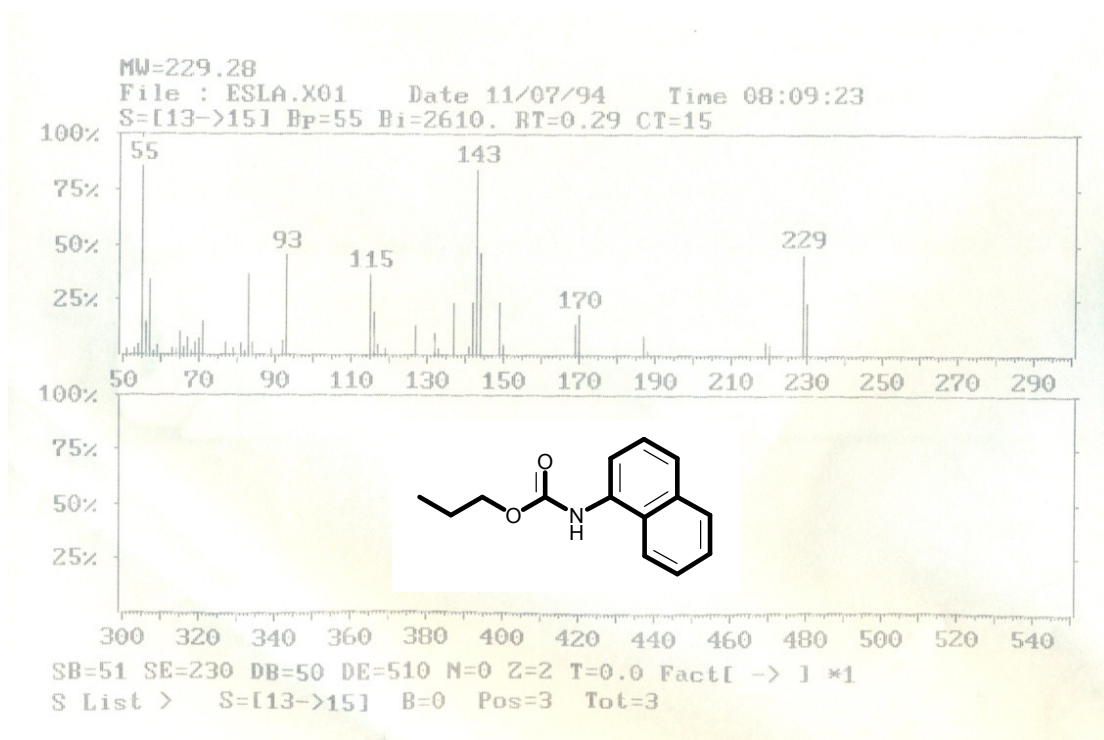
FT-IR spectra of 1-propyl naphthalen-1-ylcarbamate (**C30**) in KBr .



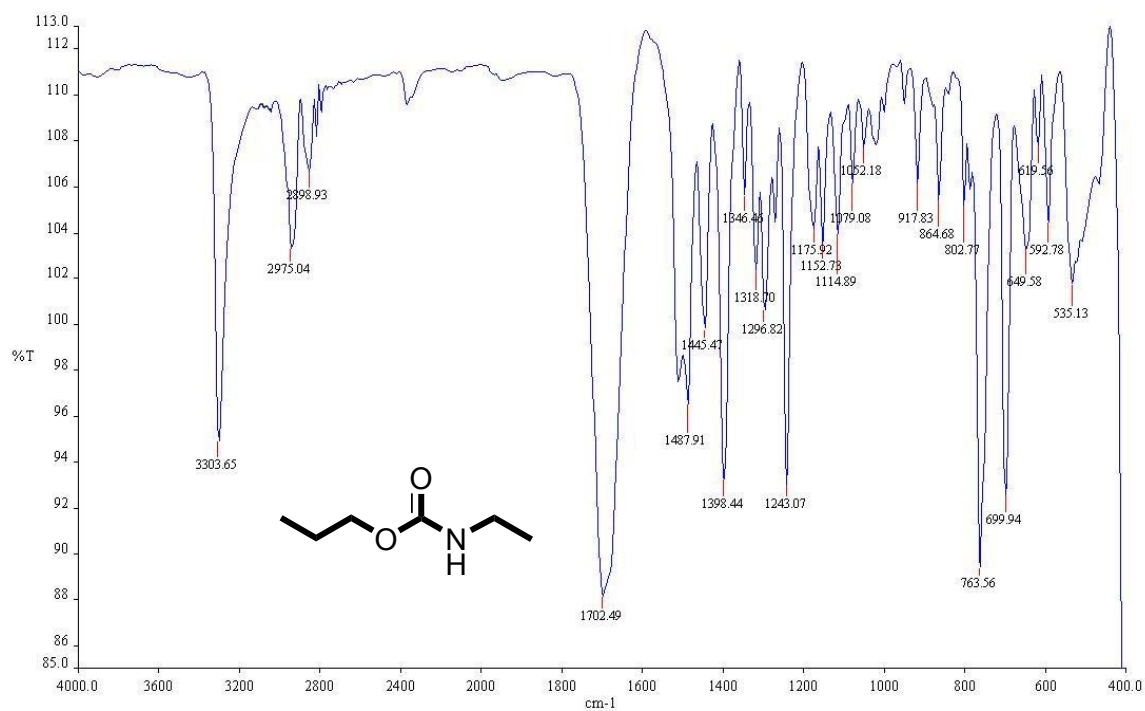
¹³C-NMR spectra (63 MHz) of 1-propyl naphthalen-1-ylcarbamate (**C30**) in CDCl₃.



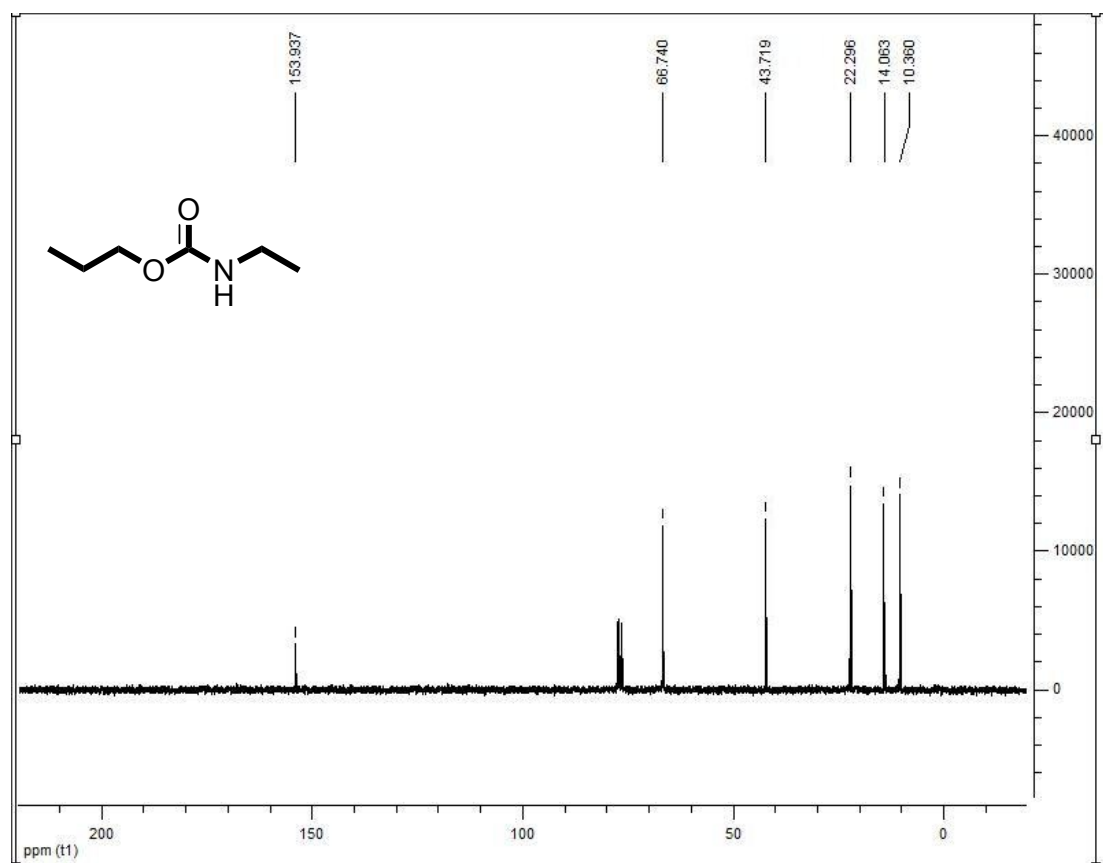
¹H-NMR spectra (250 MHz) of 1-propyl naphthalen-1-ylcarbamate (C30) in CDCl₃.



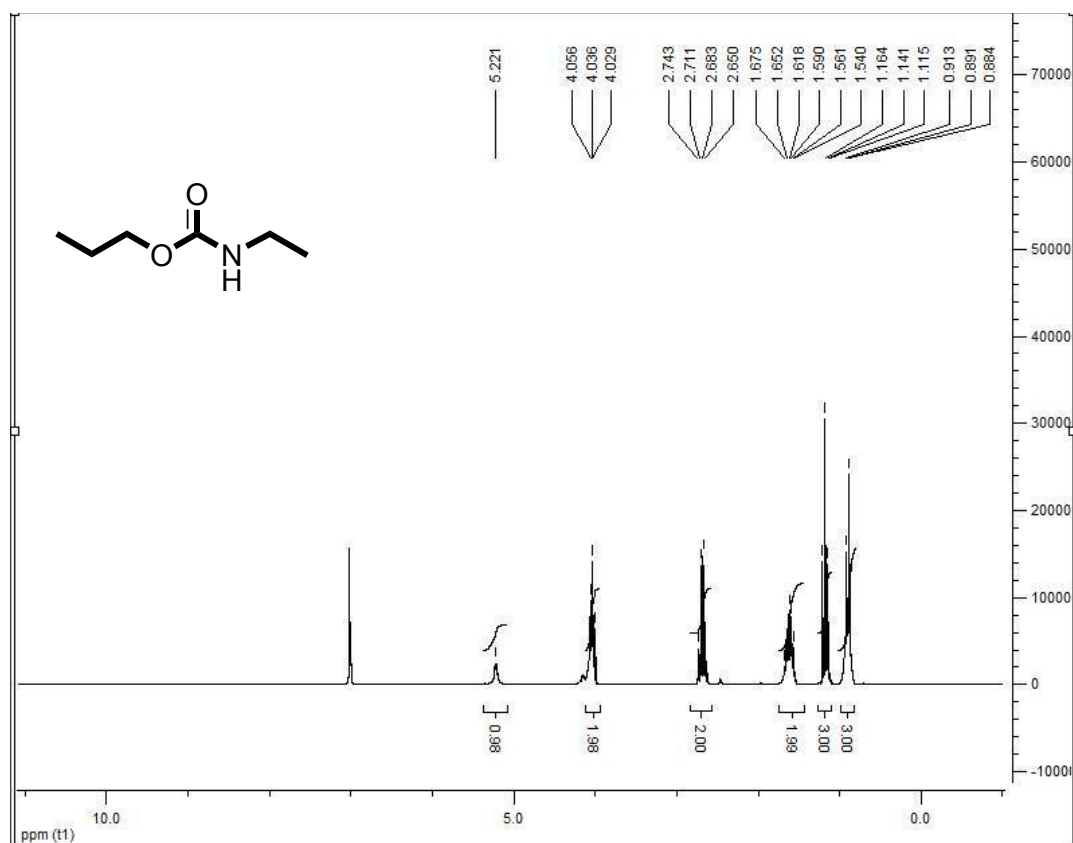
MS of 1-propyl naphthalen-1-ylcarbamate (C30).



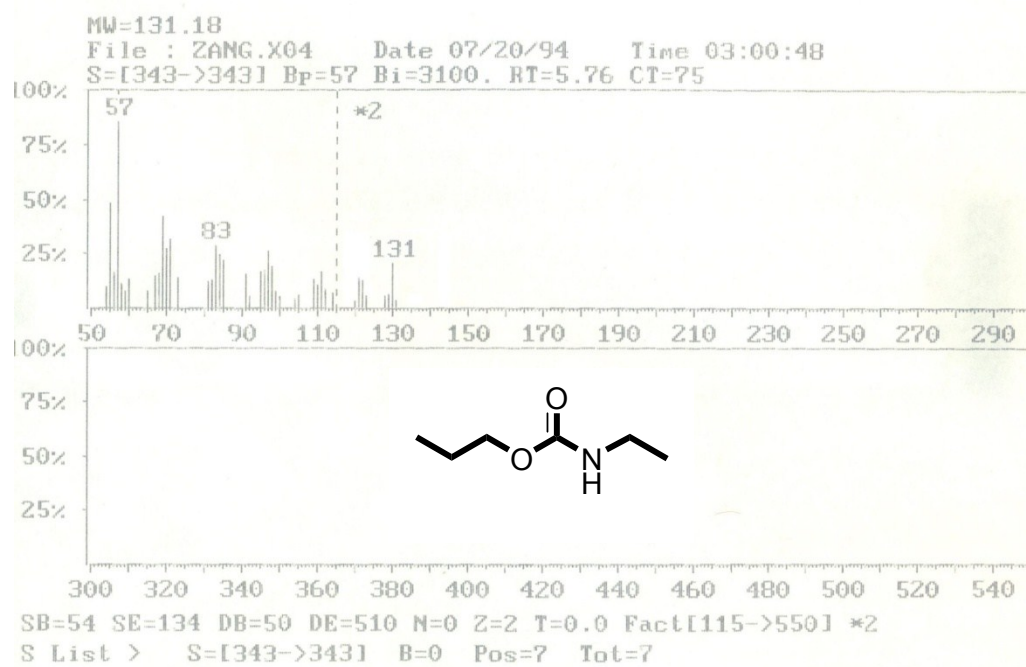
FT-IR spectra of 1-propyl ethylcarbamate (C31) in KBr .



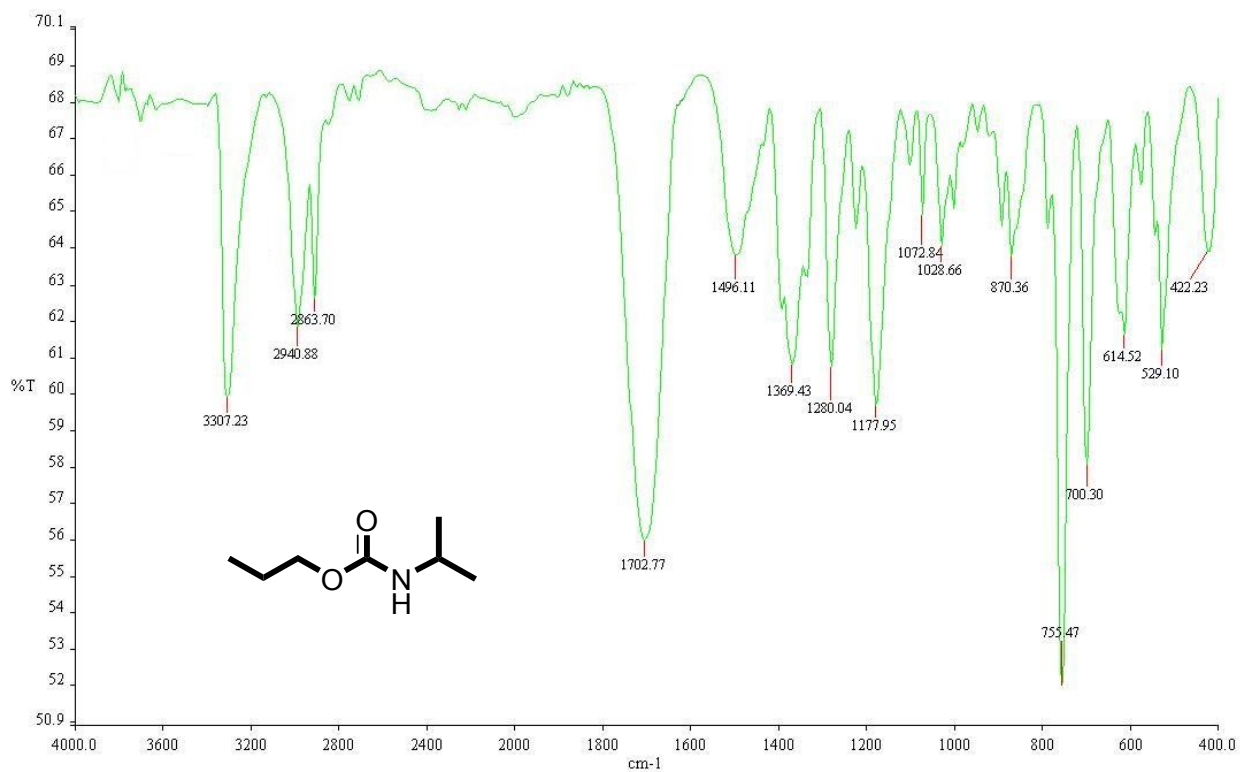
¹³C-NMR spectra (63 MHz) of 1-propyl ethylcarbamate (C31) in CDCl₃.



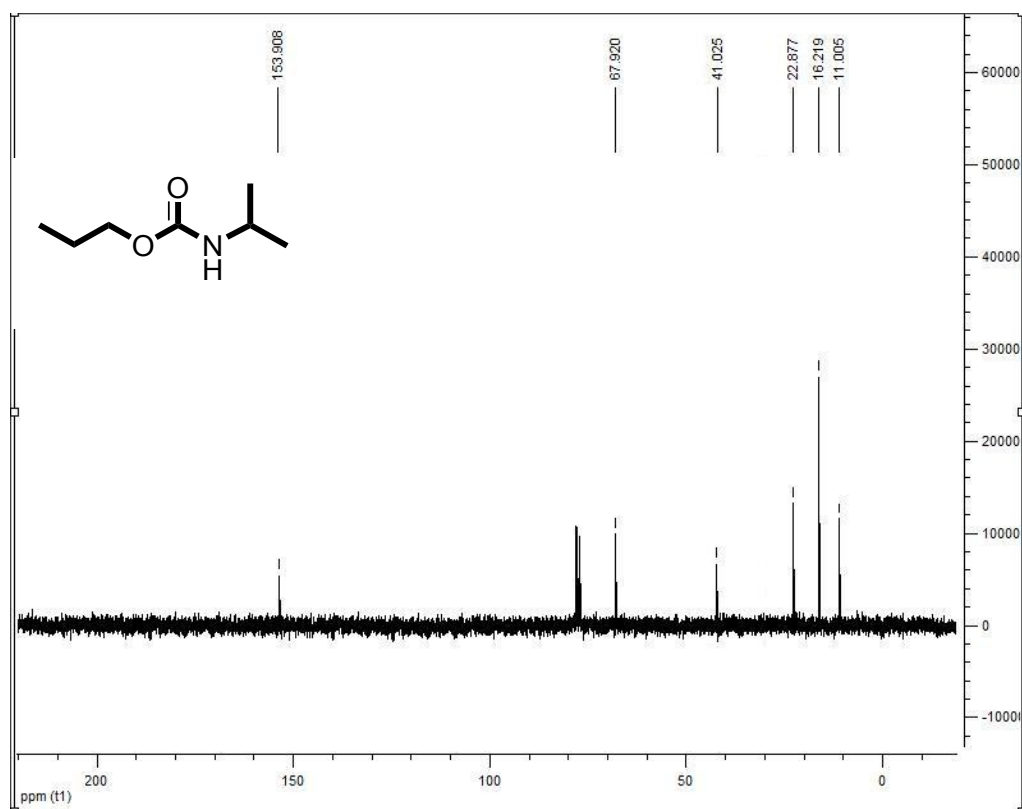
^1H -NMR spectra (250 MHz) of 1-propyl ethylcarbamate (**C31**) in CDCl_3 .



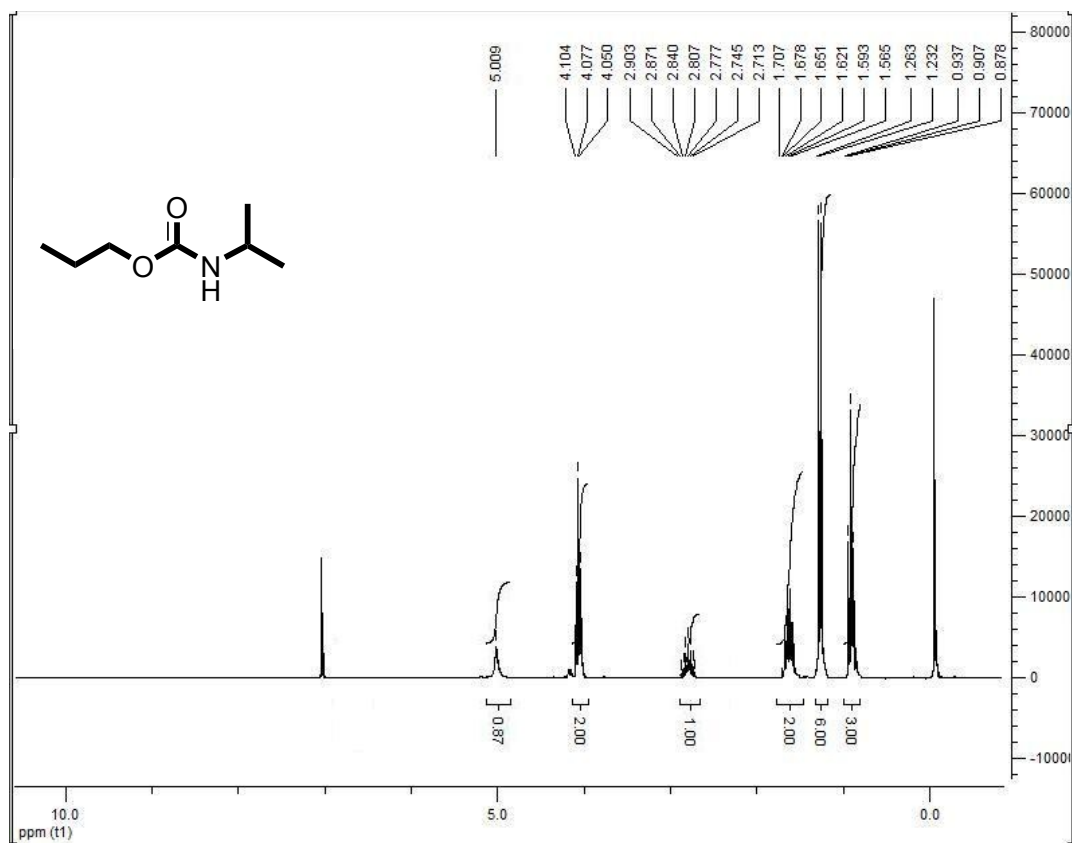
MS of 1-propyl ethylcarbamate (**C31**).



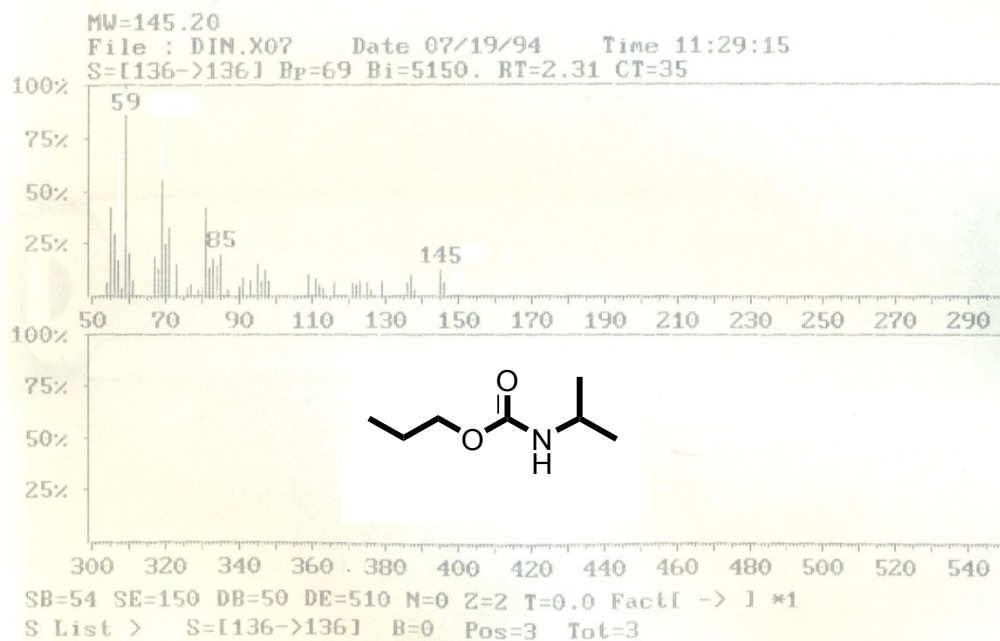
FT-IR spectra of 1-propyl *iso*-propylcarbamate (**C32**) in KBr .



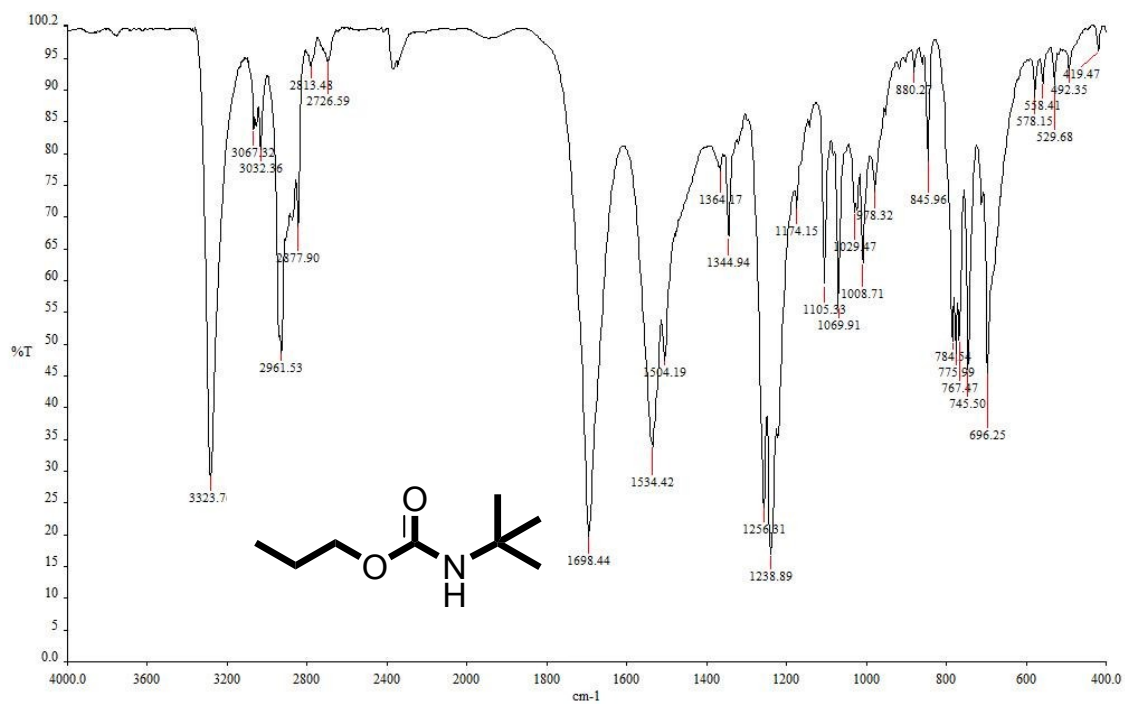
¹³C-NMR spectra (63 MHz) of 1-propyl *iso*-propylcarbamate (**C32**) in CDCl₃.



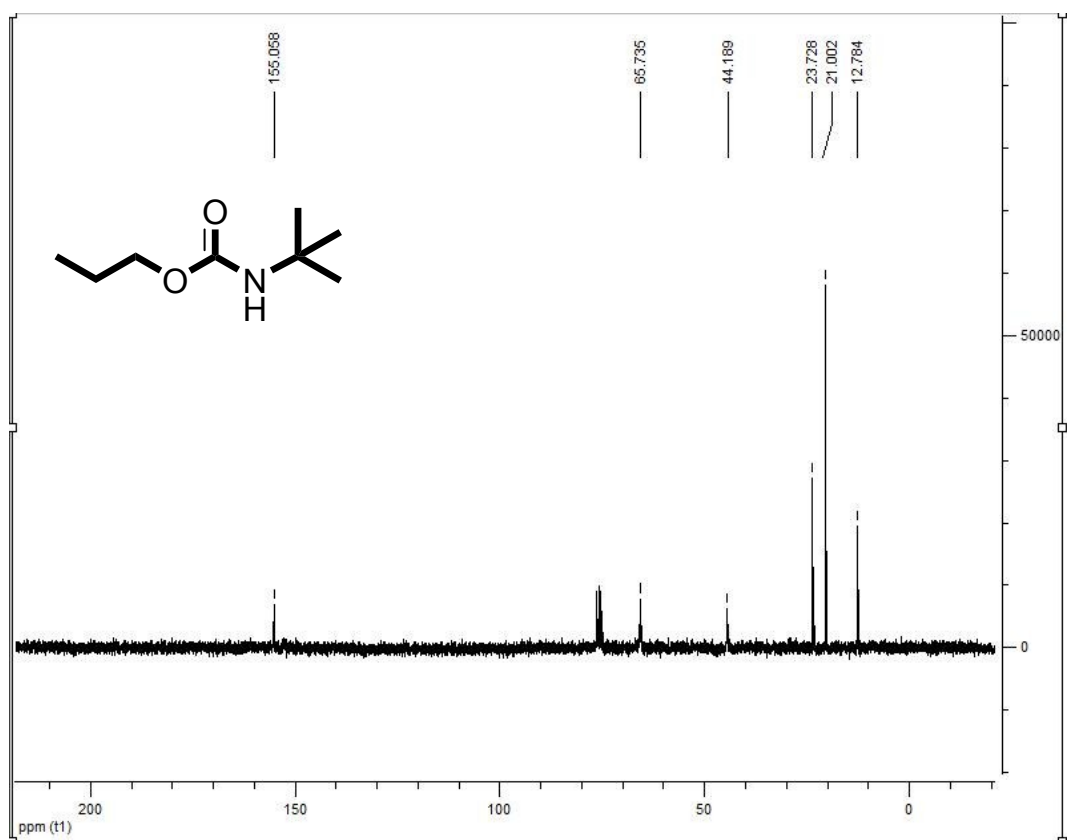
¹H-NMR spectra (250 MHz) of 1-propyl *iso*-propylcarbamate (C32) in CDCl₃.



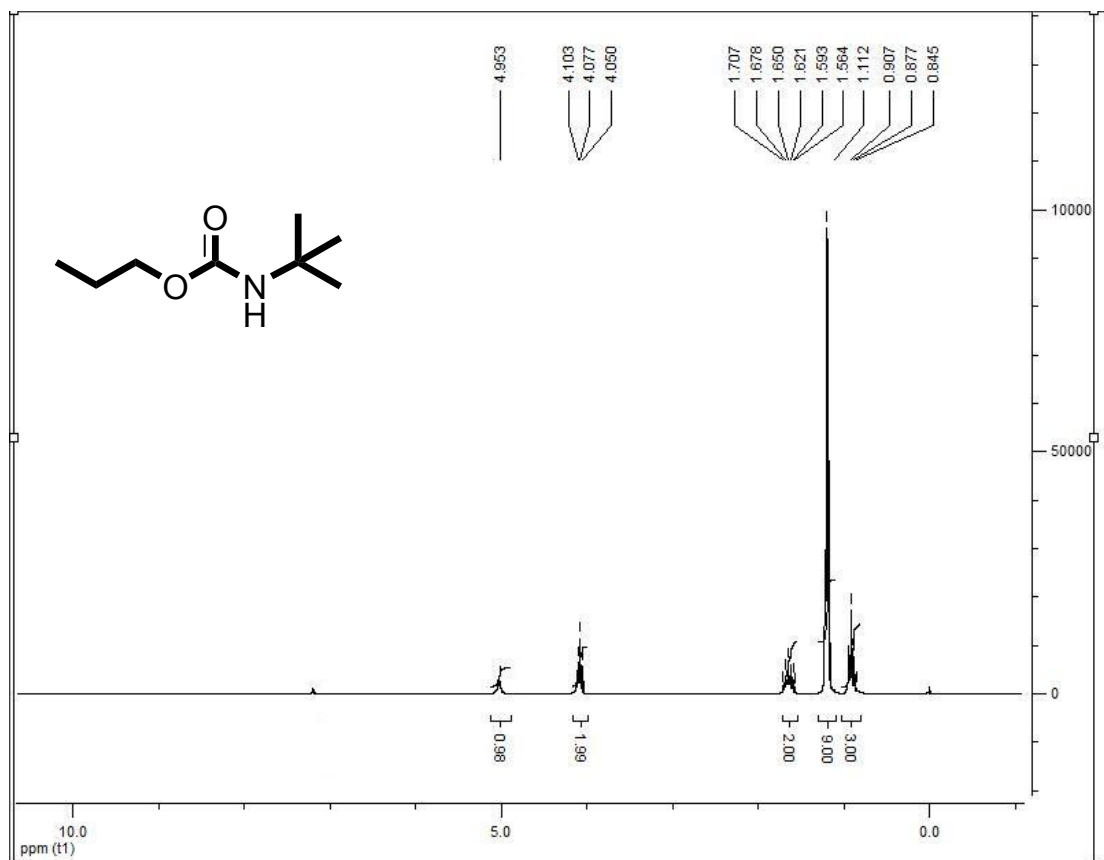
MS of 1-propyl *iso*-propylcarbamate (C32).



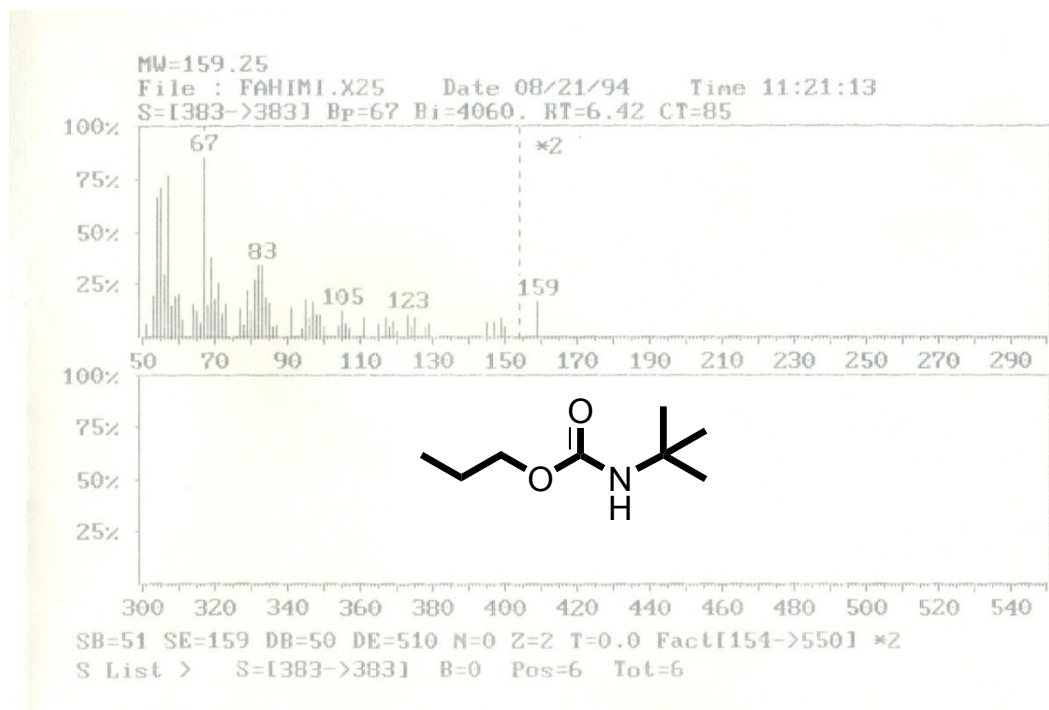
FT-IR spectra of 1-propyl *tert*-butylcarbamate (C33) in KBr .



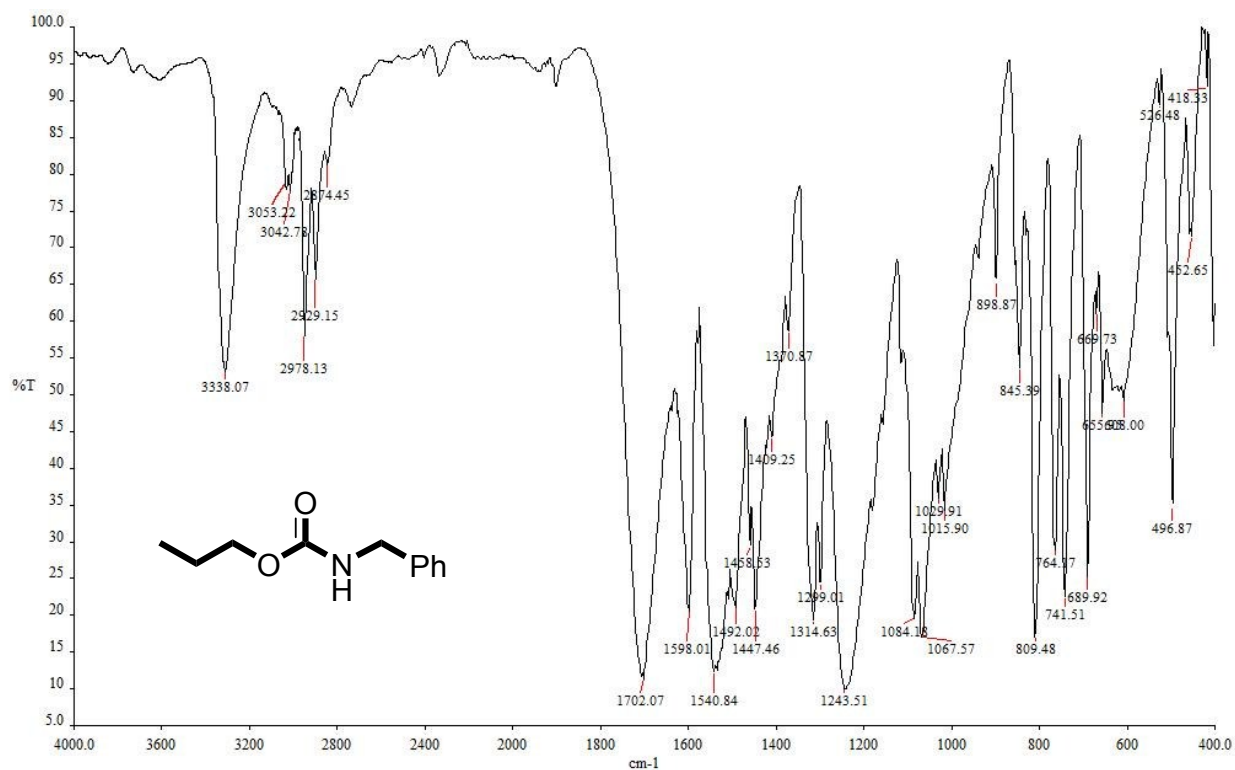
¹³C-NMR spectra (63 MHz) of 1-propyl *tert*-butylcarbamate (C33) in CDCl₃.



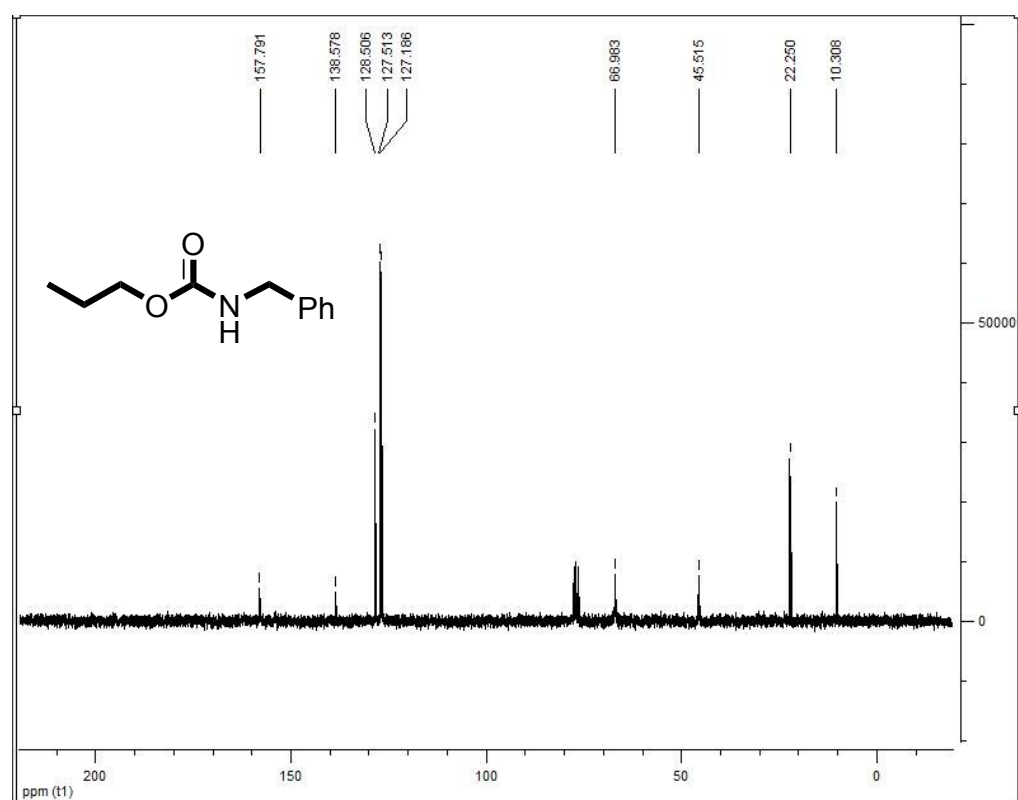
¹H-NMR spectra (250 MHz) of 1-propyl *tert*-butylcarbamate (C33) in CDCl₃.



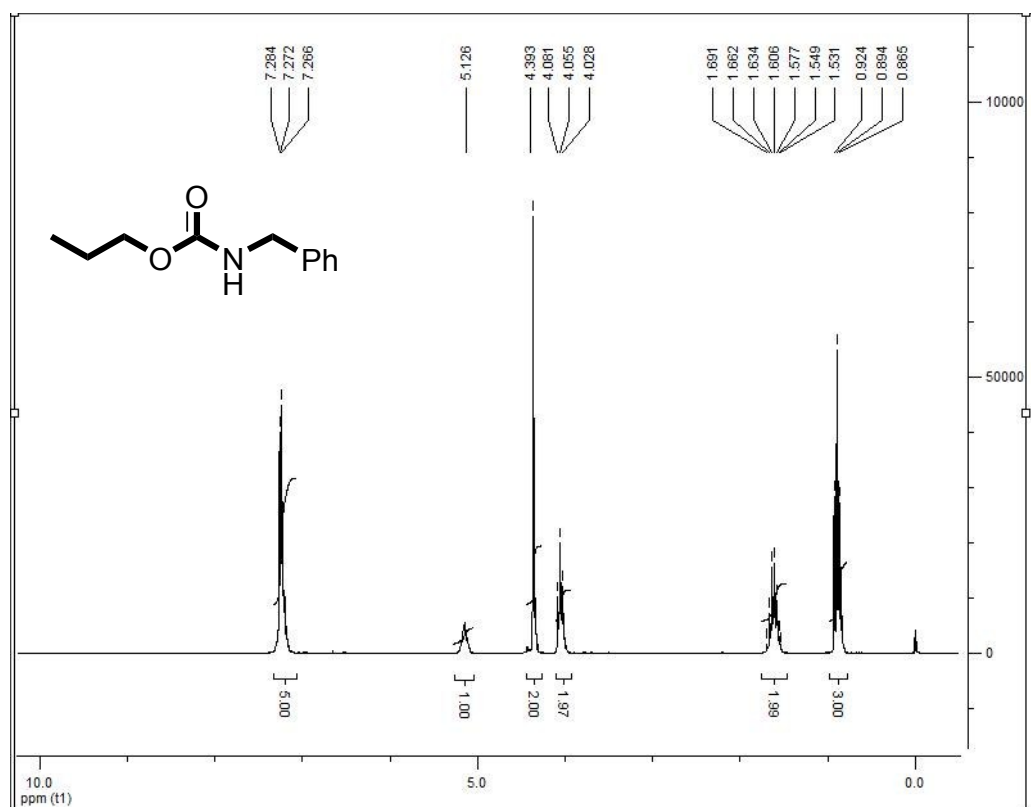
MS of 1-propyl *tert*-butylcarbamate (C33).



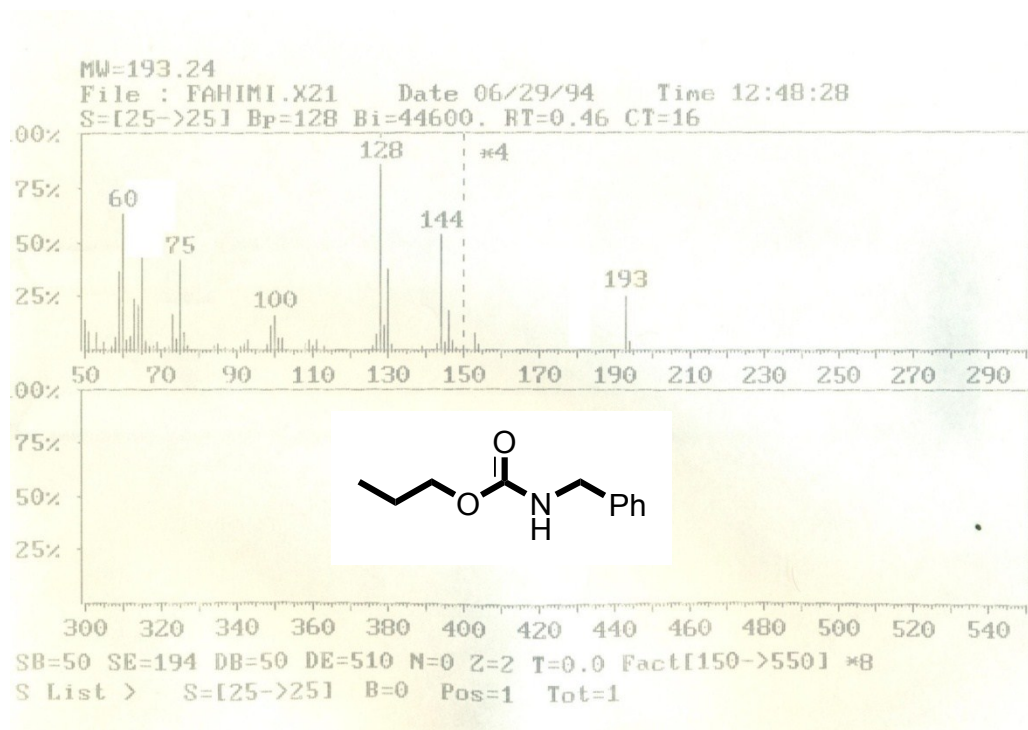
FT-IR spectra of 1-propyl benzylcarbamate (C34) in KBr .



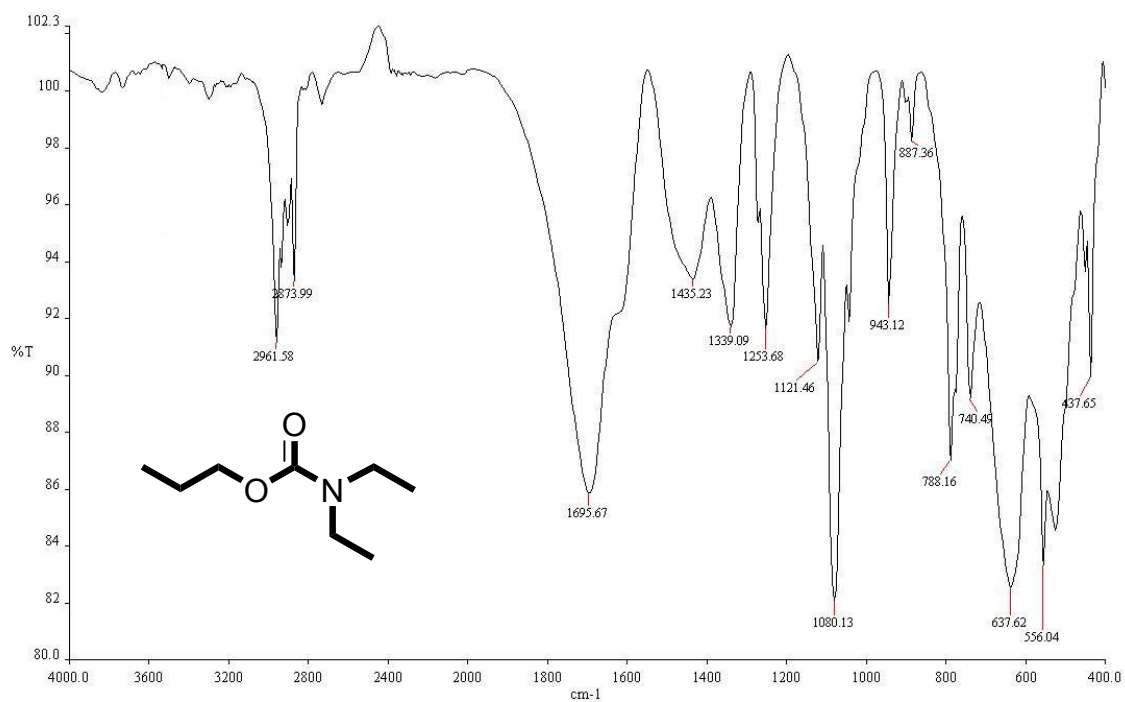
¹³C-NMR spectra (63 MHz) of 1-propyl benzylcarbamate (C34) in CDCl₃.



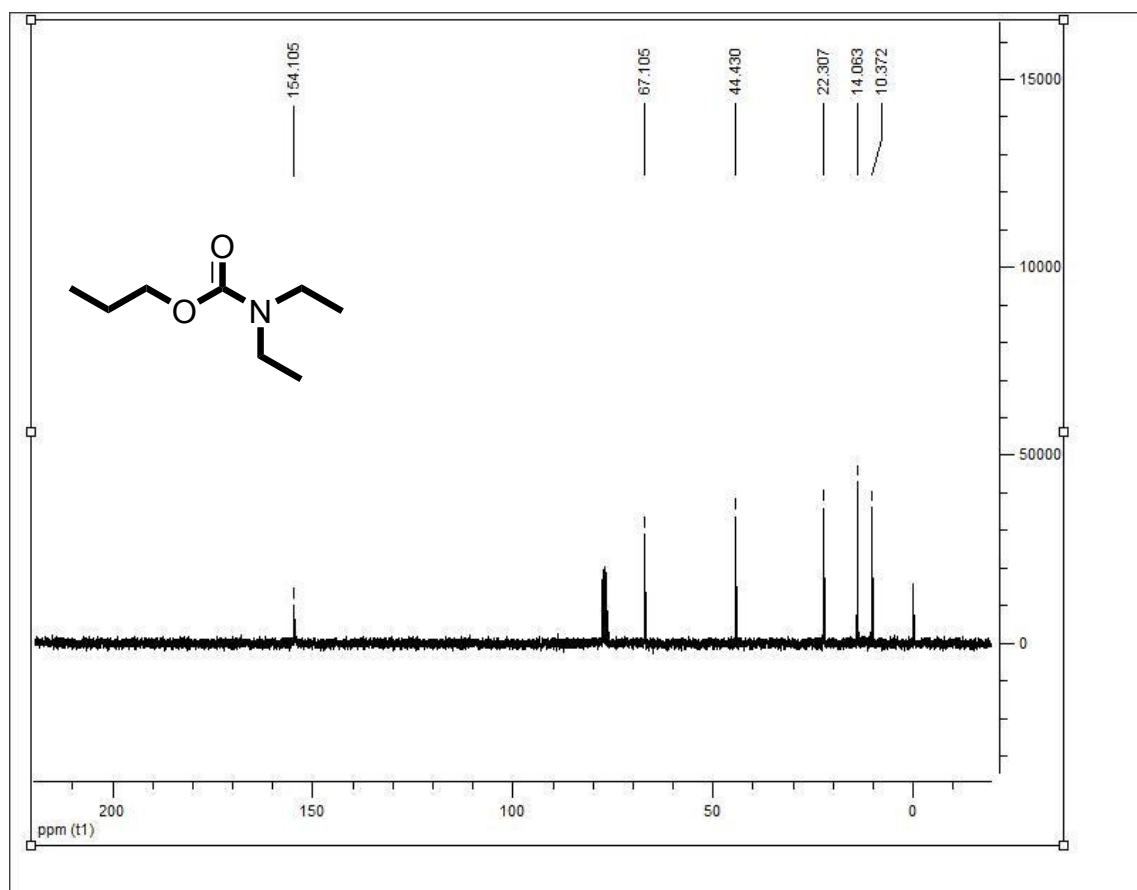
^1H -NMR spectra (250 MHz) of 1-propyl benzylcarbamate (C34) in CDCl_3 .



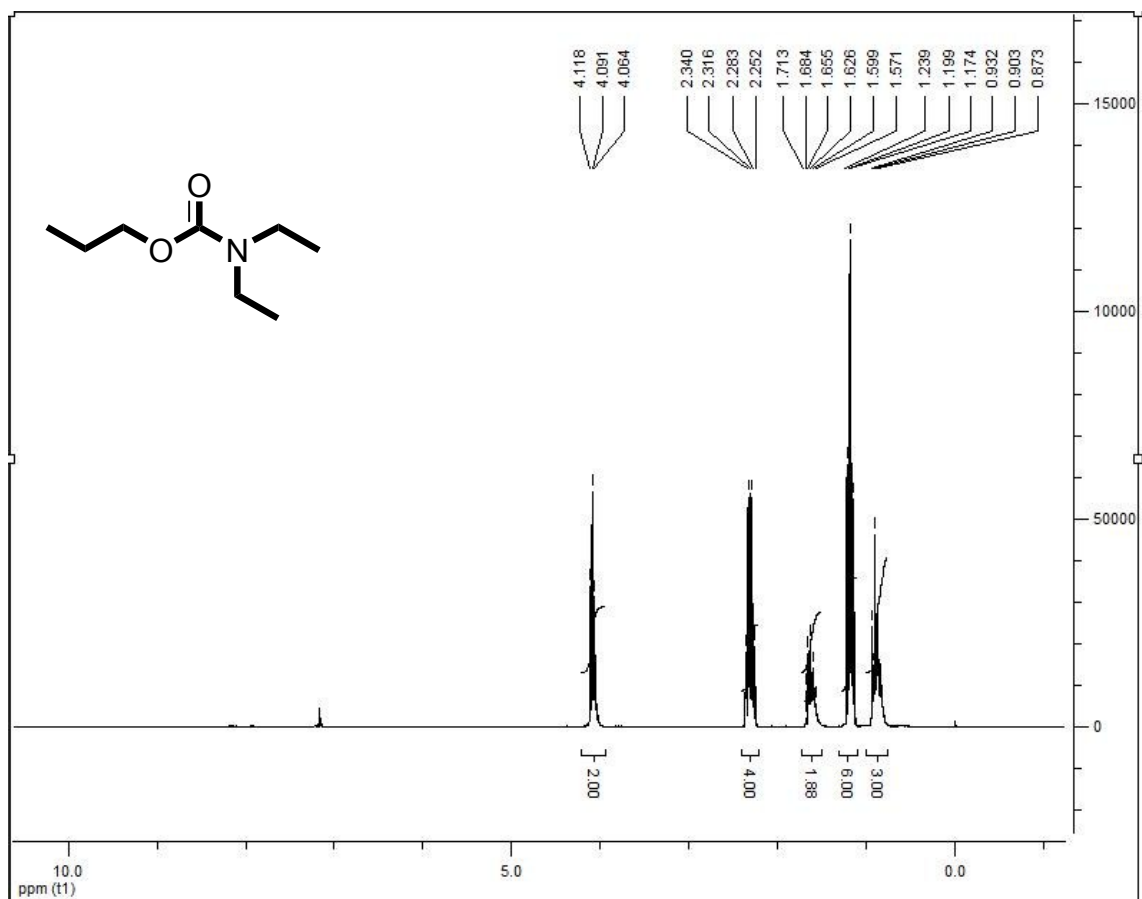
MS of 1-propyl benzylcarbamate (C34).



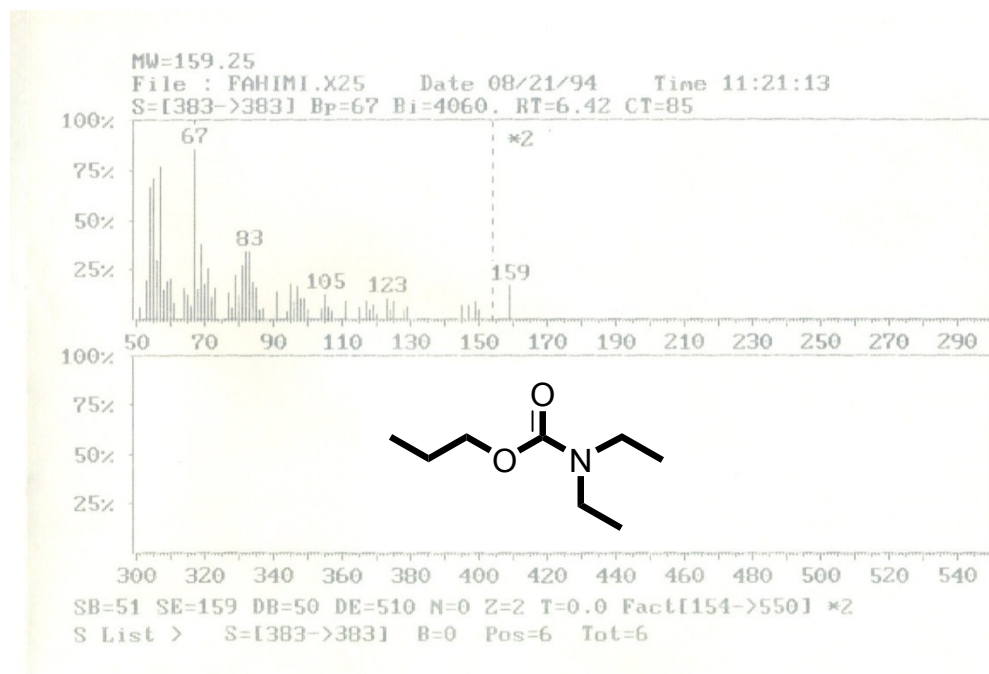
FT-IR spectra of 1-propyl diethylcarbamate (C35) in KBr .



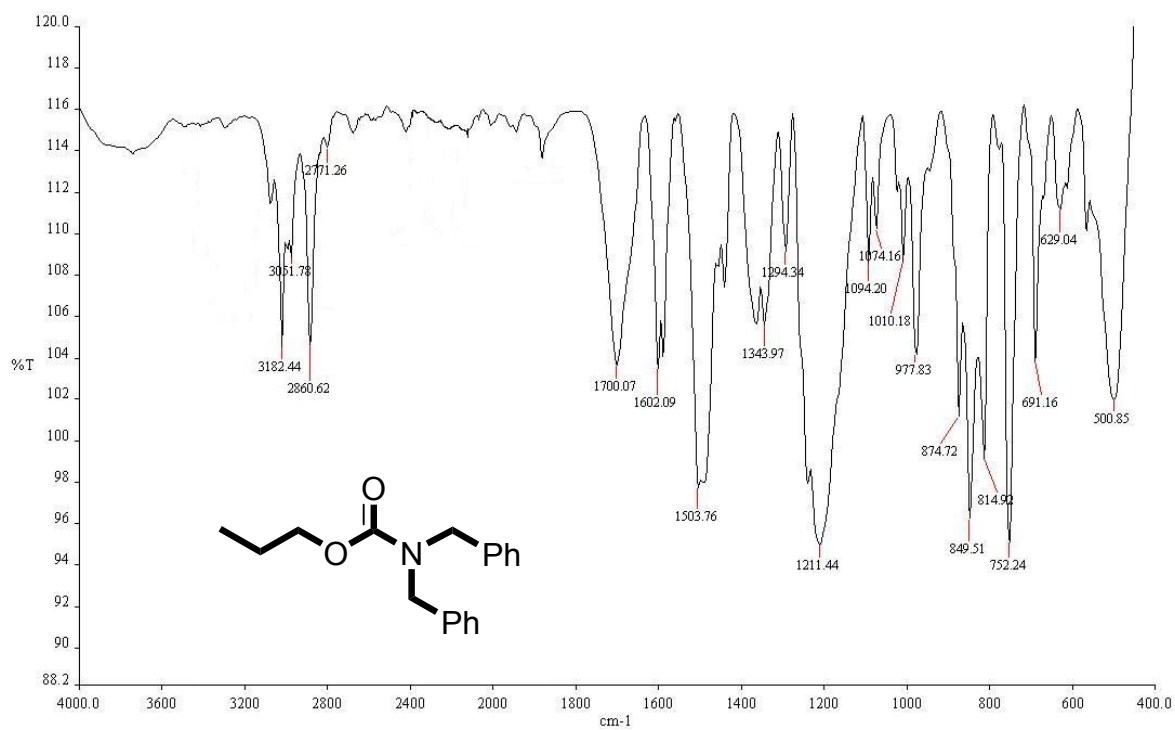
¹³C-NMR spectra (63 MHz) of 1-propyl diethylcarbamate (C35) in CDCl₃.



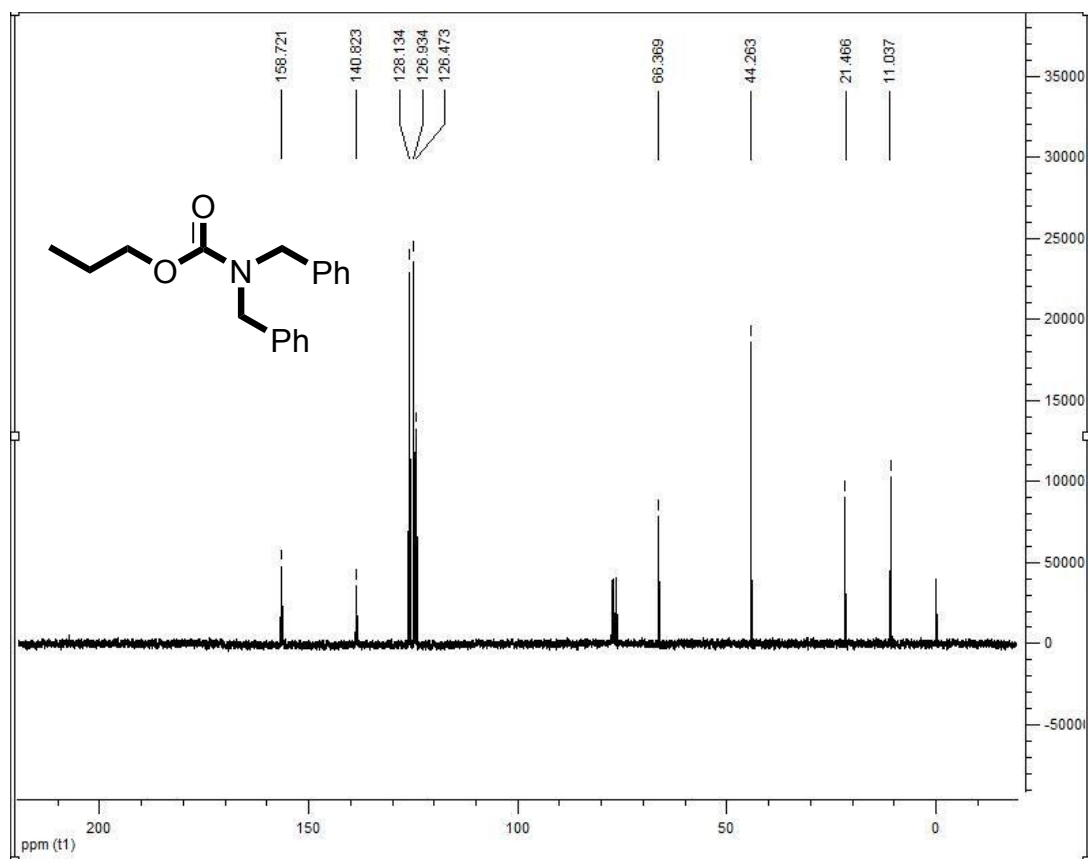
¹H-NMR spectra (250 MHz) of 1-propyl diethylcarbamate (C35) in CDCl₃.



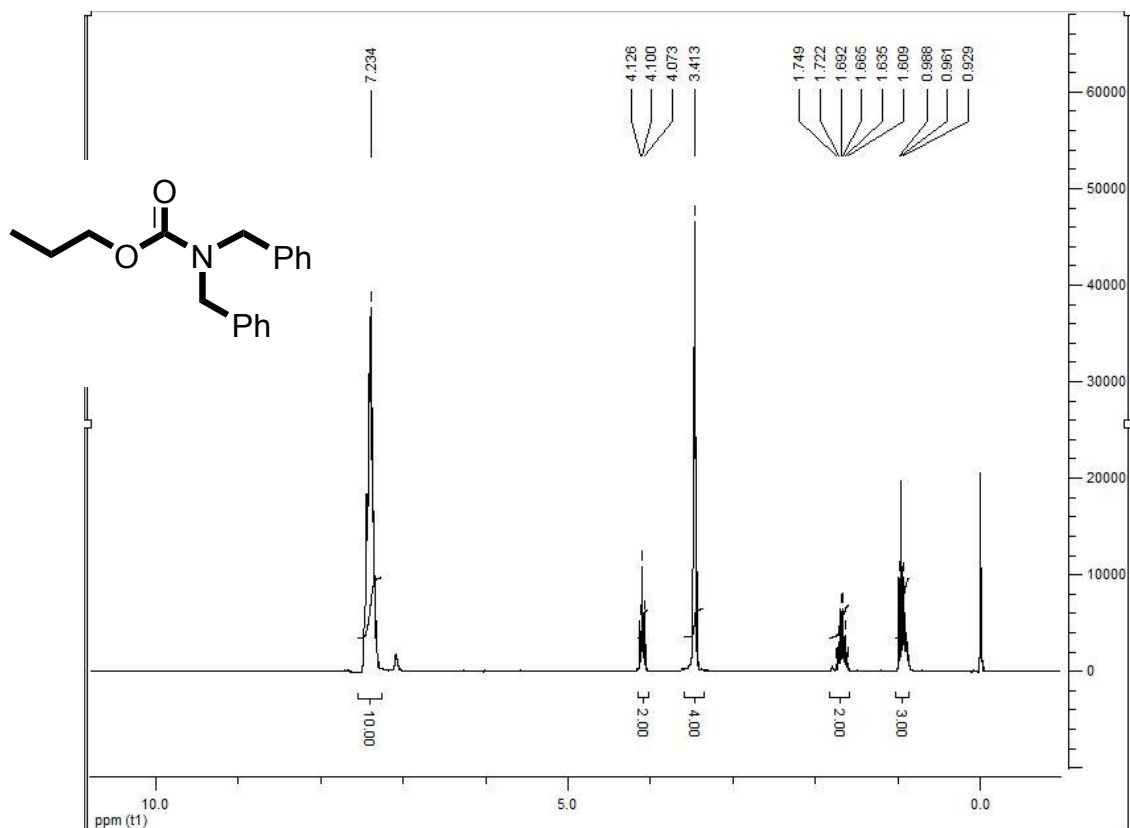
MS of 1-propyl diethylcarbamate (C35).



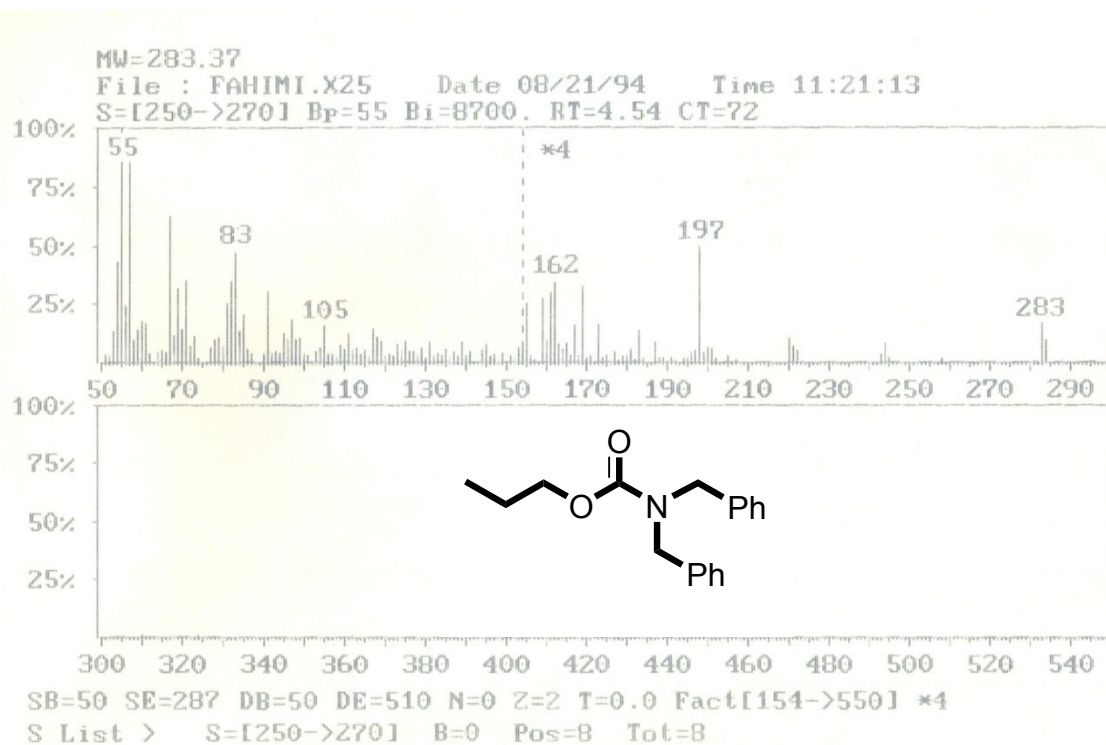
FT-IR spectra of 1-propyl dibenzylcarbamate (**C36**) in KBr .



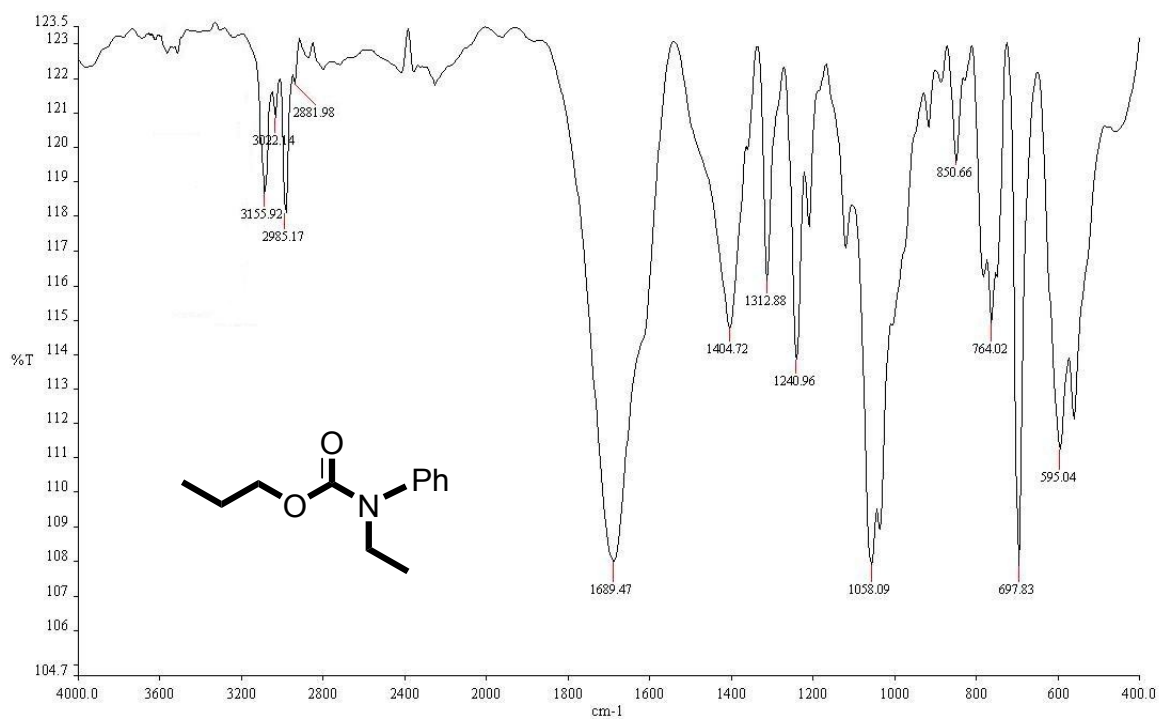
¹³C-NMR spectra (63 MHz) of 1-propyl dibenzylcarbamate (**C36**) in CDCl₃.



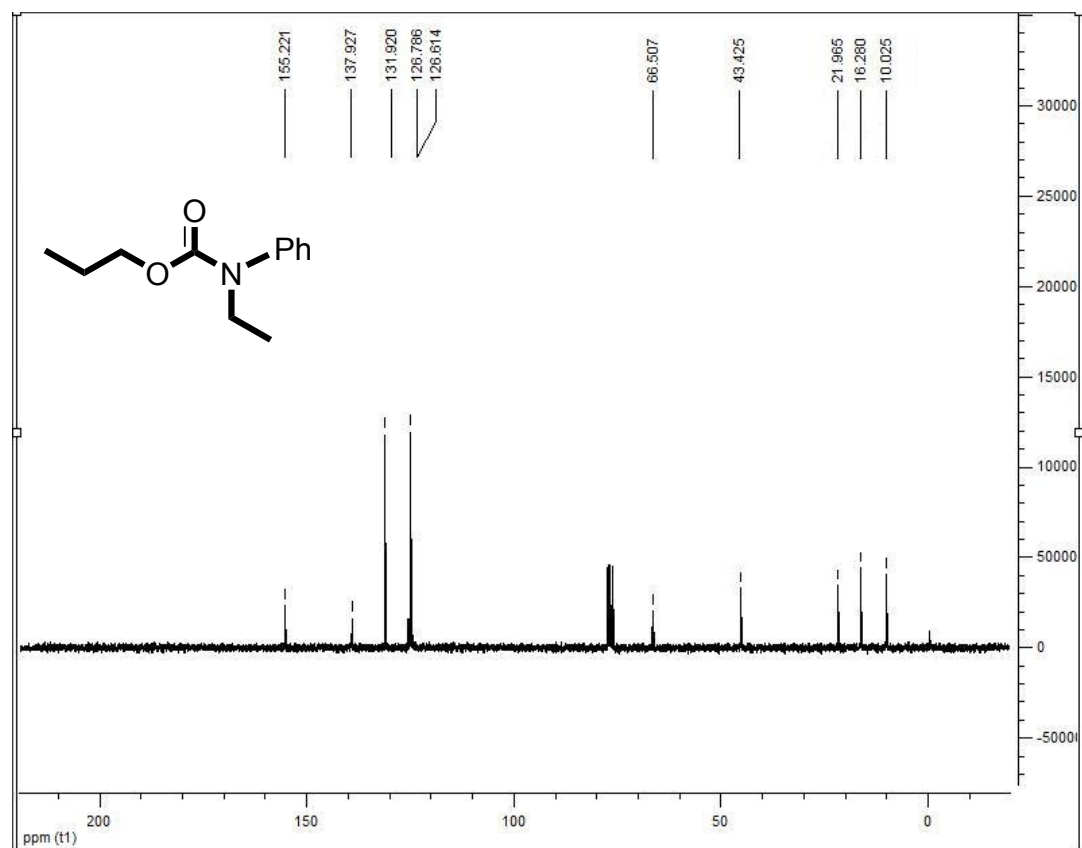
¹H-NMR spectra (250 MHz) of 1-propyl dibenzylcarbamate (C36) in CDCl₃.



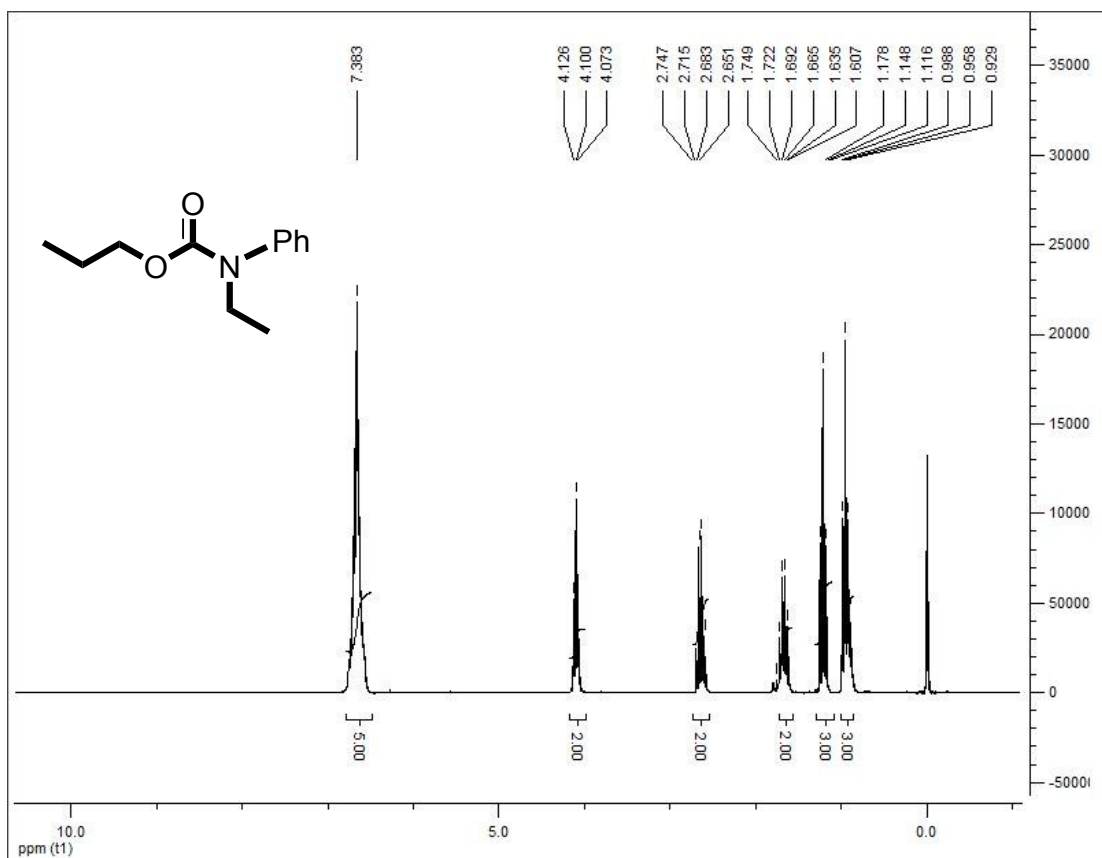
MS of 1-propyl dibenzylcarbamate (C36).



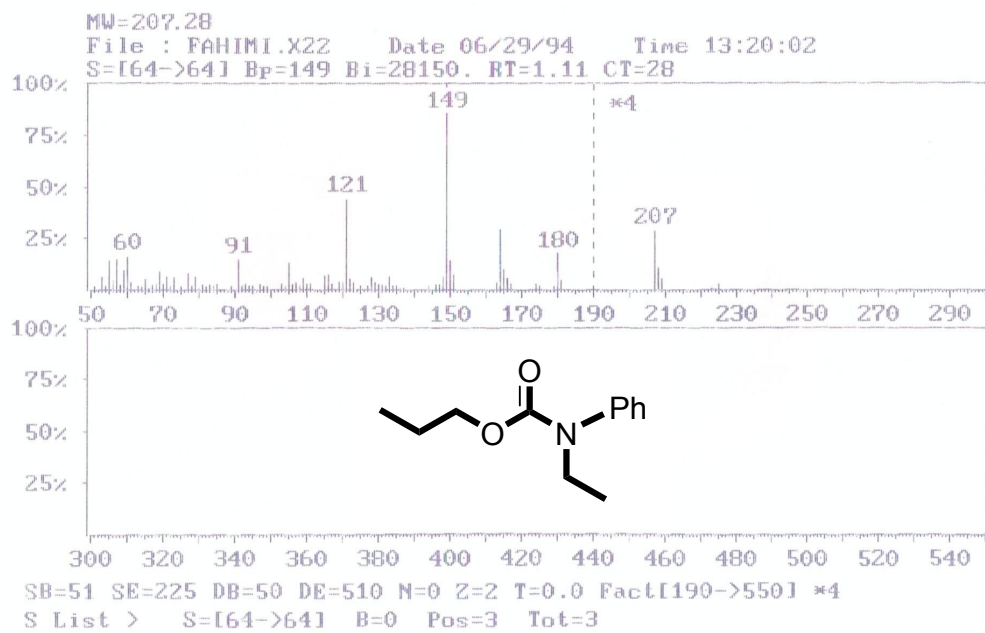
FT-IR spectra of 1-propyl ethyl(phenyl)carbamate (**C37**) in KBr .



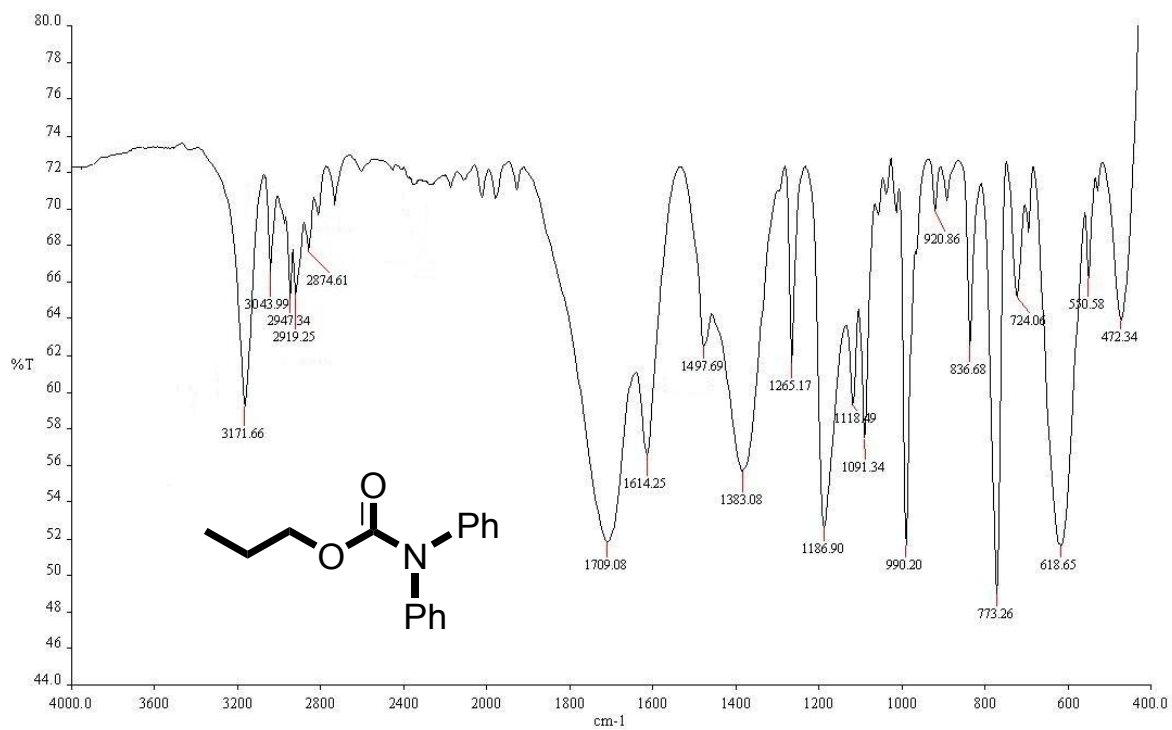
¹³C-NMR spectra (63 MHz) of 1-propyl ethyl(phenyl)carbamate (**C37**) in CDCl₃.



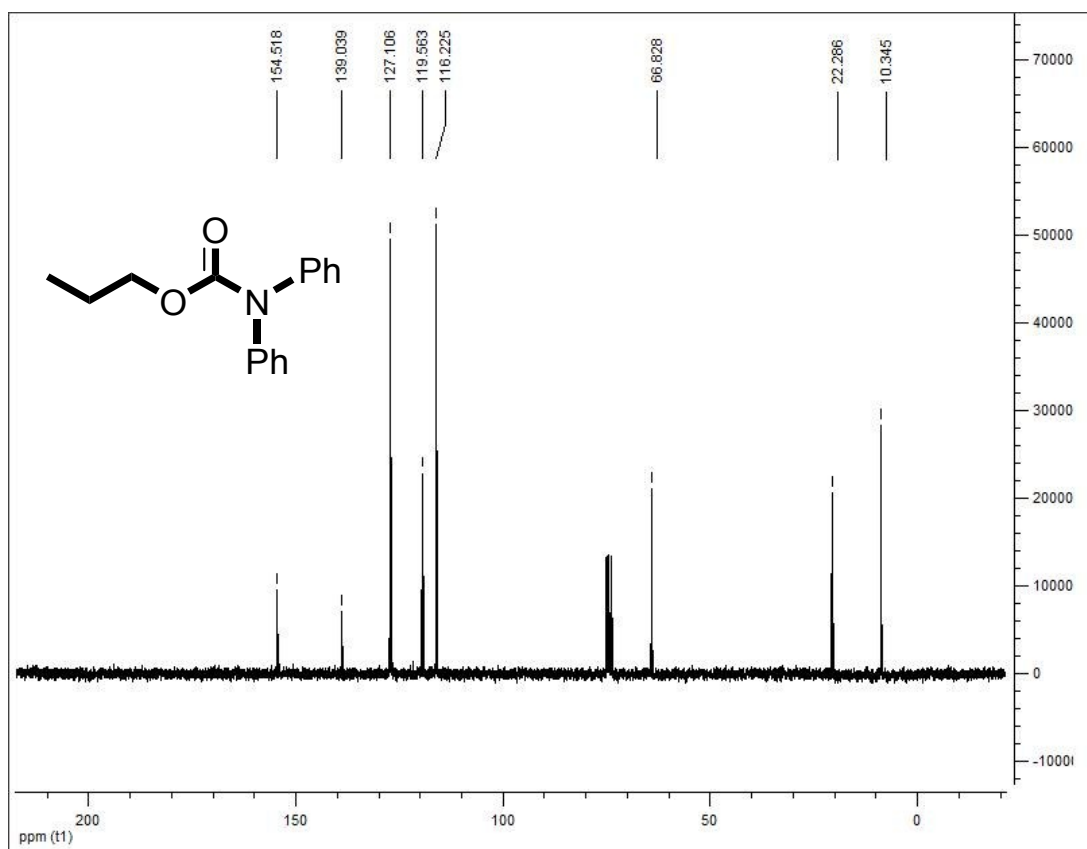
¹H-NMR spectra (250 MHz) of 1-propyl ethyl(phenyl)carbamate (C37) in CDCl₃.



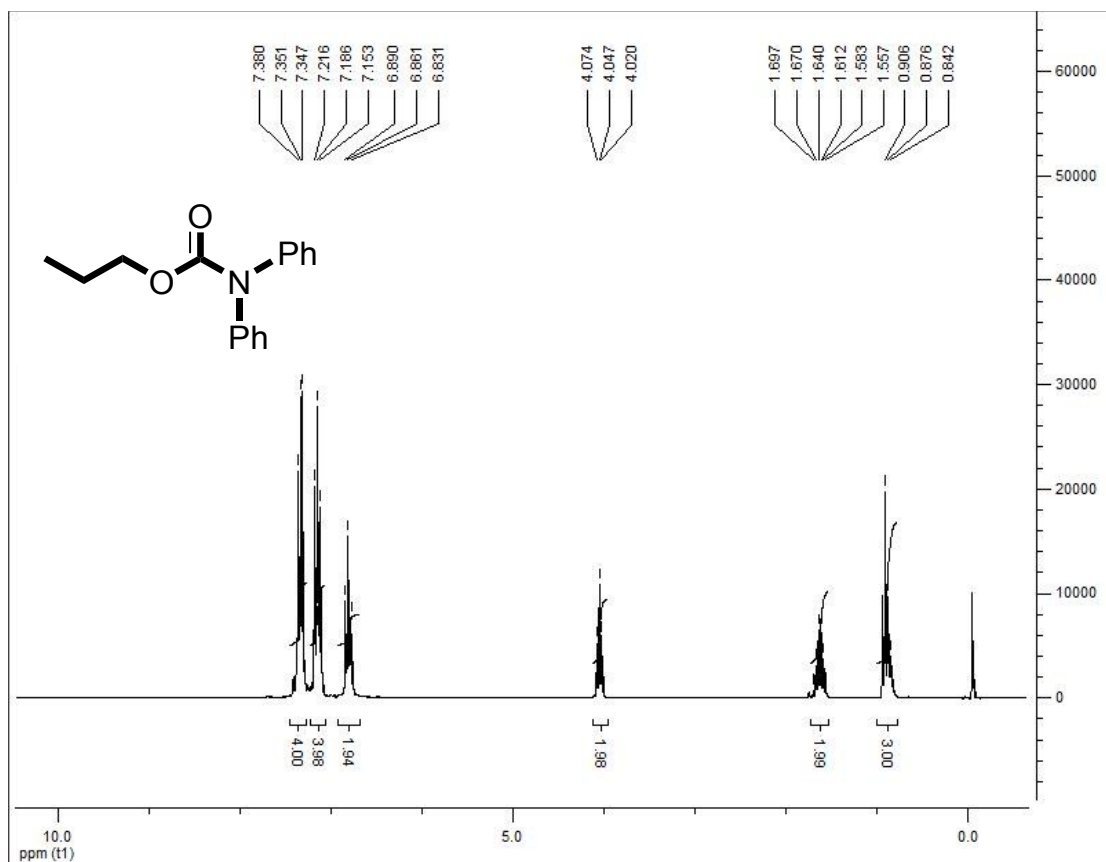
MS of 1-propyl ethyl(phenyl)carbamate (C37).



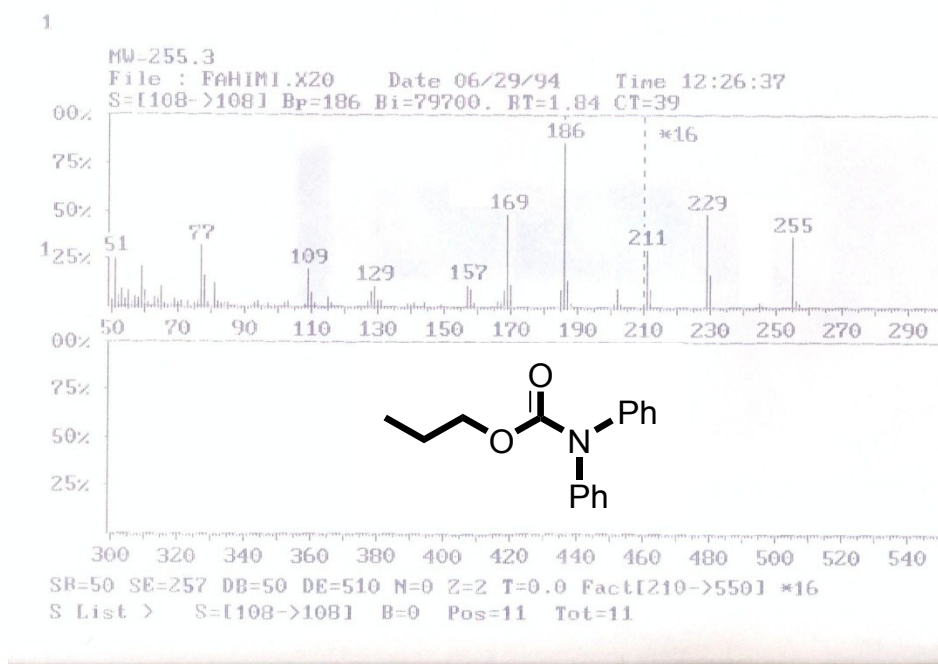
FT-IR spectra of 1-propyl diphenylcarbamate (**C38**) in KBr .



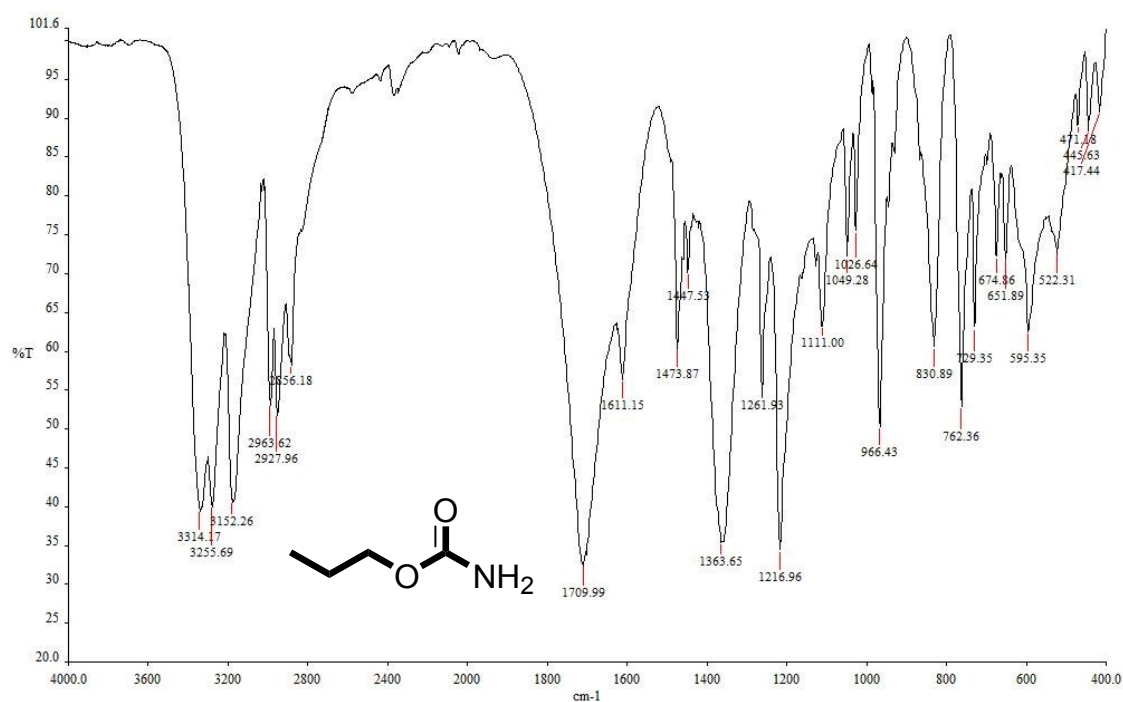
¹³C-NMR spectra (63 MHz) of 1-propyl diphenylcarbamate (**C38**) in CDCl₃.



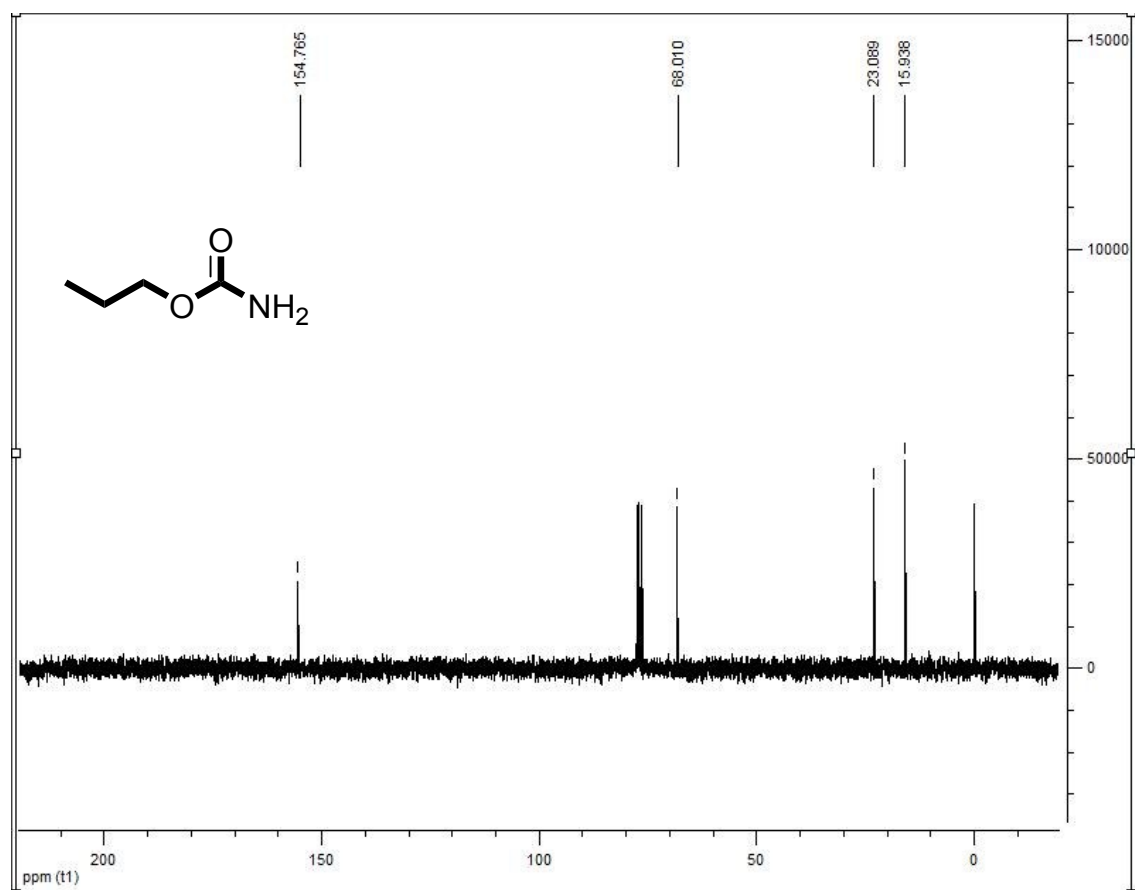
^1H -NMR spectra (250 MHz) of 1-propyl diphenylcarbamate (C38) in CDCl_3 .



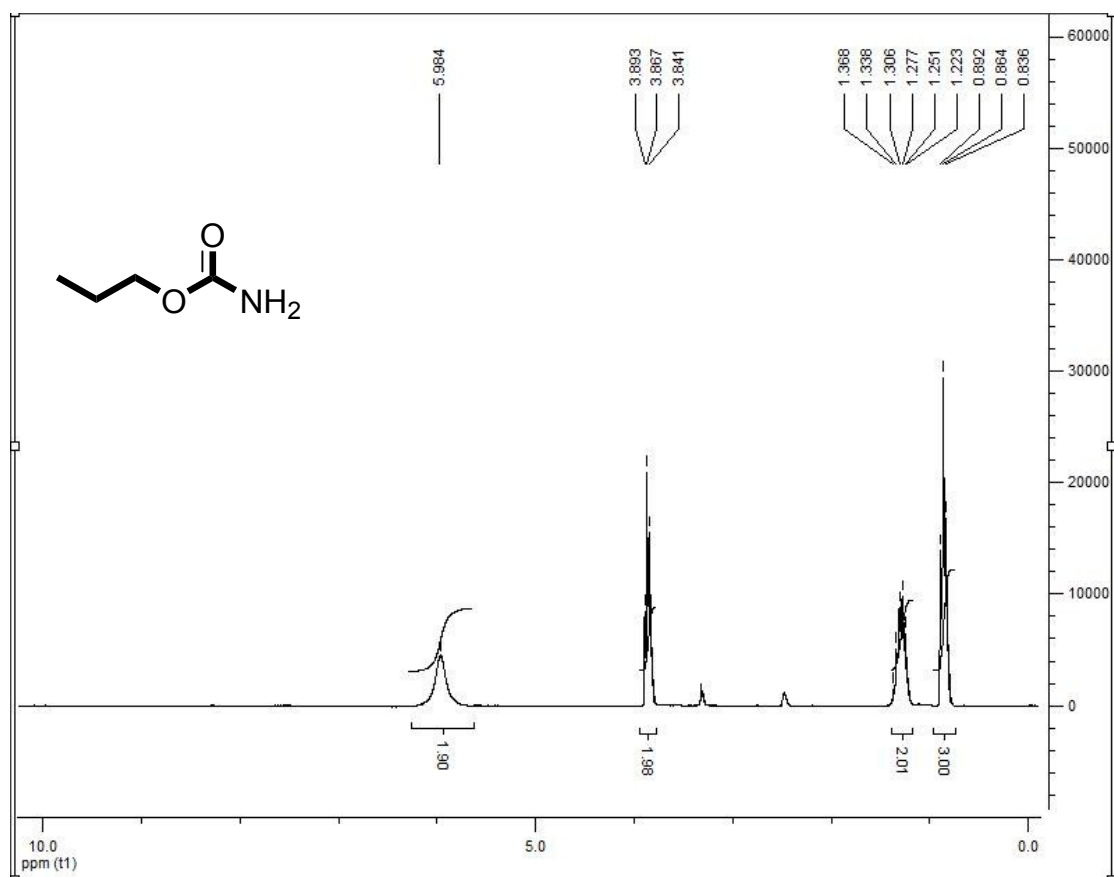
MS of 1-propyl diphenylcarbamate (C38).



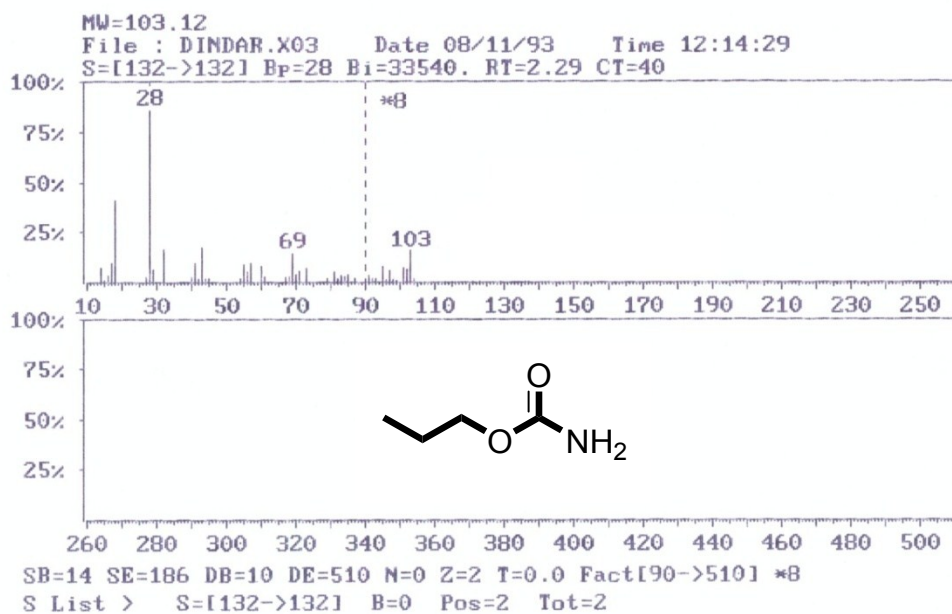
FT-IR spectra of 1-propyl carbamate (C39) in KBr .



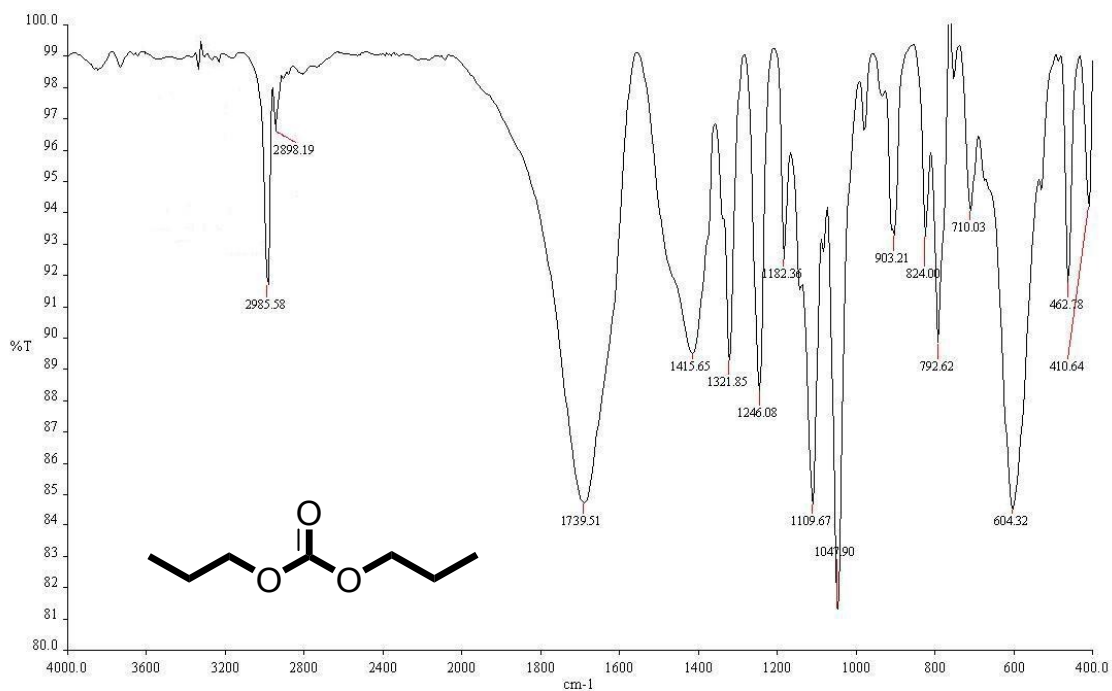
^{13}C -NMR spectra (63 MHz) of 1-propyl carbamate (**C39**) in CDCl_3 .



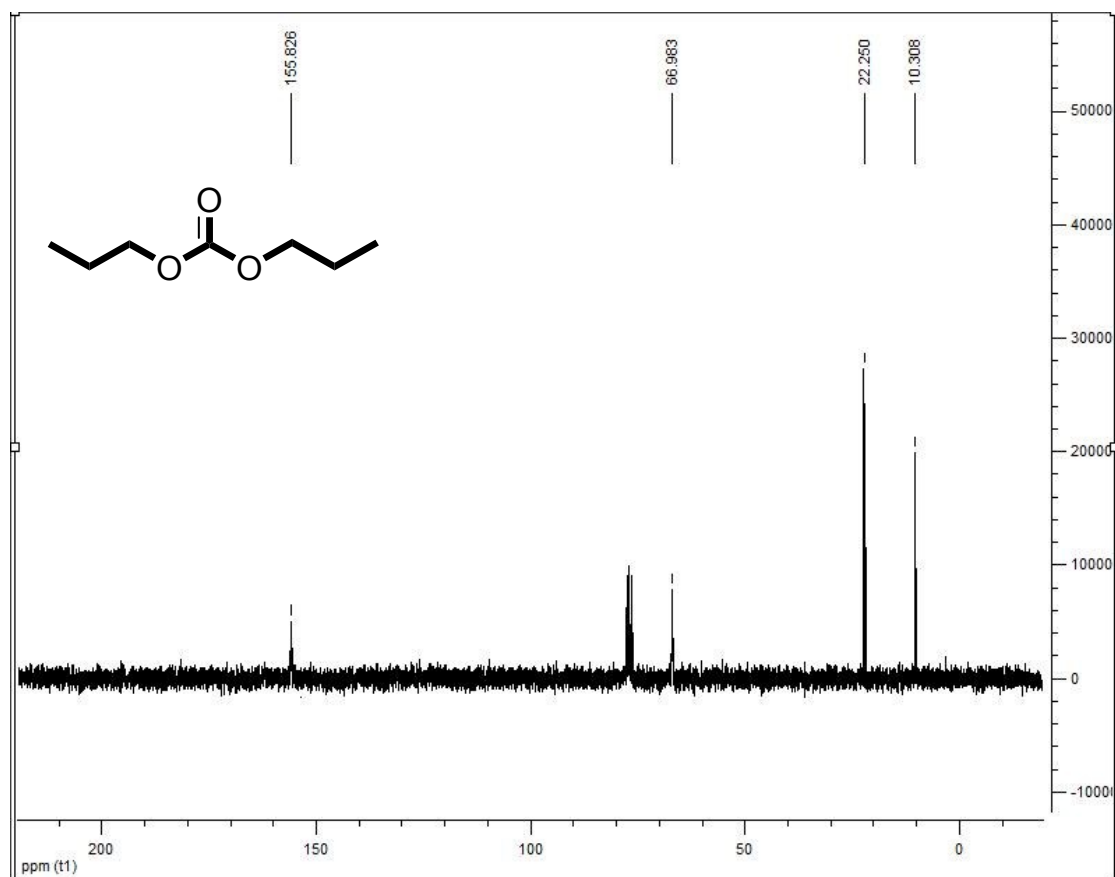
¹H-NMR spectra (250 MHz) of 1-propyl carbamate (**C39**) in CDCl₃.



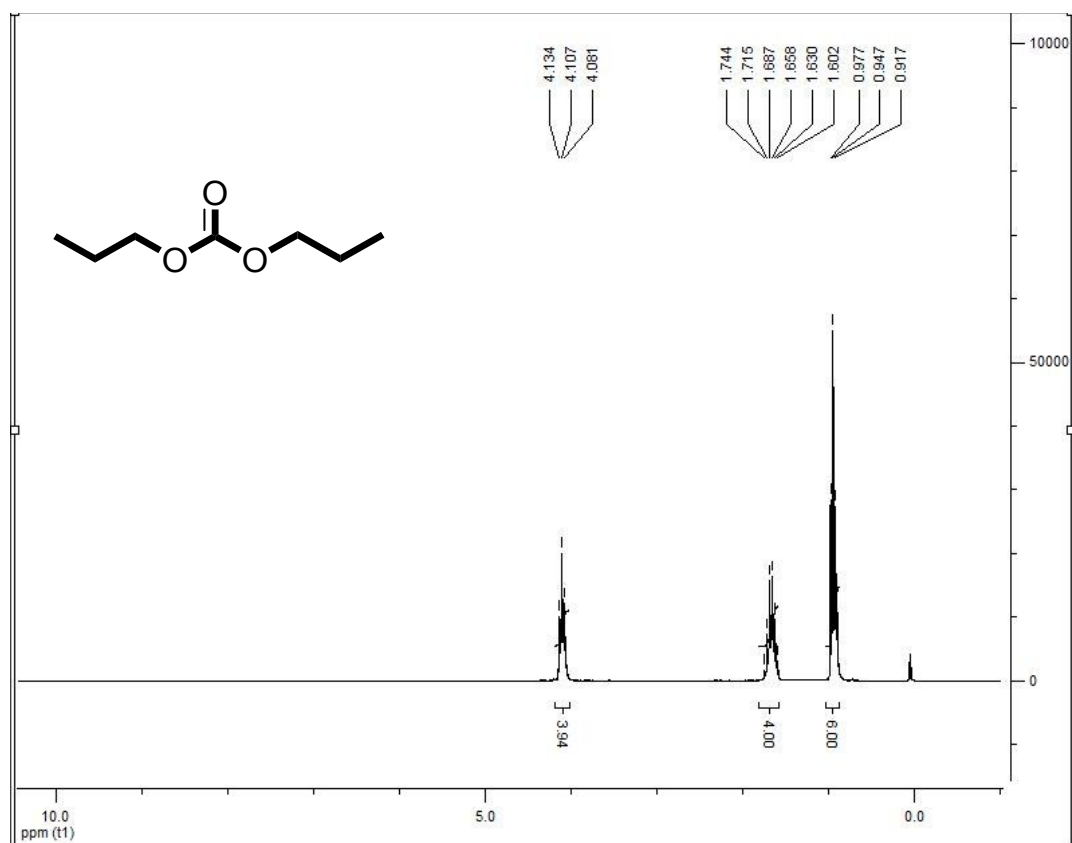
MS of 1-propyl carbamate (**C39**).



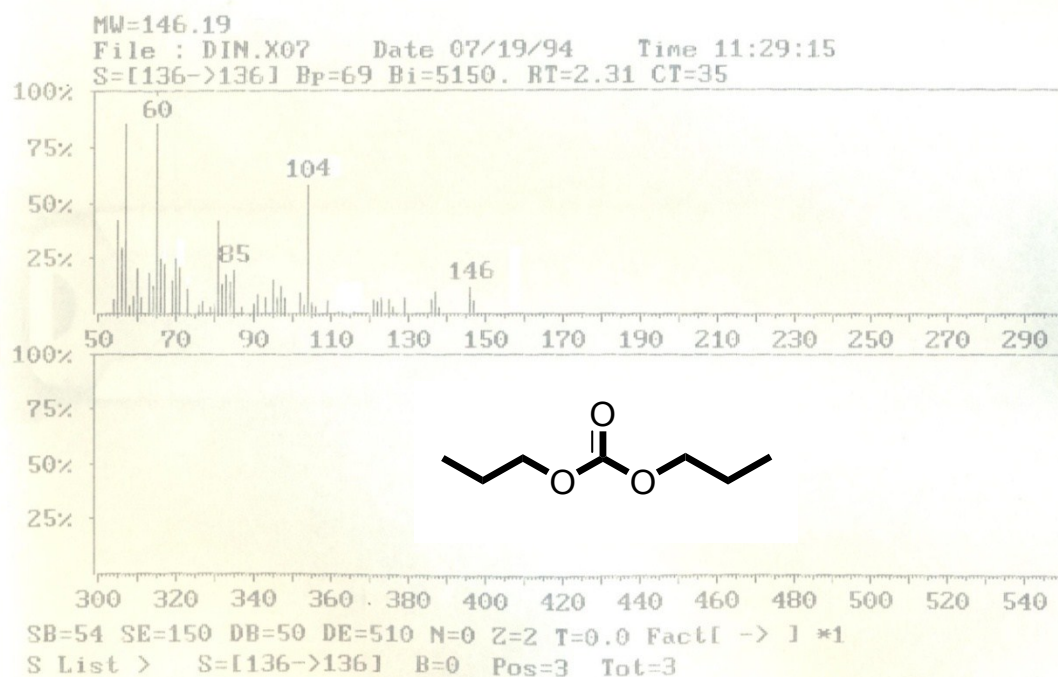
FT-IR spectra of dipropyl carbonate in KBr .



¹³C-NMR spectra (63 MHz) of dipropyl carbonate in CDCl₃.



¹H-NMR spectra (250 MHz) of dipropyl carbonate in CDCl₃.



MS of dipropyl carbonate.