SUPPLEMENTARY MATERIAL TO

**Synthesis, spectral studies and *in vitro* antimicrobial activity of some new Di/Triorganotin(IV) complexes of Schiff bases derived from 2-benzoyl pyridine**

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SPECTRAL DATA OF SYNTHESIZED LIGANDS AND ORGANOTIN COMPLEXES,

NMR SPECTRA OF Bu2SnClL2 & Bu3SnClL4, AND MASS SPECTRA OF COMPLEXES

**(E)-2-nitro-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazide** **(H1L1):**

C19H14N4O3, M.pt: 125 °C, Light brown color, Yield: 79 %. IR (KBr) ν: 1605 (C=N), 3310 (N-H), 1671 (C=O), cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 13.75 (*s*, 1H, NH, H-8), 8.82(*d*, 1H, J = 8Hz, H-1pyd.ring), 8.16 (*d*, 1H, *J* = 4), 8.02 (*d*, 1H *J* = 4), 7.82-7.71 (*m*, 2H), 7.65-7.57 (*m*, 2H), 7.46-7.22 (*m*, 7H, Ar-H). 13C NMR (CDCl3, 100 MHz, *δ*): 163.98 (C=O), 158.66 (C=N), 152.13, 149.31, 147.53, 146.69, 143.84, 141.50, 138.74, 137.23, 134.73, 133.21, 130.08, 129.81, 129.74 128.80, 123.76 (Ar-C), ESI-MS (*m/z*): Calculated for [C19H14N4O3 + H]+, 346.08, observed 347.51.Combustion analysis for C19H14N4O3: Calculated, C 65.89, H 4.07, N 16.18, O 13.86; found C 65.60, H 3.98, N 16.08, O 13.62.

**(E)-4-nitro-N'-(phenyl(pyridin-2-yl)methylene) benzohydrazide (H1L2):**

C19H14N4O3, M.pt: 152 °C, White color, Yield: 82 %. IR (KBr) ν: 1611 (C=N), 3190 (N-H), 1682 (C=O), cm-1. 1H NMR (DMSO-*d6*, 400 MHz, *δ*): 14.83 (*s*, 1H, NH, H-8), 9.00 (*d*, 1H, *J* = 4, H-1pyd.ring), 8.41 (*d*, 2H, *J* = 4), 8.13-8.04 (*m*, 3H), 7.55-7.41 (*m*, 7H) , 7.66-7.63(*m*, 2H, Ar-H), 7.41-7.32. 13C NMR (DMSO-d6, 100 MHz, *δ*): 162.16 (C=O), 153.49 (C=N), 150.10, 149.87, 149.62, 139.30, 138.34, 137.46, 131.24, 129.76, 127.33, 125.15, 124.19, 122.11, 120.57(Ar-C). ESI-MS (*m/z*): Calculated for [C19H14N4O3 + H]+, 346.07 observed 347.11. Combustion analysis for C19H14N4O3: Calculated, C 65.89, H 4.07, N 16.18, O 13.86 ; found C 65.78, H 3.98, N 16.09, O 13.66.

**(E)-4-methyl-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazide (H1L3):**

C20H17N3O, M.pt: 296 °C, white color, Yield: 78%. IR (KBr) ν: 1608 (C=N), 3292 (N-H), 1675 (C=O) cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 13.78 (*s*, 1H, NH, H-8), 8.71(*d*, 1H, *J* = 4, H-1pyd.ring), 8.23 (*d*, 1H, *J* = 8), 7.68-7.65 (*m*, 2H, Ar-H), 7.63 (*d*, 2H, *J* = 8), 7.52-7.41- (*m*, 5H, Ar-H), 7.23 (*d*, 2H, *J* = 8), 2.15 (*s*, 3H). 13C NMR (CDCl3, 100 MHz, *δ*): 163.19 (C=O), 152.46 (C=N), 150.13, 149.84, 148.50, 147.34, 139.58, 137.23, 129.7, 139.24, 137.23, 129.76, 125.72, 124.26, 120.56 (Ar-C), 23.67 (CH3). ESI-MS (*m/z*): Calculated for [C20H17N3O + H] + 315.14, observed. 316.90 Combustion analysis for C20H17N3O: Calculated, C 76.17, H 5.43, N 13.32, O 5.07; found C 76.05, H 5.21, N 13.09, O 4.99.

**(E)-4-chloro-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazide (H1L4):**

C19H14ClN3O, M.pt: 170 °C, White color, Yield: 78%.. IR (KBr) ν: 1603 (C=N), 3305 (N-H), 1686 (C=O) cm-1. 1H NMR (CDCl3, 400 MHz, δ): 15.20 (*s*, 1H, NH, H-8), 8.82 (*d*, 1H, *J* = 4, H-1pyd.ring), 7.95 (*d*, 2H, *J* = 8), 7.88-7.84 (*m*, 1H, Ar-H), 7.52-7.28 (*m*, 9H, Ar-H). 13C NMR (CDCl3, 100 MHz, δ): 163.38 (C=O), 153.11 (C=N), 148.30, 147.83, 138.19, 137.72, 137.63, 132.27, 129.48, 129.20, 129.04, 128.99, 128.43, 126.98, 124.40 (Ar-C). ESI-MS (*m/z*): Calculated for [C19H14ClN3O + H]+ 335.79, observed 336.10. Combustion analysis for C19H14ClN3O: Calculated, C 67.96, H 4.20, Cl 10.56, N 12.51, O 4.76 ; found C 67.82, H 4.09, Cl 10.31, N 12.45, O 4.56.

**(1E,N'Z)-chlorodiphenylstannyl-2-nitro-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate (Ph2SnL1Cl):**

C31H23ClN4O3Sn M.pt: 213 °C, yellow color, Yield: 78%. IR (KBr) ν: 1591 (C=N), 447 (Sn-N) , 552 (Sn-O), 731 (Sn-C), cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 9.23 (*d*, 1H, *J* = 4, H-1pyd.ring), 8.89-8.23 (*m*, 4H, Ar-H), 7.95-7.23 (*m*, 18H, Ar-H). 13C (CDCl3, 100 MHz, *δ*): 163.75 (C=O), 148.75 (C=N), 148.92, 145.74, 143.52, 131.42, 137.94, 137.35, 137.16, 131.22, 129.77, 129.58, 129.17, 128.98, 128.42, 127.79, 126.83, 125.89, 123.29, (Ar-C). 119Sn NMR (CDCl3, 149 MHz, *δ*): ‒343.76. ESI-MS (*m/z*): Calculated for [C31H23ClN4O3Sn + H]+ 653.70, observed 654.60. Combustion analysis for C31H23ClN4O3Sn: Calculated, C 56.96, H 3.55,Cl 5.42, N 8.57, O 7.34, Sn 18.16; found C 56.67, H 3.23,Cl 5.31, N 8.34, O 7.22, Sn, 18.04.

**(1E,N'Z)-dibutylchlorostannyl-2-nitro-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate (Bu2SnL1Cl):**

C27H31ClN4O3Sn, M.pt: 203 °C, Light brown, Yield: 73%. IR (KBr) ν: 1582 (C=N), 432 (Sn-N), 557 (Sn-O), 689 (Sn-C), cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 9.12 (*d*, 1H, *J* = 4, H-1pyd.ring), 8.93- 8.61 (*m*, 3H), 8.34 (*d*, 1H), 7.92-7.67 (*m*, 3H), 7.61-7.54 (*m*, 5H), 1.73-1.67 (*m*, 4H, 4CH2, Bu), 1.48-1.41 (*m*, 4H, CH2, Bu), 1.38-1.32 (*m*, 4H, CH2, Bu), 0.70 (*t*, *J* = 8, 6H, CH3, Bu). 13C NMR (CDCl3, 100 MHz, δ): 164.01 (C=O), 149.15 (C=N), 148.24, 141.25, 137.56, 133.43, 134.87, 134.27, 133.47, 131.71, 129.63, 129.52, 129.03, 129.00, 128.57, 126.32, 123.29 (Ar-C), 34.32, 28.81, 25.82, 13.57. 119Sn NMR (CDCl3, 149 MHz, *δ*): ‒297.11. ESI-MS (*m/z*): Calculated for [C31H23ClN4O3Sn + H]+ 613.72, observed (614.72). Combustion analysis for C27H31ClN4O3Sn: Calculated, C 52.84, H 5.09, Cl 5.78, N 9.13, O 7.82, Sn 19.34; found C 52.91, H 4.98, Cl 5.49, N 8.95, O 7.67, Sn 19.01.

**(1E,N'Z)-chlorodimethylstannyl-2-nitro-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate (Me2SnL1Cl):**

C21H19ClN4O3Sn, M.pt: 219°C, Yellow, Yield: 71%. IR (KBr) ν: 1576 (C=N), 435 (Sn-N), 553 (Sn-O), 692 (Sn-C), cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 8.92 (*d*, 1H, *J* = 4, H-1pyd.ring), 8.51 (*d*, 1H), 8.31-8.28 (*m*, 3H, Ar-H), 7.68-7.31 (*m*, 8H, Ar-H), 1.32 (*s*, 6H, CH3). 13C NMR (CDCl3, 100 MHz, *δ*): 161.34 (C=O), 153.94, 149.28 (C=N), 149.13, 137.96, 132.76, 130.51, 129.63, 129.19, 128.84, 128.61, 128.58, 127.87, 126.75, 124.81, 124.25, 122.34, (Ar-C), 21.1(CH3-C). 119Sn NMR (CDCl3, 149 MHz, *δ*): ‒219.89. ESI-MS (*m/z*): Calculated for [C21H19ClN4O3Sn + H]+ 529.50, observed 530.70. Combustion analysis for C21H19ClN4O3Sn: Calculated, C 47.63, H 3.62, Cl 6.69, N 10.58, O 9.06, Sn 22.42; found C 47.48, H 3.43, Cl 6.43, N 10.21, O 8.87, Sn 22.76.

**(1E,N'Z)-triphenylstannyl-2-nitro-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate (Ph3SnL1):**

C37H28N4O3Sn, M.pt: 234 °C, Yellow, Yield: 62%. IR (KBr) ν: 1579 (C=N), 437 (Sn-N), 557 (Sn-O), 703 (Sn-C), cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 9.03 (*d*, 1H, *J* = 4, H-1pyd.ring), 8.82-8.63 (*m*, 4H, *J* = 8), 7.68-7.33 (*m*, 23 H, Ar-H). 13C NMR (CDCl3, 100 MHz, *δ*): 162.48 (C=O), 149.87 (C=N), 152.76, 137.65, 137.14, 137.00, 136.78, 135.34, 134.91, 134.83, 131.72, 130.54, 130.12, 129.40, 129.37, 128.53, 128.34. 119Sn NMR (CDCl3, 149 MHz, *δ*): -437.89. ESI-MS (*m/z*): Calculated for [C37H28N4O3Sn + H]+ 695.35, observed 696.80. Combustion analysis for C37H28N4O3Sn: Calculated, C 63.89, H 4.01, N 8.03, O 6.88, Sn 17.05, found C 63.91, H 4.06, N 8.06, O 6.90, Sn 17.07.

**(1E,N'Z)-tributylstannyl-2-nitro-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate(Bu3SnL1):**

C31H40N4O3Sn, M.pt: 204 °C, Dark brown, Yield: 75%. IR (KBr) ν: 1582 (C=N), 453 (Sn-N), 554 (Sn-O), 617 (Sn-C), cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 9.18 (*d*, 1H, *J* = 4, H-1pyd.ring), 8.28 (*d*, 1H, *J* = 8 Hz), 7.94-7.91 (*m*, 2H), 7.87 (*t*, 1H, *J* = 8), 7.60-7.56 (*m*, 3H) 7.38-7.32 (*m*, 5H, Ar-H), 1.49 (*t*, 6H,-CH2, Bu), 1.41-1.21 (*m*, 12H -CH2, Bu), δ = 0.94 (*t*, 9H, CH3, J=8 Hz, Bu). 13C NMR (CDCl3, 100 MHz, *δ*): 163.81 (C=O), 148.41 (C=N), 148.20, 145.21, 131.98, 131.73, 130.72, 130.24, 129.89, 129.58, 128.81, 128.73, 124.77, 124.63, 124.41, 125.32, 123.70, (Ar-C), 12.54, 22.17, 27.88, 42.67. 119Sn NMR (CDCl3, 149 MHz, *δ*): -290.72. ESI-MS (*m/z*): Calculated for [C31H40N4O3Sn + H]+ 635.38, observed 636.80. Combustion analysis for C31H40N4O3Sn: Calculated, C 58.60, H 6.35, N 8.82, O 7.55, Sn 18.68; found C 58.71, H 6.18, N 8.54, O 7.34, Sn 18.42.

**(1E,N'Z)-trimethylstannyl-2-nitro-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate (Me3SnL1):**

C22H22N4O3Sn, M.pt: 198°C, Yellow, Yield: 69%. IR (KBr) ν: 1581 (C=N), (N-H), (C=O) disappeared, 457 (Sn-N), 564 (Sn-O), 696 (Sn-C), cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 8.96 (*d*, 1H, *J* = 4, H-1pyd.ring), 8.57-8.32 (*m*, 4H, Ar-H), 7.84-7.35 (*m*, 8H, Ar-H), 1.03 (*s*, 9H, CH3). 13C NMR (CDCl3, 100 MHz, *δ*): 167.62 (C=O), 151.72, 149.78 (C=N), 141.34, 133.18, 130.65, 129.96, 129.74, 129.86, 129.80, 129.78, 129.64, 129.59, 129.47, 128.48, 128.39, 125.29, (Ar-C), 14.54. 119Sn NMR (CDCl3, 149 MHz, *δ*): -236.84. ESI-MS (*m/z*): Calculated for [C22H22N4O3Sn + H]+ 509.15, observed 510.60. Combustion analysis for C22H22N4O3Sn: Calculated, C 51.88, H 4.03, N 10.97, O 9.41, Sn 23.30; found C 51.90, H 4.36, N 11.00, O 9.43, Sn 23.32.

**(1E,N'Z)-chlorodiphenylstannyl-4-nitro-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate (Ph2SnClL2):**

C31H23ClN4O3Sn, M.pt: 211°C, Yellow, Yield: 71%. IR (KBr) ν: 1592 (C=N), 449 (Sn-N), 561 (Sn-O), 668 (Sn-C), cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 9.25 (*d*, 1H, *J* = 4, H-1pyd.ring), 8.92-8.15 (*m*, 5H, Ar-H), 7.91-7.89 (*d*, 2H, *J* = 8), 7.34-7.17 (*m*, 15 H, Ar-H). 13C NMR (CDCl3, 100 MHz, δ): 167.40 (C=O), 149.37 (C=N), 148.27, 142.78, 137.91, 131.74, 130.78, 129.73, 129.36, 129.13, 129.07, 128.29, 128.37, 127.57, 127.02.119Sn NMR (CDCl3, 149 MHz, *δ*): -331.45. ESI-MS (*m/z*): Calculated for [C31H23ClN4O3Sn + H]+ 653.70, observed 654.70. Combustion analysis for C31H23ClN4O3Sn: Calculated, C 56.96, H 3.55, Cl 5.42, N 8.57, O 7.34, Sn 18.16; found C 56.73, H 3.27, Cl 5.34, N 8.13, O 7.09, Sn 18.03.

**(1E,N'Z)-dibutylchlorostannyl-4-nitro-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate (Bu2SnClL2):**

C27H31ClN4O3Sn, M.pt: 215 °C, Yellow, Yield: 68%.IR (KBr) ν: 1588 (C=N), 433 (Sn-N), 566 (Sn-O), 675 (Sn-C), cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 9.54 (*d*, 1H, *J* = 4 H-1pyd.ring), 8.26-8.18 (*m*, 5H, Ar-H), 7.70-7.53 (*m*, 7H, Ar-H), 1.75-1.68 (*m*, 4H, -CH2 Bu), 1.46-1.38 (*m*, 4H -CH2 Bu), 1.24-1.15 (m, 4H, -CH2,Bu), 0.73 (*t*, 6H, *J* = 8, CH3, Bu). 13C NMR (CDCl3, 100 MHz, *δ*): 162.74 (C=O), 149.57 (C=N), 140.48, 139.75, 130.48, 129.82, 129.51, 129.47, 128.68, 128.49, 126.66, 126.25, 124.79, 123.99, 123.19, 45.84, 27.65, 26.01, 25.37. 119Sn NMR (CDCl3, 149MHz, *δ*): -274.11. ESI-MS (*m/z*): Calculated for [C27H31ClN4O3Sn + H]+ 613.72, observed 614.50. Combustion analysis for C27H31ClN4O3Sn: Calculated, C 52.84, H 5.09,Cl 5.78, N 9.13, O 7.82, Sn 19.34; found C 52.58, H 4.85,Cl 5.43, N 9.01, O 7.65, Sn 19.08.

**(1E,N'Z)-chlorodimethylstannyl-4-nitro-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate (Me2SnClL2):**

C21H19ClN4O3Sn, M.pt: 238 °C, Yellow, Yield: 61%. IR (KBr) ν: 1590 (C=N), 451 (Sn-N), 553 (Sn-O), 621 (Sn-C), cm-1. 1H NMR (CDCl3, 400MHz, *δ*): 8.86 (*d*, 1H, *J* = 4, H-1pyd.ring), 8.40 (*d*, 2H, *J* = 8), 8.17 (*d*, 2H *J* = 8), 7.89 (*t*, 1H, *J* = 8), 7.66-7.64 (*m*, 2H, Ar-H), 7.52-7.38 (*m*, 5H, Ar-H), 1.67 (*s*, 6H, CH3). 13C NMR (CDCl3, 100 MHz, *δ*): 162.34 (C=O), 153.04, 149.83 (C=N), 149.83, 149.26, 147.80, 137.90, 129.49, 129.43, 128.71, 128.51, 127.27, 124.65, 124.01, 122.50, 10.49 (CH3). 119Sn NMR (CDCl3, 149M Hz, *δ*): -213.67. ESI-MS (*m/z*): Calculated for [C21H19ClN4O3Sn + H]+ 529.56, observed 530.90. Combustion analysis for C21H19ClN4O3Sn: Calculated, C 47.63, H 3.62,Cl 6.69, N 10.58, O 9.06, Sn 22.42; found C 47.34, H 3.37, Cl 6.38, N 10.29, O 8.89, Sn 22.13.

**1E,N'Z)-triphenylstannyl-4-nitro-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate((Ph3SnL2):**

C37H28N4O3Sn, M.pt: 243 °C, Yellow, Yield: 72%. IR (KBr) ν: 1578 (C=N), 456 (Sn-N), 561 (Sn-O), 708 (Sn-C), cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 8.85 (*d*, 1H, *J* = 4, H-1pyd.ring), 8.40 (*d*, 2H, *J* = 8), 8.17 (*d*, 2H, *J* = 8), 7.89(*t*, 1H, *J* = 8), 7.38-7.82 (*m*, 22H, Ar-H). 13C NMR (CDCl3, 100 MHz, *δ*): 160.81 (C=O), 152.47, 149.93 (C=N), 137.69, 137.34, 137.10, 136.48, 135.89, 134.73, 134.51, 131.47, 130.58, 130.23, 129.41, 129.38, 129.27, 128.86. 119Sn NMR (CDCl3, 400 Hz, *δ*): -453.62. ESI-MS (*m/z*): Calculated for [C37H28N4O3Sn + H]+ 695.35, observed 696.90. Combustion analysis for C37H28N4O3Sn: Calculated, C 63.91, H 4.06, N 8.08, O 6.90, Sn 17.07; found C 63.71, H 3.97, N 7.99, O 6.71, Sn 17.05.

**(1E,N'Z)-tributylstannyl-4-nitro-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate (Bu3SnL2):**

C31H40N4O3Sn, M.pt: 211°C, Light yellow, Yield- 73%. IR (KBr) ν: 1589 (C=N), 439 (Sn-N), 558 (Sn-O), 643 (Sn-C), cm-1.  1H NMR (CDCl3, 400 MHz, *δ*): 9.13 (*d*, 1H, *J* = 4, H-1pyd.ring), 8.74 (*d*, 2H, *J* = 8), 8.37 (*d*, 2H, *J* = 8), 7.93 (*t*, 1H, *J* = 8 ), 7.65(*m*, 2H, Ar-H), 7.52-7.38(*m*, 5H, Ar-H), 1.51-1.26 (*m*, 18H,-CH2, Bu), 0.91(*t*, 9H, CH3 Bu, *J* = 8 Hz). 13C NMR (CDCl3, 100 MHz, *δ*): 163.04 (C=O), 149.50 (C=N), 149.26, 147.80, 139.4, 137.29, 131.53, 130.71, 130.64, 129.43, 128.71, 128.51, 127.31, 124.65, 124.01, (Ar-C), 16.96, 21.15, 26.28, 43.67. 119Sn NMR (CDCl3, 149 MHz, *δ*): -272.48. ESI-MS (*m/z*): Calculated for [C31H40N4O3Sn + H]+ 635.38, observed 636.70. Combustion analysis for C31H40N4O3Sn: Calculated, C 58.60, H 6.35, N 8.82, O 7.55, Sn 18.68; found C 58.27, H 6.19, N 8.57, O 7.24, Sn 18.43.

**(1E,N'Z)-trimethylstannyl-4-nitro-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate (Me3SnL2):**

C22H22N4O3Sn, M.pt: 189 °C Yellow, Yield: 79%. IR (KBr) ν: 1591 (C=N), 438 (Sn-N), 567 (Sn-O), 683 (Sn-C), cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 9.12 (*d*, 1H, *J* = 4, H-1pyd.ring), 8.89-8.83 (*m*, 3H, Ar-H), 8.62 (*d*, 2H, *J* = 8), 7.95 (*d*, 2H, *J* = *8*), 7.45-7.32 (*m*, 5H, Ar-H), 0.97 (s, 9H, CH3). 13C NMR (CDCl3, 100 MHz, *δ*): 166.97 (C=O), 149.81 (C=N), 150.72, 147.47, 134.27, 130.74, 130.61, 129.84, 129.67, 129.53, 129.46, 128.40, 128.41, 127.75, 125.39, 15.39(CH3). 119Sn NMR (CDCl3, 149 MHz, *δ*): -203.35. ESI-MS (*m/z*): Calculated for [C22H22N4O3Sn + H]+ 509.15, observed 510.90. Combustion analysis for C22H22N4O3Sn: Calculated, C 51.90, H 4.36, N 11.00, O 9.43, Sn 23.32; found C 51.76, H 4.03, N 10.82, O 9.32, Sn 23.08.

**(1E,N'Z)-chlorodiphenylstannyl-4-methyl-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate (Ph2SnClL3):**

C32H26 ClN3OSn, M.pt: 133°C, Dark Yellow, Yield: 71%. IR (KBr) ν: 1575 (C=N), 445 (Sn-N), 549 (Sn-O), 701 (Sn-C), cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 9.05 (*d*, 1H, *J* = 4, H-1pyd.ring) , 8.62-8.35 (*m*, 3H, Pyrd ring), 7.57 (*d*, 2H, *J* = 8), 7.38-7.23 (*m*, 15 H, Ar-H), 6.94 (*d*, 2H, *J* = 8), 2.15 (*s*, 3H, CH3). 13C NMR (CDCl3, 100 MHz, *δ*): 168.79 (C=O), 149.29 (C=N), 143.78, 140.24, 139.92, 130.29, 130.77, 130.34, 129.08, 129.31, 129.45, 129.27, 128.37, 128.29, 125.97, 125.12, 124.06, 21.57(CH3). 119Sn NMR (CDCl3, 149 MHz, *δ*): -367.41. ESI-MS (*m/z*): Calculated for [C32H26 ClN3OSn + H] + 622.73, observed 623.70. Combustion analysis for C32H26 ClN3OSn: Calculated, C 61.72, H 4.21, Cl 5.69, N 6.75, O 2.57, Sn 19.06; found C 61.54, H 3.98, Cl 5.69, N 6.54, O 2.39, Sn 18.84.

**(1E,N'Z)-dibutylchlorostannyl-4-methyl-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate** (**Bu2SnClL3):**

C28H34 ClN3OSn, M.pt: 142°C, Dark Yellow, Yield: 74%. IR (KBr) ν: 1578 (C=N), 436 (Sn-N), 547 (Sn-O), 612 (Sn-C), cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 9.48 (*d*, 1H, *J* = 4, H-1pyd.ring), 8.02-7.98 (*m*, 3H, Pyrd ring), 7.66-7.55 (*m*, 7H, Ar-H), 7.18 (*d*, 2H, *J* = 8), 2.39 (*s*, 3H, CH3), 1.73-1.66 (*m*, 4H,-CH2, Bu), 1.48-1.35 (*m*, 4H -CH2, Bu), 1.22-1.17 (*m*, 4H,-CH2, Bu), 0.73 (*t*, 6H, CH3, Bu, *J* = 8). 13C NMR (CDCl3, 100MHz, *δ*): 173.91 (C=O), 150.42(C=N), 149.24 142.37, 140.22, 131.19, 130.77, 130.10, 129.77, 129.61, 129.54, 129.07, 128.79, 128.57, 125.97, (Ar-C), 34.81, 27.24, 25.95 21.86, 20.89. 119Sn NMR (CDCl3, 149 MHz, *δ*): -270.75. ESI-MS (*m/z*): Calculated for [C28H34 ClN3OSn + H]+ 582.75, observed 583.95. Combustion analysis for C28H34 ClN3OSn: Calculated, C 57.71, H 5.88, Cl 6.08, N 7.21, O 2.75, Sn 20.37; found C 57.59, H 5.65, Cl 5.81, N 6.94, O 2.49, Sn 20.03.

**(1E,N'Z)-chlorodimethylstannyl-4-methyl-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate** (**Me2SnClL3):**

C22H22 ClN3OSn, M.pt: 120°C, Yellow, Yield: 68%. IR (KBr) ν: 1573 (C=N), 434 (Sn-N), 523 (Sn-O), 623 (Sn-C) cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 9.28 (*d*, 1H, *J* = 4, H-1pyd.ring), 7.63 (*d*, 2H, *J* = 4), 7.41-7.37 (*m*, 8H, Ar-H), 7.13 (*d*, 2H, *J* = 8), 2.03 (*s*, 3H, CH3), 1.07 (*s*, 6H, CH3). 13C NMR (CDCl3, 100 MHz, *δ*): 162.23 (C=O), 150.79 (C=N), 149.37, 140.42, 138.83, 131.97, 131.62, 130.83, 130.05, 129.38, 129.29, 128.36, 128.17, 128.07, 127.67(Ar-C), 31.81, 20.09. 119Sn NMR (CDCl3, 149 MHz, *δ*): -228.23. ESI-MS (*m/z*): Calculated for [C22H22 ClN3OSn + H] + 498.95, observed 499.70. Combustion analysis for C22H22ClN3OSn: Calculated, C 53.00, H 4.45, Cl 7.11, N 8.43, O 3.21, Sn 23.81; found C 52.73, H 4.18; Cl 6.89, N 8.01, O 3.08, Sn 23.66.

**(1E,N'Z)-triphenylstannyl-4-methyl-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate** (**Ph3SnL3):**

C38H31N3OSn, M.pt: 198 °C, Yellow, Yield: 62%. IR (KBr) ν: 1585 (C=N), 451 (Sn-N), 556 (Sn-O), 678 (Sn-C), cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 8.96 (*d*, 1H, *J* = 4, H-1pyd.ring), 8.47-8.21 (*m*, 3H), 7.89-7.37 (*m*, 24H, Ar-H), 1.96 (s, 3H CH3). 13C NMR (CDCl3, 100 MHz, *δ*): 161.92 (C=O), 152.78, 149.36 (C=N), 137.79, 137.48, 137.67, 136.28, 135.56, 134.72, 134.53, 131.49, 130.11, 130.07, 129.67, 129.58, 129.11, 128.75. 119Sn NMR (CDCl3, 149 MHz, *δ*): -452.38. ESI-MS (*m/z*): Calculated for [C38H31N3OSn + H]+ 664.38, observed 665.20. Combustion analysis for C38H31N3OSn: Calculated, C 68.70, H 4.70, N 6.32, O 2.41, Sn 17.87; found C 68.67, H 4.66; N 6.29, O 2.39, Sn 17.85.

**(1E,N'Z)-tributylstannyl-4-methyl-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate (Bu3SnL3):**

C32H43 N3OSn, M.pt: 178 °C, Pale Yellow, Yield: 68%. IR (KBr) ν: 1572 (C=N), 457 (Sn-N), 543 (Sn-O), 679 (Sn-C), cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 8.85 (*d*, 1H, *J* = 4, H-1pyd.ring), 7.91 (*d*, 2H, *J* = 8), 7.87 (*t*, 1H, *J* = 8), 7.69-7.60 (*m*, 5H, Ar-H), 7.33 (*d*, 2H, *J* = 8), 2.45 (*s*, 3H, CH3), 1.57-1.41 (*m*, 12H-CH2), 1.34 -1.28 (*m*, 6H, -CH2), 0.92 (*t*, 9H, CH3, *J* = 8). 13C NMR (CDCl3, 100 MHz, *δ*): 168.77 (C=O), 149.78 (C=N), 149.75 141.62, 140.59, 131.83, 130.51, 130.10, 129.61, 129.37, 129.31, 129.12, 128.59, 128.27, 125.92, 45.67, 25.17, 20.35, 21.78, 14.69. 119Sn NMR (CDCl3, 149 MHz, *δ*): -273.29. ESI-MS (*m/z*): Calculated for [C32H43 N3OSn + H]+ 604.41, observed 605.90. Combustion analysis for C32H43 N3OSn: Calculated, C 63.59, H 7.17, N 6.95, O 2.65, Sn 19.64; found C 63.37, H 6.98; N 6.87, O 2.32, Sn 19.23.

**(1E,N'Z)-trimethylstannyl 4-methyl-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate (Me3SnL3):**

C23H25N3OSn, M.pt: 168 °C, Yellow, Yield: 69%. IR (KBr) ν: 1578 (C=N), 451 (Sn-N), 547 (Sn-O), 682 (Sn-C) cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 8.97 (*d*, 1H, *J* = 4, H-1pyd.ring), 8.89-8.83 (*m*, 3H), 8.62 (*d*, 2H, *J* = 8), 7.95 (*d*, 2H, *J* = 8), 7.45-7.32 (*m*, 5H, Ar-H), 0.97 (*s*, 9H, CH3). 13C NMR (CDCl3, 100 MHz, *δ*): 170.93 (C=O), 150.68, 149.78 (C=N), 140.87, 135.87, 131.74, 130.72, 129.84, 129.68, 129.51, 129.46, 128.39, 128.16, 127.87, 125.49, 41.62, 15.23. 119Sn NMR (CDCl3, 149 MHz, *δ*): -210.83. ESI-MS (*m/z*): Calculated for [C23H25N3OSn + H]+ 478.17, observed 479.80. Combustion analysis for C23H25N3OSn: Calculated, C 57.77, H 5.27, N 8.79, O 3.35, Sn 24.83; found C 57.75, H 5.24, N 8.76, O 3.32, Sn 24.79.

**(1E,N'Z)-chlorodiphenylstannyl-4-chloro-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate (Ph2SnClL4):**

C31H23Cl2N3OSn, M.pt: 122°C, Yellow, Yield: 73%. IR (KBr) ν: 1592 (C=N), 459 (Sn-N), 561 (Sn-O), 701 (Sn-C), cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 9.28 (*d*, 1H, *J* = 4, H-1pyd.ring), 8.57-8.28 (*m*, 3H, Pyrd ring), 7.63 (*d*, 2H, *J* = 8), 7.57 (*d*, 2H, *J* = 8), 7.36-7.21 (*m*, 15H, Ar-H). 13C NMR (CDCl3, 100 MHz, *δ*): 167.89 (C=O), 148.70 (C=N), 145.58, 140.24, 138.36, 131.83, 130.92, 130.45, 129.31, 129.03, 129.56, 129.27, 128.89, 127.76, 125.97. 119Sn NMR (CDCl3, 149 MHz, *δ*): -376.12. ESI-MS (*m/z*): Calculated for [C31H23Cl2N3OSn + H] + 643.15, observed 644.90. Combustion analysis for C31H23Cl2N3OSn: Calculated, C 57.89, H 3.60, N 6.53, O 2.49,Cl 11.02, Sn 18.46; found C 57.64, H 3.53, N 6.27, O 2.15,Cl 10.87, Sn 18.12.

**(1E,N'Z)-dibutylchlorostannyl-4-chloro-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate (Bu2SnClL4) :**

C27H31Cl2N3OSn, M.pt: 169°C, Yellow, Yield: 72%, IR (KBr) ν: 1579 (C=N), 433 (Sn-N), 556 (Sn-O), 693(Sn-C), cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 9.51 (*d*, 1H, *J* = 4, H-1pyd.ring), 8.23-8.16 (*m*, 5H, Ar-H), 7.71-7.54 (*m*, 5H, Ar-H), 7.50 (*d*, 2H, *J* = 8), 1.53-1.48 (*m*, 4H,-CH2), 1.38-1.33 (*m*, 4H-CH2), 1.21-1.13 (*m*, 4H, -CH2), 0.72 (*t*, 6H, CH3, *J* = 8). 13C NMR (CDCl3, 100 MHz, *δ*): 170.91 (C=O), 149.30 (C=N), 141.37, 140.12, 130.35, 131.91, 130.11, 129.64, 129.41, 128.80, 128.33, 127.85, 127.08, 126.15, 125.76, 13.51, 25.54, 25.98, 35.43. 119Sn NMR (CDCl3, 149 MHz, *δ*): -289.17. ESI-MS (*m/z*): Calculated for [C27H31Cl2N3OSn + H]+ 603.17, observed 604.70. Combustion analysis for C27H31Cl2N3OSn: Calculated, C 53.76, H 5.18, N 6.97, O 2.65,Cl 11.76, Sn 19.68; found C 53.59, H 4.97, N 6.73, O 2.47,Cl 11.64, Sn 19.56.

**(1E,N'Z)-chlorodimethylstannyl-4-chloro-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate ((Me2SnClL4):**

C21H19Cl2N3OSn, M.pt: 137°C, Yellow, Yield: 69%. IR (KBr) ν: 1593 (C=N), 431(Sn-N), 534(Sn-O), 632(Sn-C), cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 9.33 (*d*, 1H, *J* = 4, H-1pyd.ring), 8.03 (*d*, 2H, *J* = 8), 7.54-7.41 (*m*, 8H, Ar-H), 7.33 (*d*, 2H, *J* = 8), 1.12 (*s*, 6H). 13C NMR (CDCl3, 100 MHz, *δ*): 168.56 (C=O), 148.63 (C=N), 148.57, 139.80, 137.81, 131.80, 130.19, 129.59, 129.43, 129.07, 128.41, 128.22, 126.42, 125.81, 26.08 (CH3). 119Sn NMR (CDCl3, 149MHz, *δ*): -208.18. ESI-MS (*m/z*): Calculated for [C21H19Cl2N3OSn + H]+ 519.01, observed 520.70. Combustion analysis for C21H19Cl2N3OSn: Calculated, C 48.60, H 3.69, N 8.10, O 3.08, Cl 13.66, Sn 22.87; found C 48.37, H 3.47, N 7.97, O 2.95, Cl 13.34, Sn 22.53.

**(1E,N'Z)-triphenylstannyl 4-chloro-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate (Ph3SnL4):**

C37H28ClN3OSn, M.pt: 207°C, Yellow, Yield: 67%, IR (KBr) ν: 1603 (C=N), 446 (Sn-N), 548 (Sn-O), 673 (Sn-C), cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 9.01 (*d*, 1H, *J* = 4, H-1pyd.ring), 8.54-8.37 (*m*, 3H), 7.92-7.48 (*m*, 24H). 13C NMR (CDCl3, 100 MHz, *δ*): 167.91 (C=O), 152.91, 149.78 (C=N), 137.59, 137.42, 137.69, 136.33, 135.76, 134.65, 134.52, 131.53, 130.15, 130.08, 129.48, 129.32, 129.03. 119Sn NMR (CDCl3, 149MHz, *δ*): -468.18. ESI-MS (m/z): Calculated for [C37H28ClN3OSn + H]+ 684.80, observed 685.80. Combustion analysis for C37H28ClN3OSn: Calculated, C 64.89, H 4.12, N 6.14, O 2.34, Cl 5.18, Sn 17.33; found C 64.69, H 4.01, N 5.97, O 2.10, Cl 5.02, Sn 17.01.

**(1E,N'Z)-tributylstanny-4-chloro-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate(Bu3SnL4):**

C31H40ClN3OSn, M.pt: 191°C, Yellow, Yield: 71%. IR (KBr) ν: 1592 (C=N), 447 (Sn-N), 551 (Sn-O), 631 (Sn-C), cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 9.41(*d*, 1H, *J* = 4, H-1pyd.ring), 8.26-8.19 (*m*, 4H, Ar-H), 8.03 (*t*, 1H, *J* = 8), 7.69-7.52 (*m*, 7H, Ar-H), 1.81-1.05 (*m*, 18H,-CH2), 0.73 (*t*, 9H, CH3, *J* = 8). 13C NMR (CDCl3, 100 MHz, *δ*): 164.04(C=O), 149.66(C=N), 148.90, 148.49, 140.19, 139.15, 130.79, 130.58, 129.83, 129.61, 128.65, 128.53, 127.00, 126.45, 123.22, 50.87, 31.26, 25.96, 16.65. 119Sn NMR (CDCl3, 149MHz, *δ*): -252.95. ESI-MS (*m/z*): Calculated for [C31H40 ClN3OSn + H]+ 624.83, observed 625.90. Combustion analysis for C31H40 ClN3OSn: Calculated, C 59.59, H 6.45, N 6.73, O 2.56, Cl 5.67, Sn 19.00; found C 59.32, H 6.21, N 6.58, O 2.38, Cl 5.43, Sn 18.86.

**(1E,N'Z)-trimethylstannyl-4-chloro-N'-(phenyl(pyridin-2-yl)methylene)benzohydrazonate(Me3SnL4):**

C22H22ClN3OSn, M.pt: 181°C, Yellow, Yield: 74%. IR (KBr) ν: 1597 (C=N), 452 (Sn-N), 559 (Sn-O), 656 (Sn-C), cm-1. 1H NMR (CDCl3, 400 MHz, *δ*): 8.98 (*d*, 1H, *J* = 4, H-1pyd.ring), 8.83-8.74(*m*, 3H), 8.68 (*d*, 2H, *J* = 8), 7.93 (*d*, 2H, *J* = 8), 7.57-7.39 (*m*, 5H, Ar-H), 1.32 (*s*, 9H, CH3). 13C NMR (CDCl3, 100 MHz, *δ*): 170.92 (C=O), 150.06, 149.56 (C=N), 140.57, 135.86, 131.72, 130.46, 129.78, 129.62, 129.50, 129.41, 128.98, 128.26, 127.94, 125.45, 16.38 (CH3). 119Sn NMR (CDCl3, 149MHz, *δ*): -215.766. ESI-MS (*m/z*): Calculated for [C22H22ClN3OSn + H]+ 498.59, observed 499.80. Combustion analysis for C22H22ClN3OSn: Calculated, C 53.00, H 4.45, N 8.43, O 3.21, Cl 7.11, Sn 23.81; found . C 52.98, H 4.43, N 8.39, O 3.19, Cl 7.08, Sn 23.77.

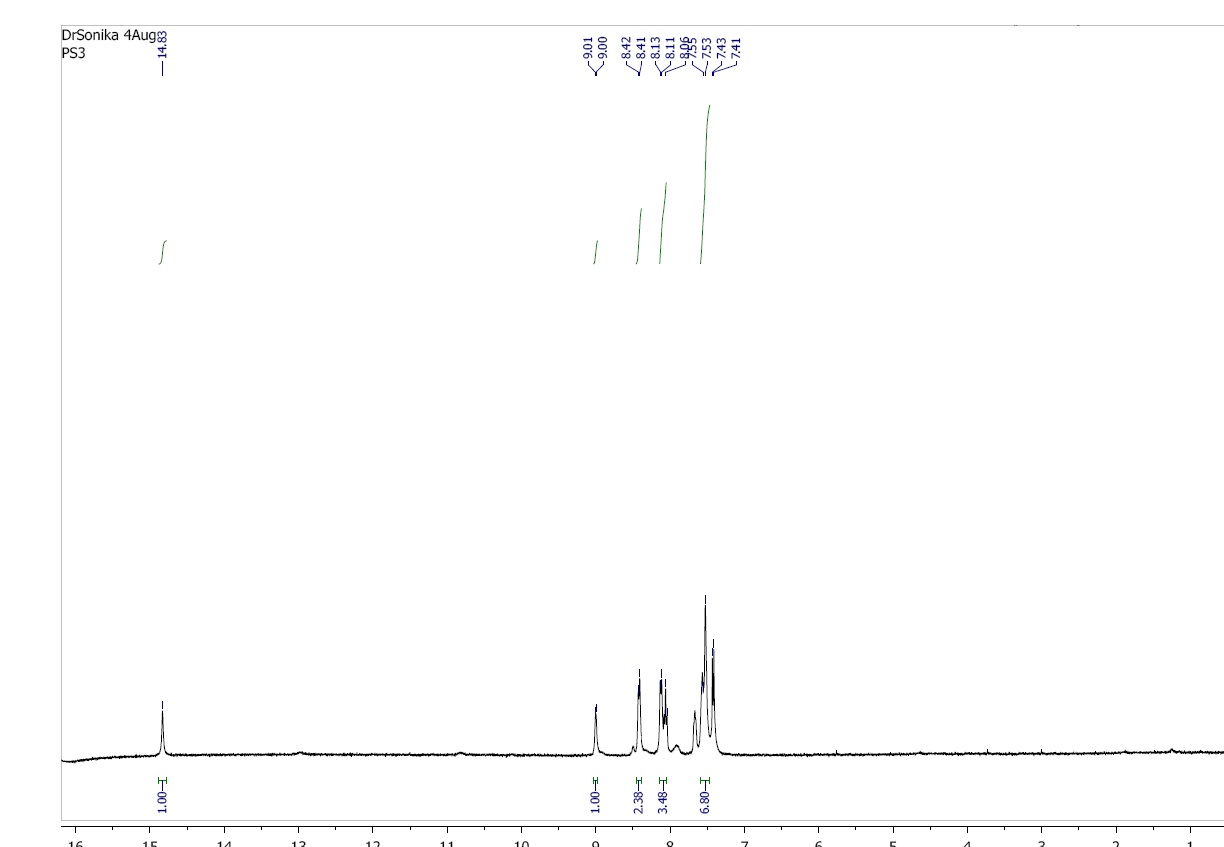


Fig S1 1H NMR of H1L2

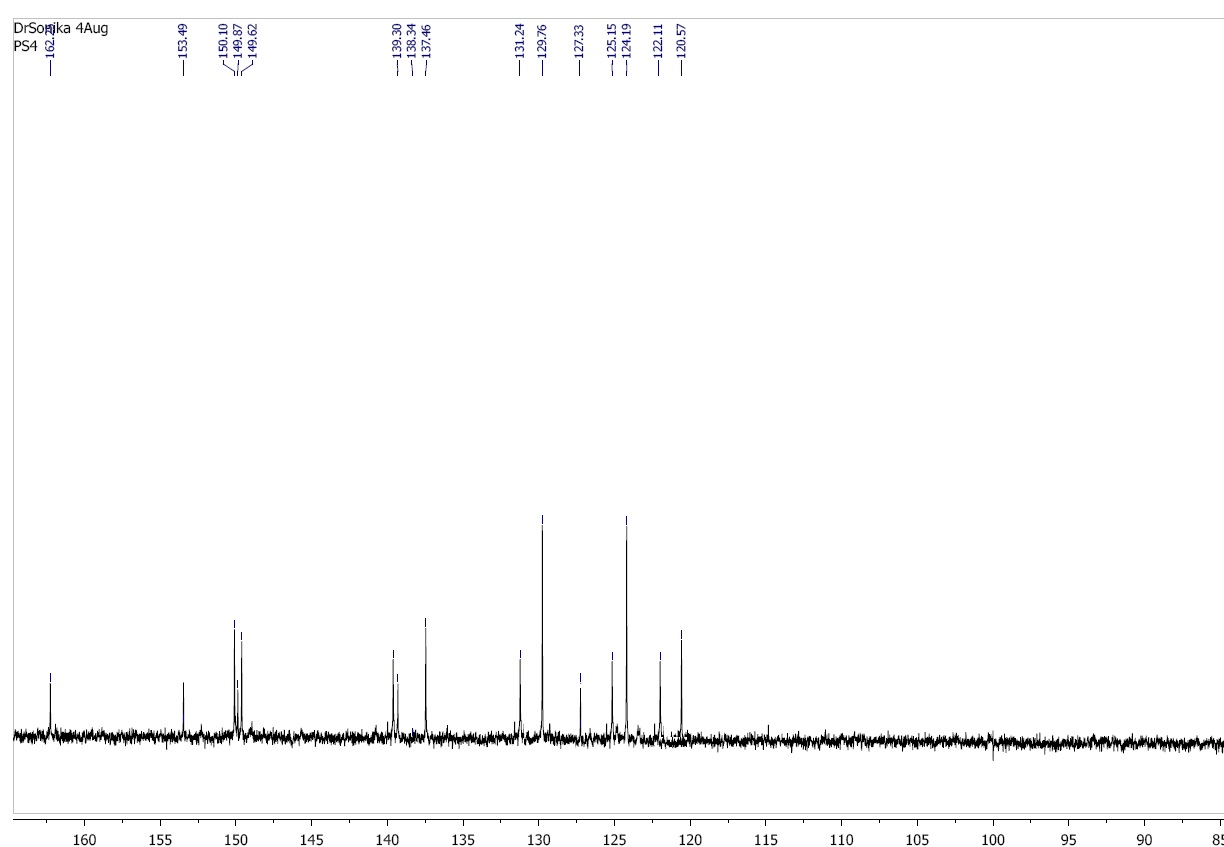


Fig S2 13C NMR of H1L2

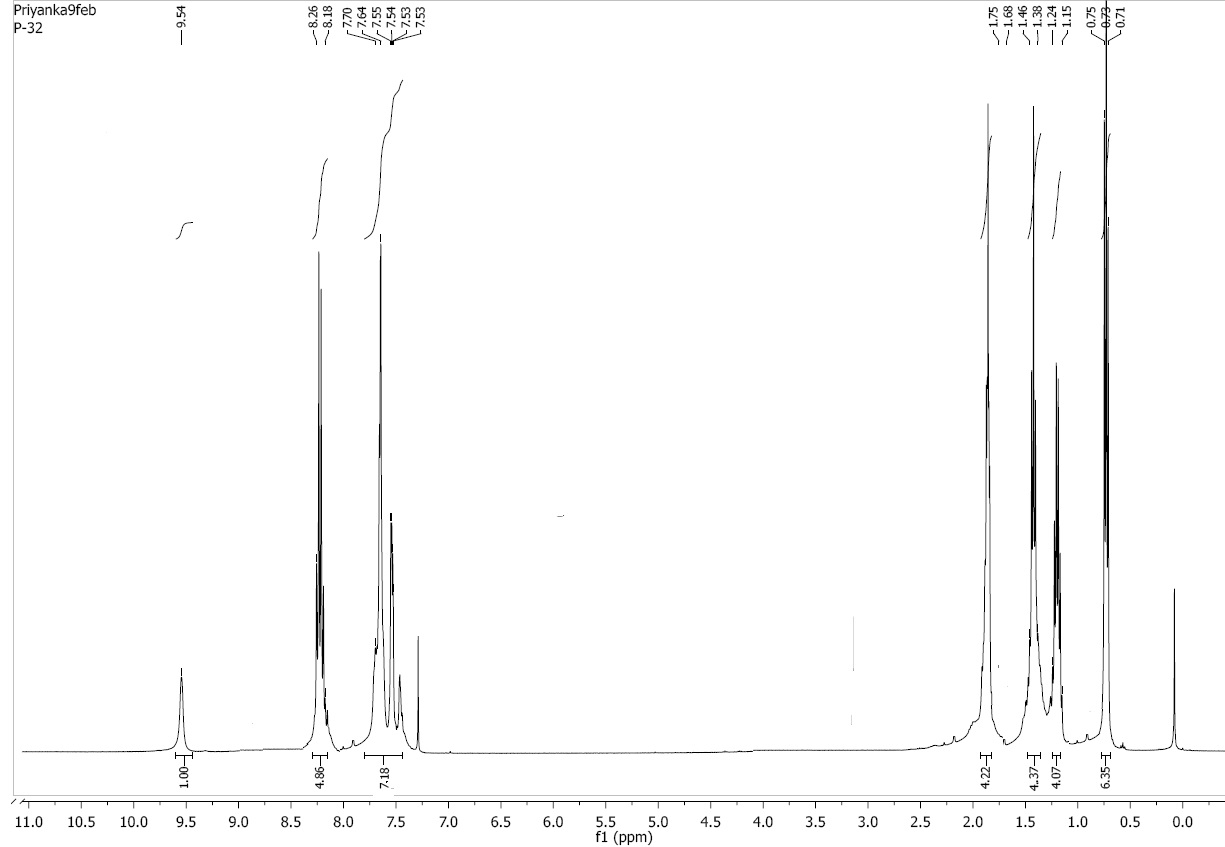


Fig S3 1H NMR of Bu2SnClL2

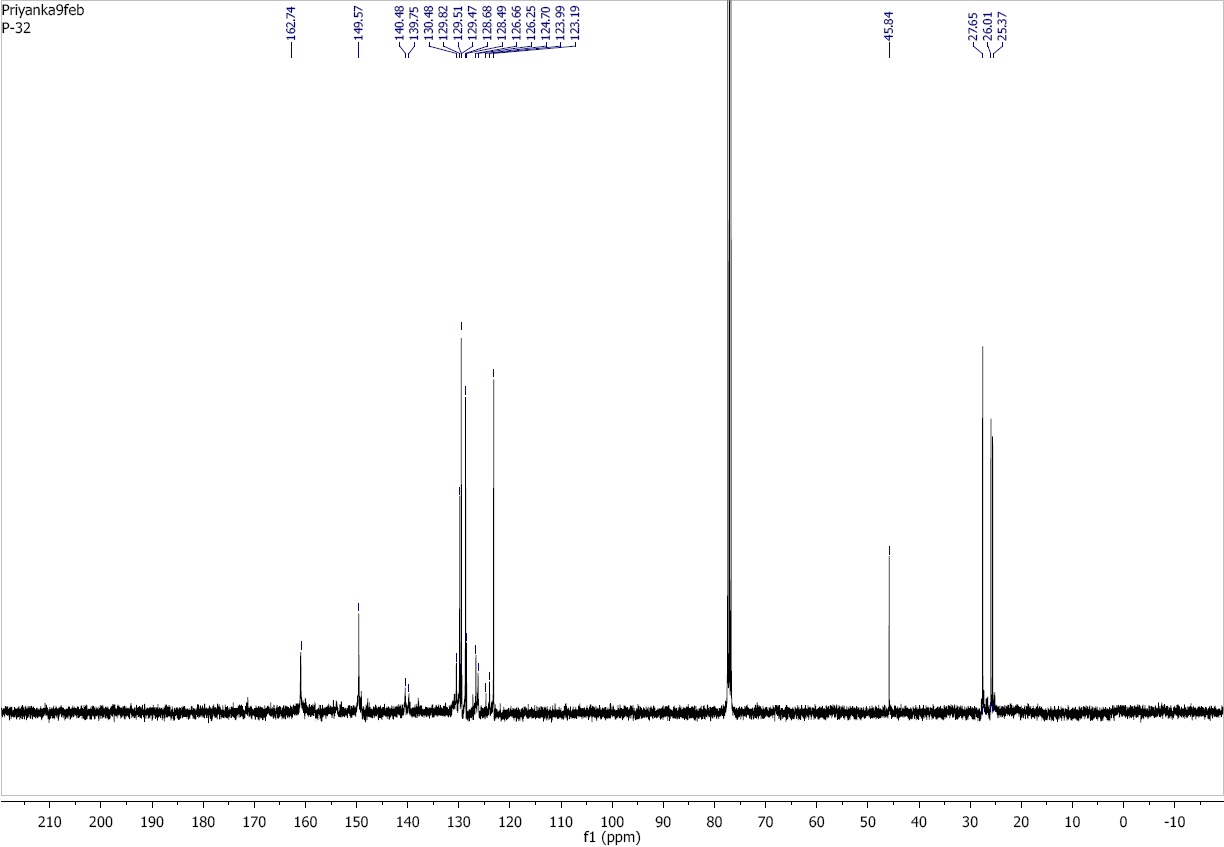


Fig S4 13C NMR of Bu2SnClL2



Fig S5 119Sn NMR of Bu2SnClL2

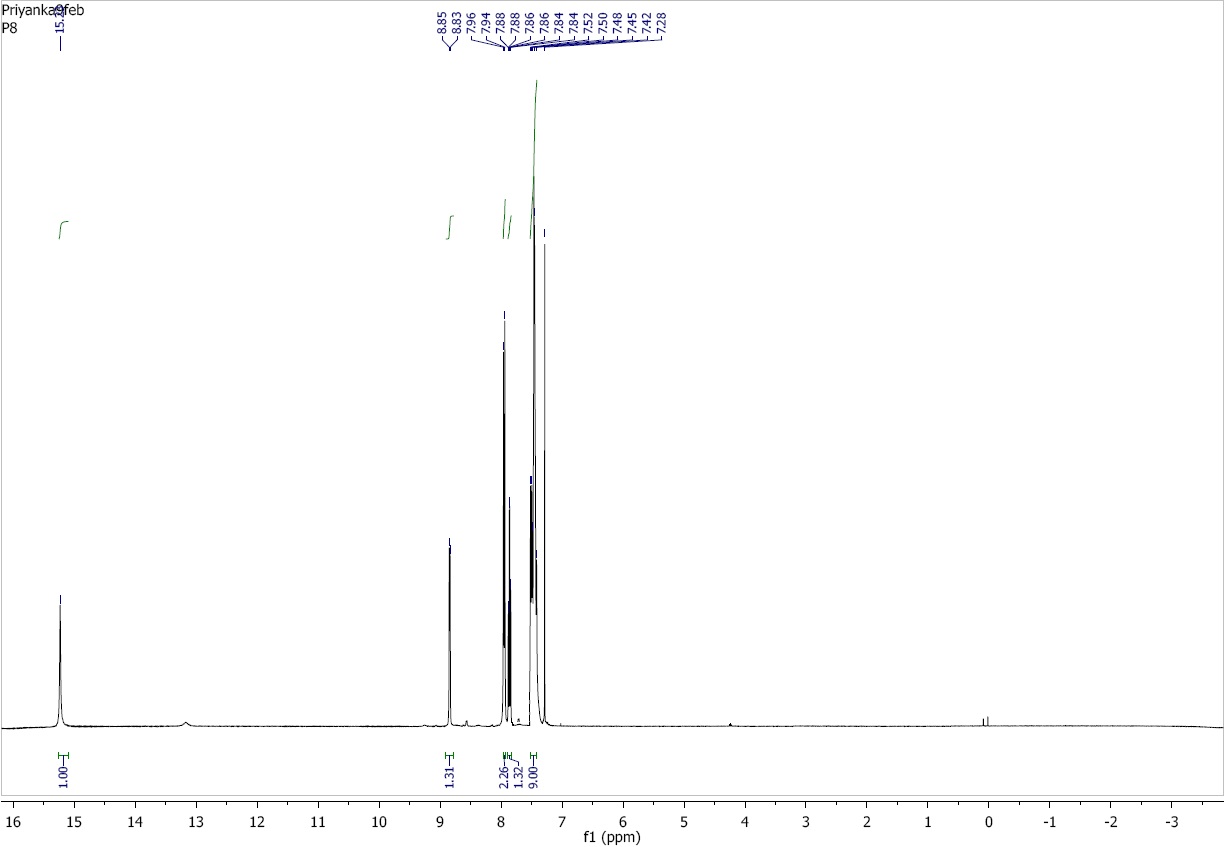


Fig S6 1HNMR of H1L4

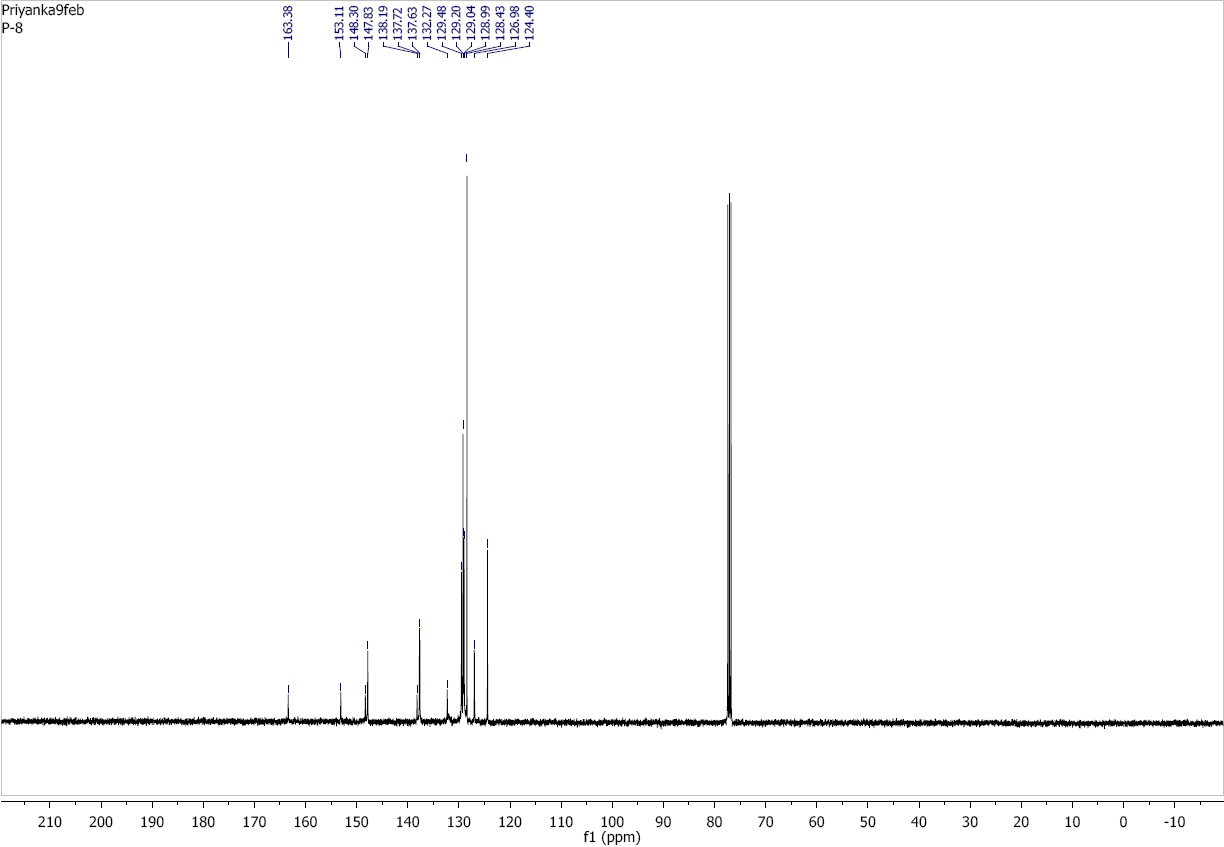


Fig S7 13CNMR of H1L4

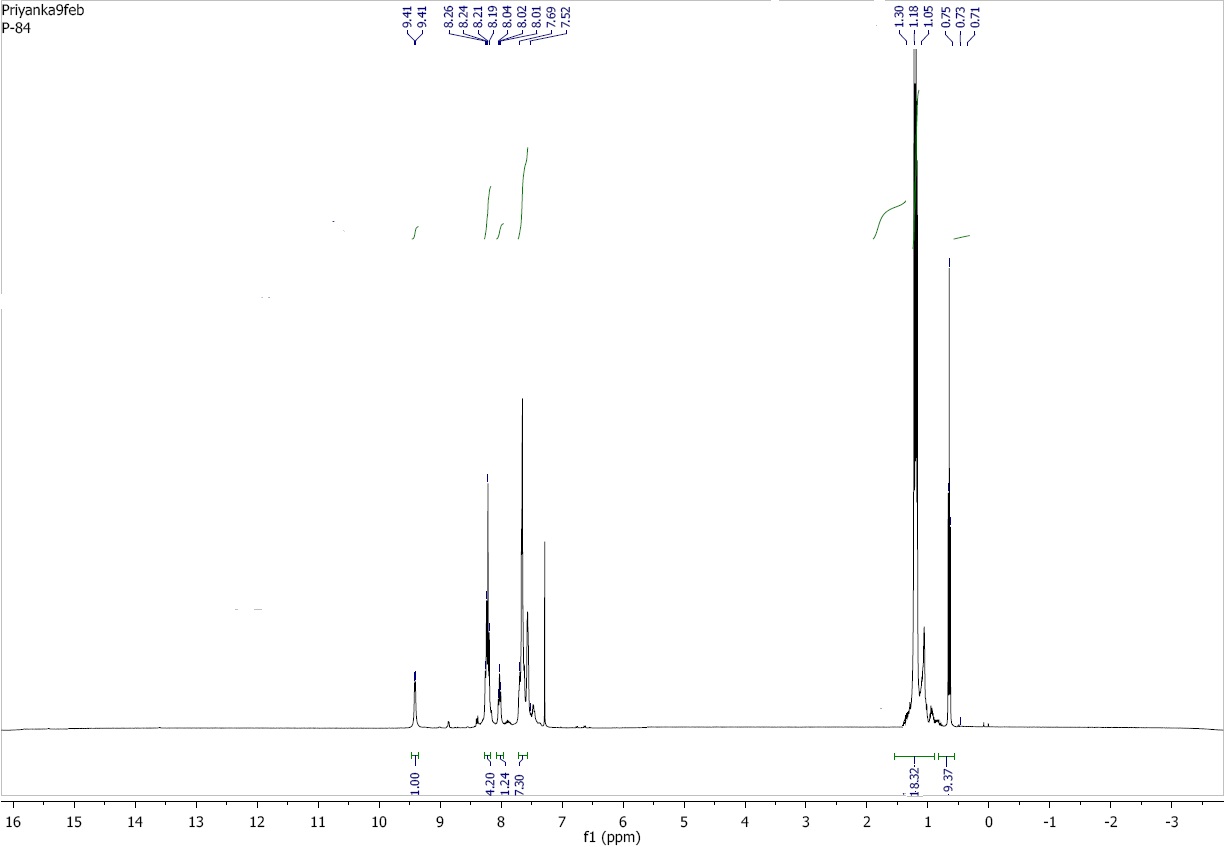


Fig S8 1HNMR of Bu3SnL4

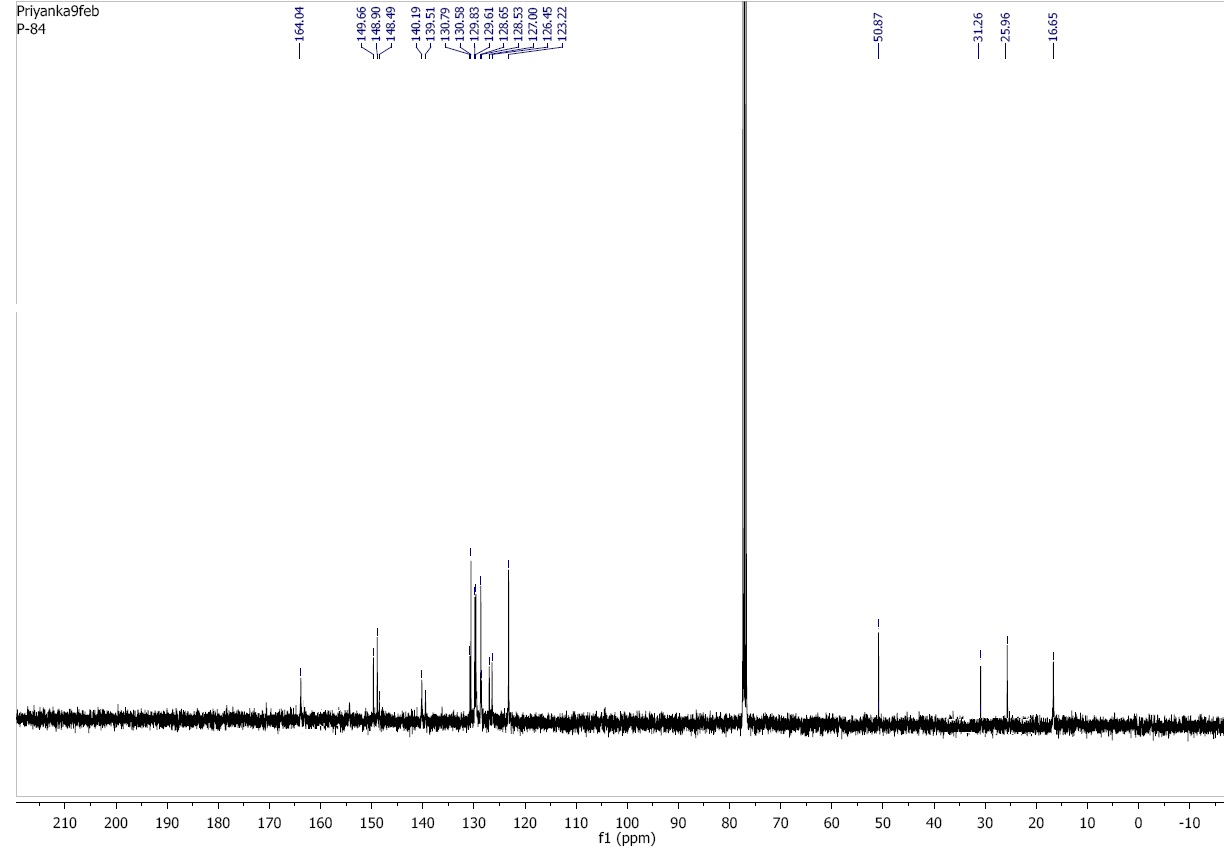


Fig S9 13C NMR of Bu3SnL4



Fig S10 119Sn NMR of Bu3SnL4

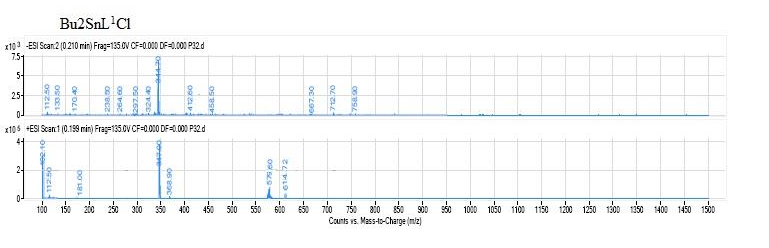


Fig S11 Mass spectrum of Bu2SnL1Cl

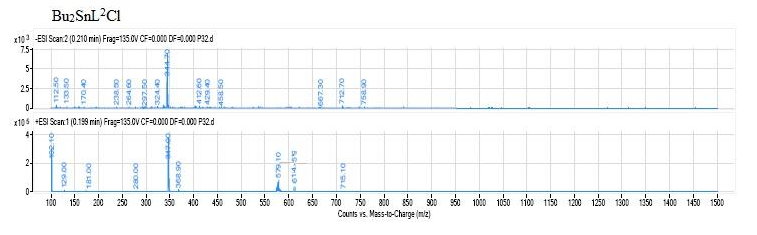


Fig S12 Mass spectrum of Bu2SnL2Cl

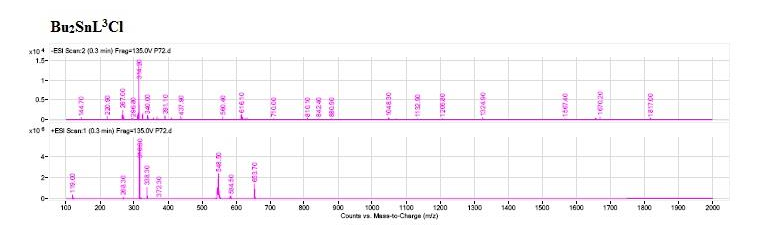


Fig S13 Mass spectrum of Bu2SnL3Cl

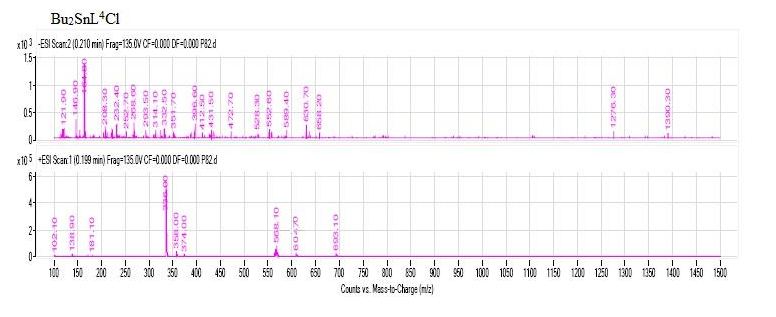


Fig S14 Mass spectrum of Bu2SnL4Cl

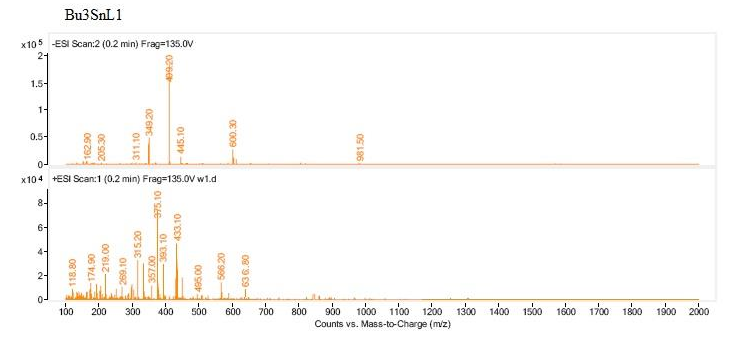


Fig S15 Mass spectrum of Bu3SnL1

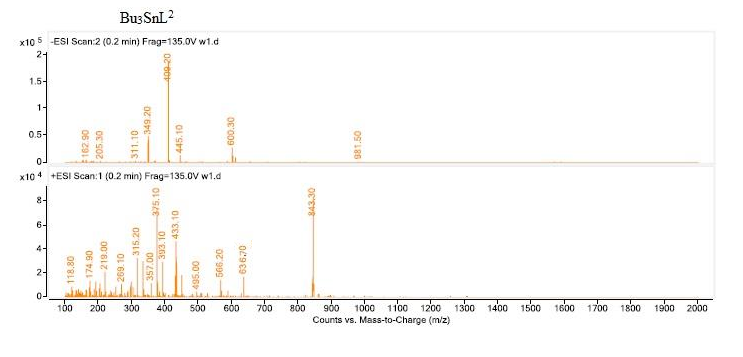


Fig S16 Mass spectrum of Bu3SnL2

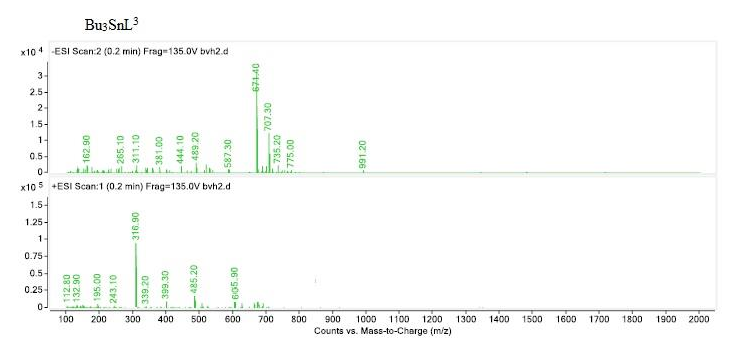


Fig S17 Mass spectrum of Bu3SnL3

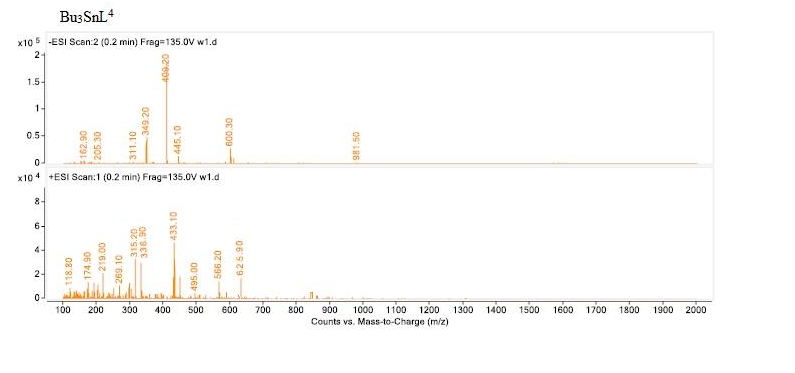


Fig S18 Mass spectrum of Bu3SnL4

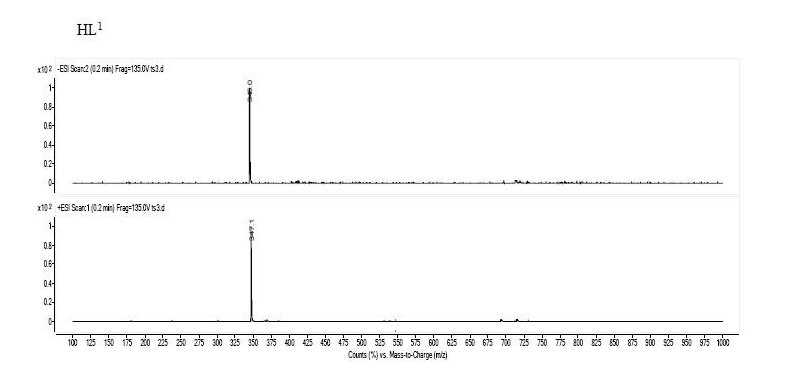


Fig S19 Mass spectrum of HL1

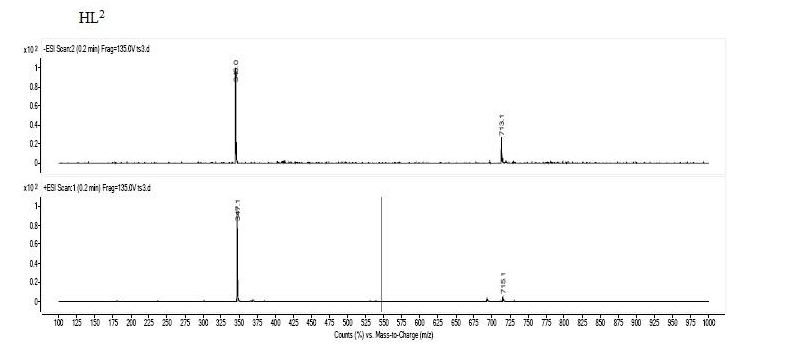


Fig S20 Mass spectrum of HL2

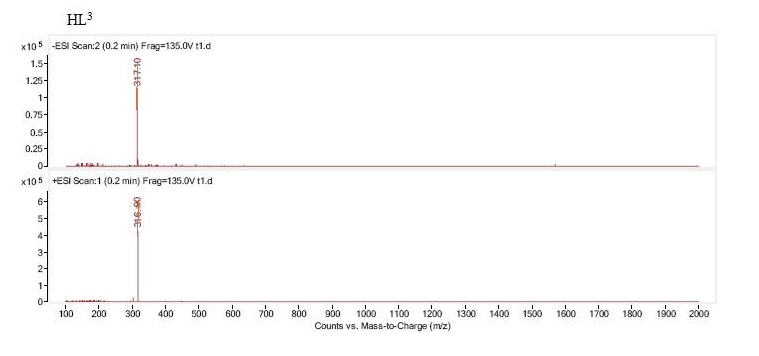


Fig S21 Mass spectrum of HL3

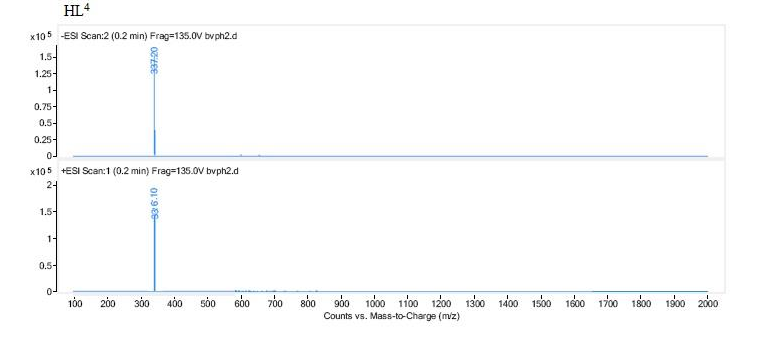


Fig S22 Mass spectrum of HL4

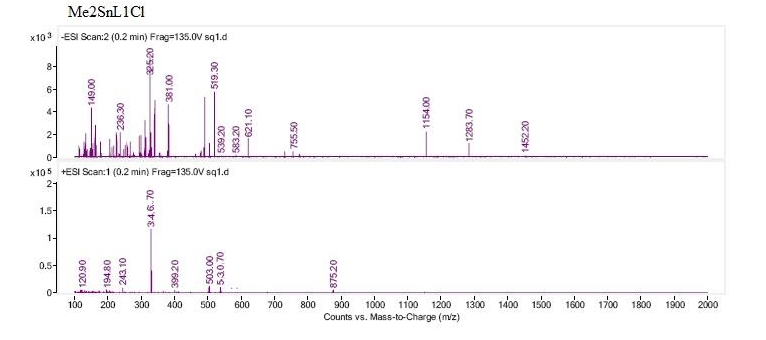


Fig S23 Mass spectrum of Me2SnL1Cl

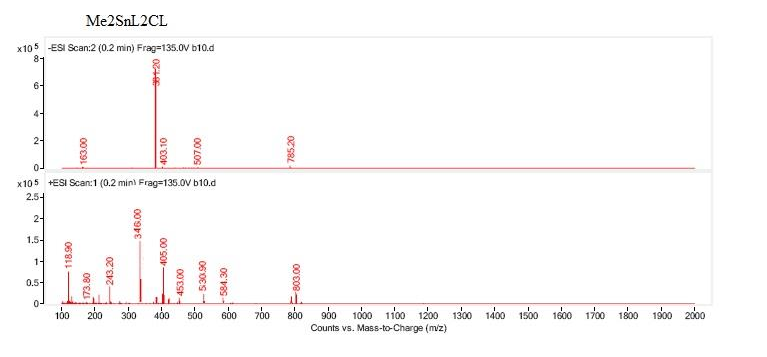


Fig S24 Mass spectrum of Me2SnL2Cl

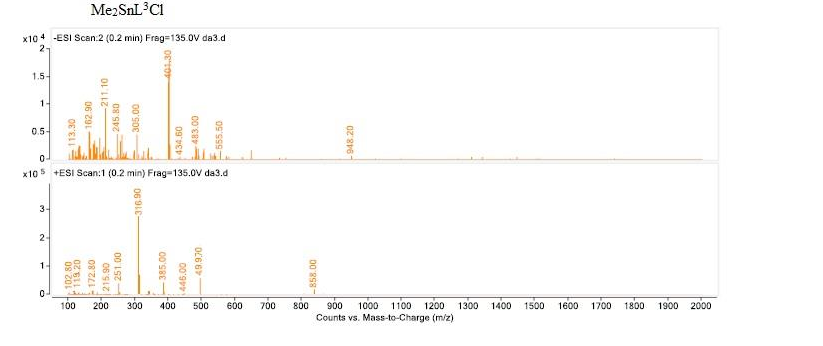


Fig S25 Mass spectrum of Me2SnL3Cl

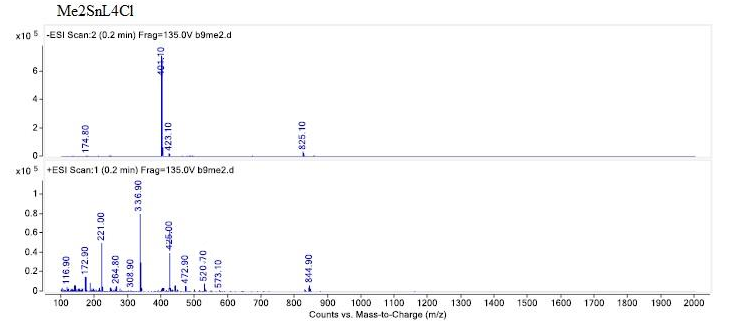


Fig S26 Mass spectrum of Me2SnL4Cl

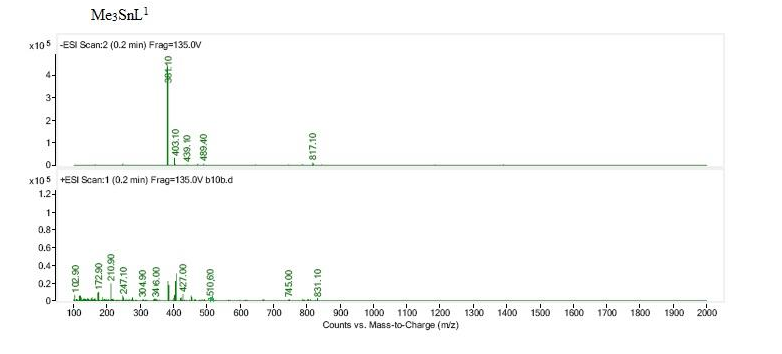


Fig S27 Mass spectrum of Me3SnL1

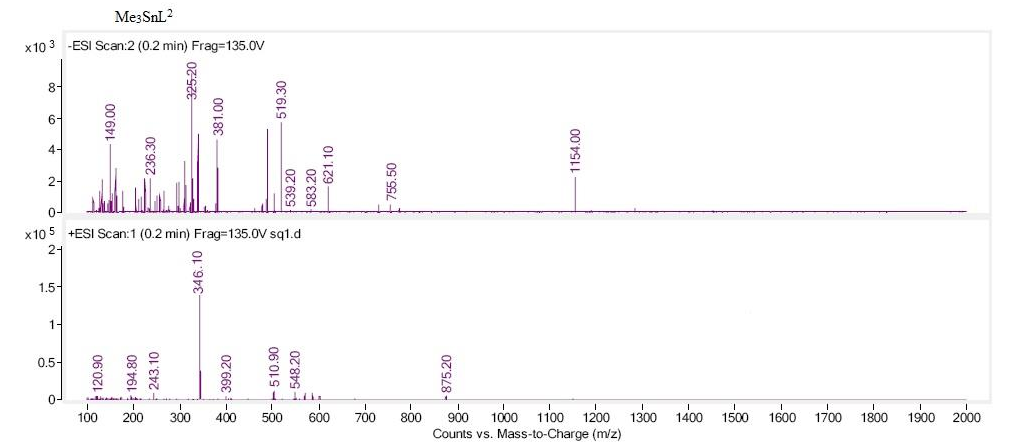


Fig S28 Mass spectrum of Me3SnL2

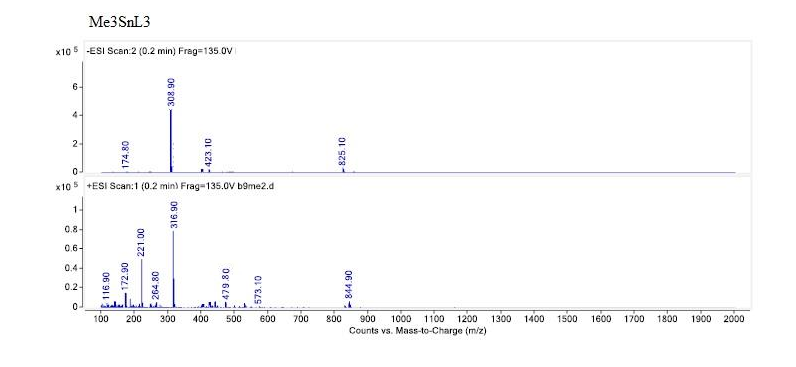


Fig S29 Mass spectrum of Me3SnL3

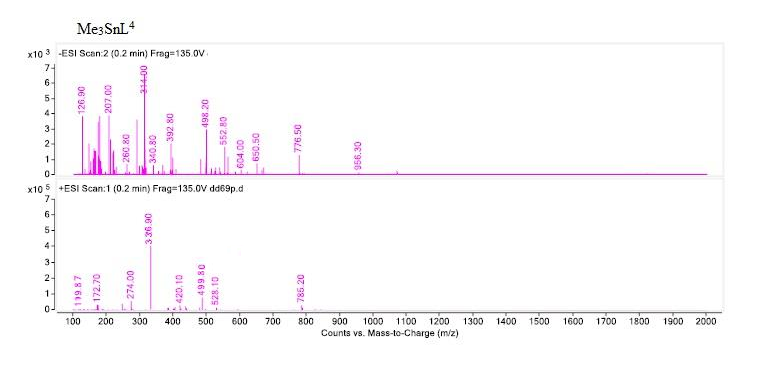


Fig S30 Mass spectrum of Me3SnL4

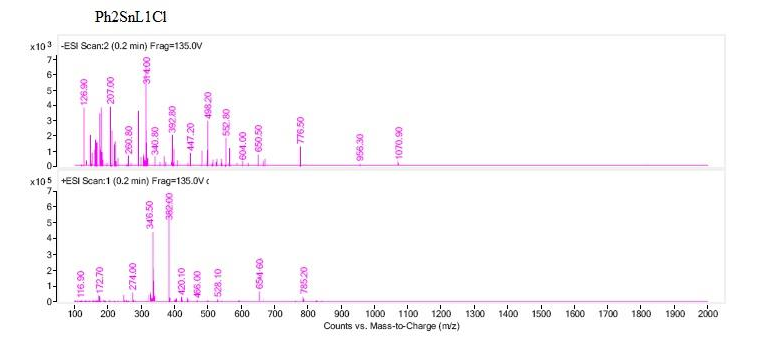


Fig S31 Mass spectrum of Ph2SnL1Cl



Fig S32 Mass spectrum of Ph2SnL2Cl

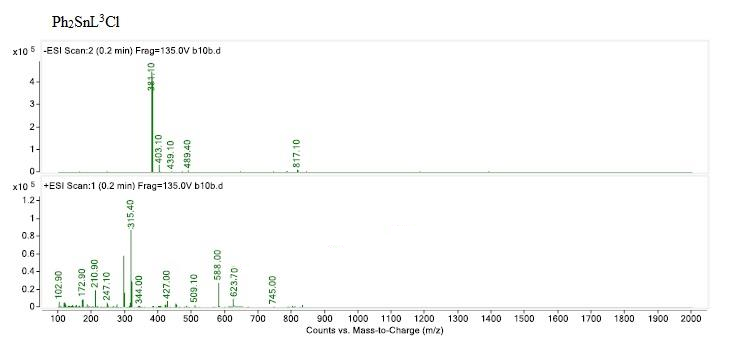


Fig S32 Mass spectrum of Ph2SnL3Cl

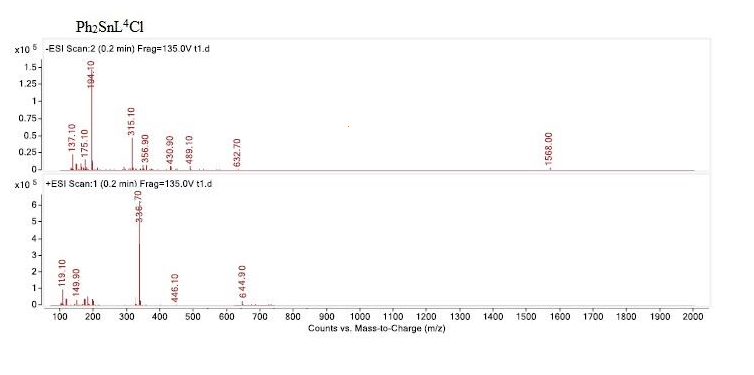


Fig S33 Mass spectrum of Ph2SnL4Cl

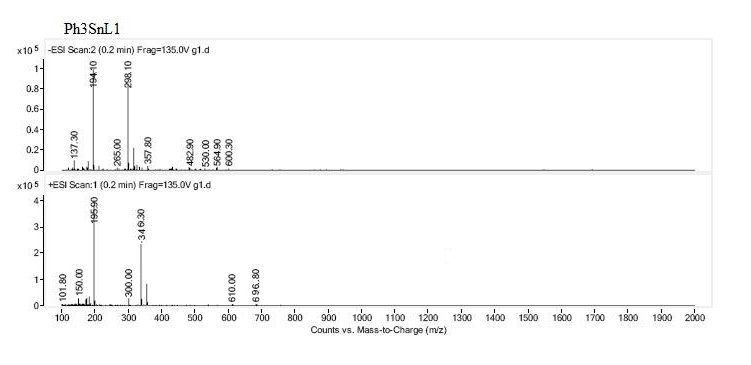


Fig S34 Mass spectrum of Ph3SnL1

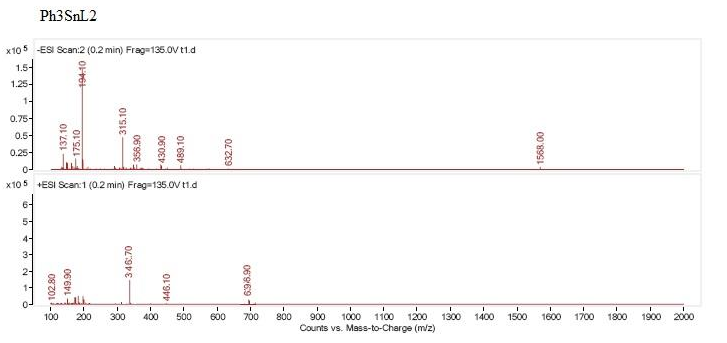


Fig S35 Mass spectrum of Ph3SnL2

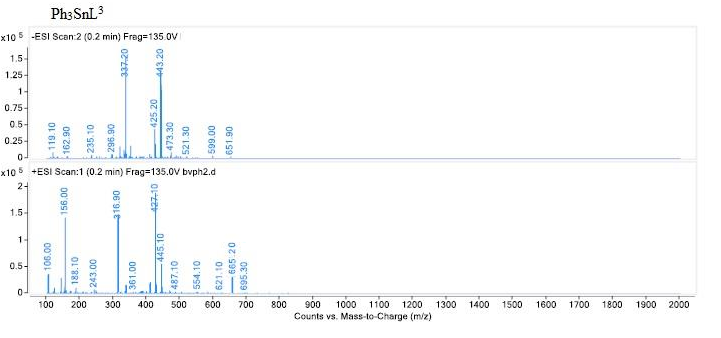


Fig S36 Mass spectrum of Ph3SnL3

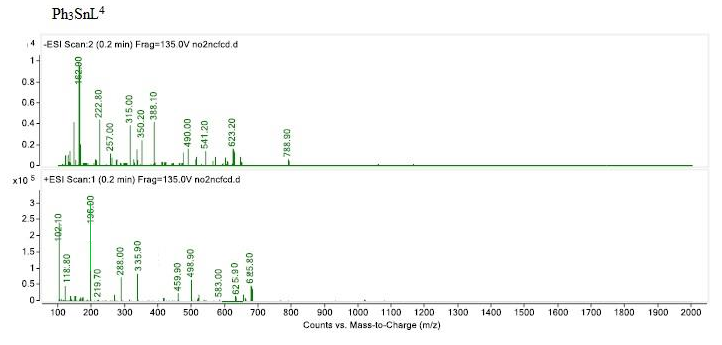


Fig S37 Mass spectrum of Ph3SnL4