



SUPPLEMENTARY MATERIAL TO

Synthesis, spectral studies and *in vitro* antimicrobial activity of some new di-/tri-organotin(IV) complexes of Schiff bases derived from 2-benzoylpyridine

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CHARACTERIZATION DATA FOR THE SYNTHESIZED LIGANDS

(E)-2-Nitro-N'-[phenyl(pyridin-2-yl)methylene]benzohydrazide (**HL₁**). Yield: 79 %; light brown; m.p.: 125 °C; Anal. Calcd. for C₁₉H₁₄N₄O₃: C, 65.89; H, 4.07; N, 16.18 %. Found: C, 65.60; H, 3.98; N, 16.08 %; IR (KBr, cm⁻¹): 3310 (N–H), 1671 (C=O), 1605 (C=N); ¹H-NMR (400 MHz, CDCl₃, δ / ppm): 13.75 (1H, *s*, NH, H-8), 8.82 (1H, *d*, *J* = 8 Hz, H-1 pyrd. ring), 8.16 (1H, *d*, *J* = 4.0 Hz), 8.02 (1H, *d*, *J* = 4.0 Hz), 7.82–7.71 (2H, *m*), 7.65–7.57 (2H, *m*), 7.46–7.22 (7H, *m*, Ar-H); ¹³C-NMR (100 MHz, CDCl₃, δ / ppm): 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*): Calcd. for [C₁₉H₁₄N₄O₃+H]⁺: 347.11. Found: 347.51.

(E)-4-Nitro-N'-[phenyl(pyridin-2-yl)methylene]benzohydrazide (**HL₂**). Yield: 82 %; white; m.p.: 152 °C; Anal. Calcd. for C₁₉H₁₄N₄O₃: C, 65.89; H, 4.07; N, 16.18 %. Found: C, 65.78; H, 3.98; N, 16.09 %; IR (KBr, cm⁻¹): 3190 (N–H), 1682 (C=O), 1611 (C=N); ¹H-NMR (400 MHz, DMSO-*d*₆, δ / ppm): 14.83 (1H, *s*, NH, H-8), 9.00 (1H, *d*, *J* = 4 Hz, H-1 pyrd. ring), 8.41 (2H, *d*, *J* = 4.0 Hz), 8.13–8.04 (3H, *m*), 7.55–7.41 (7H, *m*), 7.66–7.63 (2H, *m*, Ar-H); ¹³C-NMR (100 MHz, DMSO-*d*₆, δ / ppm): 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*): Calcd. for [C₁₉H₁₄N₄O₃+H]⁺: 347.11. Found: 347.11.

(E)-4-Methyl-N'-[phenyl(pyridin-2-yl)methylene]benzohydrazide (**HL₃**). Yield: 78 %; white; m.p.: 296 °C, Anal. Calcd. for C₂₀H₁₇N₃O: C, 76.17; H,

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5.43; N, 13.32 %. Found: C, 76.05; H, 5.21; N, 13.09 %; IR (KBr, cm^{-1}): 3292 (N–H), 1675 (C=O), 1608 (C=N); $^1\text{H-NMR}$ (400 MHz, CDCl_3 , δ / ppm): 13.78 (1H, *s*, NH, H-8), 8.71 (1H, *d*, $J = 4$ Hz, H-1 pyrd. ring), 8.23 (1H, *d*, $J = 8$ Hz), 7.68–7.65 (2H, *m*, Ar-H), 7.63 (2H, *d*, $J = 8$ Hz), 7.52–7.41 (5H, *m*, Ar-H), 7.23 (2H, *d*, $J = 8$ Hz), 2.15 (3H, *s*); $^{13}\text{C-NMR}$ (100 MHz, CDCl_3 , δ / ppm): 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 (CH_3); ESI-MS (m/z): Calcd for $[\text{C}_{20}\text{H}_{17}\text{N}_3\text{O}+\text{H}]^+$: 316.14. Found: 316.90.

(*E*)-4-Chloro-*N'*-[phenyl(pyridin-2-yl)methylene]benzohydrazide (**HL₄**). Yield: 78 %; white; m.p.: 170 °C; Anal. Calcd. for $\text{C}_{19}\text{H}_{14}\text{ClN}_3\text{O}$: C, 67.96; H, 4.20; Cl, 10.56; N, 12.51 %. Found: C, 67.82; H, 4.09; Cl, 10.31; N, 12.45 %; IR (KBr, cm^{-1}): 3305 (N–H), 1686 (C=O), 1603 (C=N). $^1\text{H-NMR}$ (400 MHz, CDCl_3 , δ / ppm): 15.20 (1H, *s*, NH, H-8), 8.82 (1H, *d*, $J = 4$ Hz, H-1 pyrd. ring), 7.95 (2H, *d*, $J = 8$ Hz), 7.88–7.84 (1H, *m*, Ar-H), 7.52–7.28 (9H, *m*, Ar-H); $^{13}\text{C-NMR}$ (100 MHz, CDCl_3 , δ / ppm): 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): Calcd. for $[\text{C}_{19}\text{H}_{14}\text{ClN}_3\text{O}+\text{H}]^+$ 336.09. Found: 336.10.

CHARACTERIZATION DATA FOR THE SYNTHESIZED ORGANOTIN COMPLEXES

(*E,N'*Z)-Chloro{2-nitro-*N'*-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}diphenyltin (**Ph₂SnCIL₁**). Yield: 78 %; yellow; m.p.: 213 °C; Anal. Calcd. for $\text{C}_{31}\text{H}_{23}\text{ClN}_4\text{O}_3\text{Sn}$: C, 56.96; H, 3.55; Cl, 5.42; N, 8.57; Sn, 18.16 %. Found: C, 56.67; H, 3.23; Cl, 5.31; N, 8.34; Sn, 18.04 %; IR (KBr, cm^{-1}): 1591 (C=N), 731 (Sn–C), 552 (Sn–O), 447 (Sn–N); $^1\text{H-NMR}$ (400 MHz, CDCl_3 , δ / ppm): 9.23 (1H, *d*, $J = 4$ Hz, H-1 pyrd. ring), 8.89–8.23 (4H, *m*, Ar-H), 7.95–7.23 (18H, *m*, Ar-H); $^{13}\text{C-NMR}$ (100 MHz, CDCl_3 , δ / ppm): 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); $^{119}\text{Sn-NMR}$ (149 MHz, CDCl_3 , δ / ppm): –343.76. ESI-MS (m/z): Calcd. for $[\text{C}_{31}\text{H}_{23}\text{ClN}_4\text{O}_3\text{Sn}+\text{H}]^+$ 655.06. Found: 654.60.

(*E,N'*Z)-Dibutylchloro{2-nitro-*N'*-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}tin (**Bu₂SnCIL₁**). Yield: 73 %; light brown; m.p.: 203 °C; Anal. Calcd. for $\text{C}_{27}\text{H}_{31}\text{ClN}_4\text{O}_3\text{Sn}$: C, 52.84; H, 5.09; Cl, 5.78; N, 9.13; Sn, 19.34 %. Found: C, 52.91; H, 4.98; Cl, 5.49; N, 8.95; Sn, 19.01 %; IR (KBr, cm^{-1}): 1582 (C=N), 689 (Sn–C), 557 (Sn–O), 432 (Sn–N); $^1\text{H-NMR}$ (400 MHz, CDCl_3 , δ / ppm): 9.12 (1H, *d*, $J = 4$ Hz, H-1, pyrd. ring), 8.93–8.61 (3H, *m*), 8.34 (1H, *d*), 7.92–7.67 (3H, *m*), 7.61–7.54 (5H, *m*), 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); $^{13}\text{C-NMR}$ (100 MHz, CDCl_3 , δ / ppm): 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; ^{119}Sn -NMR (149 MHz, CDCl_3 , δ / ppm): -297.11; ESI-MS (m/z): Calcd. for $[\text{C}_{31}\text{H}_{23}\text{ClN}_4\text{O}_3\text{Sn}+\text{H}]^+$: 615.12. Found: 614.72.

(*IE,N'Z*)-Chlorodimethyl{2-nitro-*N'*-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}tin (**Me₂SnCIL₁**). Yield: 71 %; yellow; m.p.: 219 °C; Anal. Calcd. for $\text{C}_{21}\text{H}_{19}\text{ClN}_4\text{O}_3\text{Sn}$: C, 47.63; H, 3.62; Cl, 6.69; N, 10.58; Sn, 22.42 %. Found: C, 47.48; H, 3.43; Cl, 6.43; N, 10.21; Sn, 22.76 %; IR (KBr, cm^{-1}): 1576 (C=N), 692 (Sn-C), 553 (Sn-O), 435 (Sn-N); ^1H -NMR (400 MHz, CDCl_3 , δ / ppm): 8.92 (1H, *d*, $J = 4$ Hz, H-1 pyrd. ring), 8.51 (1H, *d*, $J = 8$ Hz), 8.31–8.28 (3H, *m*, Ar-H), 7.68–7.31 (8H, *m*, Ar-H), 1.32 (6H, *s*, CH_3); ^{13}C -NMR (100 MHz, CDCl_3 , δ / ppm): 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 (CH_3 -C); ^{119}Sn -NMR (149 MHz, CDCl_3 , δ / ppm): -219.89. ESI-MS (m/z): Calcd. for $[\text{C}_{21}\text{H}_{19}\text{ClN}_4\text{O}_3\text{Sn}+\text{H}]^+$ 531.02. Found: 530.70.

(*IE,N'Z*)-{2-Nitro-*N'*-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}triphenyltin (**Ph₃SnL₁**). Yield: 62 %; yellow; m.p.: 234 °C; Anal. Calcd. for $\text{C}_{37}\text{H}_{28}\text{N}_4\text{O}_3\text{Sn}$: C, 63.89; H, 4.01; N, 8.03; Sn, 17.05 %. Found: C, 63.91; H, 4.06; N, 8.06; Sn, 17.07 %; IR (KBr, cm^{-1}): 1579 (C=N), 703 (Sn-C), 557 (Sn-O), 437 (Sn-N); ^1H -NMR (400 MHz, CDCl_3 , δ / ppm): 9.03 (1H, *d*, $J = 4$ Hz, H-1, pyrd. ring), 8.82–8.63 (4H, *m*, $J = 8$ Hz), 7.68–7.33 (23 H, *m*, Ar-H); ^{13}C -NMR (100 MHz, CDCl_3 , δ / ppm): 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; ^{119}Sn -NMR (149 MHz, CDCl_3 , δ / ppm): -437.89; ESI-MS (m/z): Calcd. for $[\text{C}_{37}\text{H}_{28}\text{N}_4\text{O}_3\text{Sn}+\text{H}]^+$: 697.13. Found: 696.80.

(*IE,N'Z*)-Tributyl{2-nitro-*N'*-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}tin (**Bu₃SnL₁**). Yield: 75 %; dark brown; m.p.: 204 °C; Anal. Calcd. for $\text{C}_{31}\text{H}_{40}\text{N}_4\text{O}_3\text{Sn}$: C, 58.60; H, 6.35; N, 8.82; Sn, 18.68 %. Found: C, 58.71; H, 6.18; N, 8.54; Sn, 18.42 %; IR (KBr, cm^{-1}): 1582 (C=N), 617 (Sn-C), 554 (Sn-O), 453 (Sn-N); ^1H -NMR (400 MHz, CDCl_3 , δ / ppm): 9.18 (1H, *d*, $J = 4$ Hz, H-1, pyrd. ring), 8.28 (1H, *d*, $J = 8$ Hz), 7.94–7.91 (2H, *m*), 7.87 (1H, *t*, $J = 8$ Hz), 7.60–7.56 (3H, *m*) 7.38–7.32 (5H, *m*, Ar-H), 1.49 (6H, *t*, CH_2 , Bu), 1.41–1.21 (12H, *m*, CH_2 , Bu), 0.94 (9H, *t*, $J = 8$ Hz, CH_3 , Bu); ^{13}C -NMR (100 MHz, CDCl_3 , δ / ppm): 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; ^{119}Sn -NMR (149 MHz, CDCl_3 , δ / ppm): -290.72; ESI-MS (m/z): Calcd. for $[\text{C}_{31}\text{H}_{40}\text{N}_4\text{O}_3\text{Sn}+\text{H}]^+$: 637.22. Found: 636.80.

(*IE,N'Z*)-Trimethyl{2-nitro-*N'*-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}tin (**Me₃SnL₁**). Yield: 69 %; yellow; m.p.: 198 °C; Anal. Calcd. for

$C_{22}H_{22}N_4O_3Sn$: C, 51.88; H, 4.03; N, 10.97; Sn, 23.30 %. Found: C, 51.90; H, 4.36; N, 11.00; Sn, 23.32 %; IR (KBr, cm^{-1}): 1581 (C=N), 696 (Sn-C), 564 (Sn-O), 457 (Sn-N); 1H -NMR (400 MHz, $CDCl_3$, δ / ppm): 8.96 (1H, *d*, $J = 4$ Hz, H-1, pyrd. ring), 8.57–8.32 (4H, *m*, Ar-H), 7.84–7.35 (8H, *m*, Ar-H), 1.03 (9H, *s*, CH_3); ^{13}C -NMR (100 MHz, $CDCl_3$, δ / ppm): 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; ^{119}Sn -NMR (149 MHz, $CDCl_3$, δ / ppm): –236.84. ESI-MS (m/z): Calcd. for $[C_{22}H_{22}N_4O_3Sn+H]^+$: 511.08. Found: 510.60.

(*IE,N'Z*)-Chloro{4-nitro-*N'*-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}diphenyltin (**Ph₂SnCIL₂**). Yield: 71 %; yellow; m.p.: 211 °C; Anal. Calcd. for $C_{31}H_{23}ClN_4O_3Sn$: C, 56.96; H, 3.55; Cl, 5.42; N, 8.57; Sn, 18.16 %. Found: C, 56.73; H, 3.27; Cl, 5.34; N, 8.13; Sn, 18.03 %; IR (KBr, cm^{-1}): 1592 (C=N), 668 (Sn-C), 561 (Sn-O), 449 (Sn-N); 1H -NMR (400 MHz, $CDCl_3$, δ / ppm): 9.25 (1H, *d*, $J = 4$ Hz, H-1, pyrd. ring), 8.92–8.15 (5H, *m*, Ar-H), 7.91–7.89 (2H, *d*, $J = 8$ Hz), 7.34–7.17 (15H, *m*, Ar-H); ^{13}C -NMR (100 MHz, $CDCl_3$, δ / ppm): 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; ^{119}Sn -NMR (149 MHz, $CDCl_3$, δ / ppm): –331.45; ESI-MS (m/z): Calcd. for $[C_{31}H_{23}ClN_4O_3Sn+H]^+$: 655.06. Found: 654.70.

(*IE,N'Z*)-Dibutylchloro{4-nitro-*N'*-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}tin (**Bu₂SnCIL₂**). Yield: 68 %; yellow, m.p.: 215 °C, Anal. Calcd. for $C_{27}H_{31}ClN_4O_3Sn$: C, 52.84; H, 5.09; Cl, 5.78; N, 9.13; Sn, 19.34 %. Found: C, 52.58; H, 4.85; Cl, 5.43; N, 9.01; Sn, 19.08 %; IR (KBr, cm^{-1}): 1588 (C=N), 675 (Sn-C), 566 (Sn-O), 433 (Sn-N); 1H -NMR (400 MHz, $CDCl_3$, δ / pm): 9.54 (1H, *d*, $J = 4$ Hz, H-1, pyrd. ring), 8.26–8.18 (5H, *m*, Ar-H), 7.70–7.53 (7H, *m*, Ar-H), 1.75–1.68 (4H, *m*, CH_2 , Bu), 1.46–1.38 (4H *m*, CH_2 , Bu), 1.24–1.15 (4H, *m*, CH_2 , Bu), 0.73 (6H, *t*, $J = 8$ Hz, CH_3 , Bu); ^{13}C -NMR (100 MHz, $CDCl_3$, δ / ppm): 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; ^{119}Sn -NMR (149 MHz, $CDCl_3$, δ / ppm): –274.11; ESI-MS (m/z): Calcd. for $[C_{27}H_{31}ClN_4O_3Sn+H]^+$: 615.12. Found: 614.50.

(*IE,N'Z*)-Chlorodimethyl{4-nitro-*N'*-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}tin (**Me₂SnCIL₂**). Yield: 61 %; Yellow; m.p.: 238 °C, Anal. Calcd. for $C_{21}H_{19}ClN_4O_3Sn$: C, 47.63; H, 3.62; Cl, 6.69; N, 10.58; Sn, 22.42 %. Found: C, 47.34; H, 3.37; Cl, 6.38; N, 10.29; Sn, 22.13 %; IR (KBr, cm^{-1}): 1590 (C=N), 621 (Sn-C), 553 (Sn-O), 451 (Sn-N); 1H -NMR (400 MHz, $CDCl_3$, δ / ppm): 8.86 (1H, *d*, $J = 4$ Hz, H-1, pyrd. ring), 8.40 (2H, *d*, $J = 8$ Hz), 8.17 (2H, *d*, $J = 8$ Hz), 7.89 (1H, *t*, $J = 8$ Hz), 7.66–7.64 (2H, *m*, Ar-H), 7.52–7.38 (5H, *m*, Ar-H), 1.67 (6H, *s*, CH_3); ^{13}C -NMR (100 MHz, $CDCl_3$, δ / ppm): 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 (149 MHz, CDCl₃, δ / ppm): -213.67; ESI-MS (*m/z*): Calcd. for [C₂₁H₁₉ClN₄O₃Sn+H]⁺: 531.02. Found: 530.90.

(*1E,N'Z*)-{4-Nitro-*N'*-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}tri-phenyltin (**(Ph₃SnL₂)**). Yield: 72 %; yellow; m.p.: 243 °C; Anal. Calcd. for C₃₇H₂₈N₄O₃Sn: C, 63.91; H, 4.06; N, 8.08; Sn, 17.07 %. Found: C, 63.71; H, 3.97; N, 7.99; Sn, 17.05 %; IR (KBr, cm⁻¹): 1578 (C=N), 708 (Sn-C), 561 (Sn-O), 456 (Sn-N); ¹H-NMR (400 MHz, CDCl₃, δ / ppm): 8.85 (1H, *d*, *J* = 4 Hz, H-1, pyrd. ring), 8.40 (2H, *d*, *J* = 8 Hz), 8.17 (2H, *d*, *J* = 8 Hz), 7.89 (1H, *t*, *J* = 8 Hz), 7.38–7.82 (22H, *m*, Ar-H); ¹³C-NMR (100 MHz, CDCl₃, δ / ppm): 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 (149 MHz, CDCl₃, δ / ppm): -453.62; ESI-MS (*m/z*): Calcd. for [C₃₇H₂₈N₄O₃Sn+H]⁺: 697.13. Found: 696.90.

(*1E,N'Z*)-Tributyl{4-nitro-*N'*-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}tin (**(Bu₃SnL₂)**). Yield: 73 %; light yellow; m.p.: 211 °C; Anal. Calcd. for C₃₁H₄₀N₄O₃Sn: C, 58.60; H, 6.35; N, 8.82; Sn, 18.68 %. Found: C, 58.27; H, 6.19; N, 8.57; Sn, 18.43 %; IR (KBr, cm⁻¹): 1589 (C=N), 643 (Sn-C), 558 (Sn-O), 439 (Sn-N); ¹H-NMR (400 MHz, CDCl₃, δ / ppm): 9.13 (1H, *d*, *J* = 4 Hz, H-1, pyrd. ring), 8.74 (2H, *d*, *J* = 8 Hz), 8.37 (2H, *d*, *J* = 8 Hz), 7.93 (1H, *t*, *J* = 8 Hz), 7.65 (2H, *m*, Ar-H), 7.52–7.38 (5H, *m*, Ar-H), 1.51–1.26 (18H, *m*, CH₂, Bu), 0.91 (9H, *t*, *J* = 8 Hz, CH₃ Bu); ¹³C-NMR (100 MHz, CDCl₃, δ / ppm): 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 (149 MHz, CDCl₃, δ / ppm): -272.48; ESI-MS (*m/z*): Calcd. for [C₃₁H₄₀N₄O₃Sn+H]⁺: 637.22. Found: 636.70.

(*1E,N'Z*)-Trimethyl{4-nitro-*N'*-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}tin (**(Me₃SnL₂)**). Yield: 79 %; yellow; m.p.: 189 °C; Anal. Calcd. for C₂₂H₂₂N₄O₃Sn: C, 51.90; H, 4.36; N, 11.00; Sn, 23.32 %; Found: C, 51.76; H, 4.03; N, 10.82; Sn, 23.08 %; IR (KBr, cm⁻¹): 1591 (C=N), 683 (Sn-C), 567 (Sn-O), 438 (Sn-N); ¹H-NMR (400 MHz, CDCl₃, δ / ppm): 9.12 (1H, *d*, *J* = 4 Hz, H-1, pyrd. ring), 8.89–8.83 (3H, *m*, Ar-H), 8.62 (2H, *d*, *J* = 8 Hz), 7.95 (2H, *d*, *J* = 8 Hz), 7.45–7.32 (5H, *m*, Ar-H), 0.97 (9H, *s*, CH₃); ¹³C-NMR (100 MHz, CDCl₃, δ / ppm): 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 (149 MHz, CDCl₃, δ / ppm): -203.35; ESI-MS (*m/z*): Calcd. for [C₂₂H₂₂N₄O₃Sn+H]⁺: 511.08. Found: 510.90.

(*1E,N'Z*)-Chloro{4-methyl-*N'*-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}diphenyltin (**(Ph₂SnCIL₃)**). Yield: 71 %; dark yellow; m.p.: 133 °C; Anal. Calcd. for C₃₂H₂₆ClN₃OSn: C, 61.72; H, 4.21; Cl, 5.69; N, 6.75; Sn, 19.06 %. Found: C, 61.54; H, 3.98; Cl, 5.69; N, 6.54; Sn, 18.84 %; IR (KBr, cm⁻¹): 1575

(C=N), 701 (Sn-C), 549 (Sn-O), 445 (Sn-N); $^1\text{H-NMR}$ (400 MHz, CDCl_3 , δ / ppm): 9.05 (1H, *d*, $J = 4$ Hz, H-1, pyrd. ring), 8.62–8.35 (3H, *m*, pyrd. ring), 7.57 (2H, *d*, $J = 8$ Hz), 7.38–7.23 (15 H, *m*, Ar-H), 6.94 (2H, *d*, $J = 8$ Hz), 2.15 (3H, *s*, CH_3); $^{13}\text{C-NMR}$ (100 MHz, CDCl_3 , δ / ppm): 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 (CH_3); $^{119}\text{Sn-NMR}$ (149 MHz, CDCl_3 , δ / ppm): –367.41; ESI-MS (m/z): Calcd. for $[\text{C}_{32}\text{H}_{26}\text{ClN}_3\text{OSn}+\text{H}]^+$: 624.09. Found: 623.70.

(*IE,N'Z*)-Dibutylchloro{4-methyl-N'-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}tin (**Bu₂SnCIL₃**). Yield: 74 %; dark yellow; m.p.: 142 °C; Anal. Calcd. for $\text{C}_{28}\text{H}_{34}\text{ClN}_3\text{OSn}$: C, 57.71; H, 5.88; Cl, 6.08; N, 7.21; Sn, 20.37 %. Found: C, 57.59; H, 5.65; Cl, 5.81; N, 6.94; Sn, 20.03 %; IR (KBr, cm^{-1}): 1578 (C=N), 612 (Sn-C), 547 (Sn-O), 436 (Sn-N); $^1\text{H-NMR}$ (400 MHz, CDCl_3 , δ / ppm): 9.48 (1H, *d*, $J = 4$ Hz, H-1, pyrd. ring), 8.02–7.98 (3H, *m*, pyrd. ring), 7.66–7.55 (7H, *m*, Ar-H), 7.18 (2H, *d*, $J = 8$ Hz), 2.39 (3H, *s*, CH_3), 1.73–1.66 (4H, *m*, CH_2 , Bu), 1.48–1.35 (4H, *m*, CH_2 , Bu), 1.22–1.17 (4H, *m*, CH_2 , Bu), 0.73 (6H, *t*, $J = 8$ Hz, CH_3 , Bu.); $^{13}\text{C-NMR}$ (100 MHz, CDCl_3 , δ / ppm): 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; $^{119}\text{Sn-NMR}$ (149 MHz, CDCl_3 , δ / ppm): –270.75; ESI-MS (m/z): Calcd. for $[\text{C}_{28}\text{H}_{34}\text{ClN}_3\text{OSn}+\text{H}]^+$: 584.15. Found: 583.95.

(*IE,N'Z*)-Chlorodimethyl{4-methyl-N'-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}tin (**Me₂SnCIL₃**). Yield: 68 %; yellow; m.p.: 120 °C; Anal. Calcd. for $\text{C}_{22}\text{H}_{22}\text{ClN}_3\text{OSn}$: C, 53.00; H, 4.45; Cl, 7.11; N, 8.43; Sn, 23.81 %. Found: C, 52.73; H, 4.18; Cl, 6.89; N, 8.01; Sn, 23.66 %; IR (KBr cm^{-1}): 1573 (C=N), 623 (Sn-C), 523 (Sn-O), 434 (Sn-N); $^1\text{H-NMR}$ (400 MHz, CDCl_3 , δ / ppm): 9.28 (1H, *d*, $J = 4$ Hz, H-1, pyrd. ring), 7.63 (2H, *d*, $J = 4\text{Hz}$), 7.41–7.37 (8H, *m*, Ar-H), 7.13 (2H, *d*, $J = 8$ Hz), 2.03 (3H, *s*, CH_3), 1.07 (6H, *s*, CH_3); $^{13}\text{C-NMR}$ (100 MHz, CDCl_3 , δ / ppm): 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; $^{119}\text{Sn-NMR}$ (149 MHz, CDCl_3 , δ / ppm): –228.23; ESI-MS (m/z): Calcd. for $[\text{C}_{22}\text{H}_{22}\text{ClN}_3\text{OSn}+\text{H}]^+$: 500.06. Found: 499.70.

(*IE,N'Z*)-{4-methyl-N'-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}triphenyltin (**Ph₃SnL₃**). Yield: 62 %; yellow; m.p.: 198 °C; Anal. Calcd. for $\text{C}_{38}\text{H}_{31}\text{N}_3\text{OSn}$: C, 68.70; H, 4.70; N, 6.32; Sn, 17.87 %. Found: C, 68.67; H, 4.66; N, 6.29; Sn, 17.85 %; IR (KBr, cm^{-1}): 1585 (C=N), 678 (Sn-C), 556 (Sn-O), 451 (Sn-N); $^1\text{H-NMR}$ (400 MHz, CDCl_3 , δ / ppm): 8.96 (1H, *d*, $J = 4$ Hz, H-1, pyrd. ring), 8.47–8.21 (3H, *m*), 7.89–7.37 (24H, *m*, Ar-H), 1.96 (3H, *s*, CH_3); $^{13}\text{C-NMR}$ (100 MHz, CDCl_3 , δ / ppm): 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; ^{119}Sn -NMR (149 MHz, CDCl_3 , δ / ppm): -452.38; ESI-MS (m/z): calcd. for $[\text{C}_{38}\text{H}_{31}\text{N}_3\text{OSn}+\text{H}]^+$: 666.25. Found: 665.20.

(*IE,N'Z*)-Tributyl{4-methyl-N'-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}tin (**Bu₃SnL₃**). Yield: 68 %; pale yellow; m.p.: 178 °C; Anal. Calcd. for $\text{C}_{32}\text{H}_{43}\text{N}_3\text{OSn}$: C, 63.59; H, 7.17; N, 6.95; Sn, 19.64 %. Found: C, 63.37; H, 6.98; N, 6.87; Sn, 19.23 %; IR (KBr, cm^{-1}): 1572 (C=N), 679 (Sn-C), 543 (Sn-O), 457 (Sn-N); ^1H -NMR (400 MHz, CDCl_3 , δ / ppm): 8.85 (1H, *d*, $J = 4$ Hz, H-1, pyrd. ring), 7.91 (2H, *d*, $J = 8$ Hz), 7.87 (1H, *t*, $J = 8$ Hz), 7.69–7.60 (5H, *m*, Ar-H), 7.33 (2H, *d*, $J = 8$ Hz), 2.45 (3H, *s*, CH_3), 1.57–1.41 (12H, *m*, CH_2), 1.34–1.28 (6H, *m*, CH_2), 0.92 (9H, *t*, $J = 8$ Hz, CH_3); ^{13}C -NMR (100 MHz, CDCl_3 , δ / ppm): 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; ^{119}Sn -NMR (149 MHz, CDCl_3 , δ / ppm): -273.29; ESI-MS (m/z): Calcd. for $[\text{C}_{32}\text{H}_{43}\text{N}_3\text{OSn}+\text{H}]^+$: 606.25. Found: 605.90.

(*IE,N'Z*)-Trimethyl{4-methyl-N'-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}tin (**Me₃SnL₃**). Yield: 69 %; yellow, m.p.: 168 °C, Anal. Calcd. for $\text{C}_{23}\text{H}_{25}\text{N}_3\text{OSn}$: C, 57.77; H, 5.27; N, 8.79; Sn, 24.83 %. Found: C, 57.75; H, 5.24; N, 8.76; Sn, 24.79 %; IR (KBr, cm^{-1}): 1578 (C=N), 682 (Sn-C), 547 (Sn-O), 451 (Sn-N); ^1H -NMR (400 MHz, CDCl_3 , δ / ppm): 8.97 (1H, *d*, $J = 4$ Hz, H-1, pyrd. ring), 8.89–8.83 (3H, *m*), 8.62 (2H, *d*, $J = 8$ Hz), 7.95 (2H, *d*, $J = 8$ Hz), 7.45–7.32 (5H, *m*, Ar-H), 0.97 (9H, *s*, CH_3); ^{13}C -NMR (100 MHz, CDCl_3 , δ / ppm): 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; ^{119}Sn -NMR (149 MHz, CDCl_3 , δ / ppm): -210.83; ESI-MS (m/z): Calcd. for $[\text{C}_{23}\text{H}_{25}\text{N}_3\text{OSn}+\text{H}]^+$: 480.11. Found: 479.80.

(*IE,N'Z*)-Chloro{4-chloro-N'-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}diphenyltin (**Ph₂SnCIL₄**). Yield: 73 %; yellow; m.p.: 122 °C; Anal. Calcd. for $\text{C}_{31}\text{H}_{23}\text{Cl}_2\text{N}_3\text{OSn}$: C, 57.89; H, 3.60; N, 6.53; Cl, 11.02; Sn, 18.46 %. Found: C, 57.64; H, 3.53; N, 6.27; Cl, 10.87; Sn, 18.12 %; IR (KBr, cm^{-1}): 1592 (C=N), 701 (Sn-C), 561 (Sn-O), 459 (Sn-N); ^1H -NMR (400 MHz, CDCl_3 , δ / ppm): 9.28 (1H, *d*, $J = 4$ Hz, H-1, pyrd. ring), 8.57–8.28 (3H, *m*, pyrd. ring), 7.63 (2H, *d*, $J = 8$ Hz), 7.57 (2H, *d*, $J = 8$ Hz), 7.36–7.21 (15H, *m*, Ar-H); ^{13}C -NMR (100 MHz, CDCl_3 , δ / ppm): 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; ^{119}Sn -NMR (149 MHz, CDCl_3 , δ / ppm): -376.12; ESI-MS (m/z): Calcd. for $[\text{C}_{31}\text{H}_{23}\text{Cl}_2\text{N}_3\text{OSn}+\text{H}]^+$: 644.03. Found: 644.90.

(*IE,N'Z*)-Dibutylchloro{4-chloro-N'-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}tin (**Bu₂SnCIL₄**). Yield: 72 %; yellow; m.p.: 169 °C, Anal. Calcd. for $\text{C}_{27}\text{H}_{31}\text{Cl}_2\text{N}_3\text{OSn}$: C, 53.76; H, 5.18; N, 6.97; Cl, 11.76; Sn, 19.68 %. Found: C, 53.59; H, 4.97; N, 6.73; Cl, 11.64; Sn, 19.56 %; IR (KBr, cm^{-1}): 1579 (C=N), 693 (Sn-C), 556 (Sn-O), 433 (Sn-N); ^1H -NMR (400 MHz, CDCl_3 , δ / ppm):

9.51 (1H, *d*, $J = 4$ Hz, H-1, pyrd. ring), 8.23–8.16 (5H, *m*, Ar-H), 7.71–7.54 (5H, *m*, Ar-H), 7.50 (2H, *d*, $J = 8$ Hz), 1.53–1.48 (4H, *m*, CH₂), 1.38–1.33 (4H, *m*, CH₂), 1.21–1.13 (4H, *m*, CH₂), 0.72 (6H, *t*, $J = 8$ Hz, CH₃); ¹³C-NMR (100 MHz, CDCl₃, δ / ppm): 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, 35.43, 25.98, 25.54, 13.51; ¹¹⁹Sn-NMR (149 MHz, CDCl₃, δ / ppm): –289.17; ESI-MS (*m/z*): Calcd. for [C₂₇H₃₁Cl₂N₃OSn+H]⁺: 604.09. Found: 604.70.

(*IE,N'Z*)-Chloro{4-chloro-N'-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}dimethyltin (**Me₂SnCIL₄**). Yield: 69 %; yellow. m.p.: 137 °C; Anal. Calcd. for C₂₁H₁₉Cl₂N₃OSn: C, 48.60; H, 3.69; N, 8.10; Cl, 13.66; Sn, 22.87 %. Found: C, 48.37; H, 3.47; N, 7.97; Cl, 13.34; Sn, 22.53 %; IR (KBr, cm⁻¹): 1593 (C=N), 632 (Sn–C), 534 (Sn–O), 431 (Sn–N); ¹H-NMR (400 MHz, CDCl₃, δ / ppm): 9.33 (1H, *d*, $J = 4$ Hz, H-1, pyrd. ring), 8.03 (2H, *d*, $J = 8$ Hz), 7.54–7.41 (8H, *m*, Ar-H), 7.33 (2H, *d*, $J = 8$ Hz), 1.12 (6H, *s*); ¹³C-NMR (100 MHz, CDCl₃, δ / ppm): 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 (149 MHz, CDCl₃, δ / ppm): –208.18; ESI-MS (*m/z*): Calcd. for [C₂₁H₁₉Cl₂N₃OSn+H]⁺: 520.00. Found: 520.70.

(*IE,N'Z*)-{4-Chloro-N'-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}-triphenyltin (**Ph₃SnL₄**). Yield: 67 %; yellow; m.p.: 207 °C, Anal. Calcd. for C₃₇H₂₈ClN₃OSn: C, 64.89; H, 4.12; N, 6.14; Cl, 5.18; Sn, 17.33 %. Found: C, 64.69; H, 4.01; N, 5.97; Cl, 5.02; Sn, 17.01 %; IR (KBr, cm⁻¹): 1603 (C=N), 673 (Sn–C), 548 (Sn–O), 446 (Sn–N); ¹H-NMR (400 MHz, CDCl₃, δ / ppm): 9.01 (1H, *d*, $J = 4$ Hz, H-1, pyrd. ring), 8.54–8.37 (3H, *m*), 7.92–7.48 (24H, *m*); ¹³C-NMR (100 MHz, CDCl₃, δ / ppm): 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 (149 MHz, CDCl₃, δ / ppm): –468.18; ESI-MS (*m/z*): Calcd. for [C₃₇H₂₈ClN₃OSn+H]⁺: 686.10. Found: 685.80.

(*IE,N'Z*)-Tributyl{4-chloro-N'-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}tin (**Bu₃SnL₄**). Yield: 71 %; yellow; m.p.: 191 °C; Anal. Calcd. for C₃₁H₄₀ClN₃OSn: C, 59.59; H, 6.45; N, 6.73; Cl, 5.67; Sn, 19.00 %. Found: C, 59.32; H, 6.21; N, 6.58; Cl, 5.43; Sn, 18.86 %; IR (KBr, cm⁻¹): 1592 (C=N), 631 (Sn–C), 551 (Sn–O), 447 (Sn–N); ¹H-NMR (400 MHz, CDCl₃, δ / ppm): 9.41 (1H, *d*, $J = 4$ Hz, H-1, pyrd. ring), 8.26–8.19 (4H, *m*, Ar-H), 8.03 (1H, *t*, $J = 8$ Hz), 7.69–7.52 (7H, *m*, Ar-H), 1.81–1.05 (18H, *m*, CH₂), 0.73 (9H, *t*, $J = 8$ Hz, CH₃); ¹³C-NMR (100 MHz, CDCl₃, δ / ppm): 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 (149 MHz, CDCl₃, δ / ppm): –252.95; ESI-MS (*m/z*): Calcd. for [C₃₁H₄₀ClN₃OSn+H]⁺: 626.20. Found: 625.90.

(1E,N'Z)-{4-Chloro-N'-[phenyl(pyridin-2-yl)methylene]benzohydrazidato}-trimethyltin (**Me₃SnL₄**). Yield: 74 %; yellow; m.p.: 181 °C; Anal. Calcd. for C₂₂H₂₂ClN₃OSn: C, 53.00; H, 4.45; N, 8.43; Cl, 7.11; Sn, 23.81 %. Found: C, 52.98; H, 4.43; N, 8.39; Cl, 7.08; Sn, 23.77 %; IR (KBr, cm⁻¹): 1597 (C=N), 656 (Sn-C), 559 (Sn-O), 452 (Sn-N); ¹H-NMR (400 MHz, CDCl₃, δ ppm): 8.98 (1H, *d*, *J* = 4 Hz, H-1, pyrd. ring), 8.83–8.74(3H, *m*), 8.68 (2H, *d*, *J* = 8 Hz), 7.93 (2H, *d*, *J* = 8 Hz), 7.57–7.39 (5H, *m*, Ar-H), 1.32 (9H, *s*, CH₃); ¹³C-NMR (100 MHz, CDCl₃, δ / ppm): 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 (149 MHz, CDCl₃, δ / ppm): -215.766; ESI-MS (*m/z*): Calcd. for [C₂₂H₂₂ClN₃OSn+H]⁺: 500.06. Found: 499.80.

¹H- AND ¹³C-NMR SPECTRA OF HL₂ AND HL₄

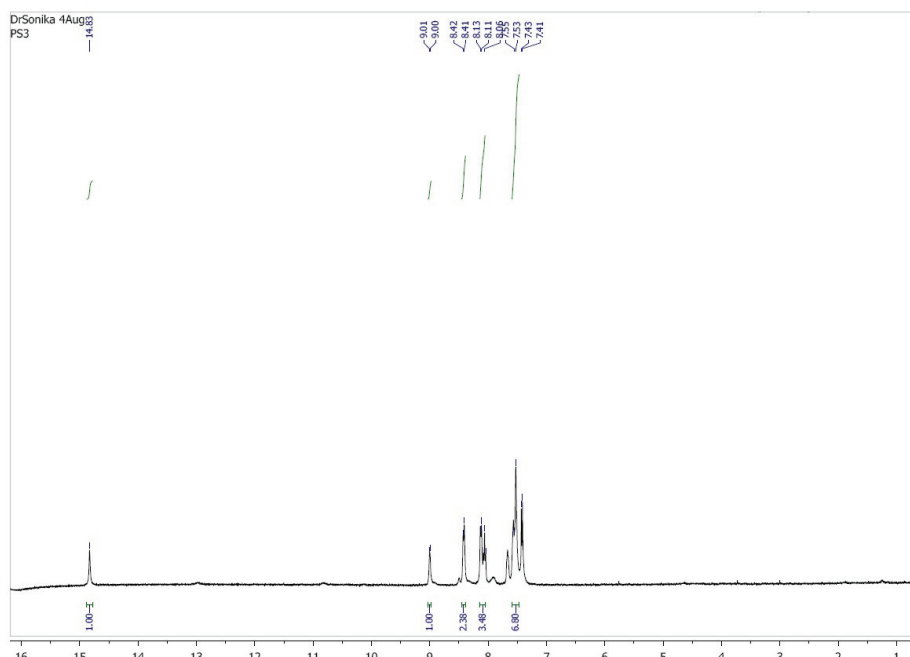
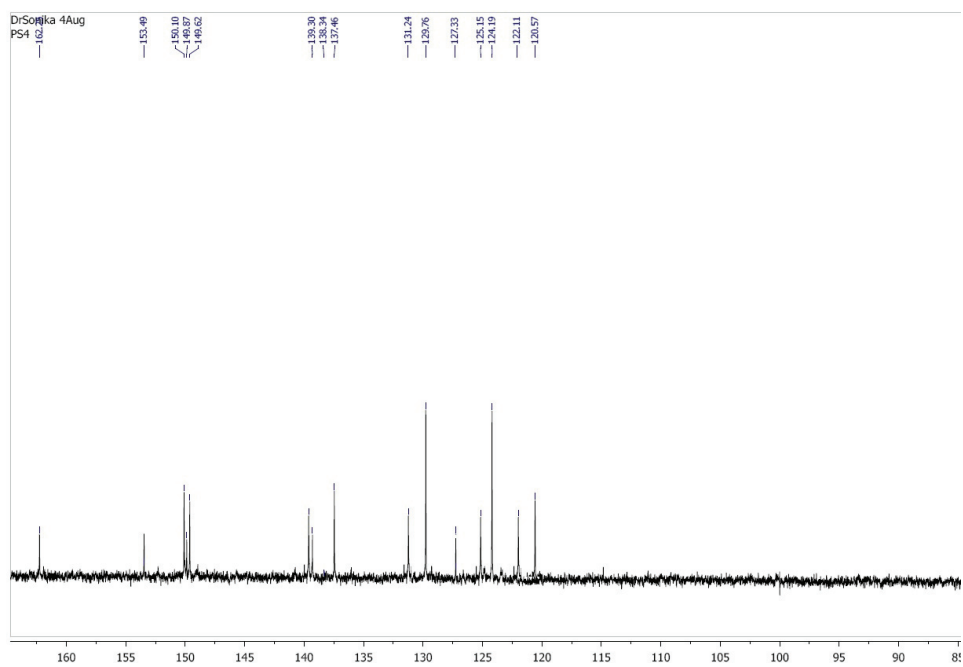
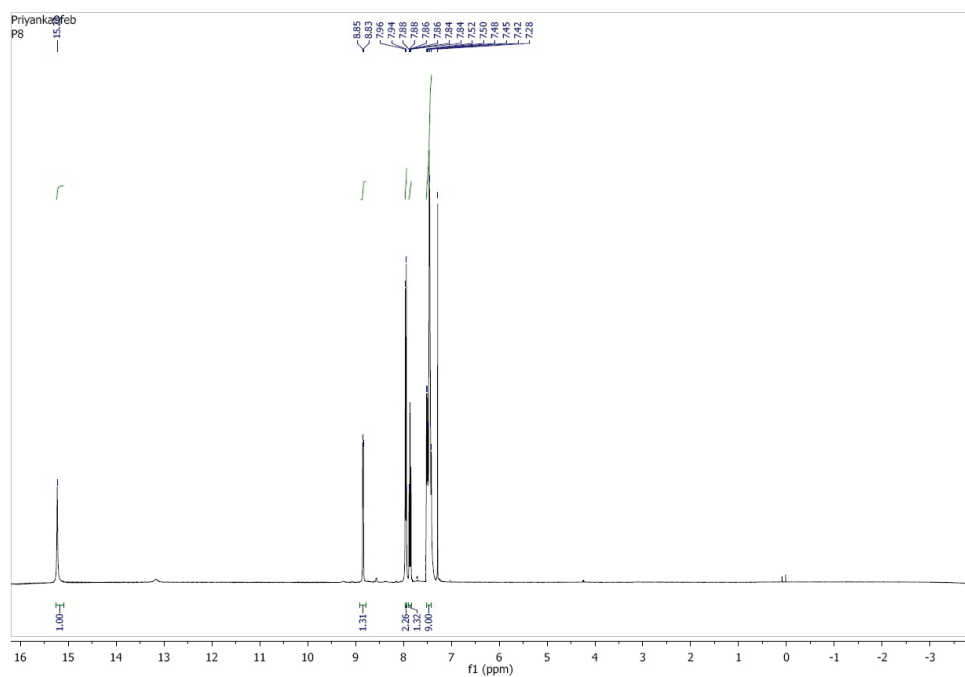


Fig. S-1. ¹H-NMR spectrum of HL₂.

Fig. S-2. ¹³C-NMR spectrum of HL₂.Fig. S-3. ¹H-NMR of HL₄.

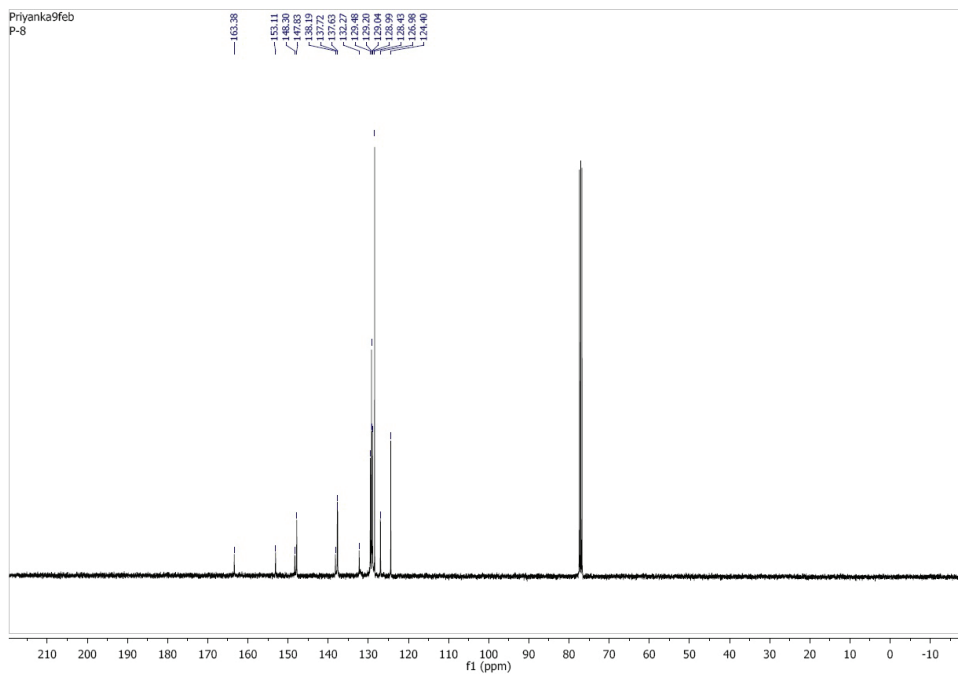


Fig. S-4. ^{13}C -NMR spectrum of HL_4 .

NMR SPECTRA OF Bu_2SnCl_2 AND Bu_3SnCl

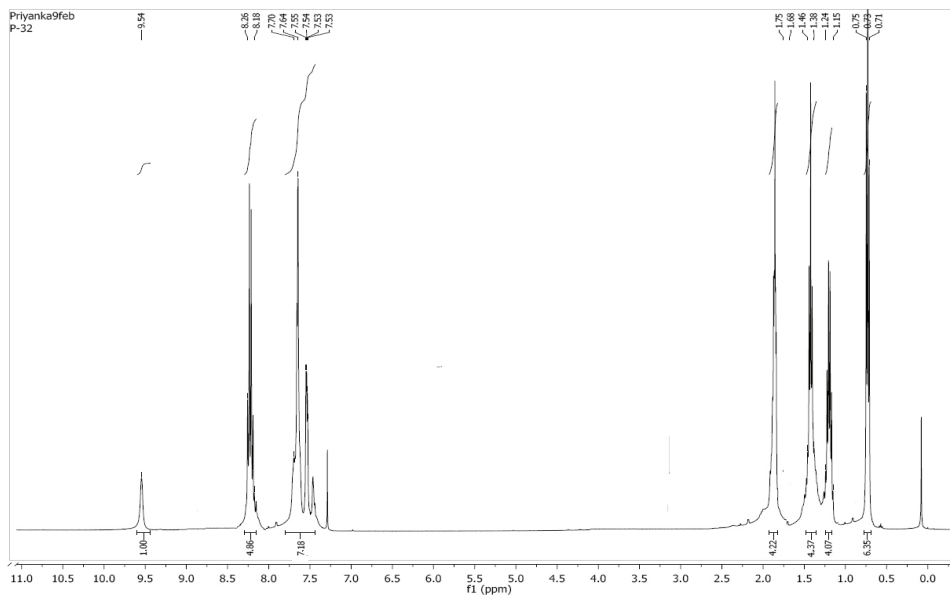
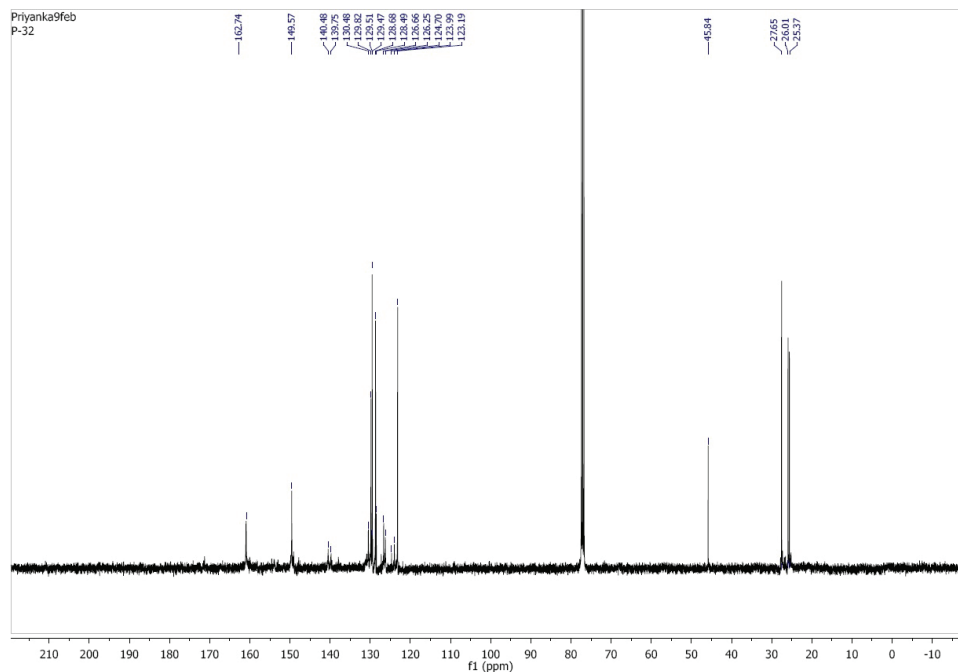
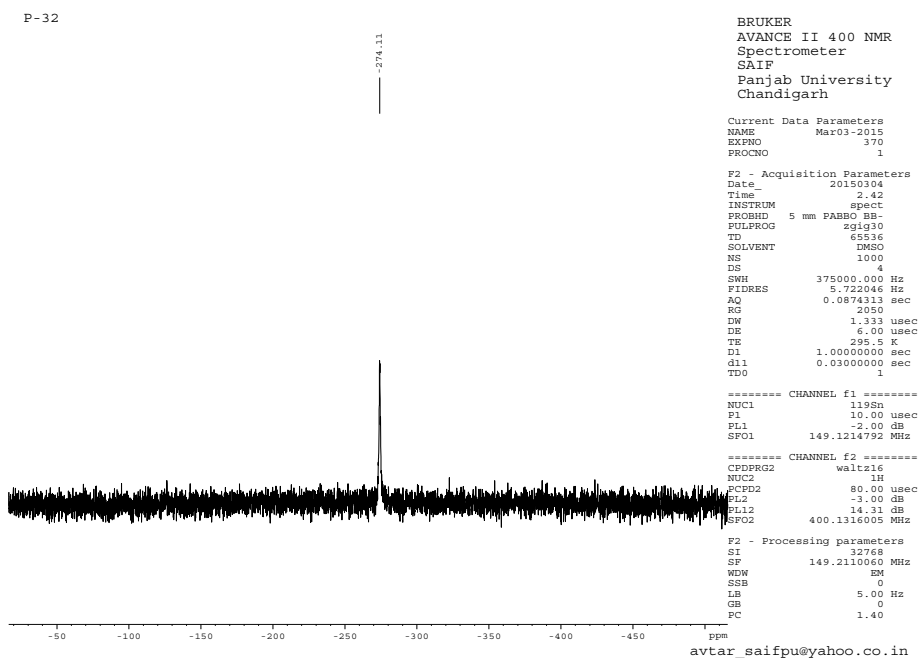


Fig. S-5. ^1H -NMR spectrum of Bu_2SnCl_2 .

Fig. S-6. ^{13}C -NMR spectrum of Bu_2SnCl_2 .Fig. S-7. ^{119}Sn -NMR spectrum of Bu_2SnCl_2 .

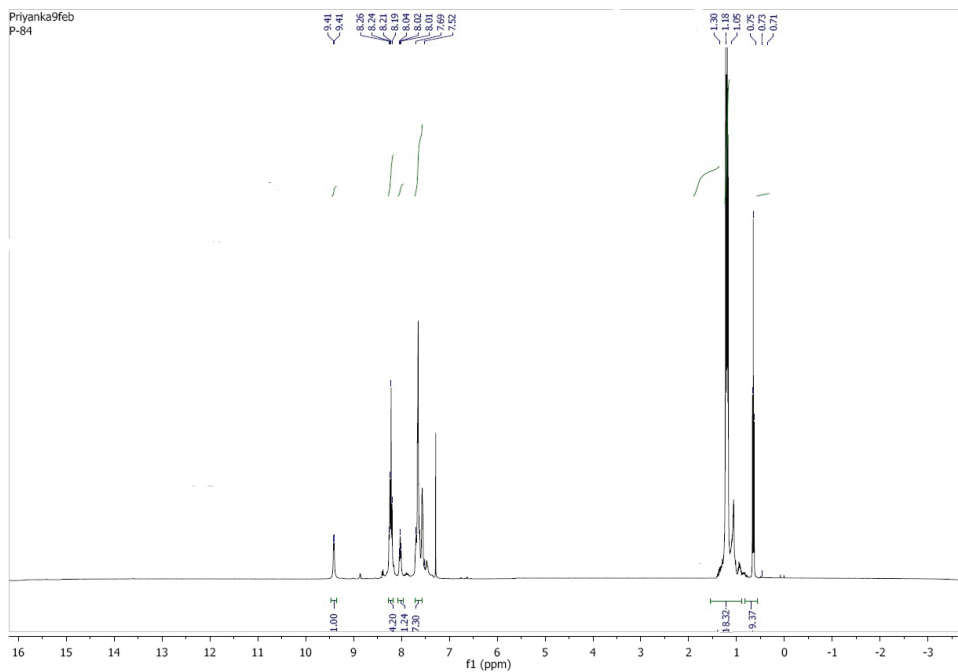


Fig. S-8. $^1\text{H-NMR}$ of Bu_3SnL_4 .

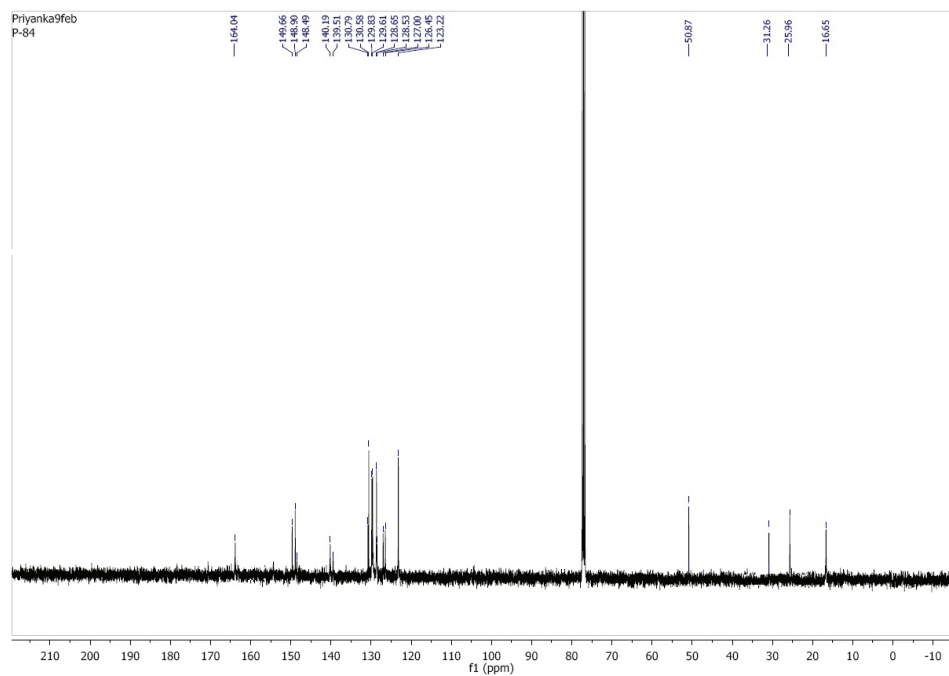
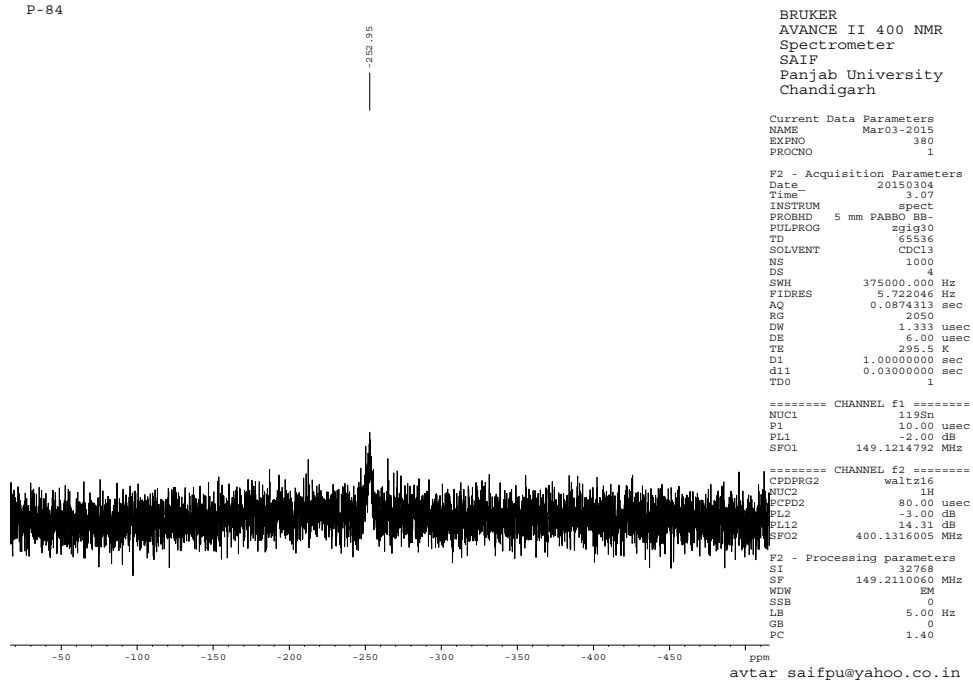
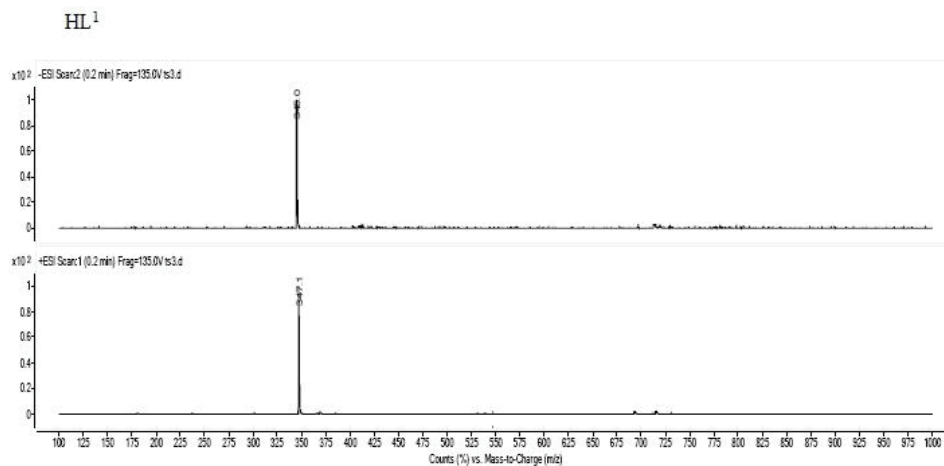


Fig. S-9. $^{13}\text{C-NMR}$ spectrum of Bu_3SnL_4 .

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Fig. S-10. ^{119}Sn -NMR of Bu_3SnL_4 .

MASS SPECTRA OF THE LIGANDS

Fig. S-11. Mass spectrum of HL_1 .

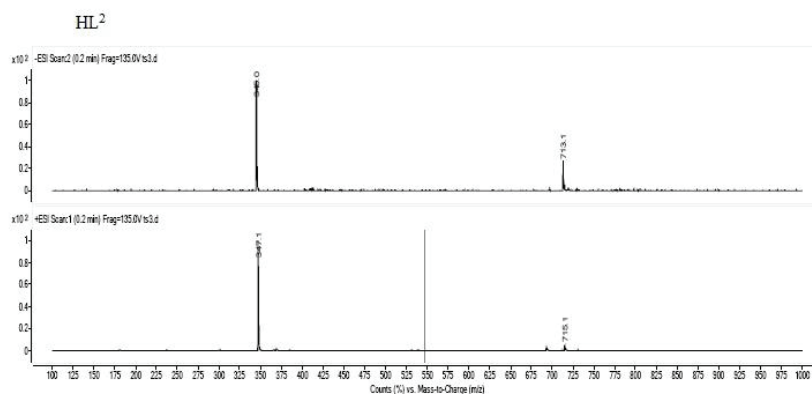


Fig. S-12. Mass spectrum of HL₂.

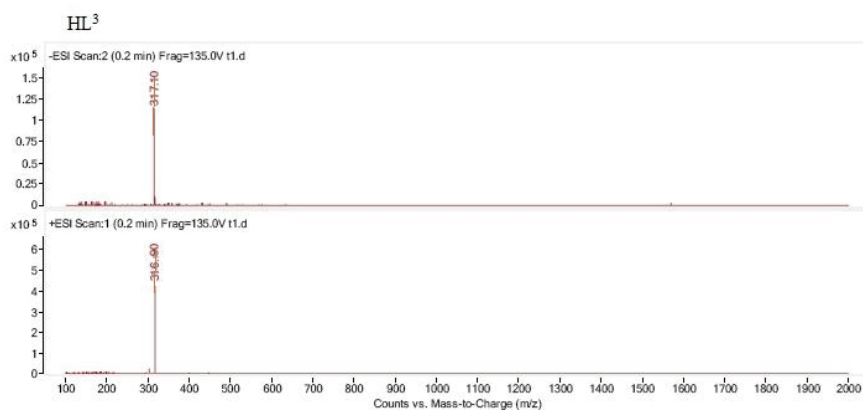


Fig. S-13. Mass spectrum of HL₃.

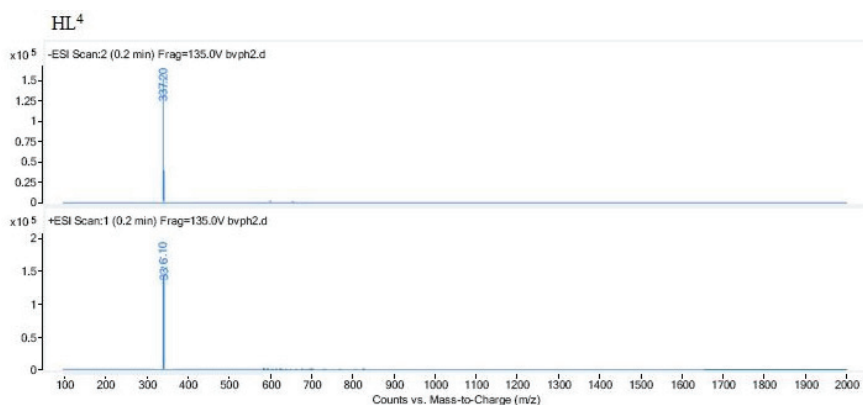
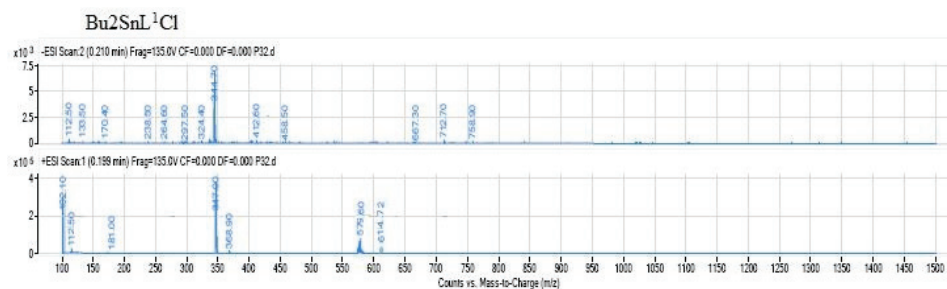
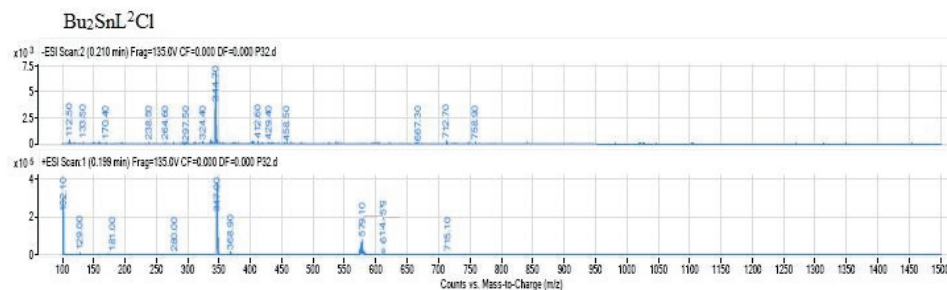
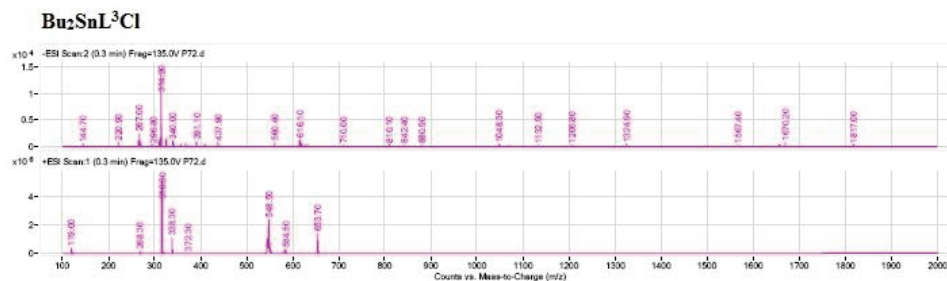


Fig. S-14. Mass spectrum of HL₄.

MASS SPECTRA OF THE COMPLEXES

Fig. S-15. Mass spectrum of Bu₂SnClL₁.Fig. S-16. Mass spectrum of Bu₂SnClL₂.Fig. S-17. Mass spectrum of Bu₂SnClL₃.

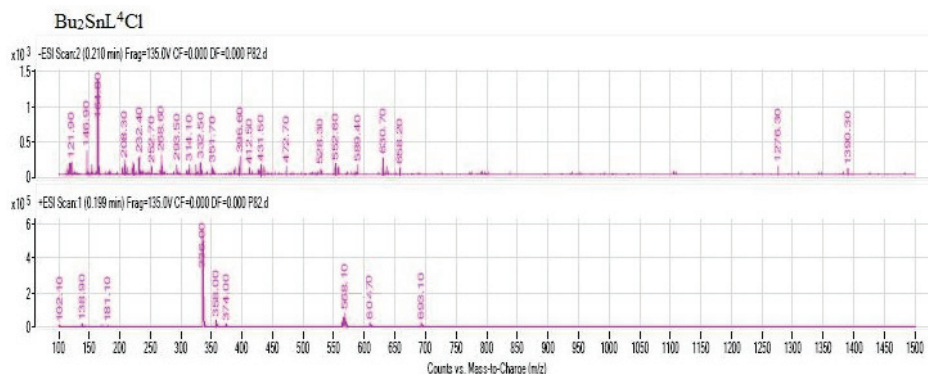


Fig. S-18. Mass spectrum of Bu₂SnCl₄.

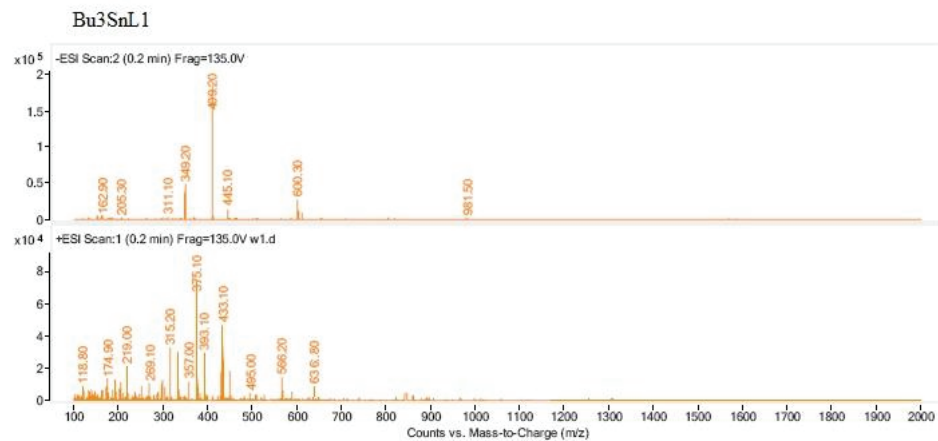


Fig. S-19. Mass spectrum of Bu₃SnL₁.

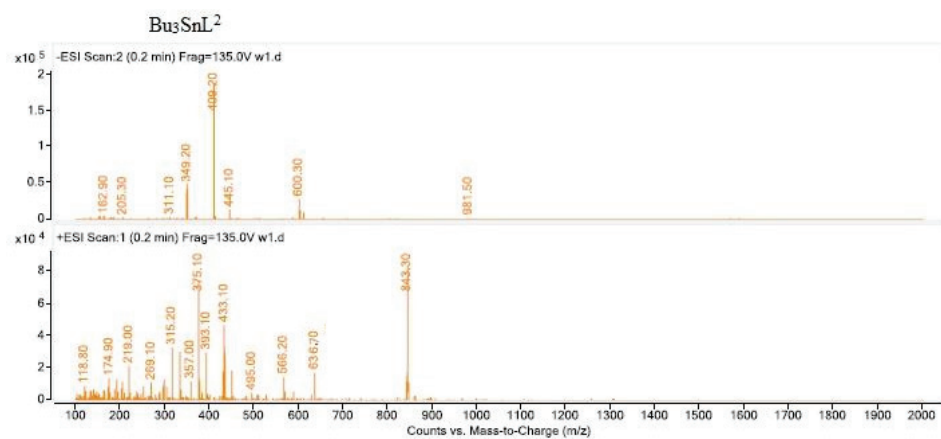
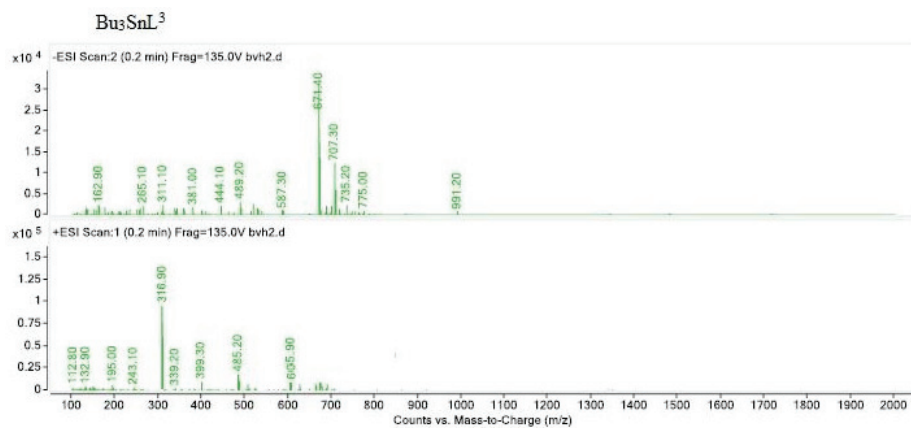
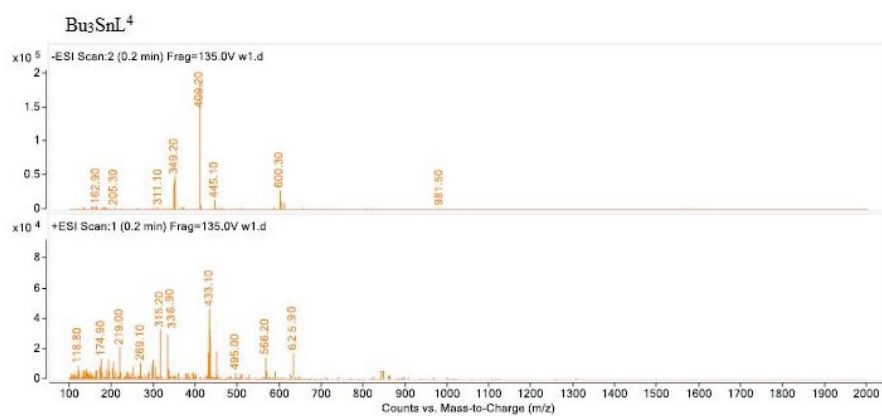
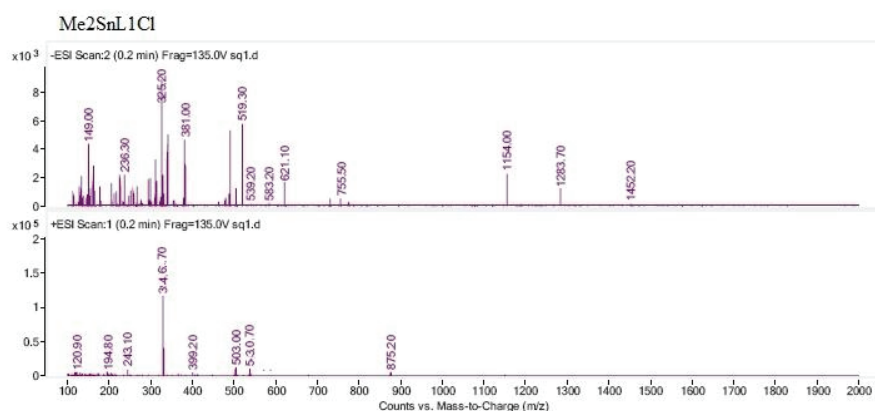


Fig. S-20. Mass spectrum of Bu₃SnL₂.

Fig. S-21. Mass spectrum of Bu_3SnL_3 .Fig. S-22. Mass spectrum of Bu_3SnL_4 .Fig. S-23. Mass spectrum of $\text{Me}_2\text{SnLCl}_1$.

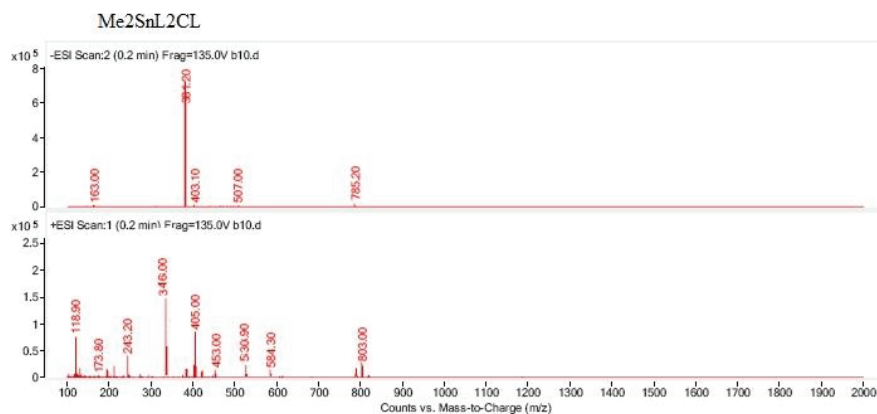


Fig. S-24. Mass spectrum of Me₂SnClL₂.

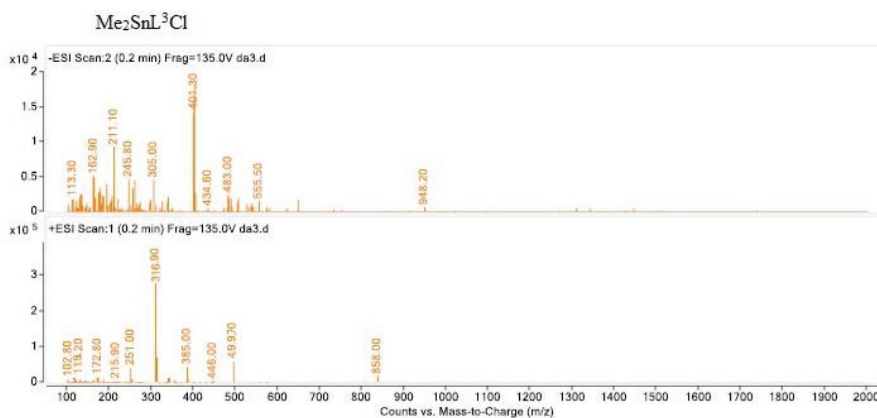


Fig. S-25. Mass spectrum of Me₂SnClL₃.

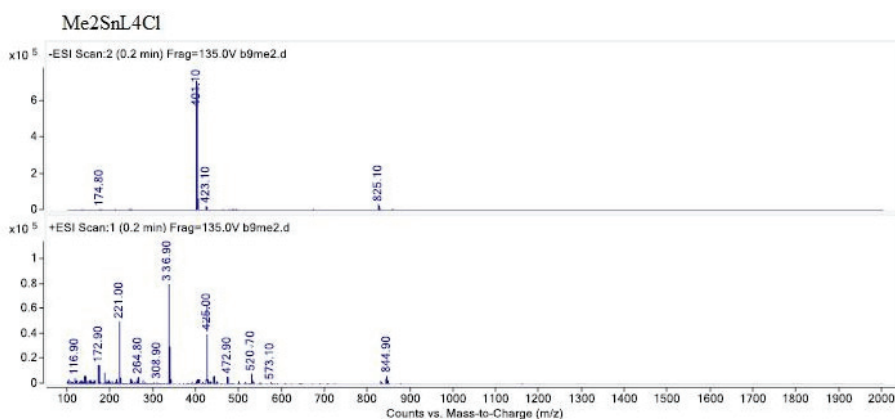
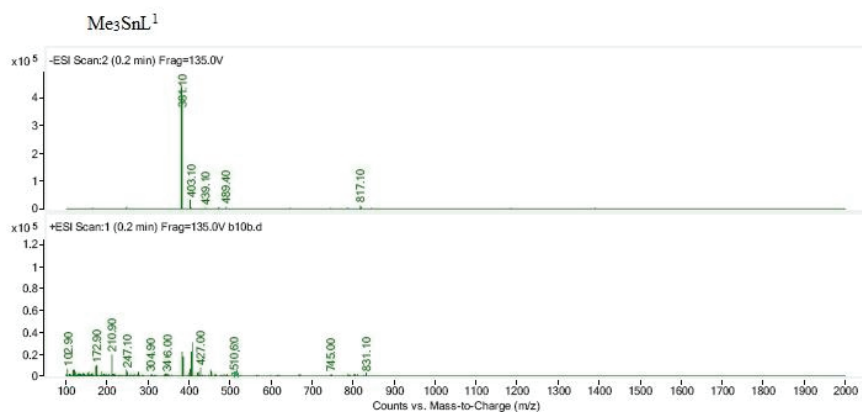
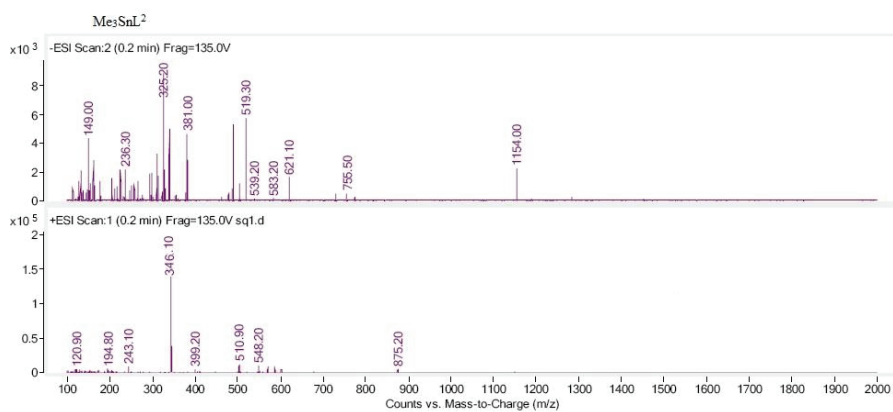
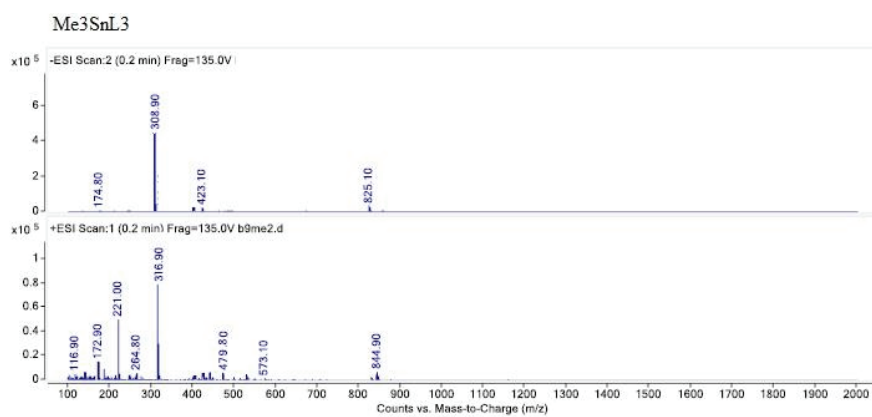


Fig. S-26. Mass spectrum of Me₂SnClL₄.

Fig. S-27. Mass spectrum of Me₃SnL₁.Fig. S-28. Mass spectrum of Me₃SnL₂.Fig. S-29. Mass spectrum of Me₃SnL₃.

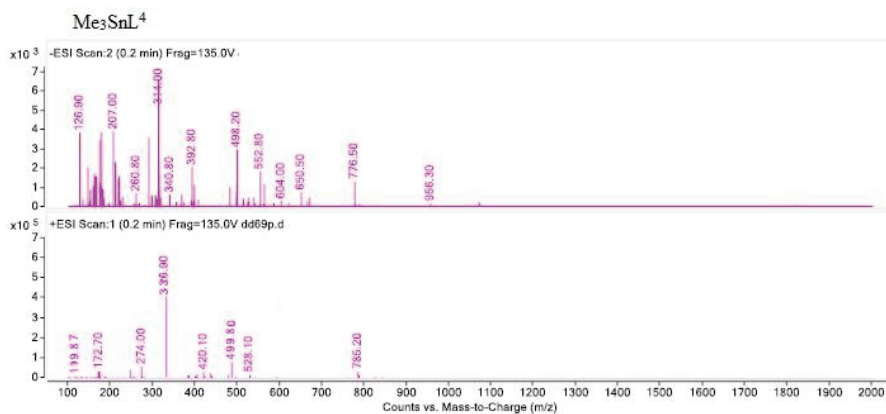


Fig. S-30. Mass spectrum of Me₃SnL₄.

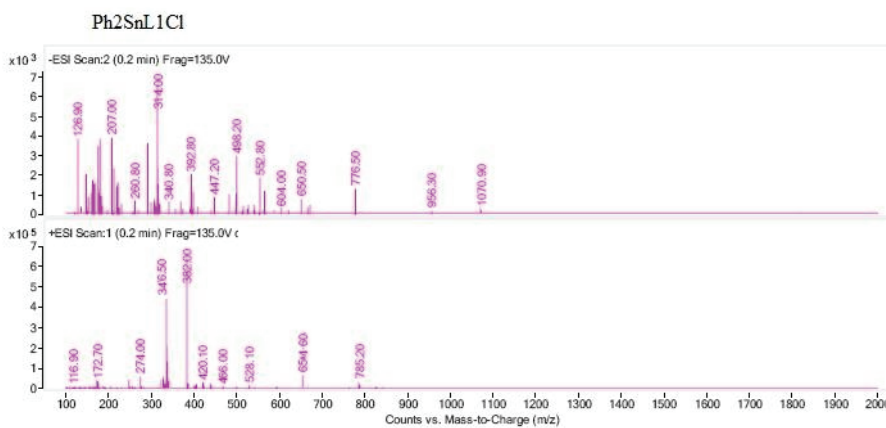


Fig. S-31. Mass spectrum of Ph₂SnLCl₁.

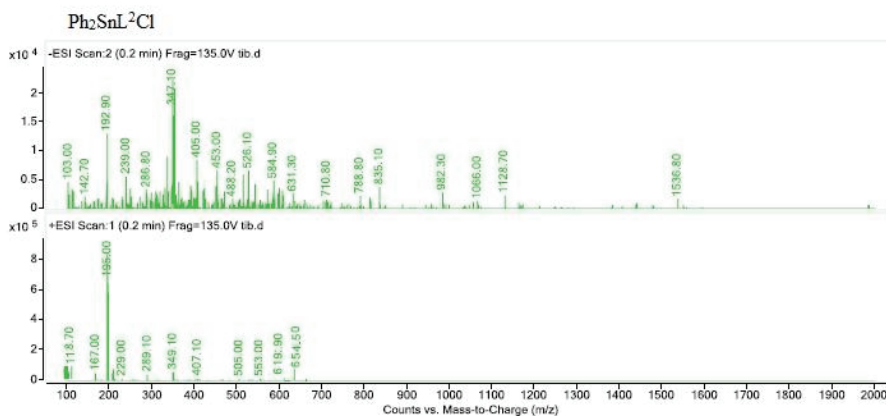
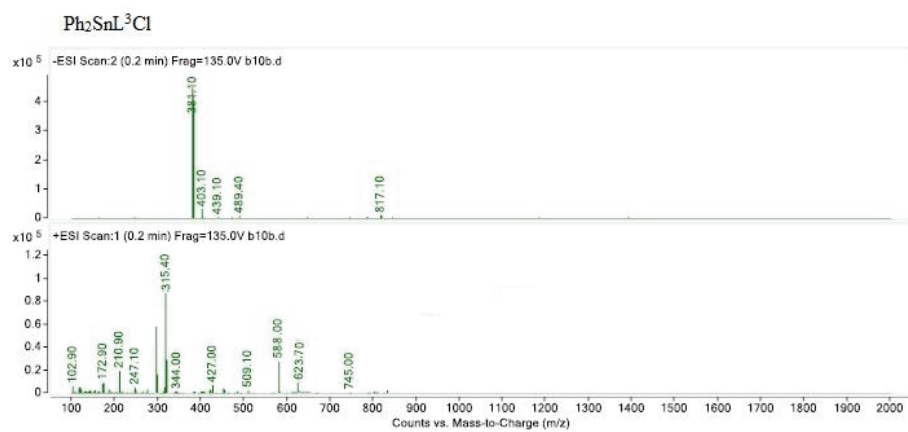
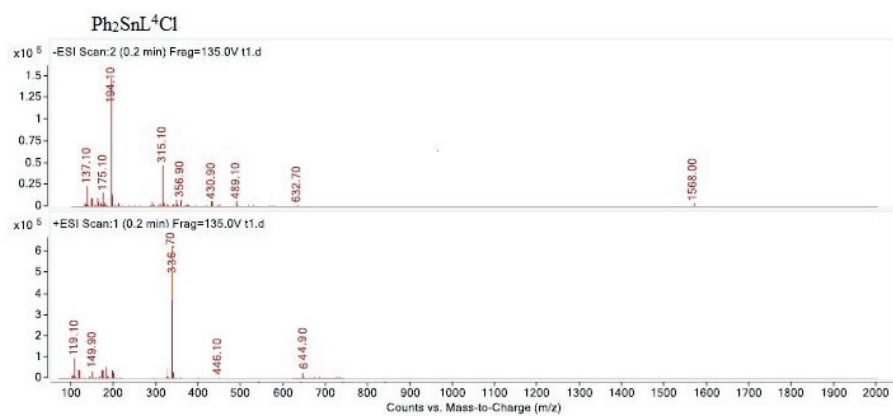
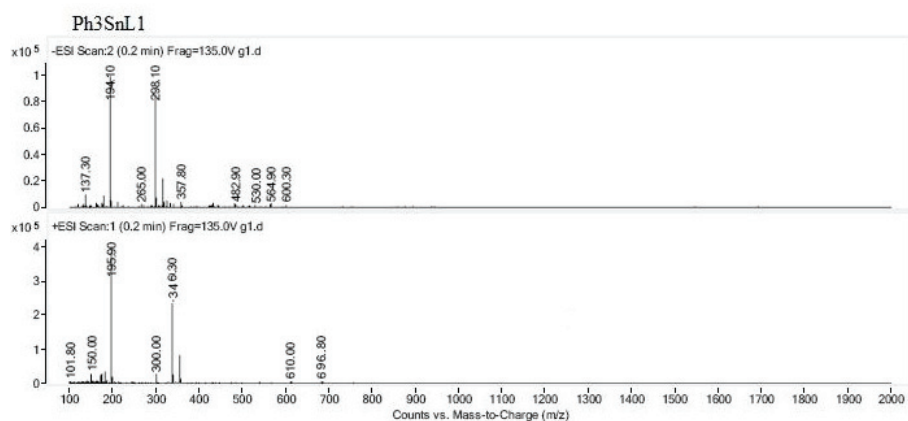


Fig. S-32. Mass spectrum of Ph₂SnLCl₂.

Fig. S-32. Mass spectrum of Ph₂SnCl₃.Fig. S-33. Mass spectrum of Ph₂SnCl₄.Fig. S-34. Mass spectrum of Ph₃SnL₁.

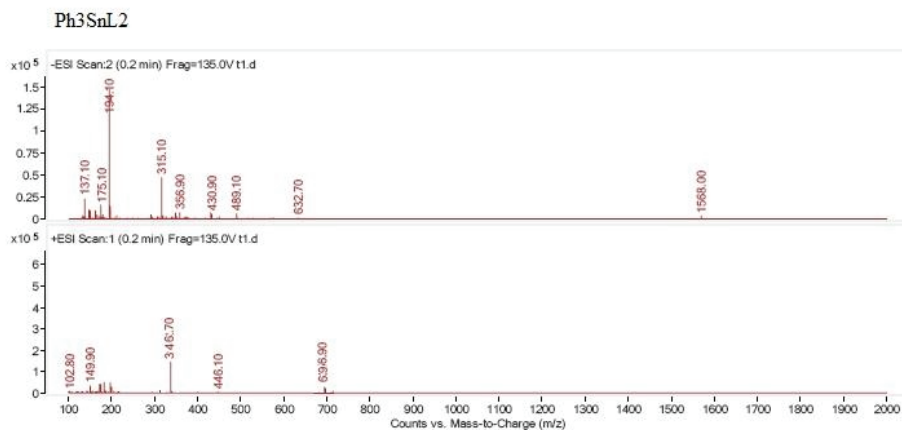


Fig. S-35. Mass spectrum of Ph₃SnL₂.

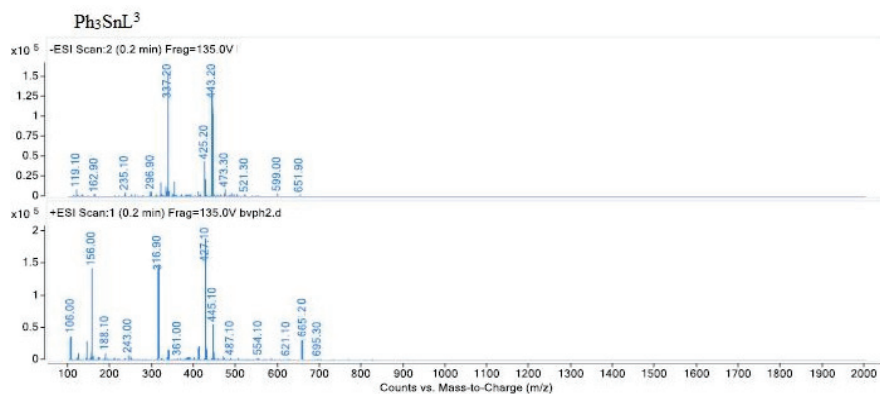


Fig. S-36. Mass spectrum of Ph₃SnL₃.

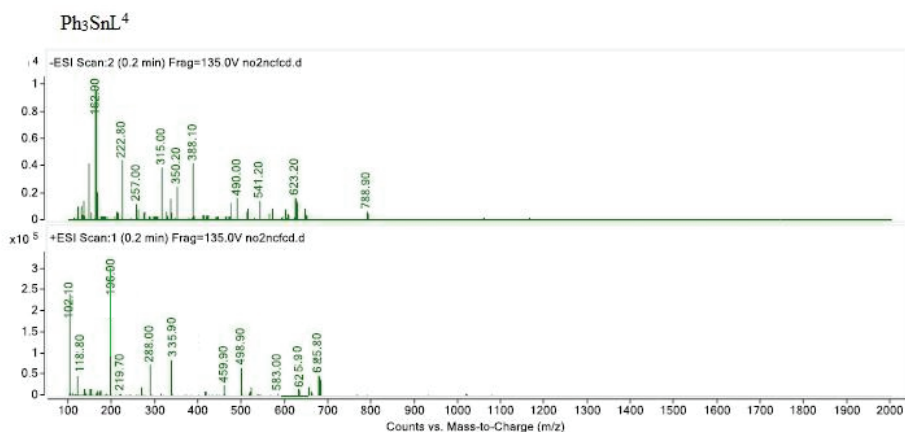


Fig. S-37. Mass spectrum of Ph₃SnL₄.