Electronic Supplementary Information

Tin-Catalyzed Hydrophosphination of Alkenes

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Figure S1: $Cp^*_2SnCl_2$ + Ph_2PH + Vinyl Pyridine, ^{31}P NMR spectrum, final

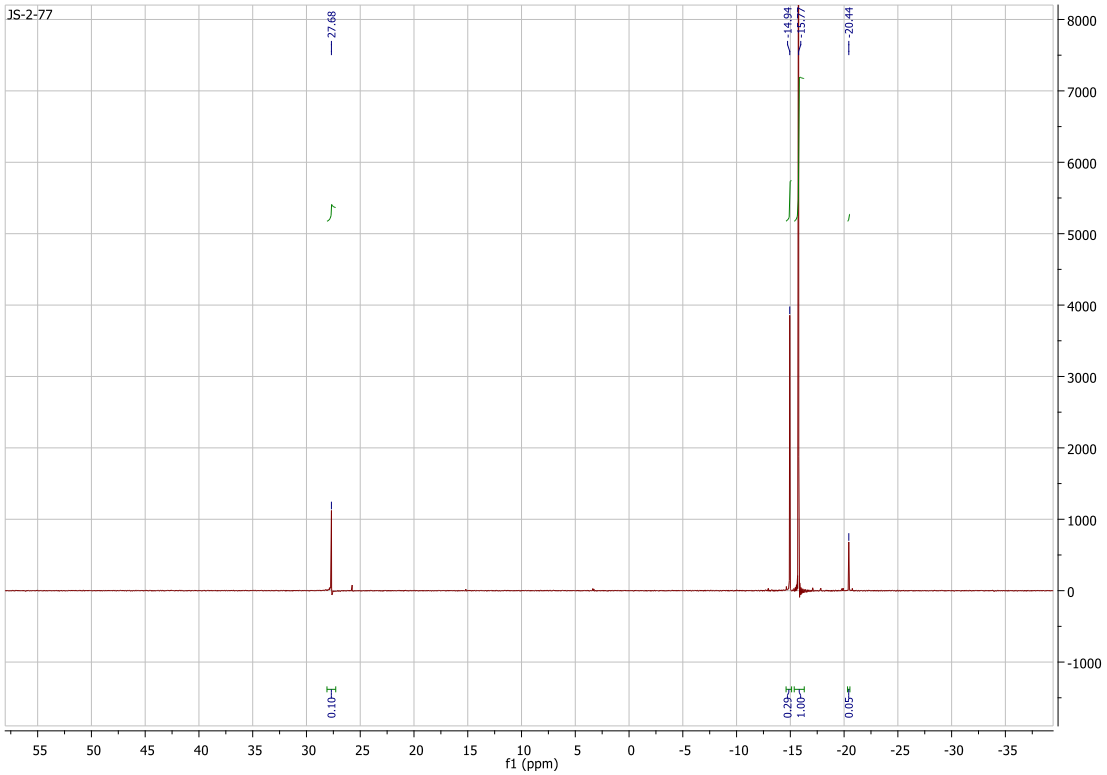

Figure S2: $Cp^*_2SnCl_2$ + Ph_2PH + Vinyl Pyridine, $^{31}P\{^1H\}$ NMR spectrum, final

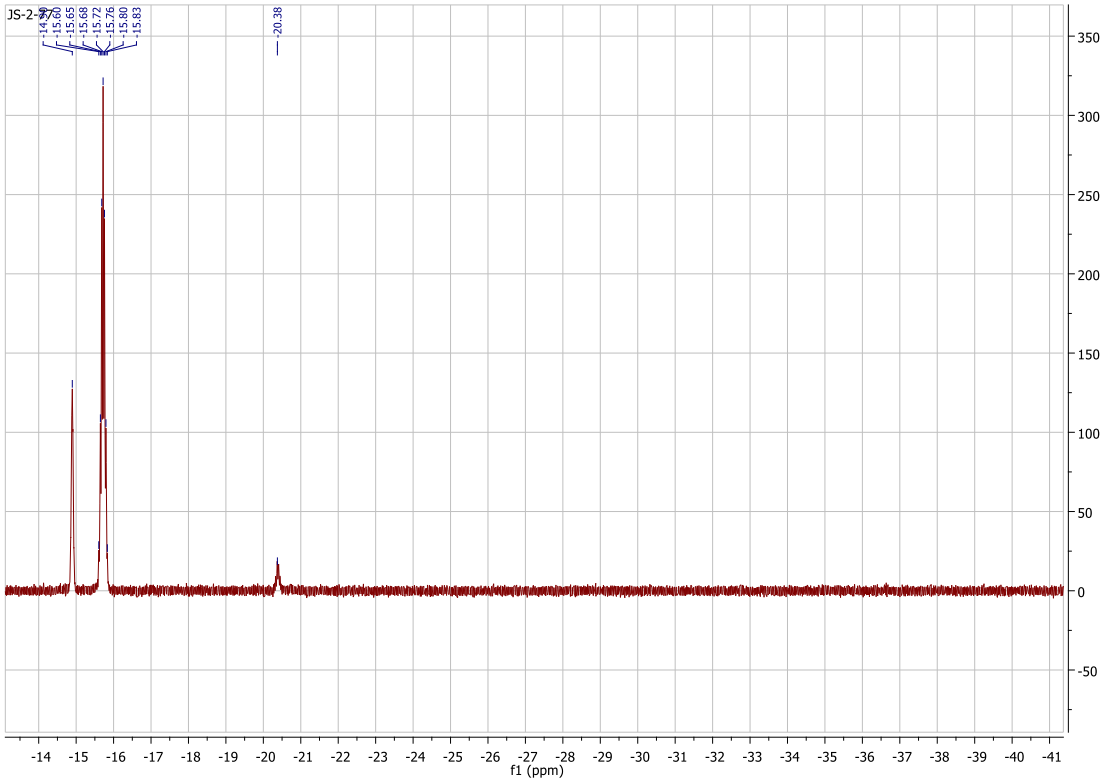

Figure S3: $Cp^*_2SnCl_2$ + Ph_2PH + 2-Vinyl Pyridine, ^1H NMR spectrum, final

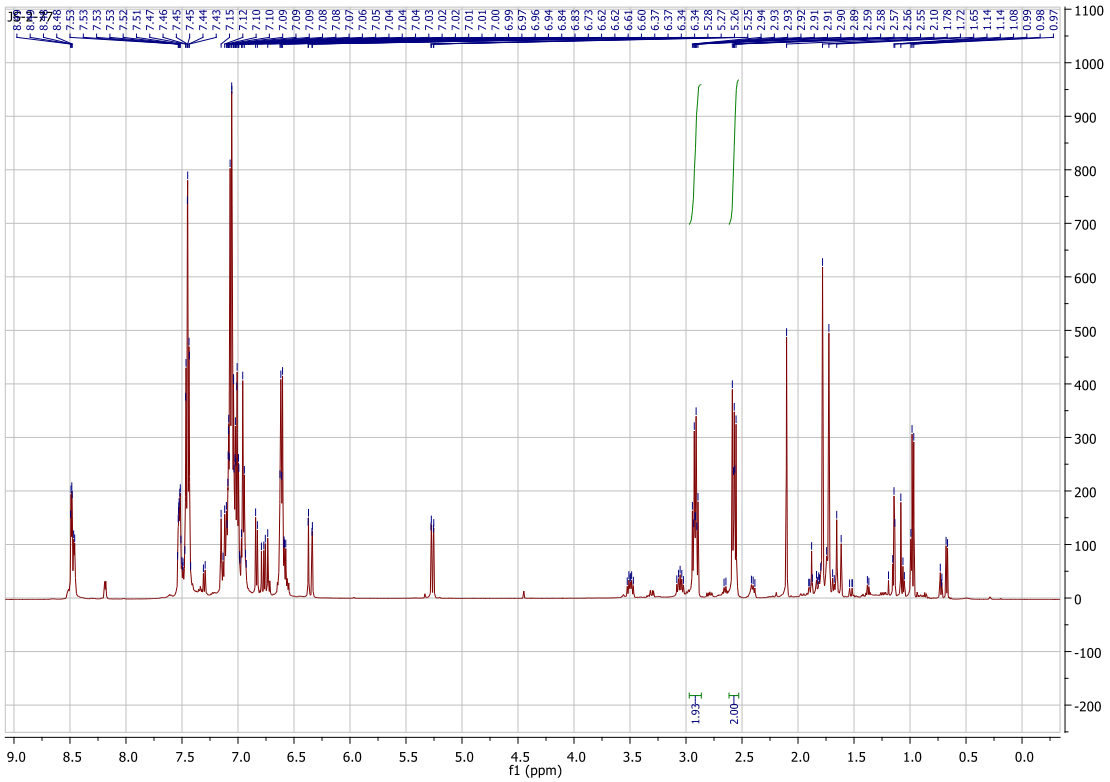

Figure S4: $Cp^*_2SnCl_2$ + Ph_2PH + acrylonitrile, ^{31}P NMR spectrum, final

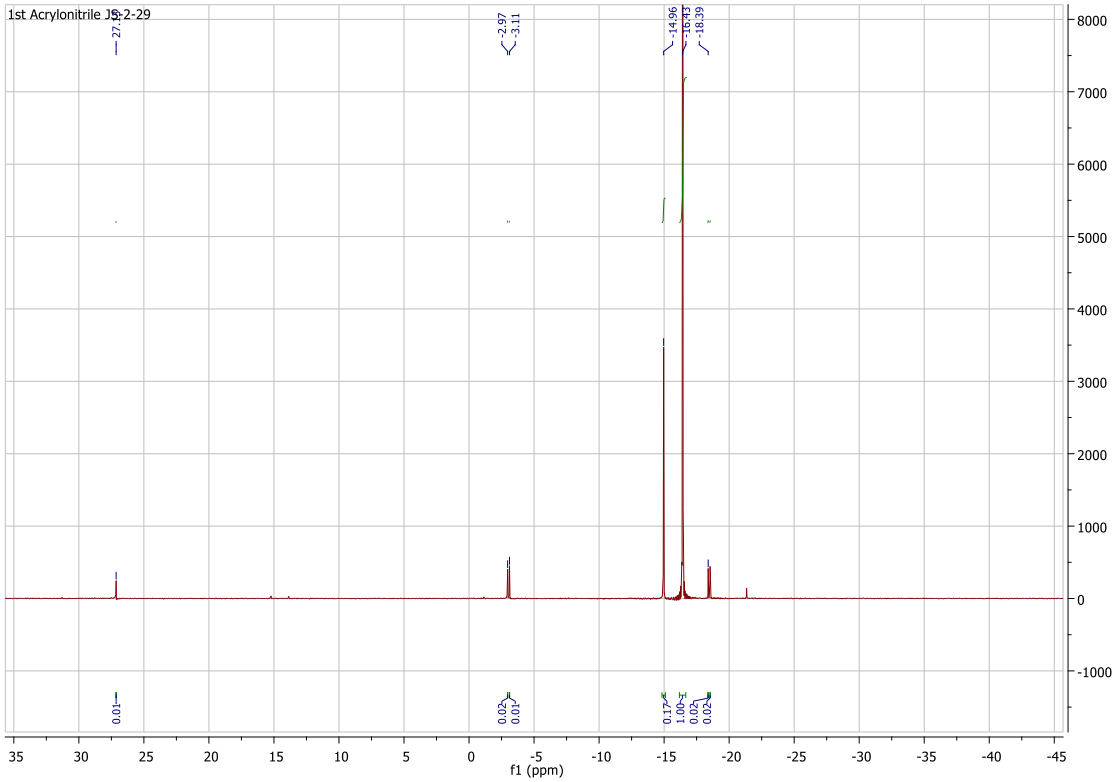

Figure S5: Cp*2SnCl2 + Ph2PH + acrylonitrile, ^{1}H NMR spectrum, final

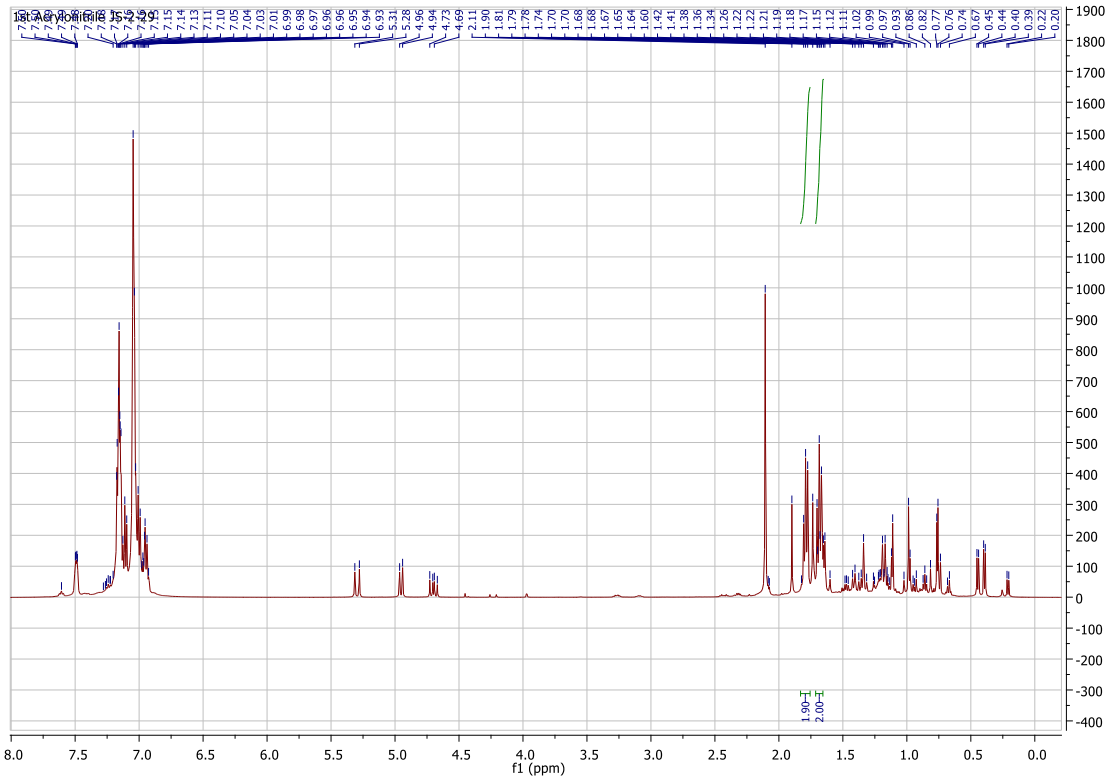

Figure S6: Cp*$_2$SnCl$_2$ + Ph$_2$PH + 4-bromo styrene, ^{31}P NMR spectrum, final

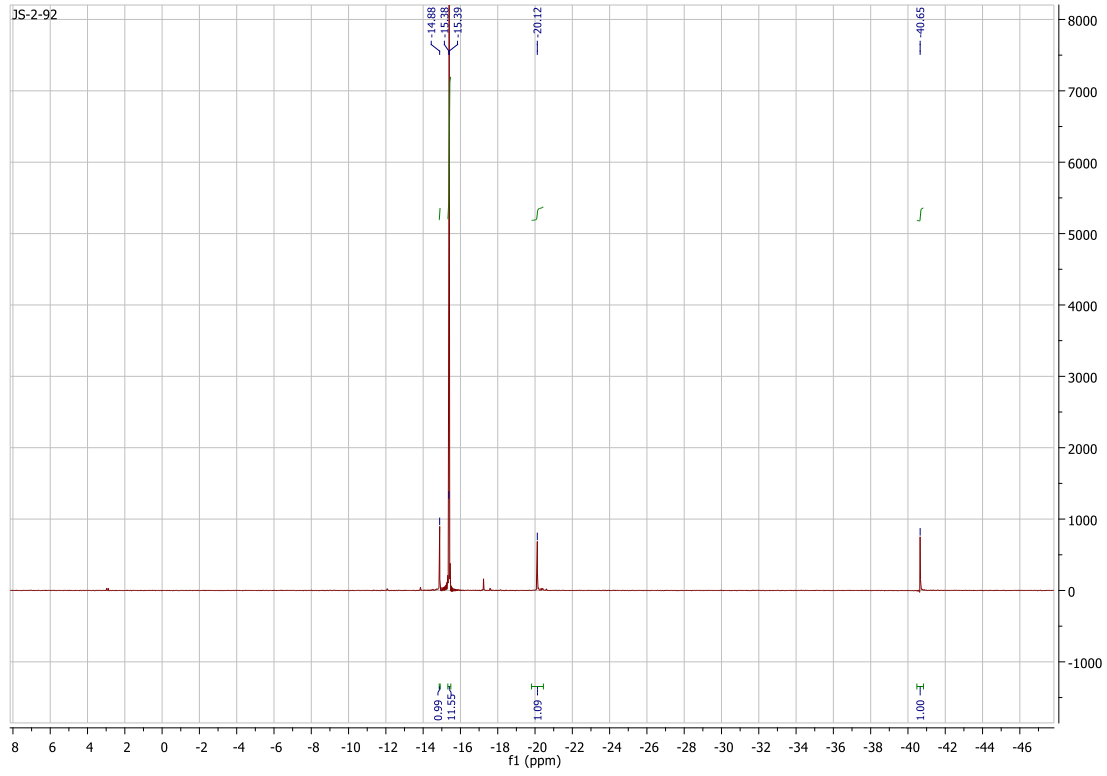

Figure S7: $Cp^*_2SnCl_2$ + Ph_2PH + 4-bromo styrene, $^{31}P\{^1H\}$ NMR spectrum, final

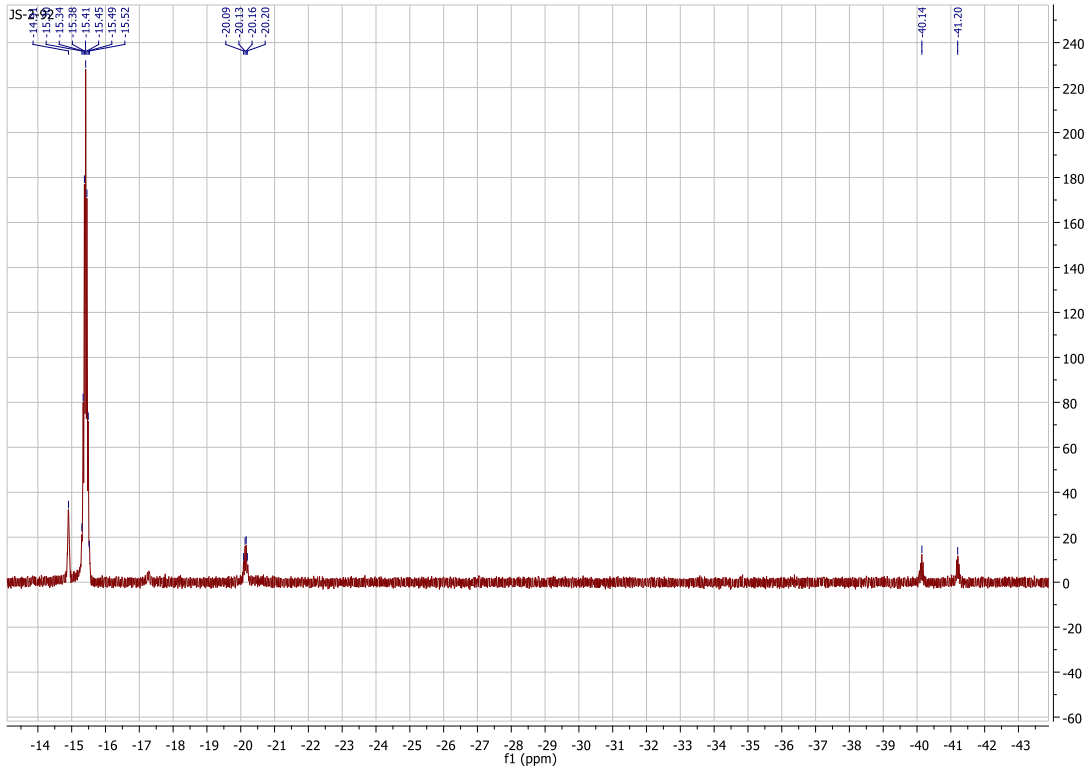

Figure S8: $Cp^*_2Sn\ Cl_2$ + Ph_2PH + 4-bromo styrene, ^1H NMR spectrum, final

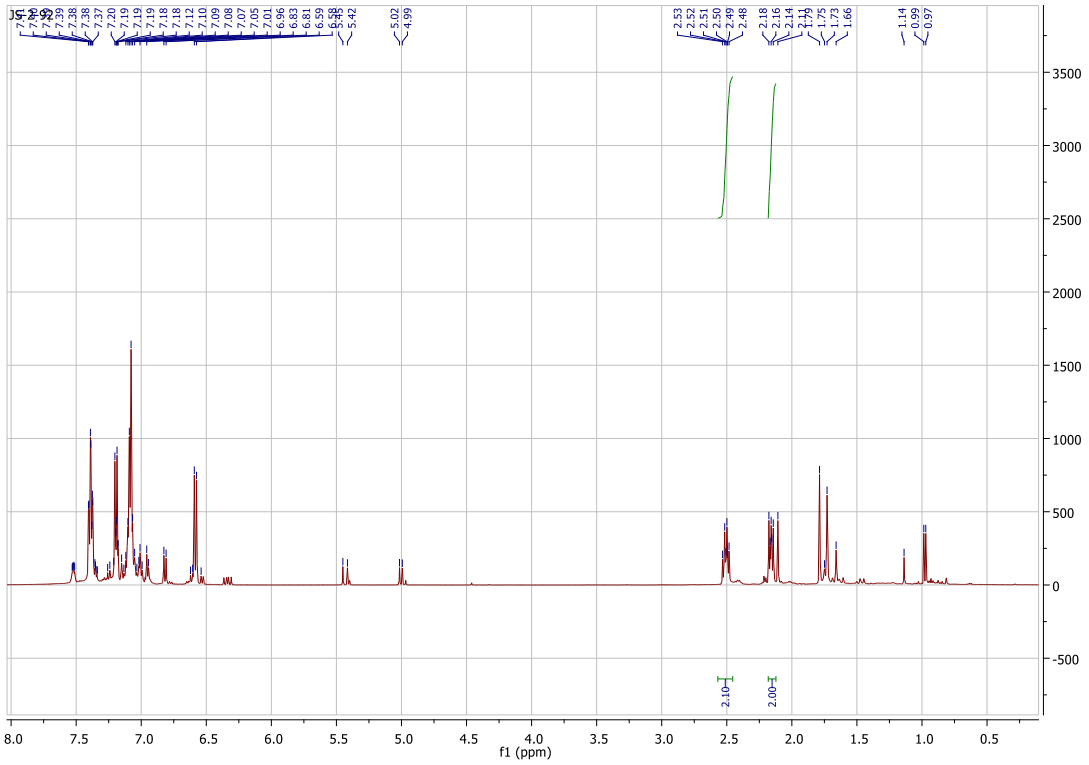

Figure S9: $Cp^*_2SnCl_2$ + Ph_2PH + ethyl acrylate, ^{31}P NMR spectrum, final

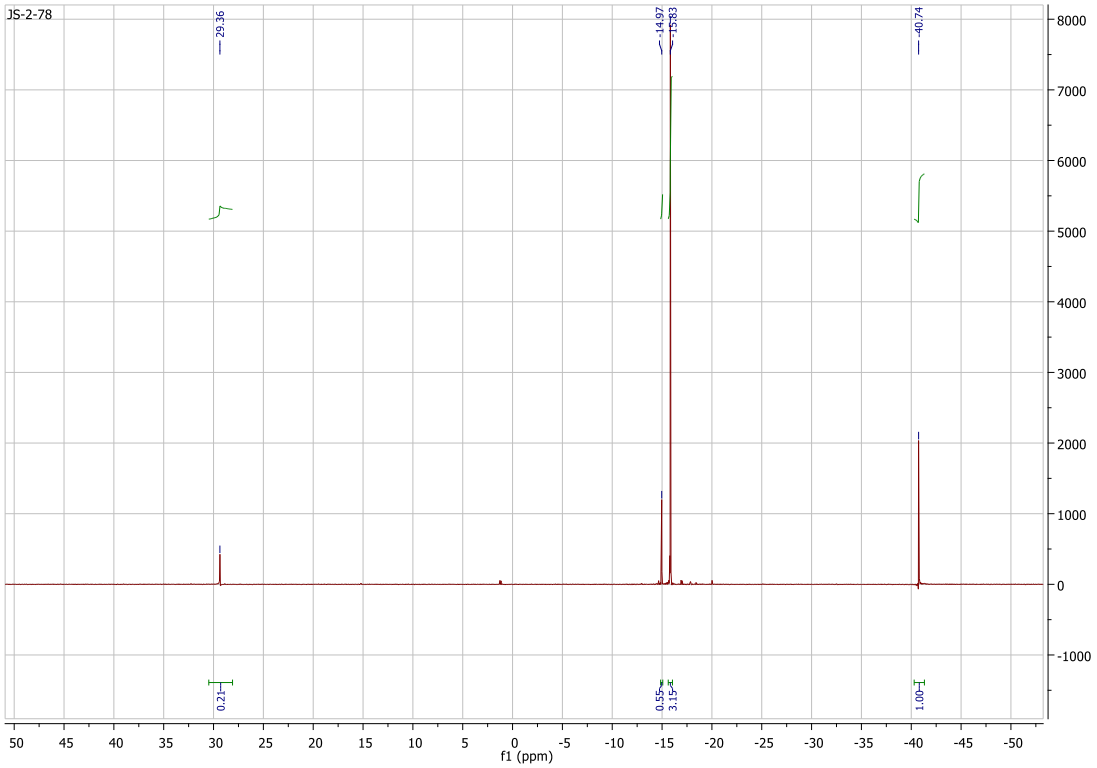

Figure S10: $Cp^*_2SnCl_2$ + Ph_2PH + ethyl acrylate, $^{31}P\{^1H\}$ NMR spectrum, final

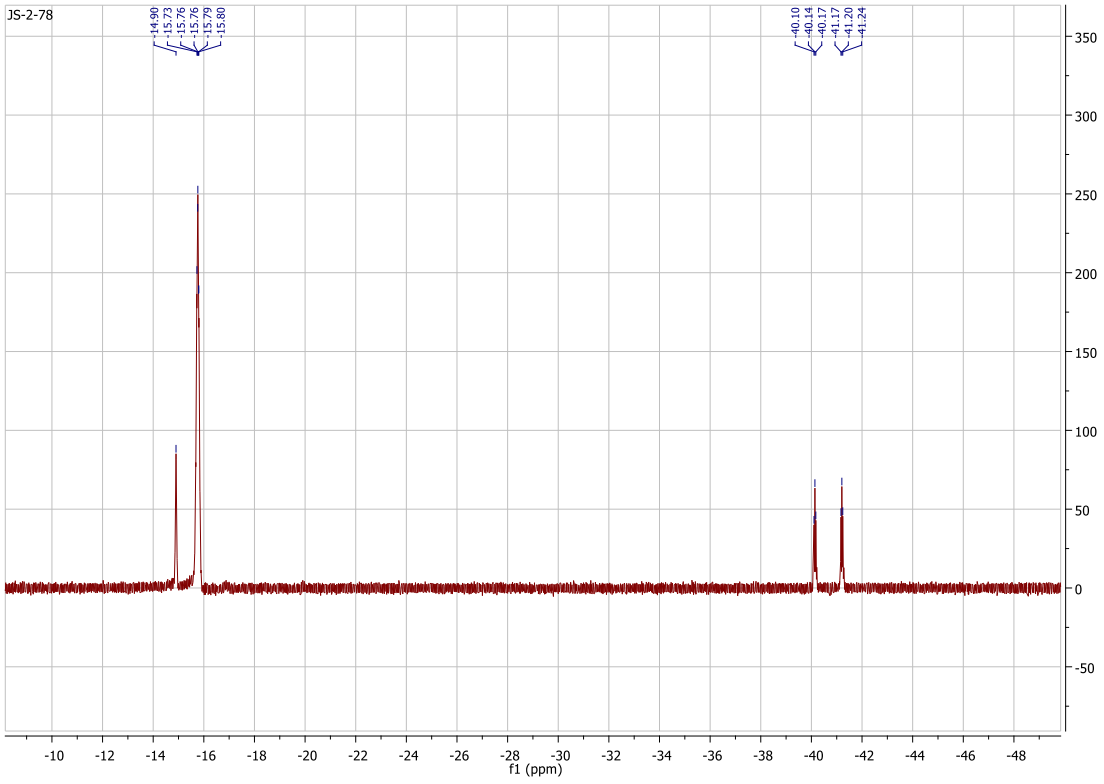

Figure S11: $Cp^*_2Sn\ Cl_2$ + Ph_2PH + ethyl acylate, ^1H NMR spectrum, final

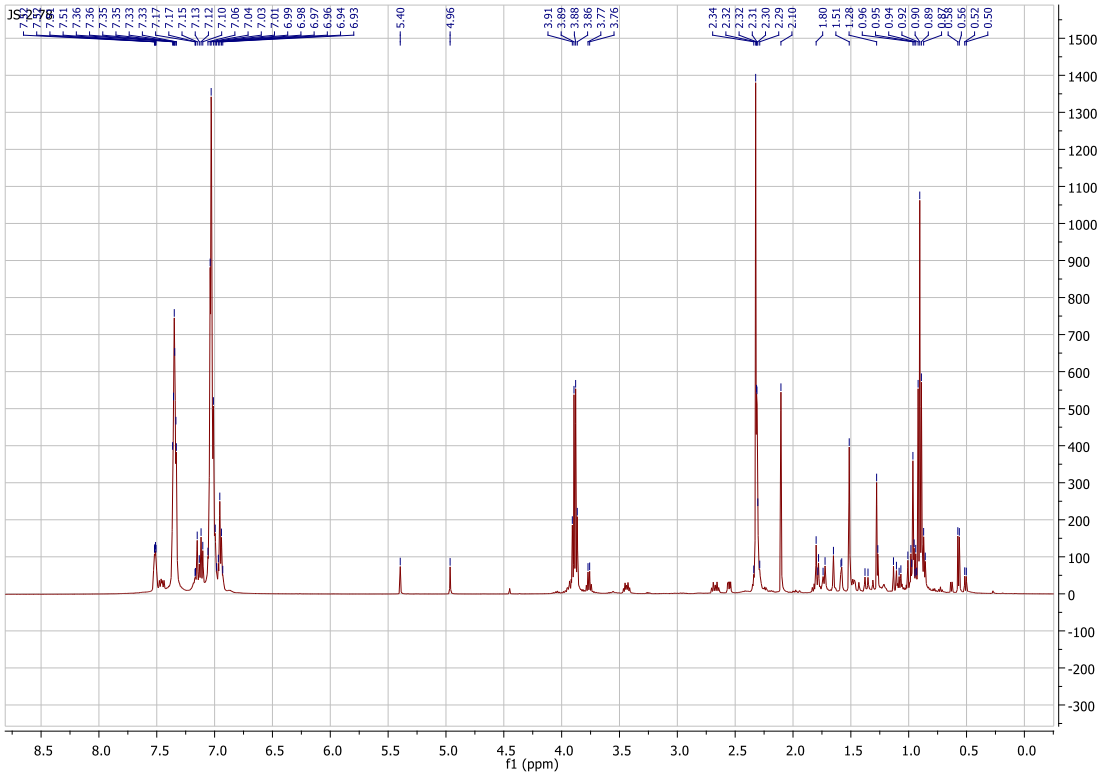

Figure S12: $Cp^*_2SnCl_2$ + Ph_2PH + 4-trifluromethyl styrene, ^{31}P NMR spectrum, final

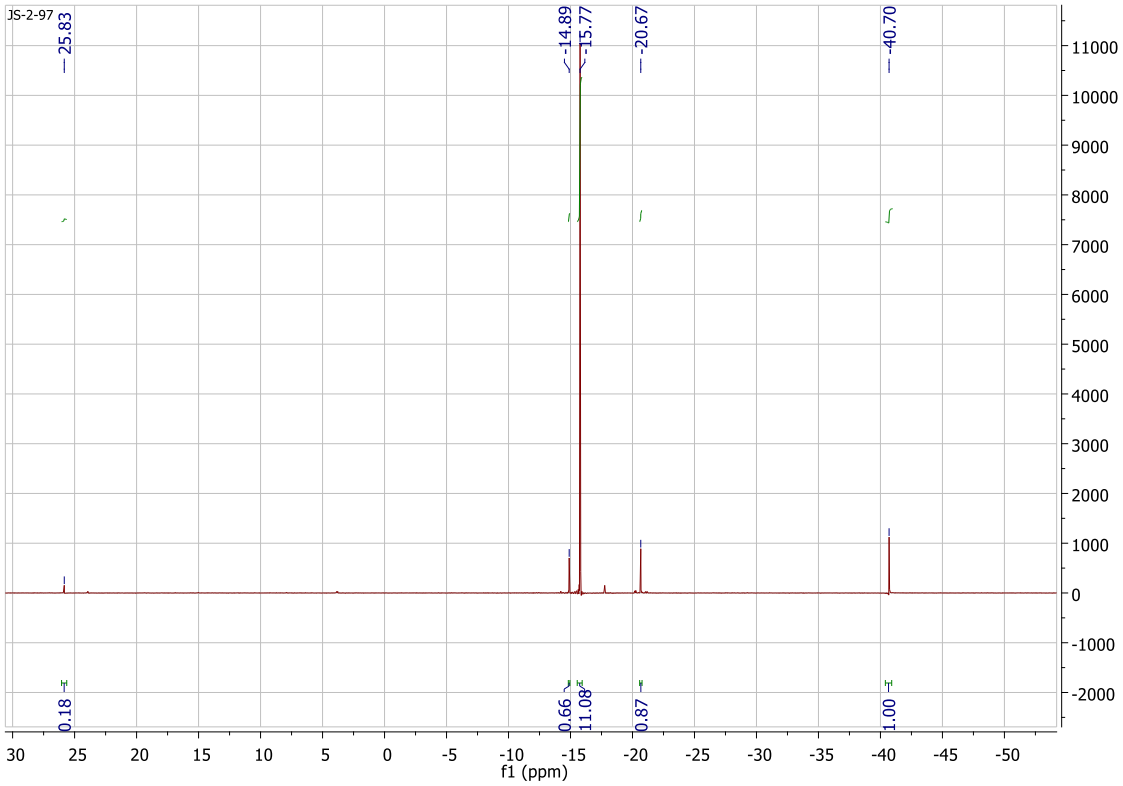

Figure S13: $Cp^*_2SnCl_2$ + Ph_2PH + 4-trifluromethyl styrene, $^{31}P\{^1H\}$ NMR spectrum, final

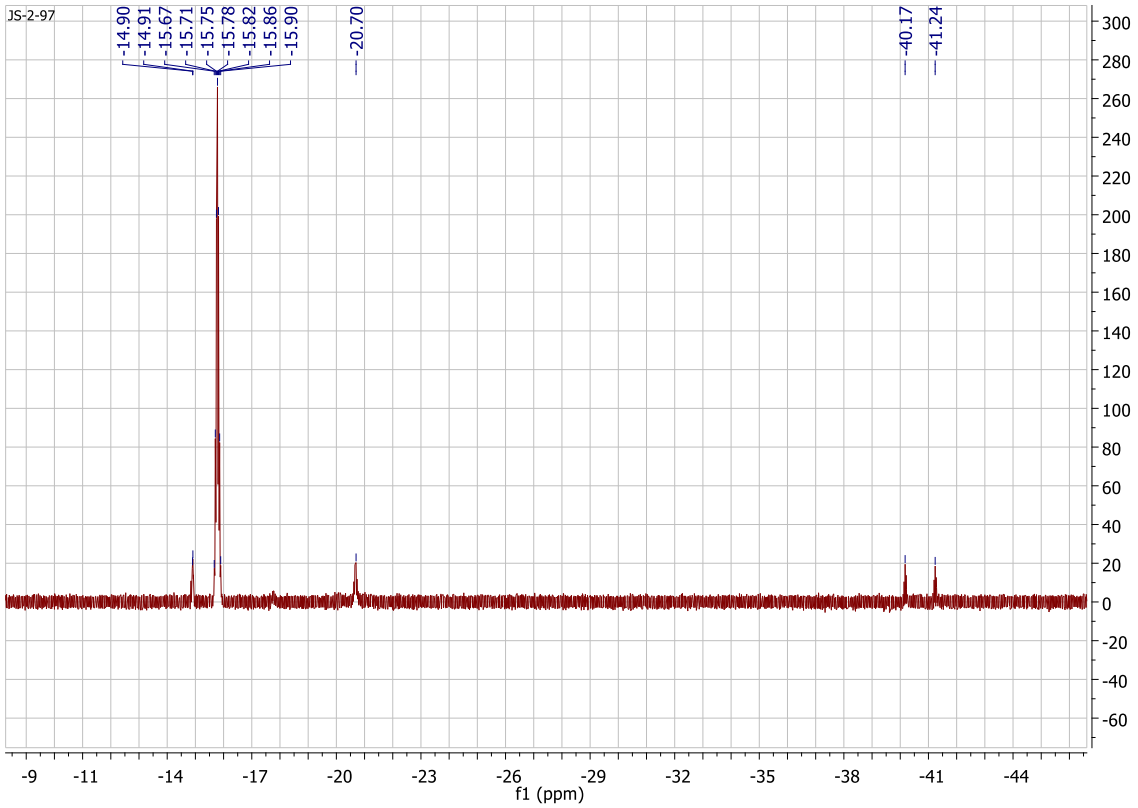

Figure S14: $Cp^*_2Sn\ Cl_2$ + Ph_2PH + 4-trifluromethyl styrene, ^1H NMR spectrum, final

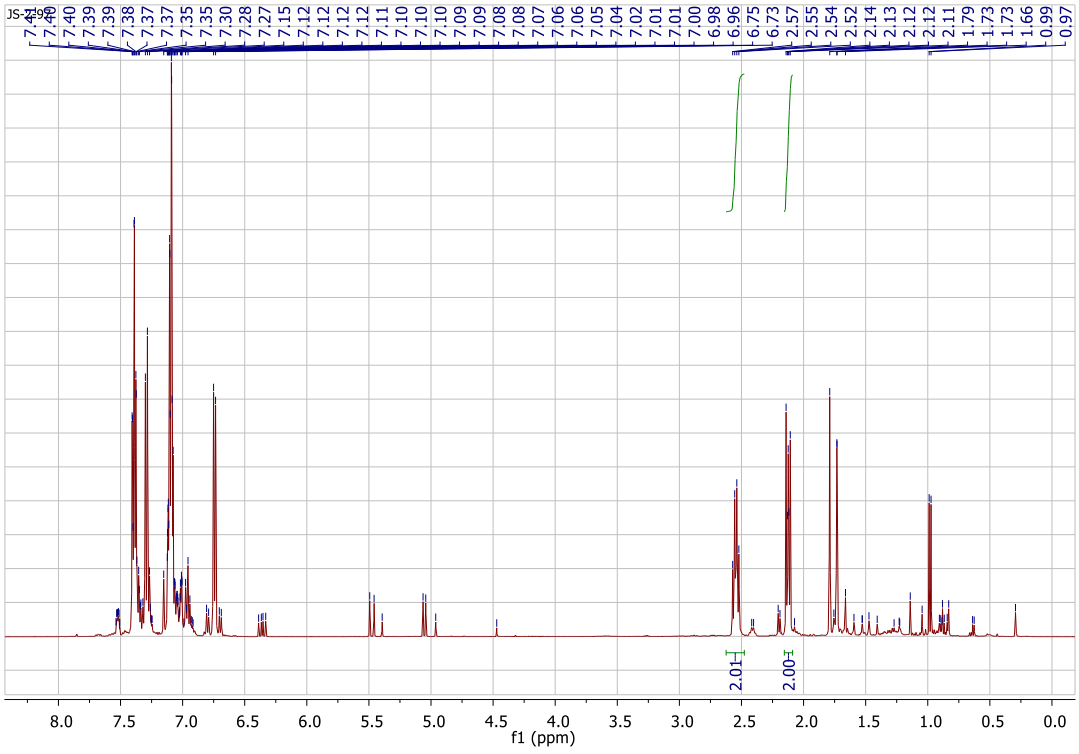

Figure S15: $Cp^*_2SnCl_2$ + Ph_2PH + 4-methyl styrene, ^{31}P NMR spectrum, final

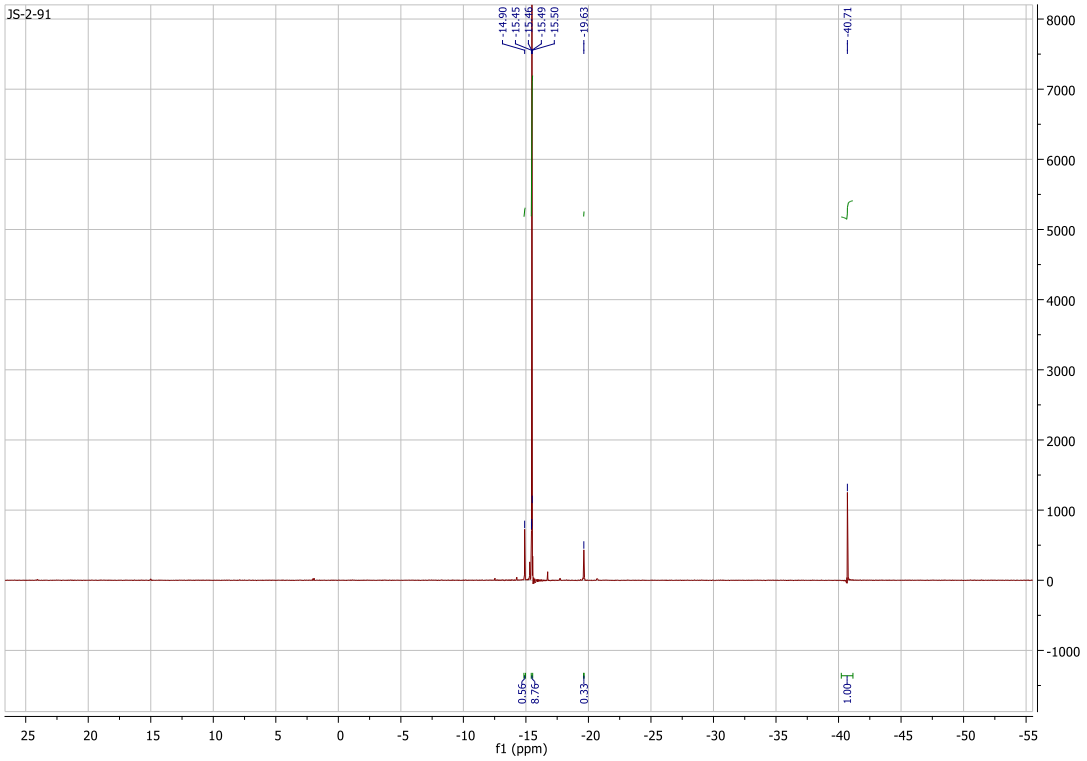

Figure S16: $Cp^*_2SnCl_2$ + Ph_2PH + 4-methyl styrene, $^{31}P\{^1H\}$ NMR spectrum, final

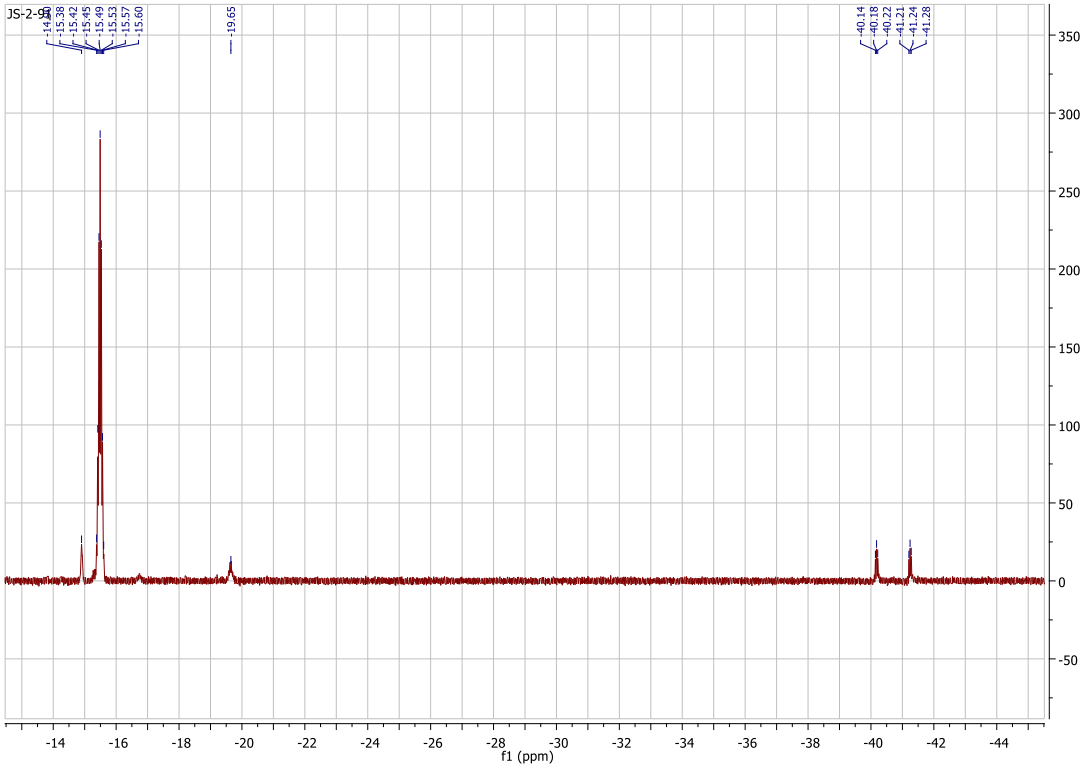

Figure S17: $Cp^*_2Sn\ Cl_2$ + Ph_2PH + 4-methyl styrene, ^1H NMR spectrum, final

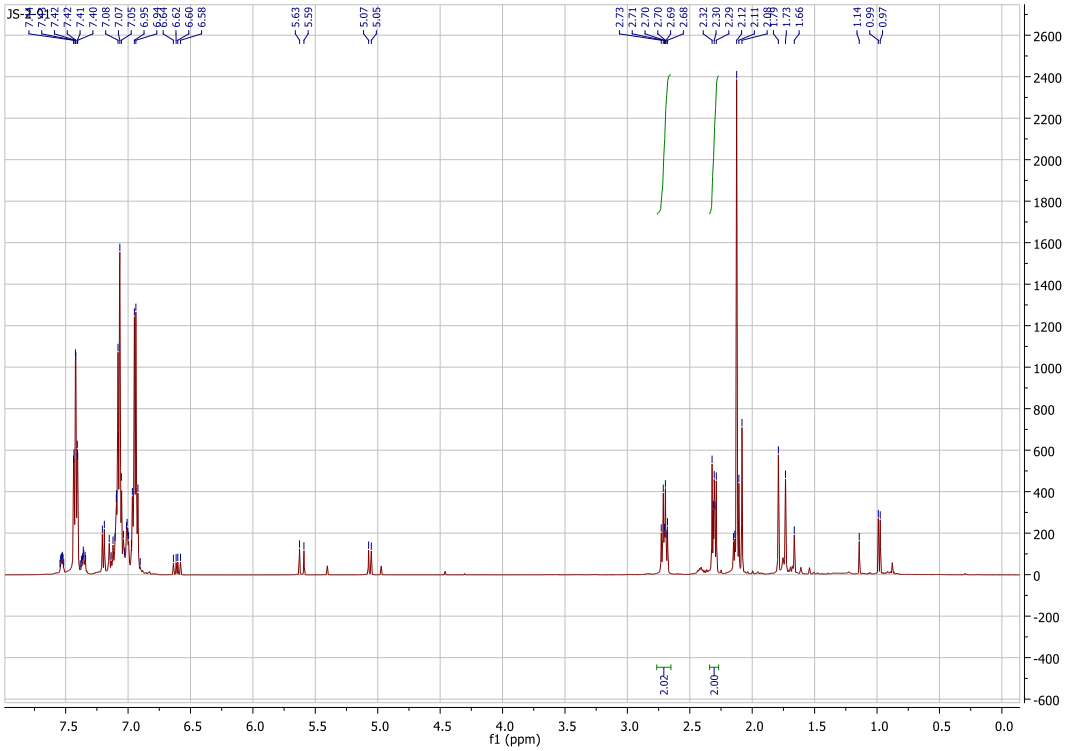

Figure S18: $Cp^*_2SnCl_2$ + Ph_2PH + phenyl acetylene, ^{31}P NMR spectrum, final

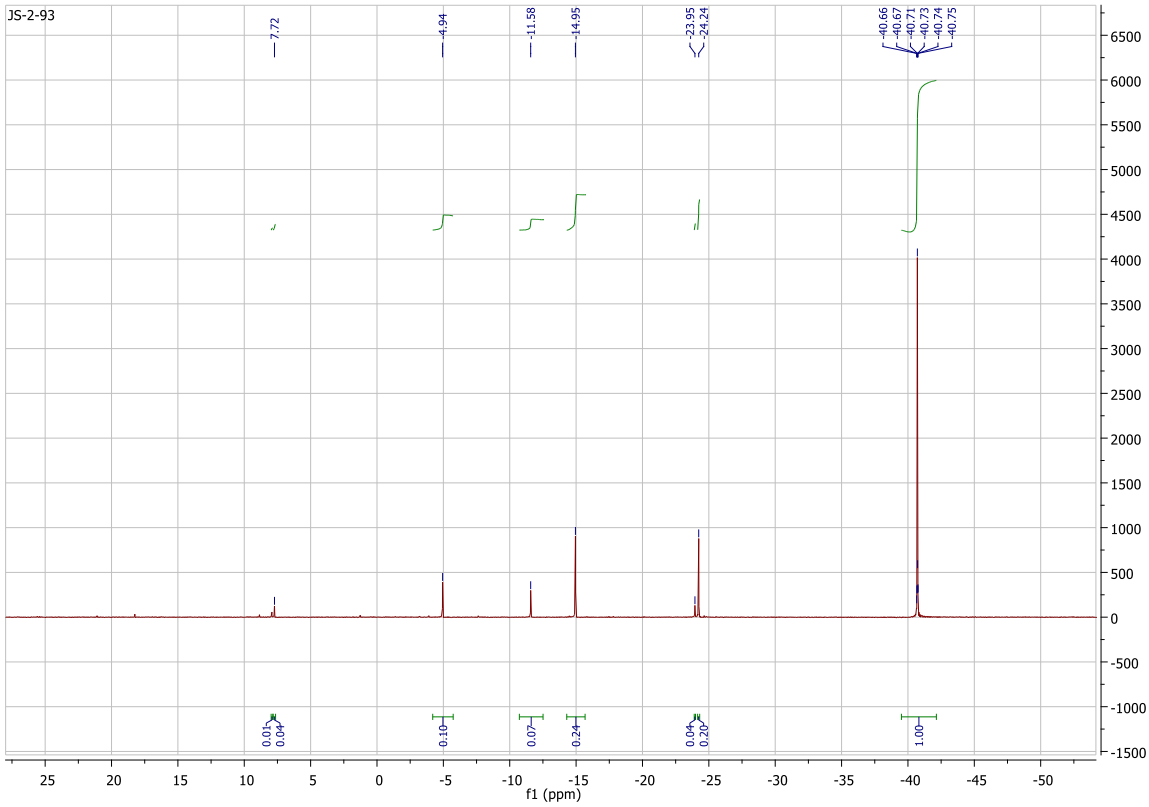

Figure S19: $Cp^*_2SnCl_2$ + Ph_2PH + phenyl acetylene, $^{31}P\{^1H\}$ NMR spectrum, final

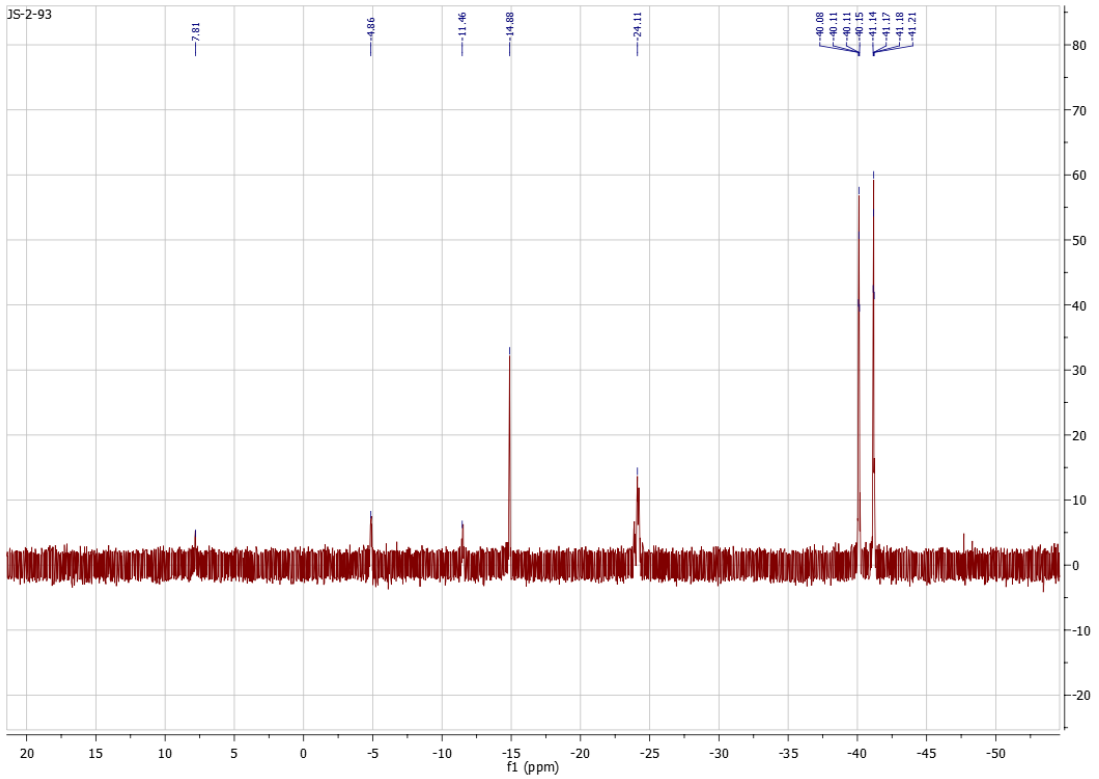

Figure S20: $Cp^*_2Sn\ Cl_2$ + Ph_2PH + phenyl acetylene, ^1H NMR spectrum, final

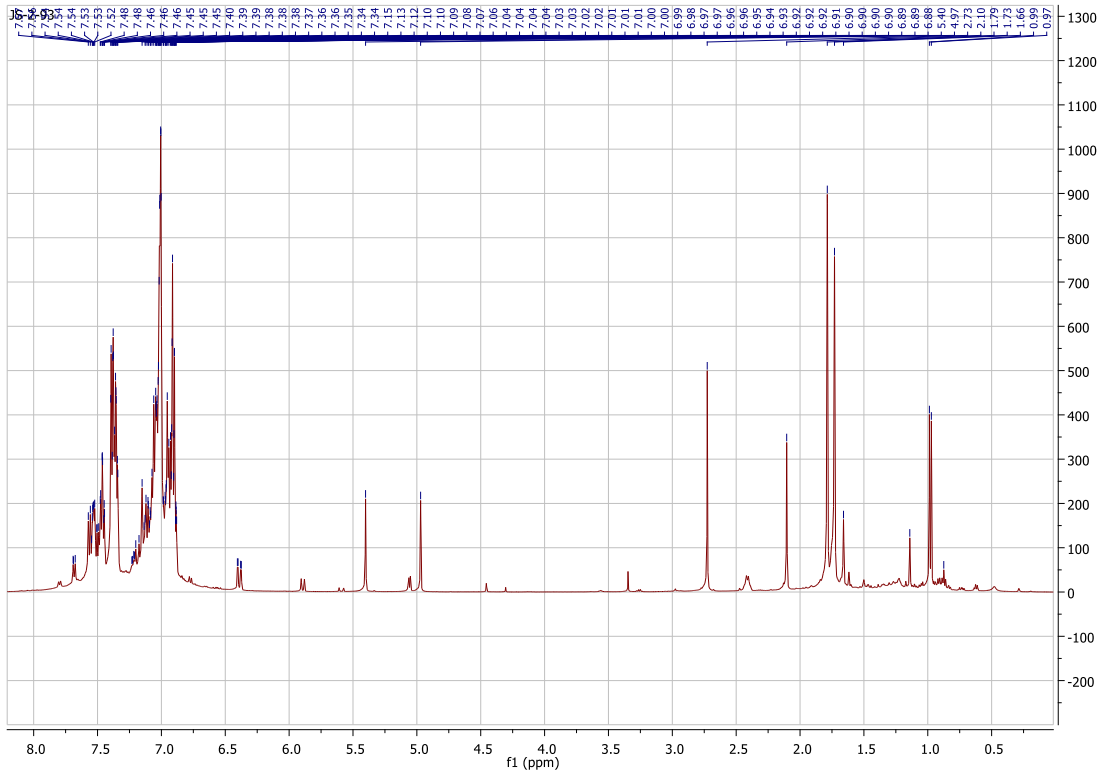

Figure S21: $Cp^*_2SnCl_2$ + Ph_2PH + styrene, ^{31}P NMR spectrum, final

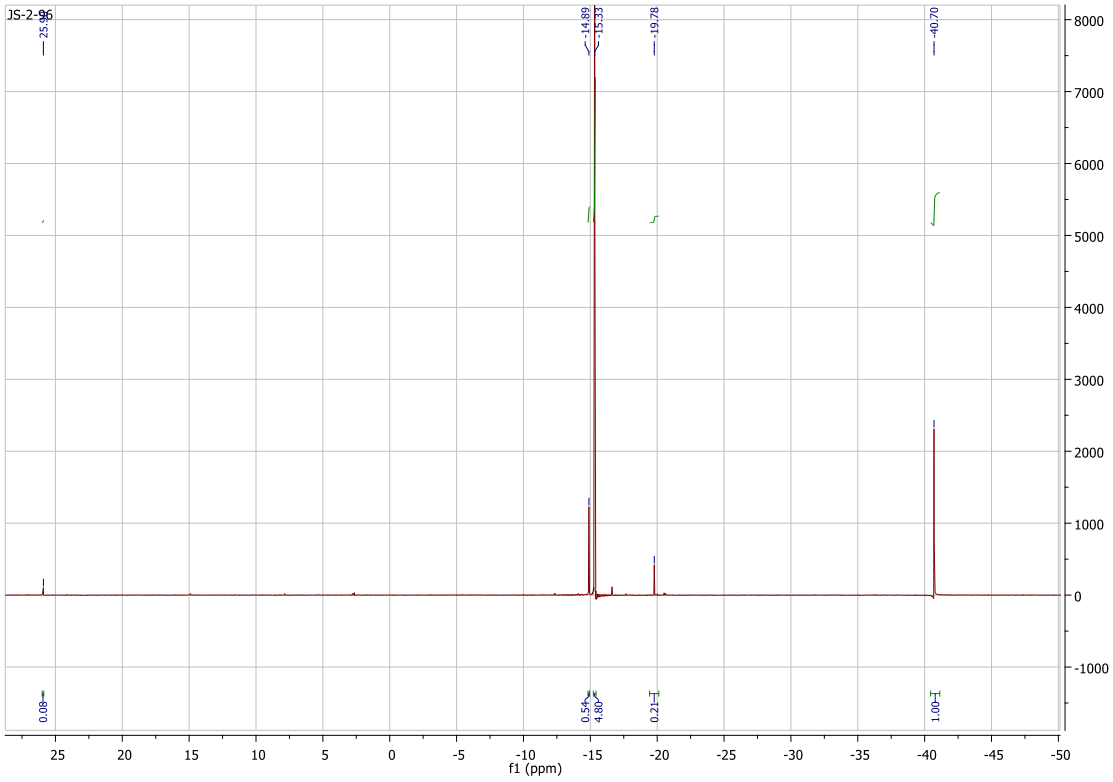

Figure S22: $Cp^*_2SnCl_2$ + Ph_2PH + styrene, $^{31}P\{^1H\}$ NMR spectrum, final

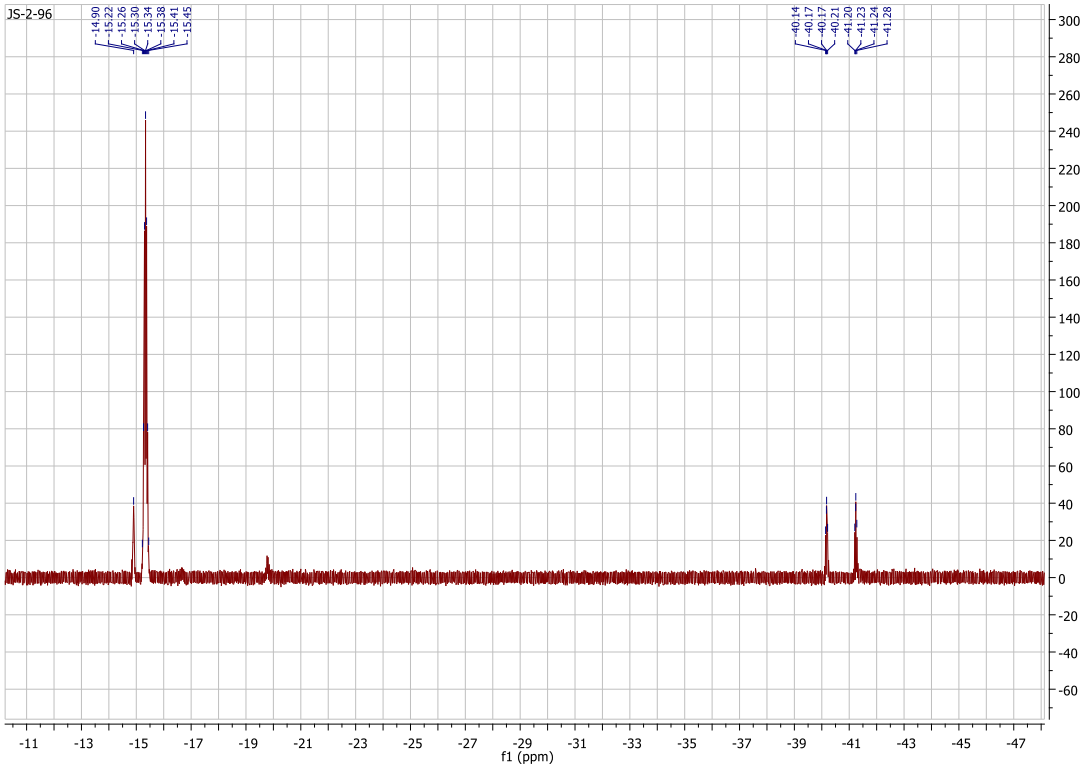

Figure S23: $Cp^*_2Sn\ Cl_2$ + Ph_2PH + styrene, ^1H NMR spectrum, final

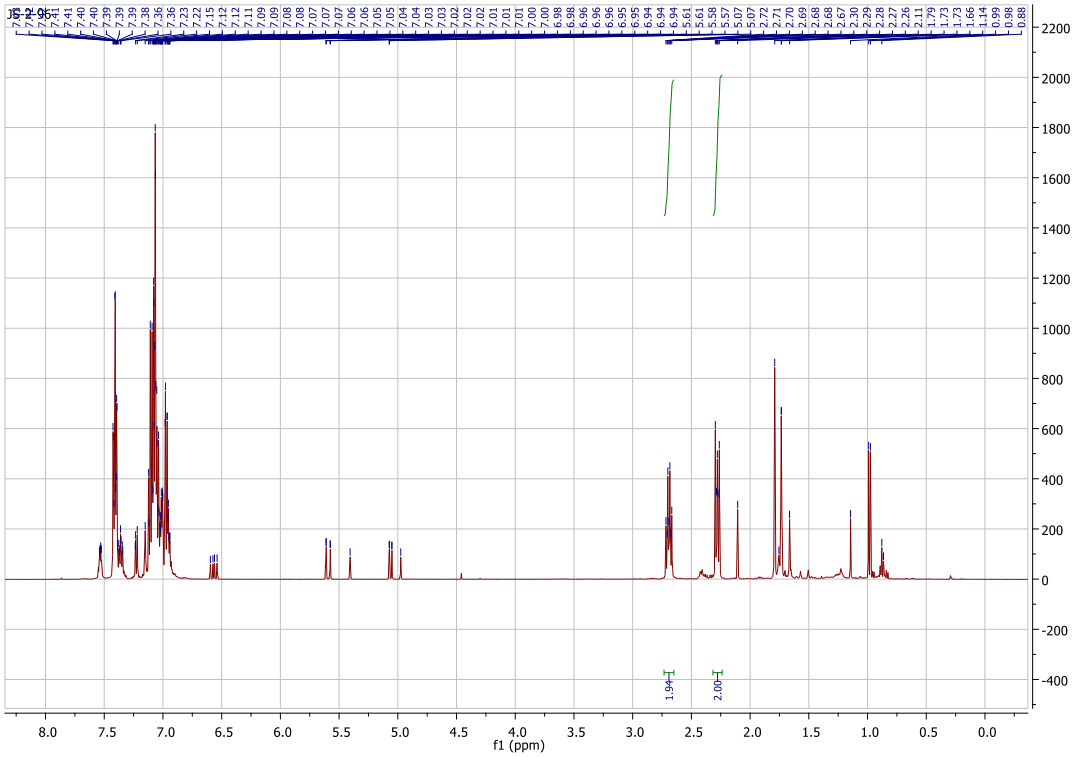

Figure S24: $Cp^*_2SnCl_2$ + Ph_2PH + vinyl ethyl ether, ^{31}P NMR spectrum, final

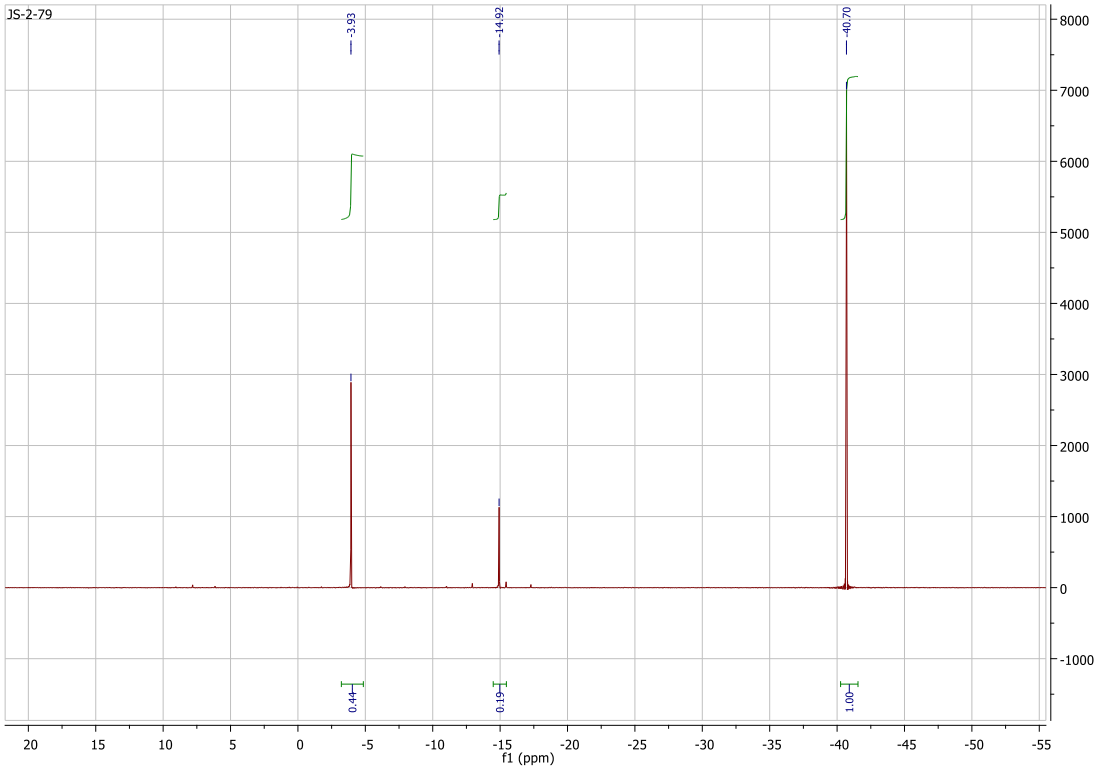

Figure S25: $Cp^*_2SnCl_2$ + Ph_2PH + vinyl ethyl ether, $^{31}P\{^1H\}$ NMR spectrum, final

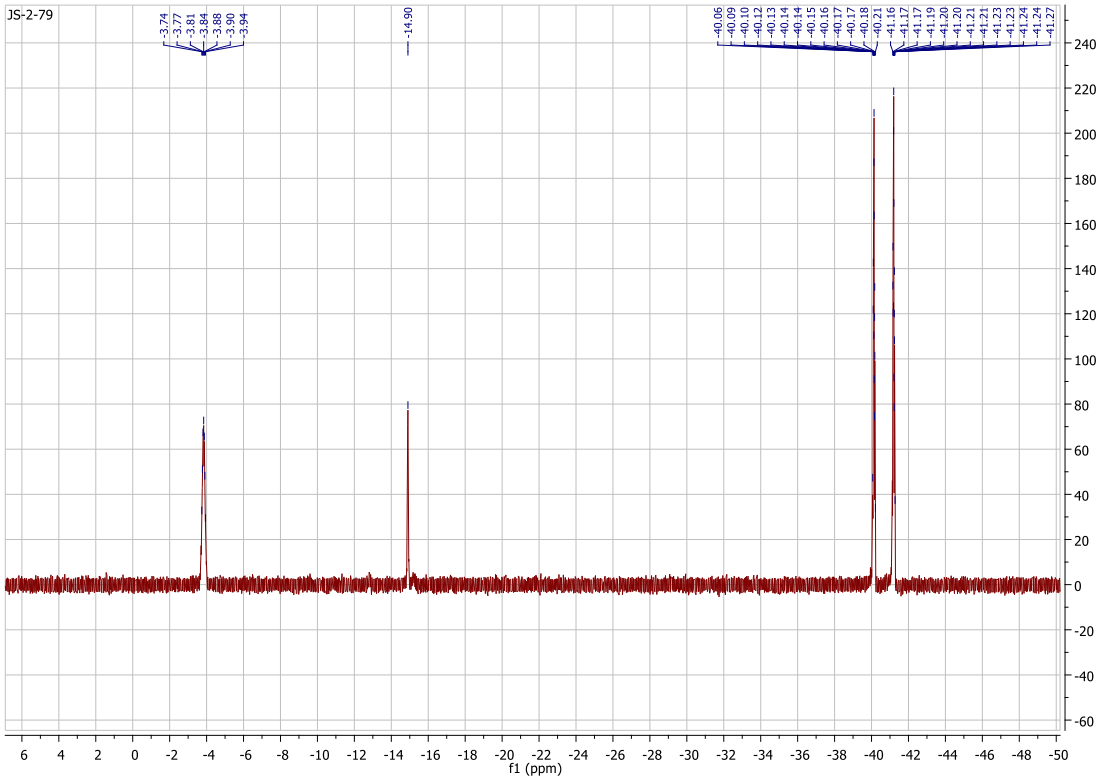

Figure S26: $Cp^*_2Sn\ Cl_2$ + Ph_2PH + vinyl ethyl ether, ^1H NMR spectrum, final

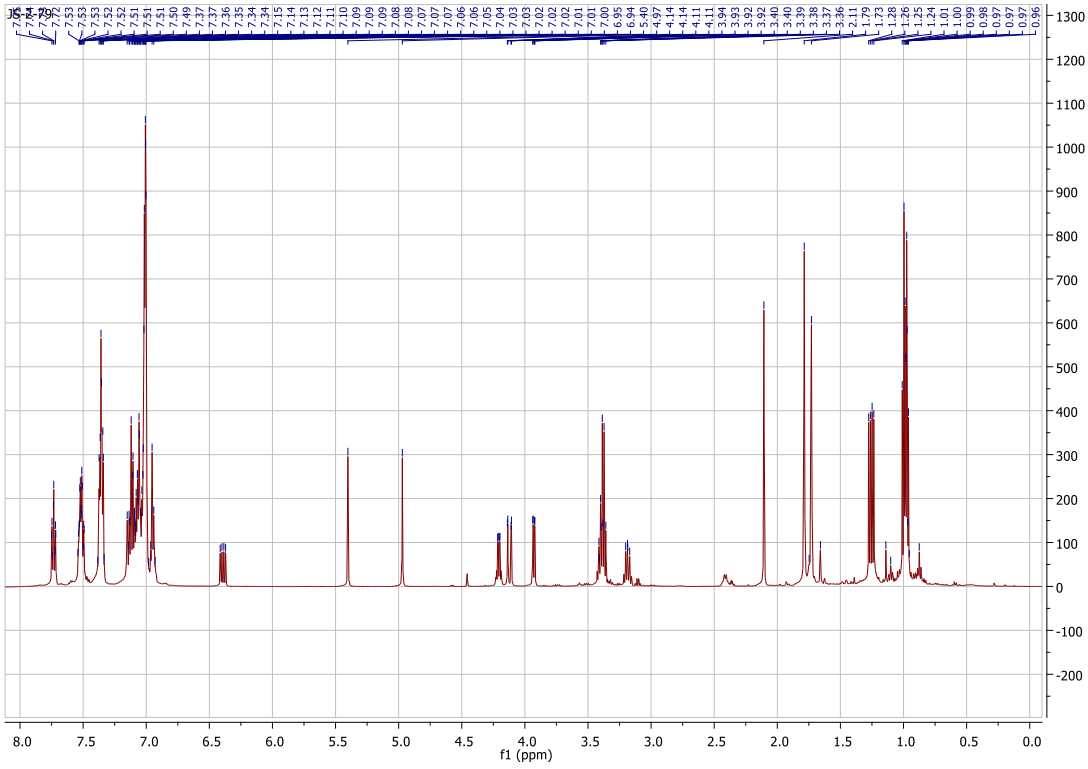

Figure S27: $Cp^*_2SnCl_2$ + Ph_2PH + styrene, ^{31}P NMR spectrum, final

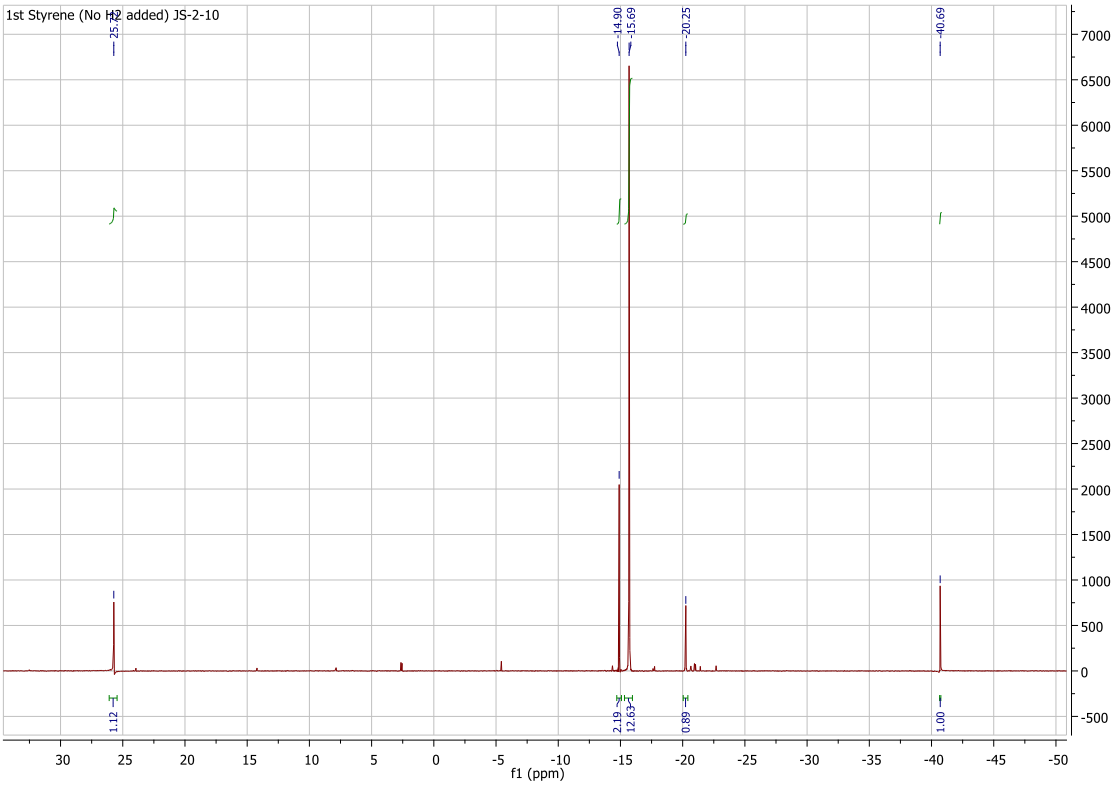

Figure S28: $Cp^*_2Sn\ Cl_2$ + Ph_2PH + styrene, ^{1}H NMR spectrum, final

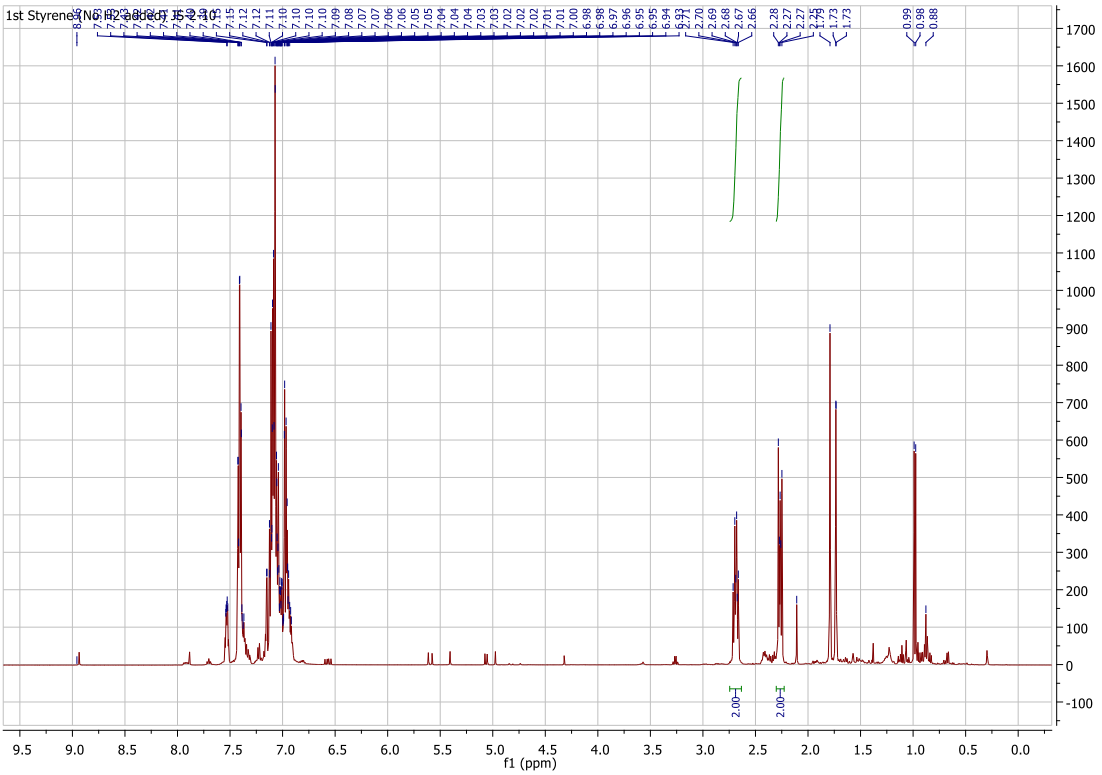

Figure S29: Ph_2SnCl_2 + Ph_2PH + acrylonitrile, ^{31}P NMR spectrum, final

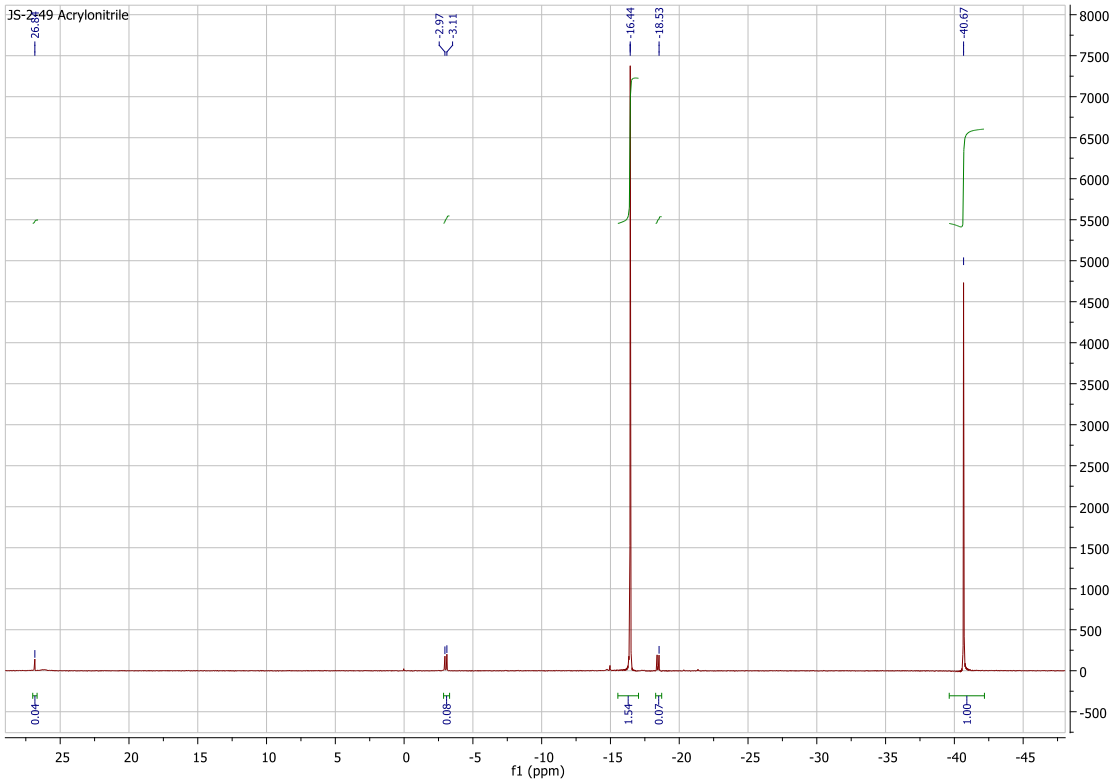

Figure S30: $Ph_2Sn\ Cl_2$ + Ph_2PH + acrylonitrile, ^{1}H NMR spectrum, final

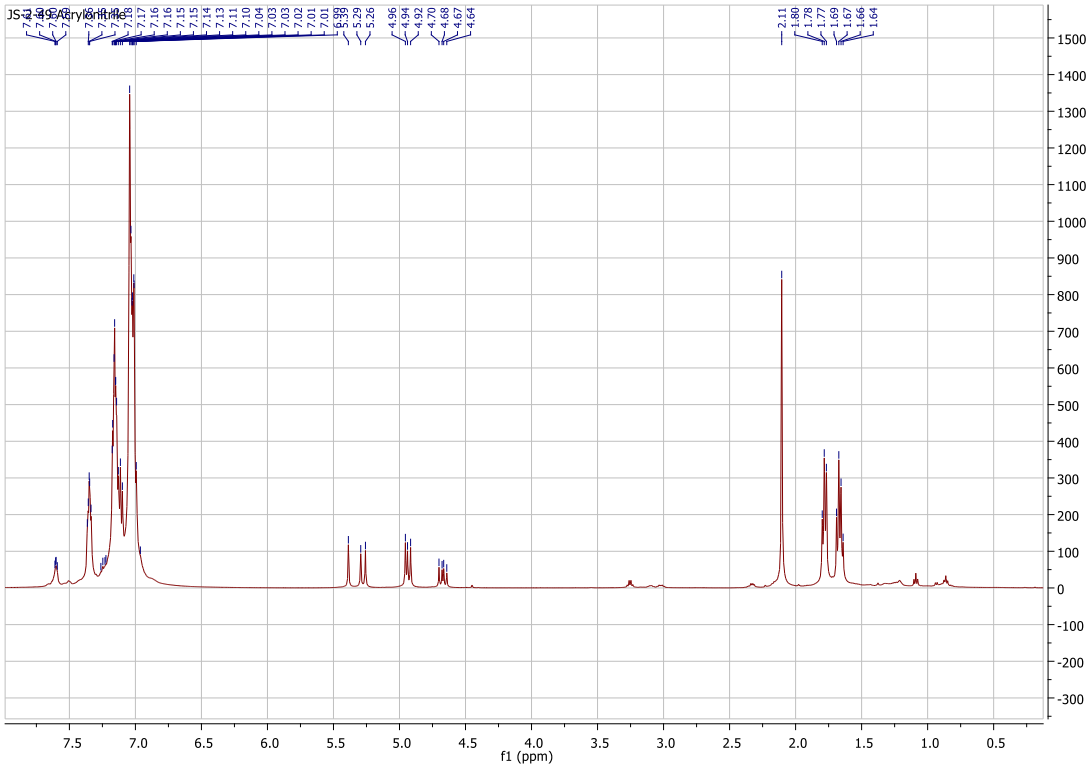

Figure S31: Ph_2SnCl_2 + Ph_2PH + ethyl acrylate, ^{31}P NMR spectrum, final

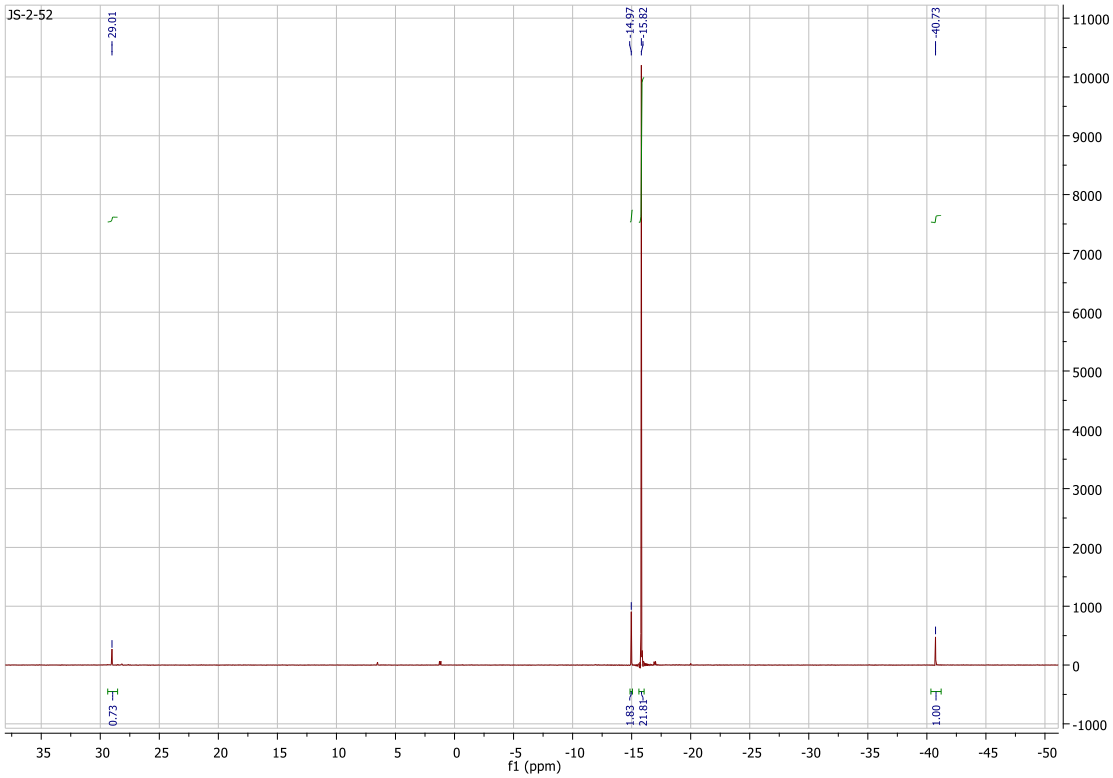

Figure S32: $Ph_2Sn\ Cl_2$ + Ph_2PH + ethyl acrylate, ^{1}H NMR spectrum, final

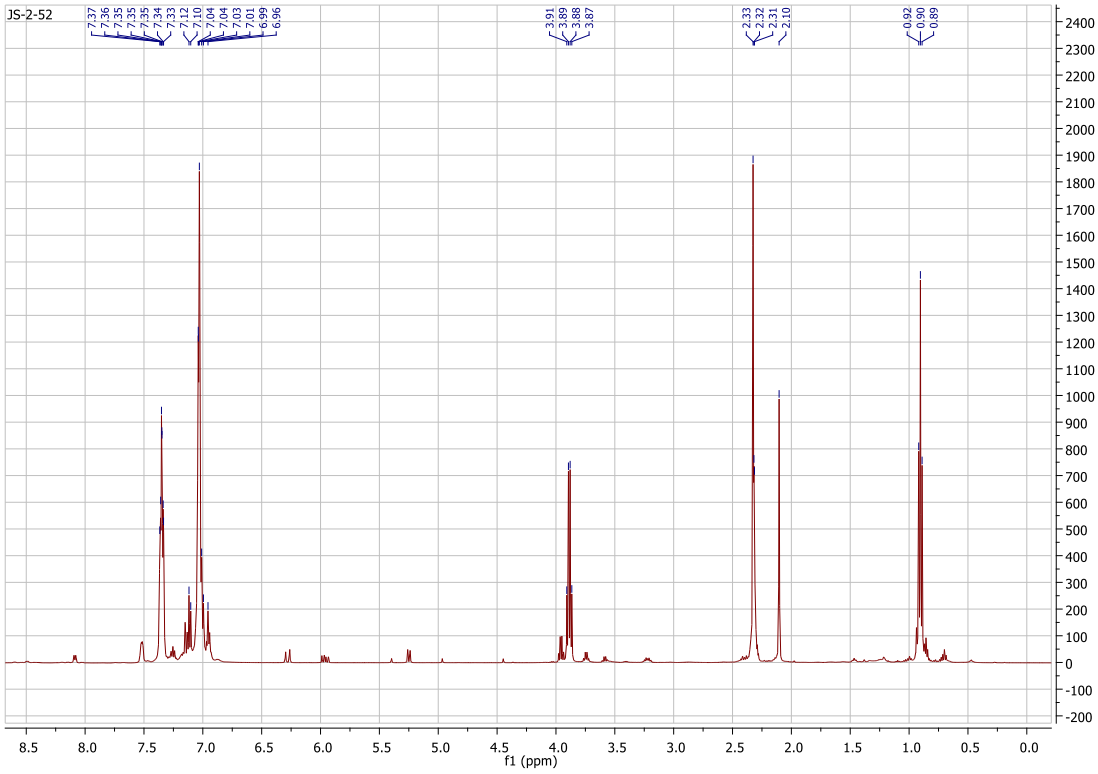

Figure S33: Ph_2SnCl_2 + Ph_2PH + vinyl ethyl ether, ^{31}P NMR spectrum, final

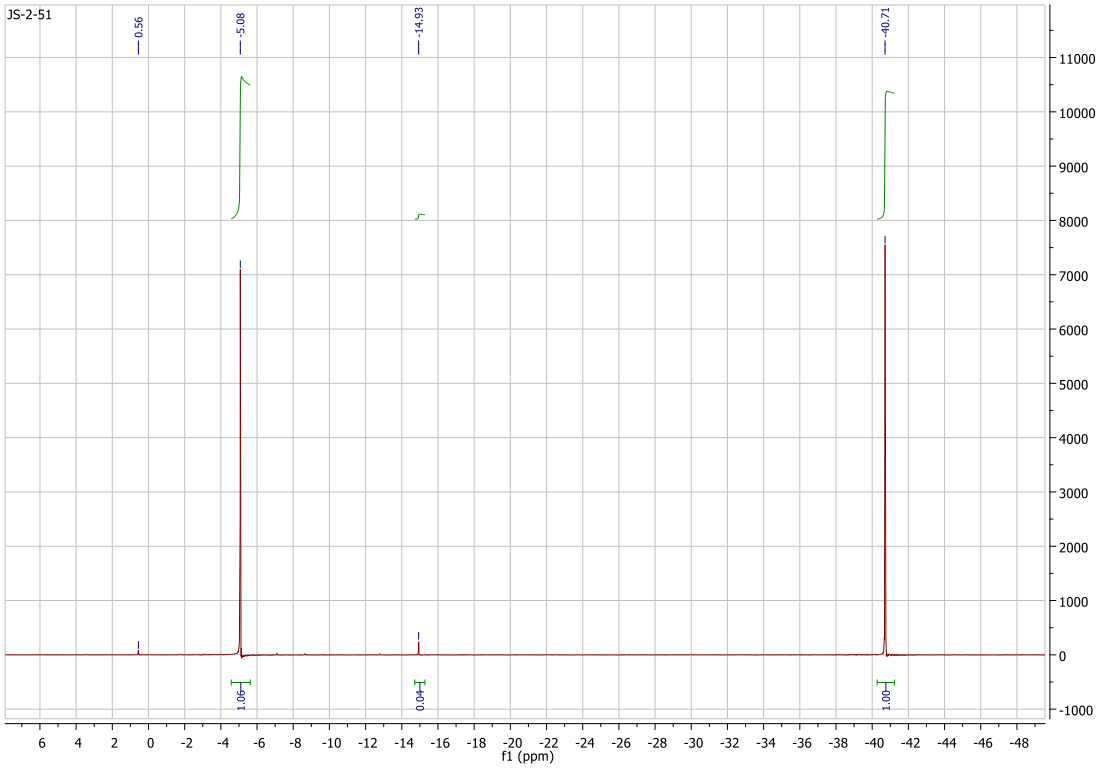

Figure S34: $Ph_2Sn\ Cl_2$ + Ph_2PH + vinyl ethyl ether, ^{1}H NMR spectrum, final

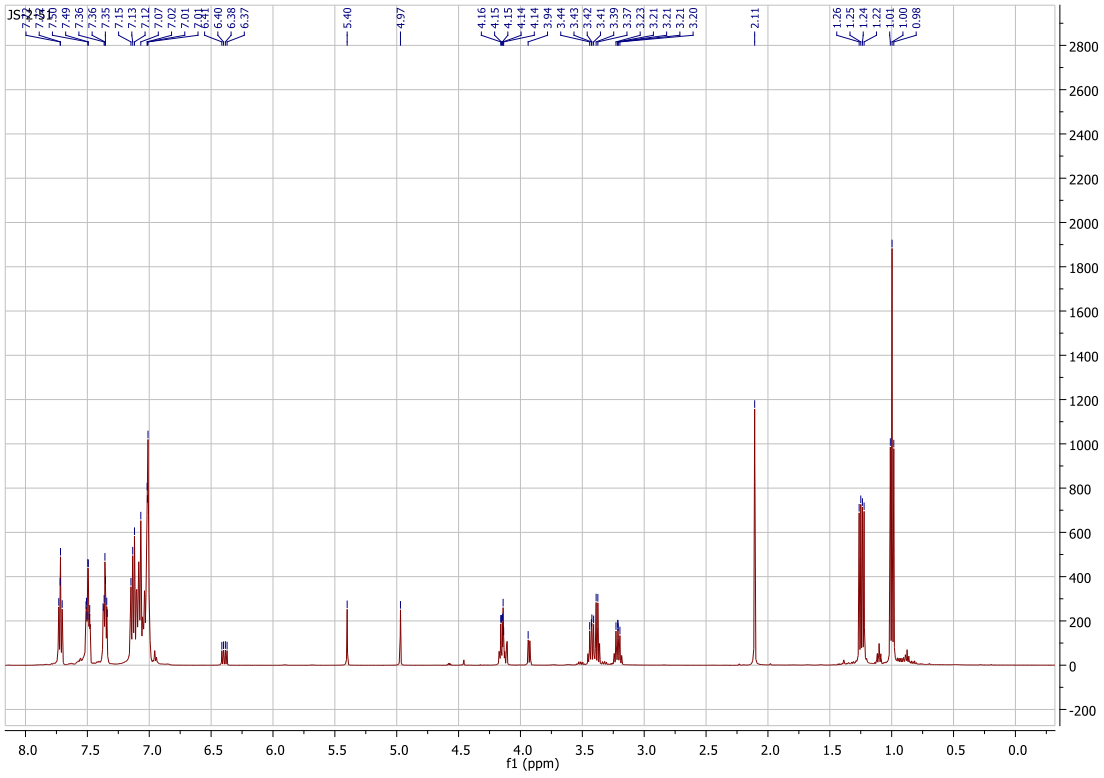

Figure S35: Ph_2SnCl_2 + Ph_2PH + 2-vinyl pyridine, ^{31}P NMR spectrum, final

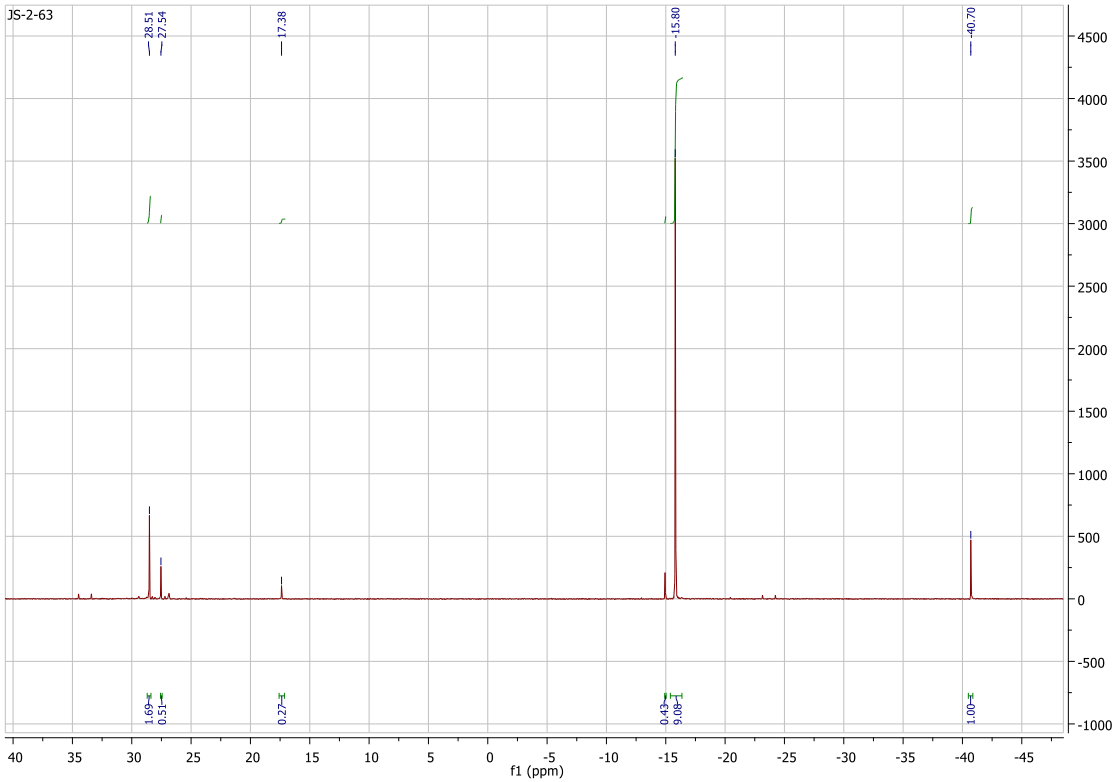

Figure S36: $Ph_2Sn\ Cl_2$ + Ph_2PH + 2-vinyl pyridine, ^{1}H NMR spectrum, final

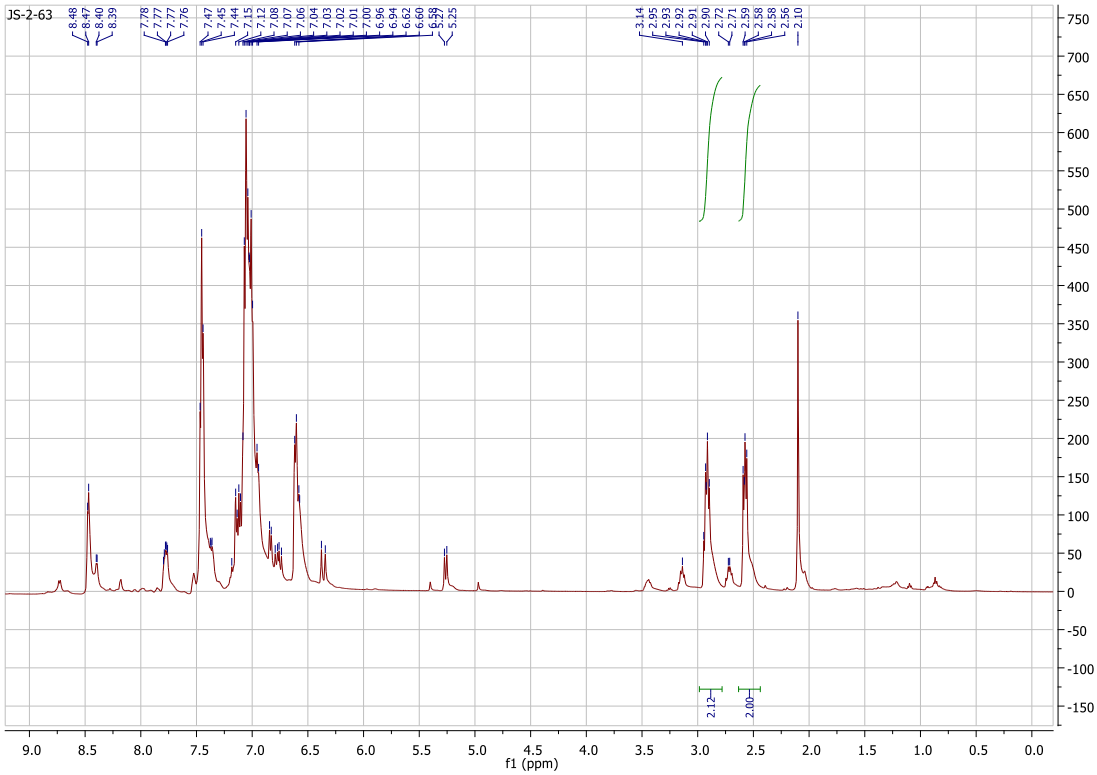

Figure S37: Ph_2SnCl_2 + Ph_2PH + 2-vinyl pyridine, ^{31}P NMR spectrum, final

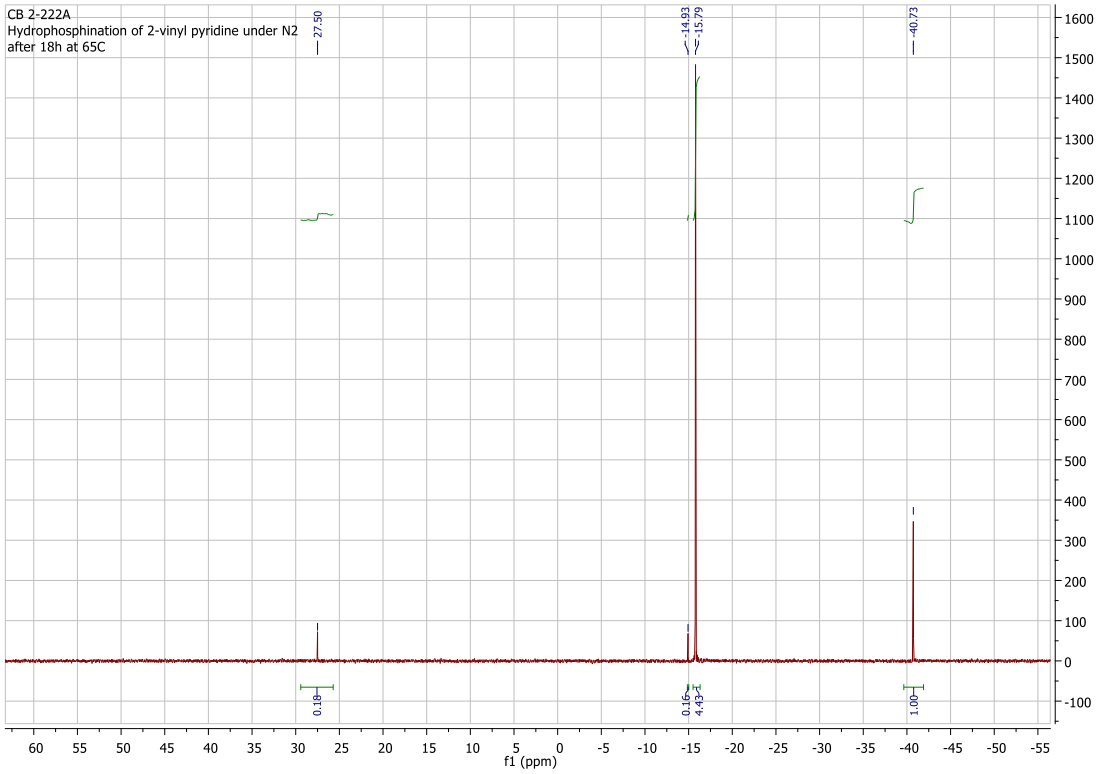

Figure S38: $Ph_2Sn\ Cl_2$ + Ph_2PH + 2-vinyl pyridine, ^{1}H NMR spectrum, final

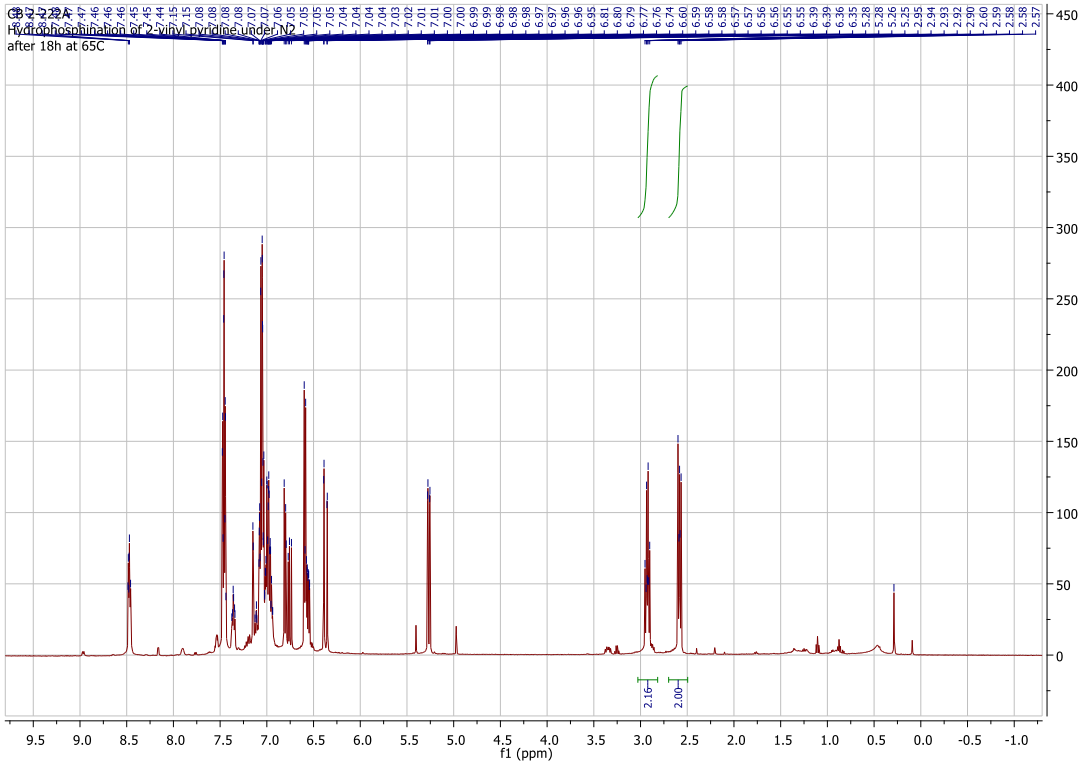

Figure S39: Cp^*_2Sn + Ph_2PH + acrylonitrile, ^{31}P NMR spectrum, final

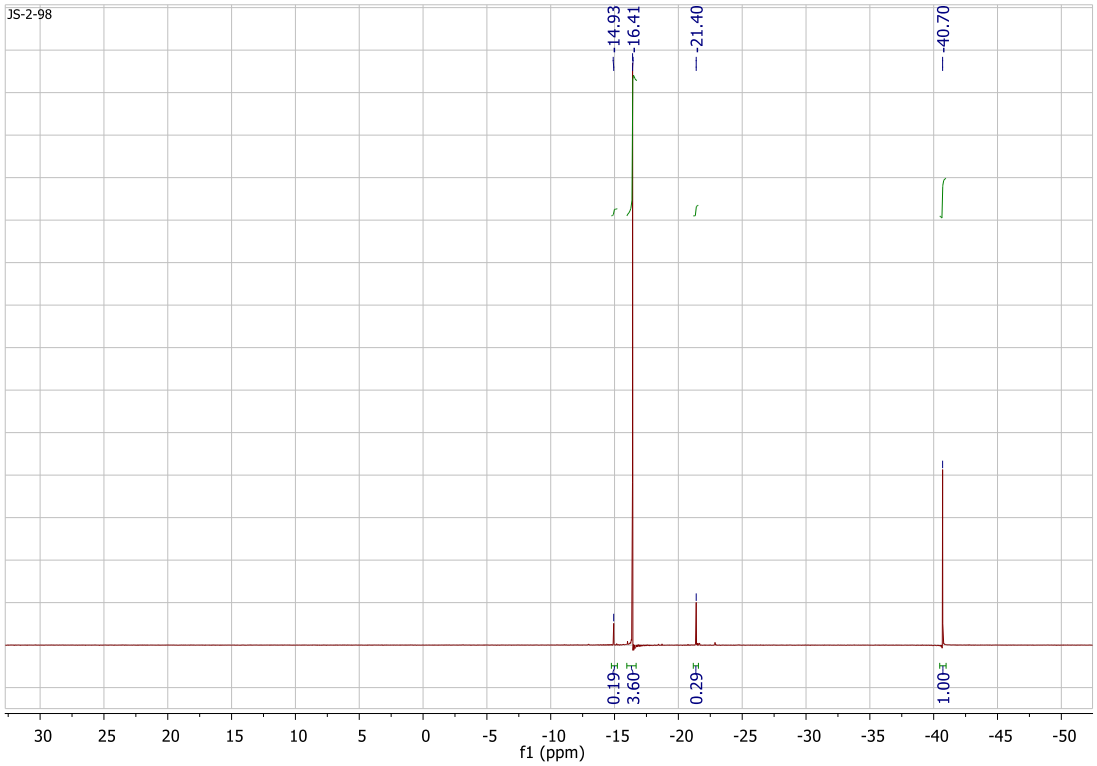

Figure S40: Cp^*_2Sn + Ph_2PH + acrylonitrile, ^{1}H NMR spectrum, final

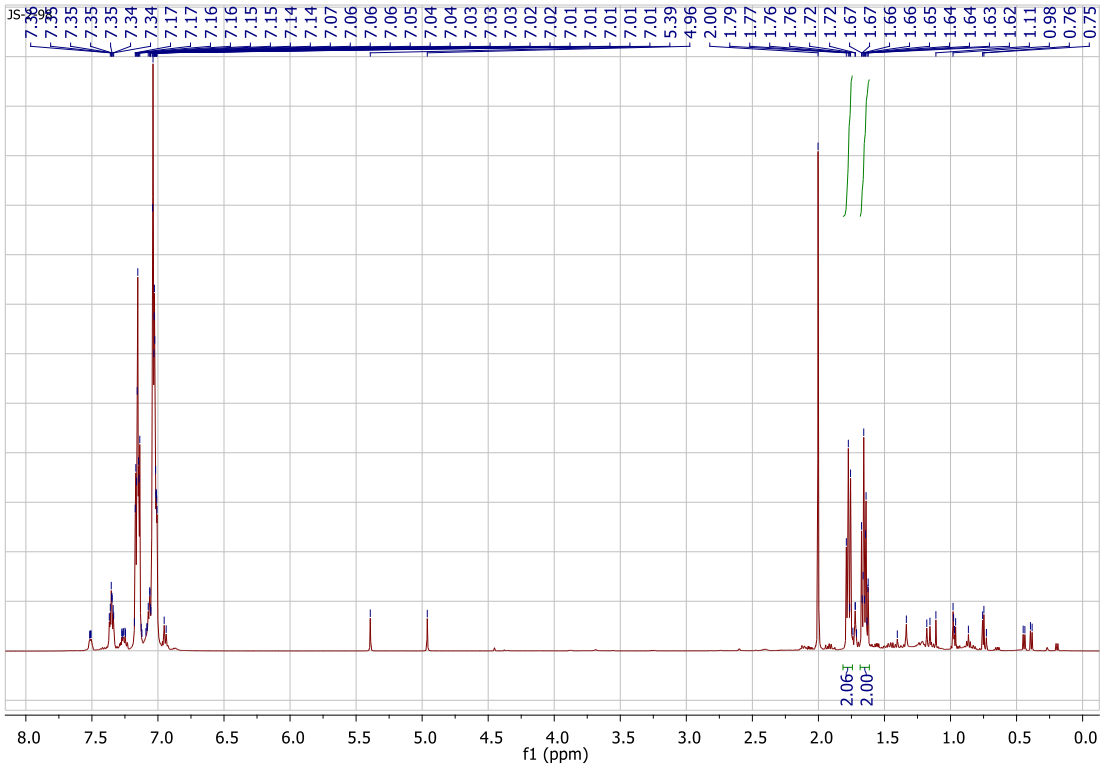

Figure S41: $Cp^*_2Sn + Ph_2PH$ + styrene, ^{31}P NMR spectrum, final

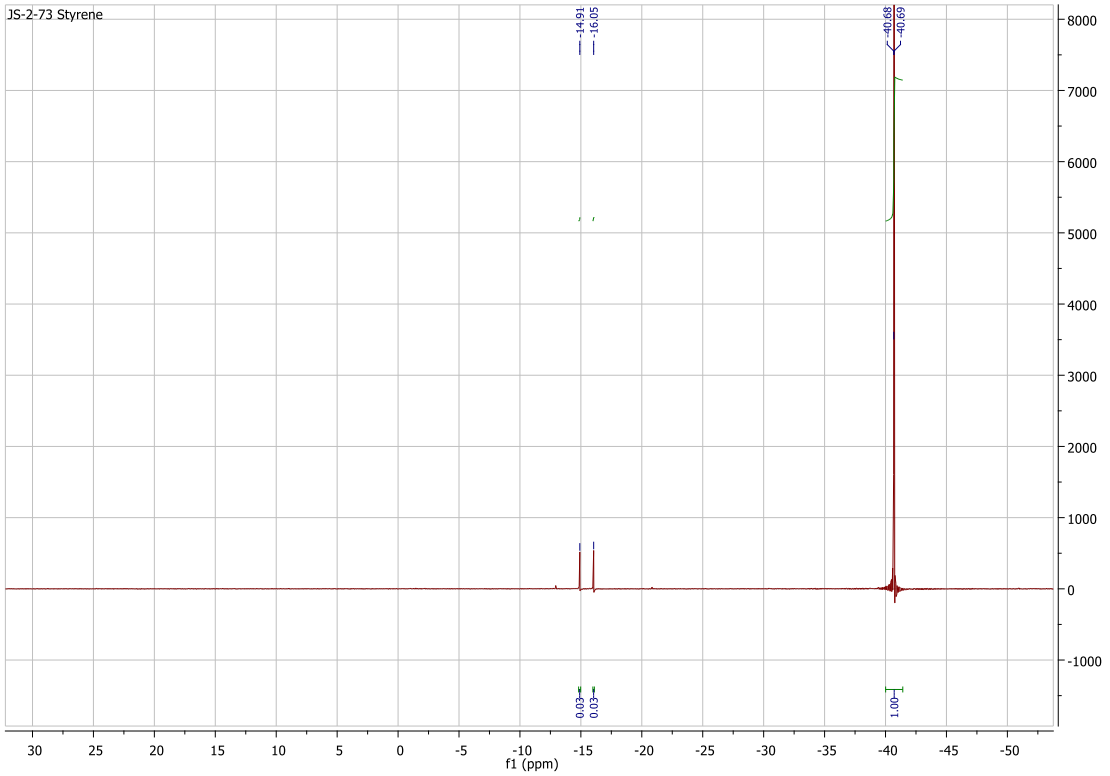

Figure S42: $Cp^*_2Sn + Ph_2PH$ + styrene, ^{1}H NMR spectrum, final

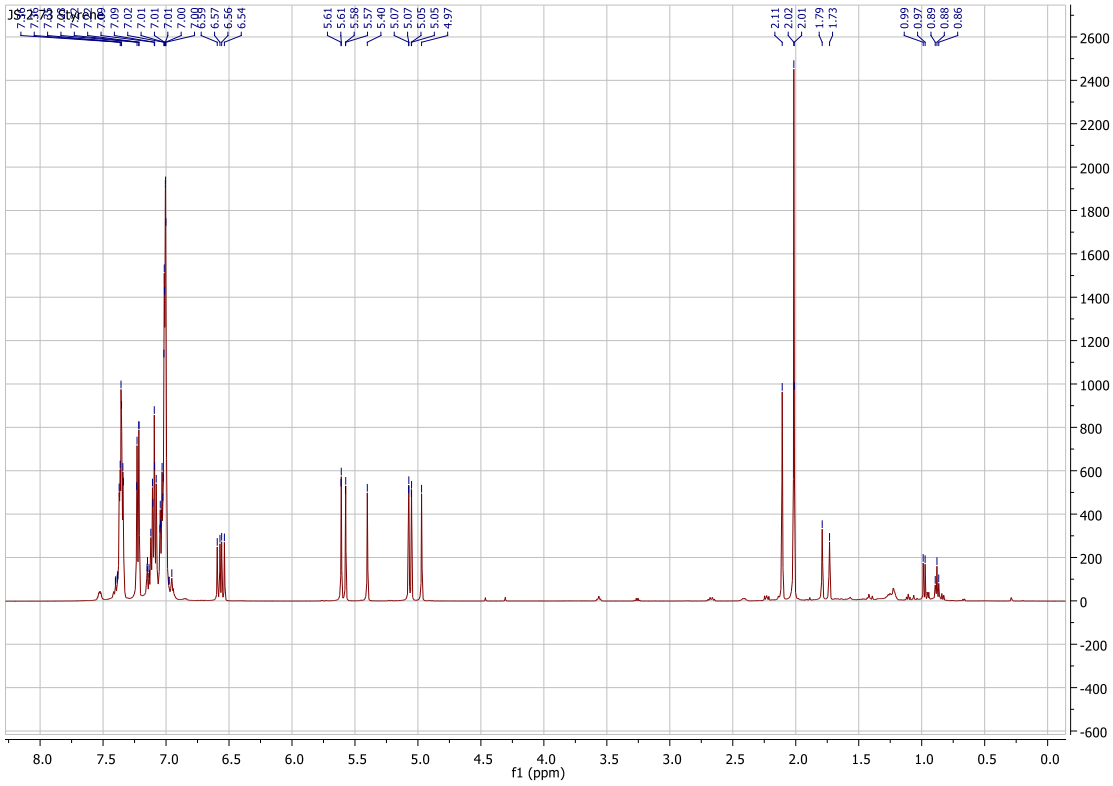

Figure S43: Cp^*_2Sn + Ph_2PH + 2-vinyl pyridine, ^{31}P NMR spectrum, final

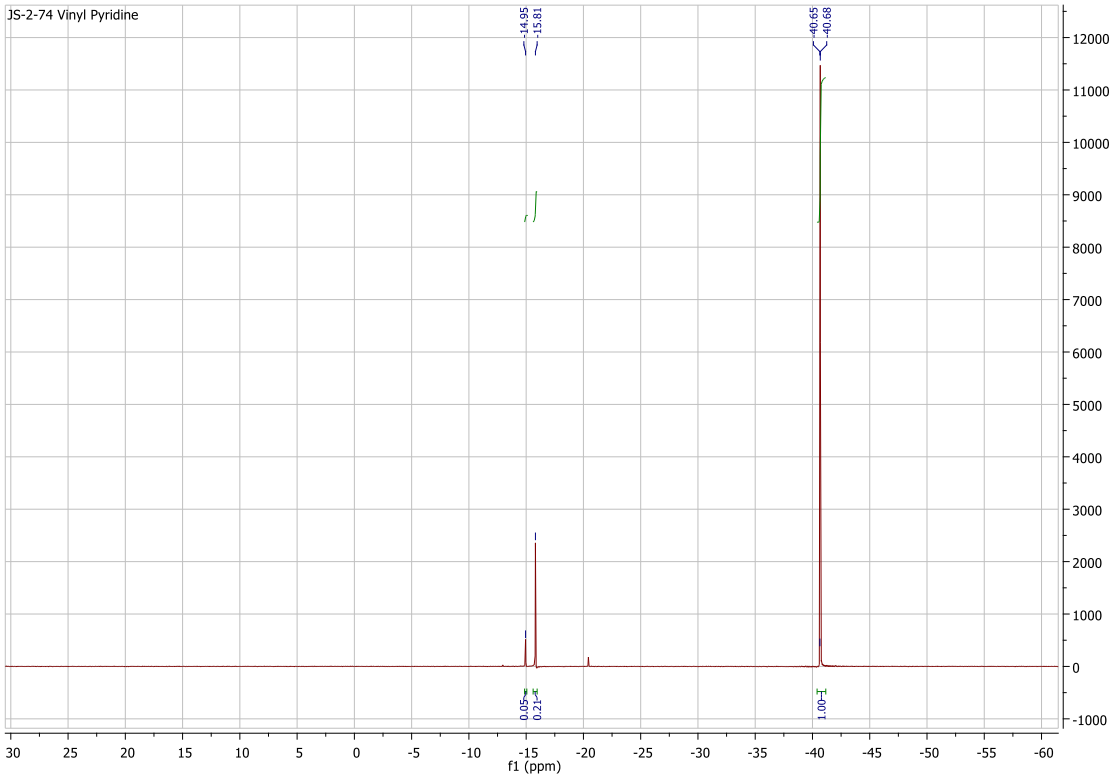

Figure S44: Cp^*_2Sn + Ph_2PH + 2-vinyl pyridine, ^{1}H NMR spectrum, final

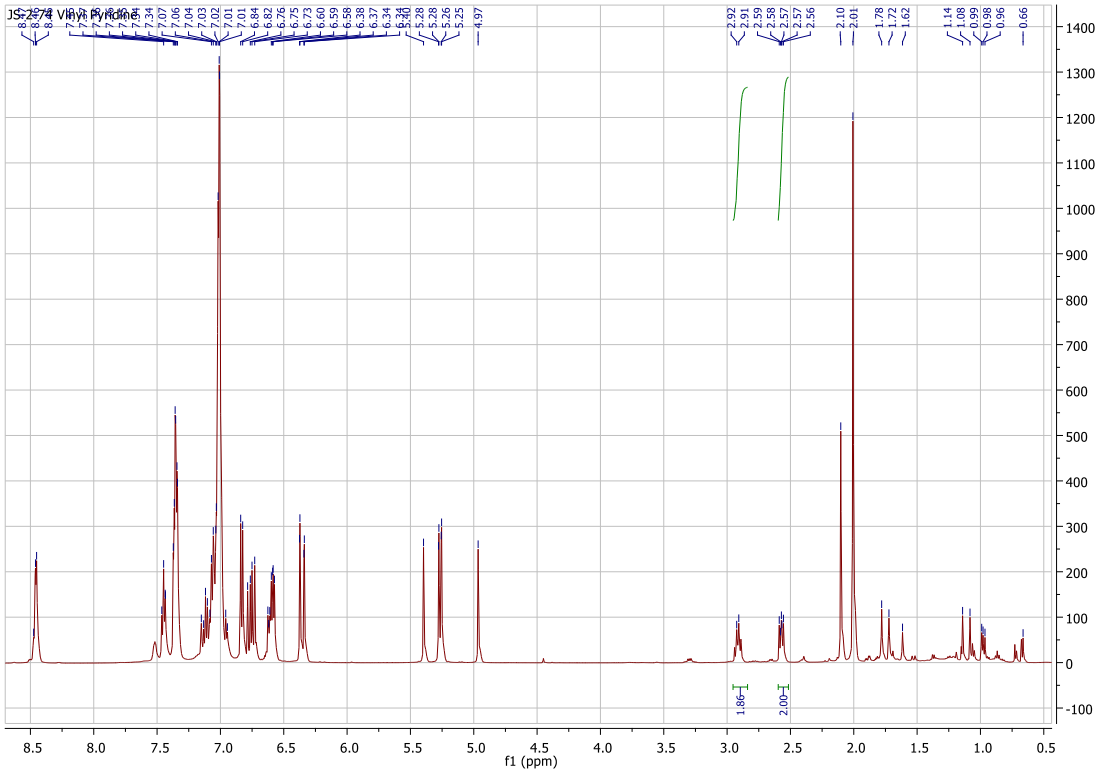

Figure S45: $Cp^*_2Sn + Ph_2PH$, ^{31}P NMR spectrum, final

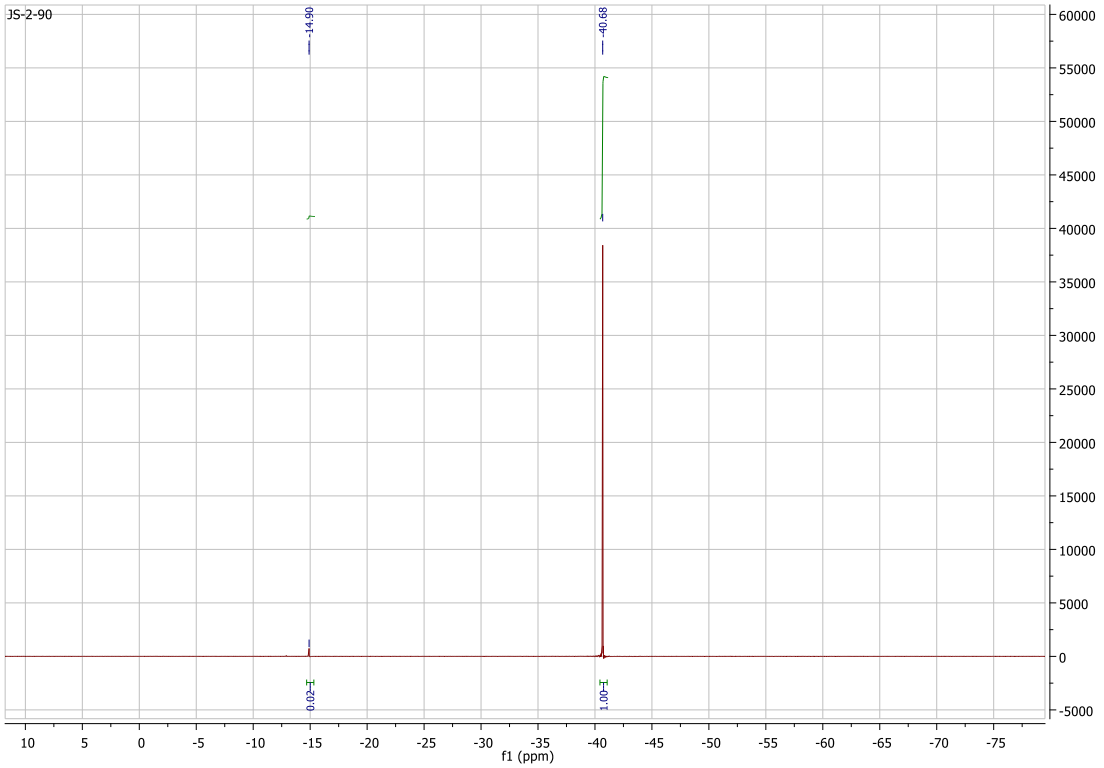

Figure S46: $Cp^*_2SnCl_2 + Ph_2PH$, ^{31}P NMR spectrum, final

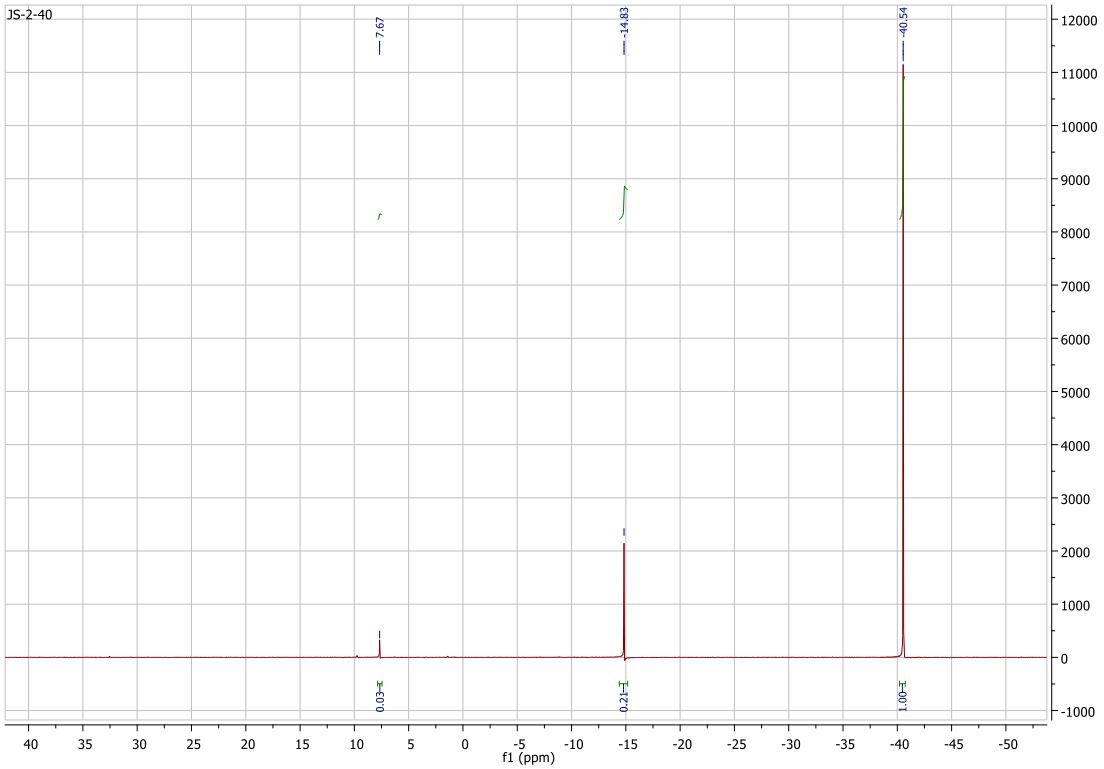

Figure S47: Ph_2SnCl_2 + Ph_2PH, ^{31}P NMR spectrum, final

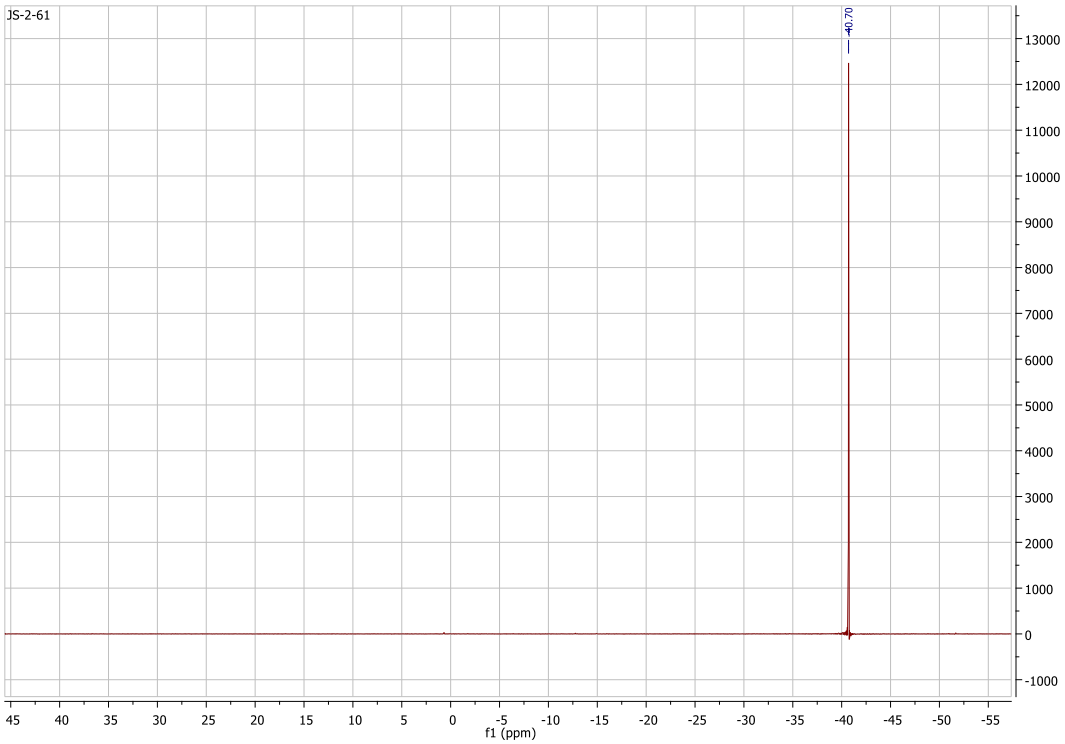

Figure S48: Ph_2PH + 2-vinyl pyridine, ^{31}P NMR spectrum, final

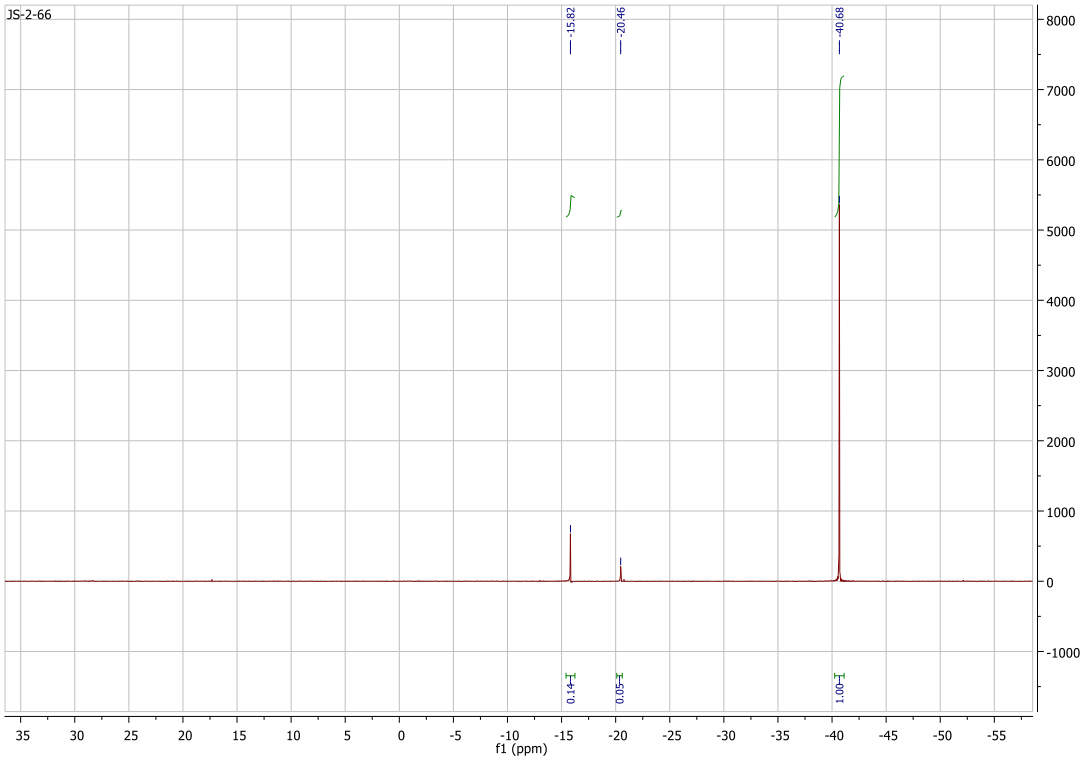

Figure S49: Ph_2PH + 2-vinyl pyridine, ^1H NMR spectrum, final

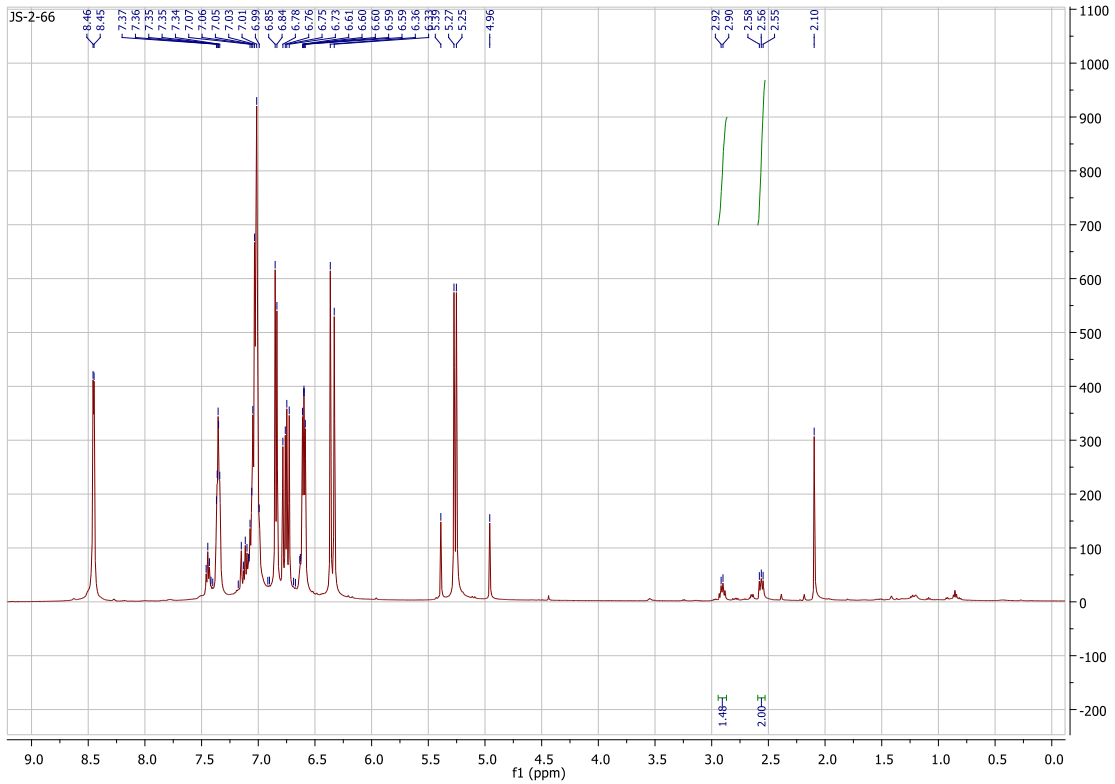

Figure S50: GC – MS (EI) of (4-bromophenylethyl) diphenylphosphine

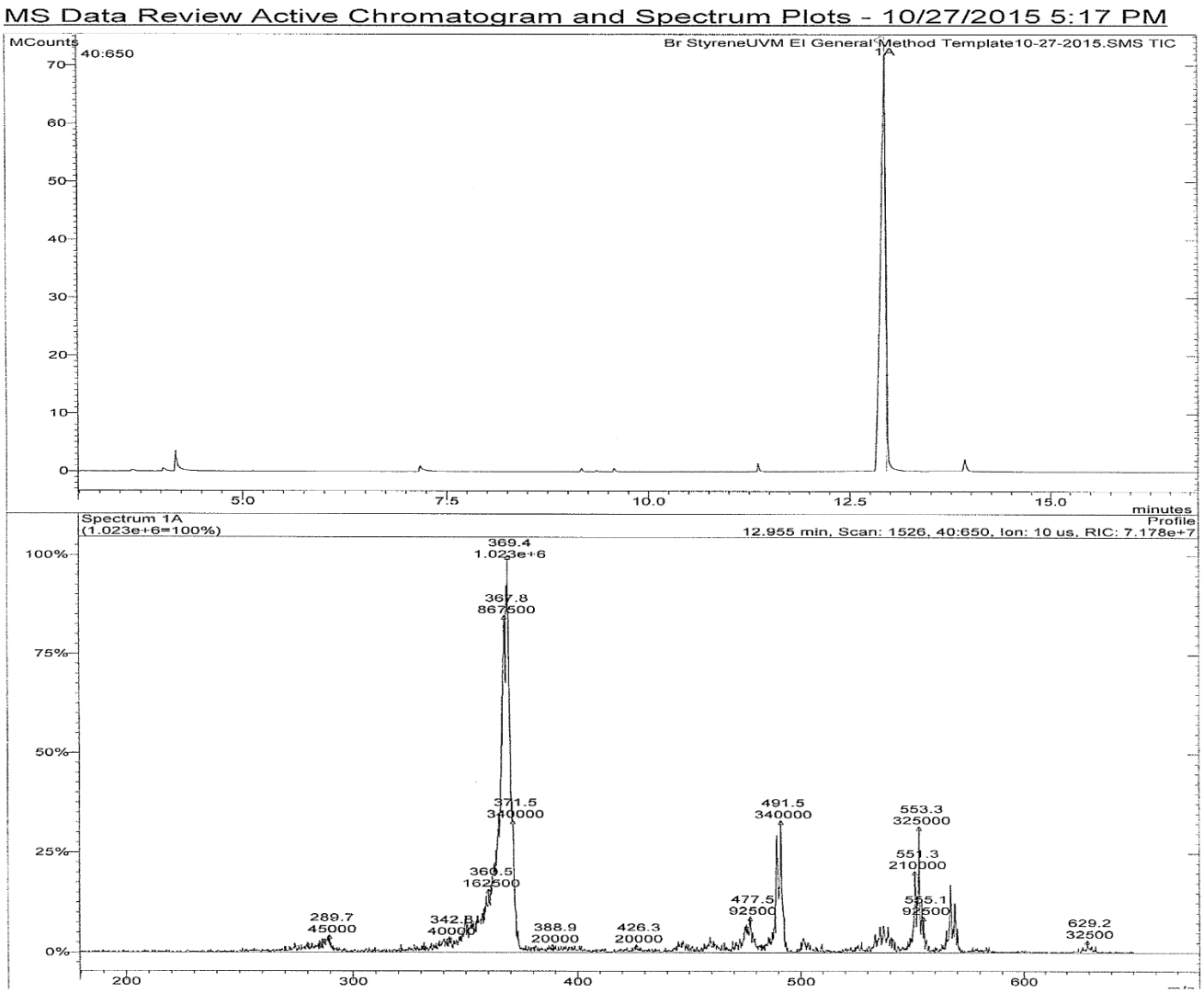

Figure S51: GC – MS (EI) of (4-trifluromethylphenylethyl) diphenylphosphine

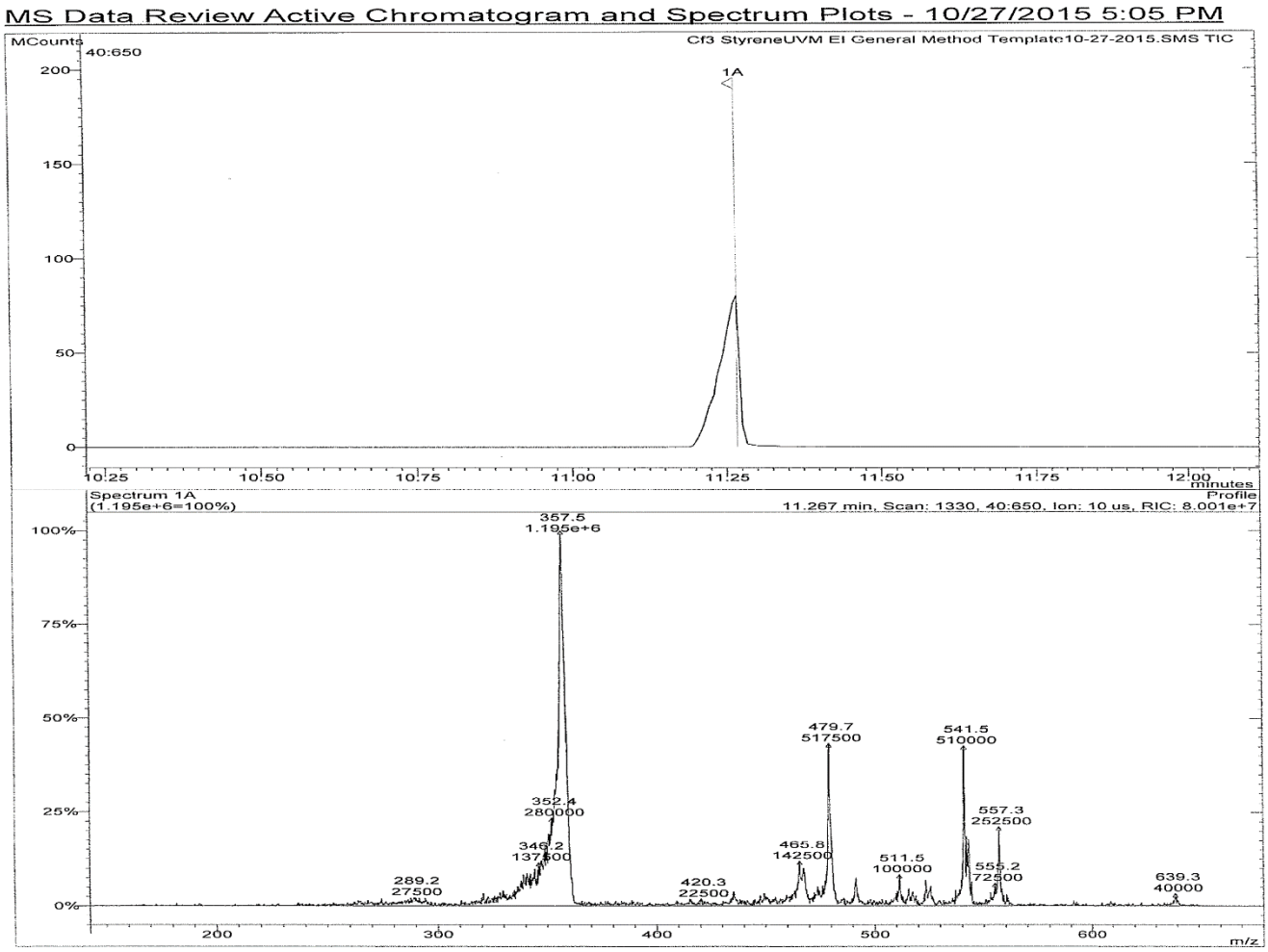

Figure S52: $B(C_6F_5)_3$ + Ph_2PH + styrene + N_2 at 65 °C for 18 hours, ^{31}P NMR, final

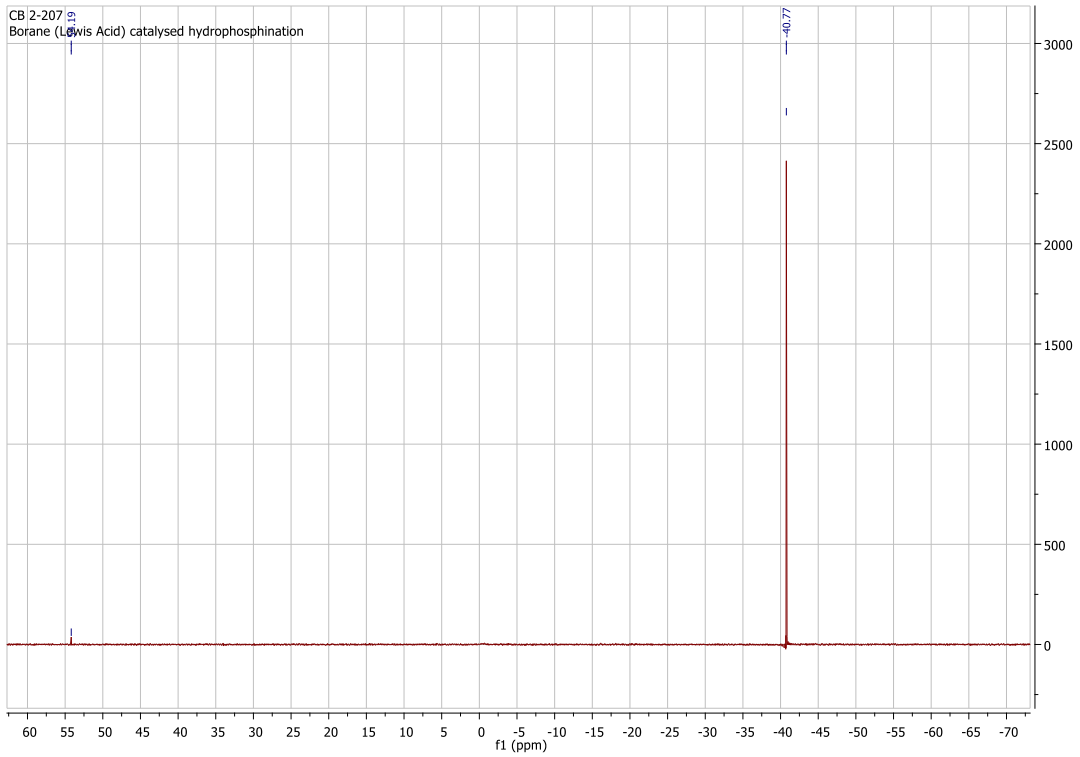

Figure S53: $B(C_6F_5)_3$ + Ph_2PH + styrene + N_2 at 100 °C for 20 hours, ^{31}P NMR, final

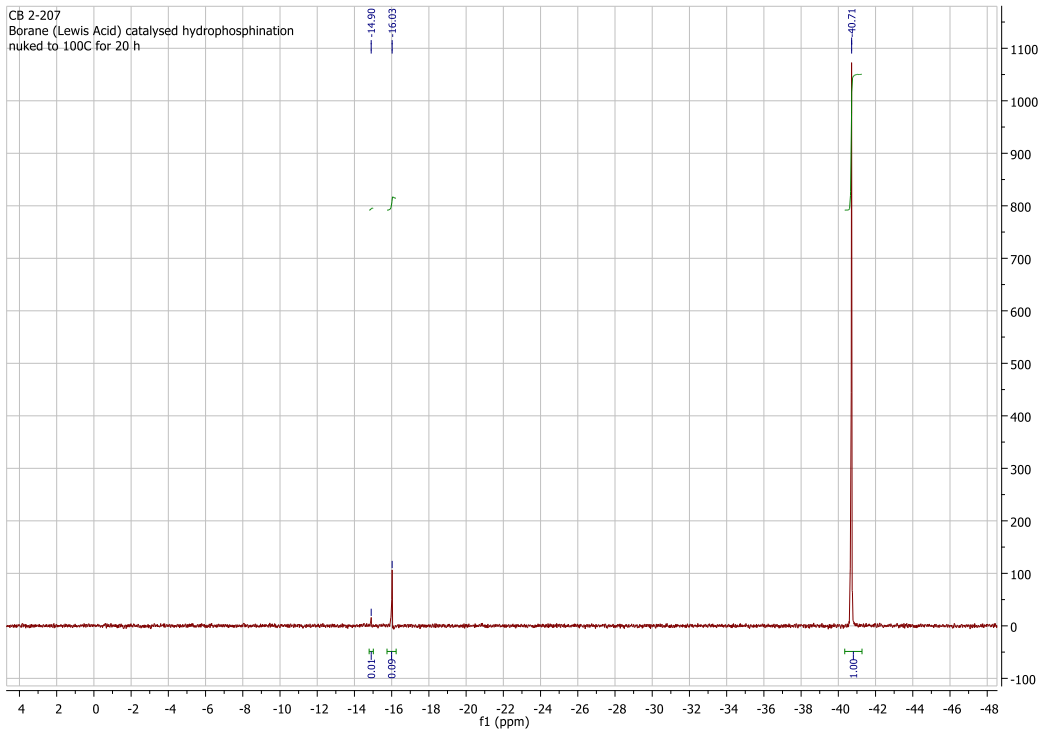

Figure S54: $B(C_6F_5)_3$ + Ph_2PH + 4-bromo styrene + N_2 at 100 °C for 18 hours, ^{31}P NMR, final

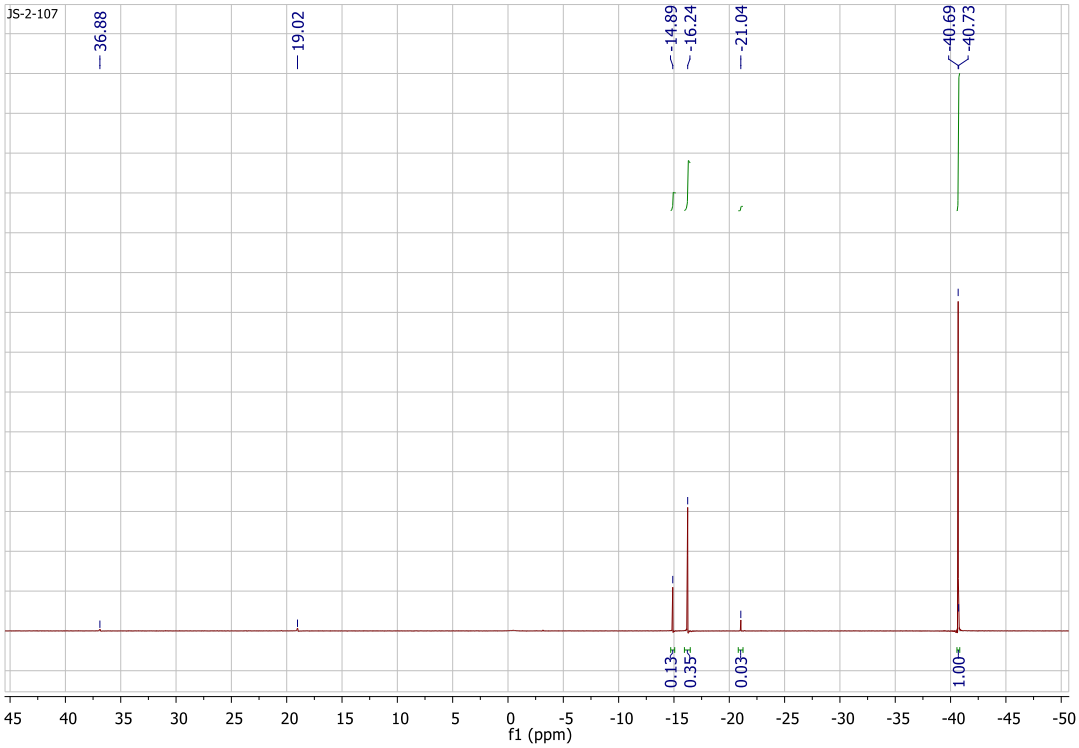

Figure S55: $B(C_6F_5)_3$ + Ph_2PH + 4-Bromo Styrene + N_2 at 100 °C for 18 hours, ^{1}H NMR, final

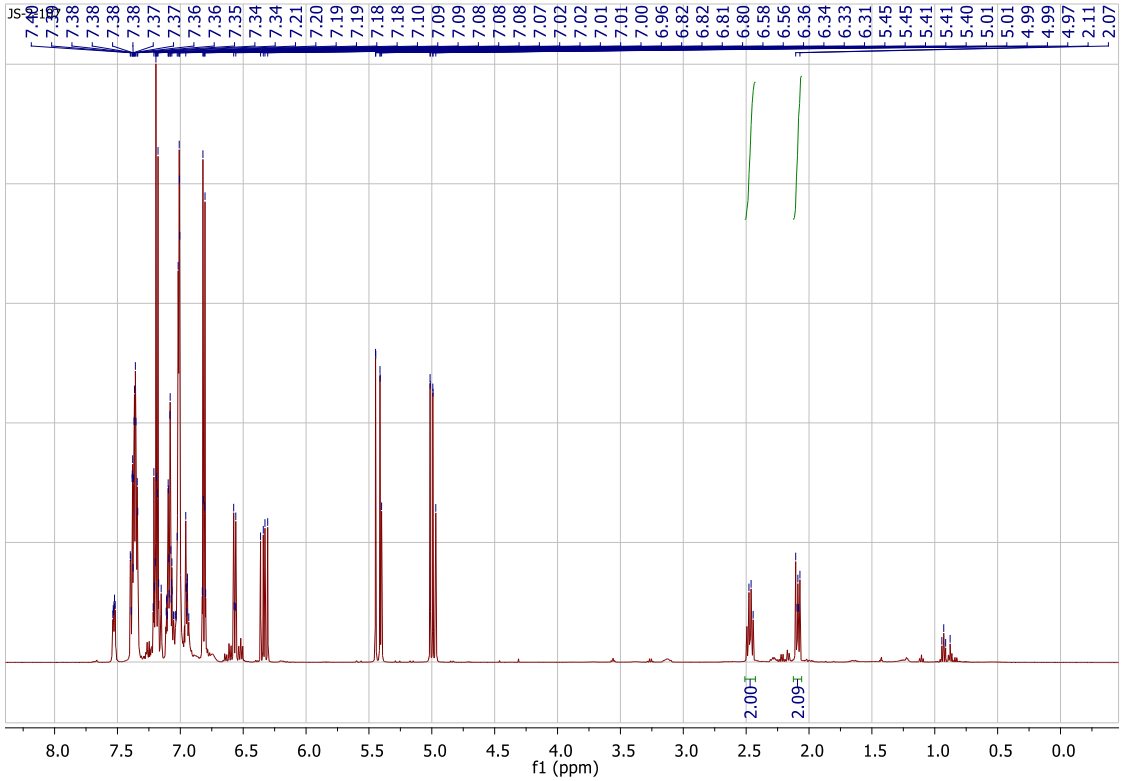

Figure S56: $B(C_6F_5)_3$ + Ph_2PH + 4-methyl styrene + N_2 at 100 °C for 18 hours, ^{31}P NMR, final

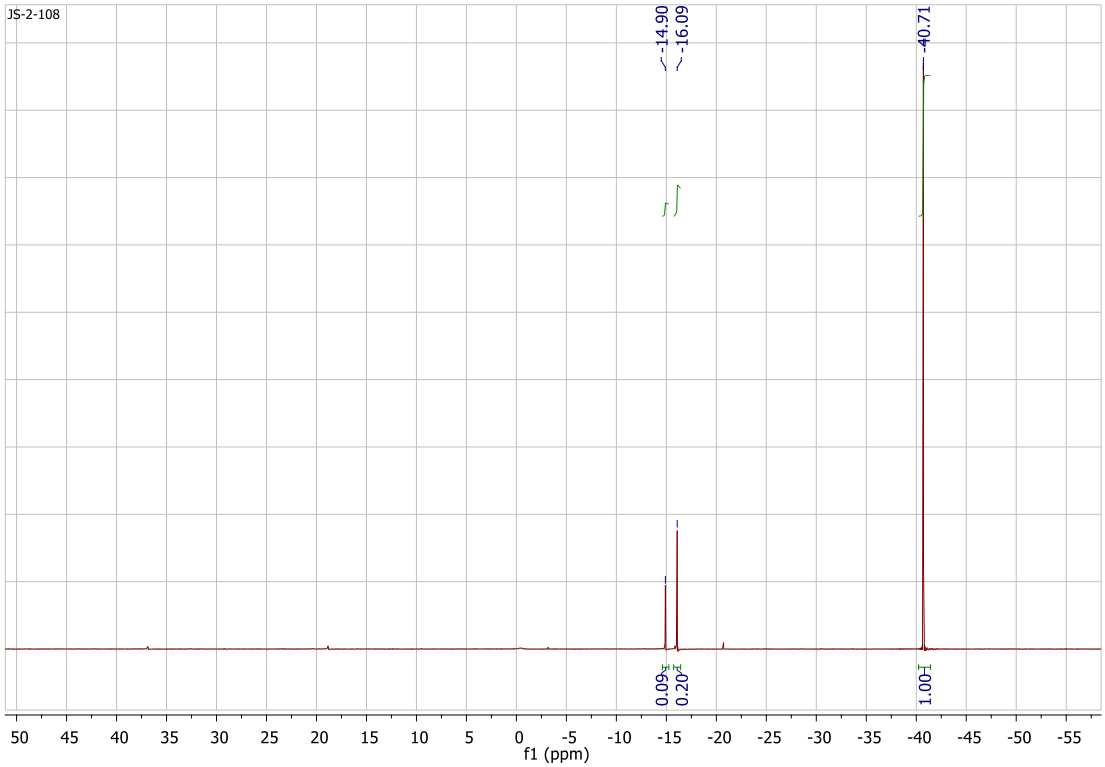

Figure S57: $B(C_6F_5)_3$ + Ph_2PH + 4-methyl styrene + N_2 at 100 °C for 18 hours, ^{1}H NMR, final

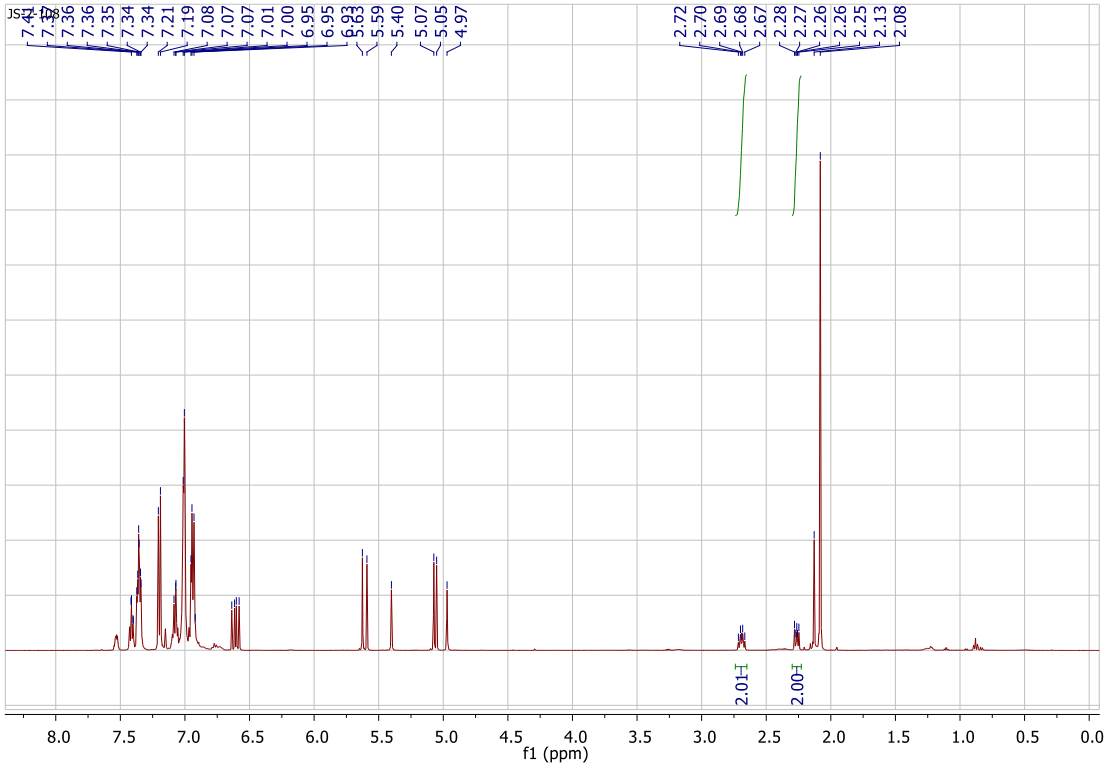

Figure S58: $B(C_6F_5)_3$ + Ph_2PH + 4-trifluromethyl styrene + N_2 at 100 °C for 18 hours, ^{31}P NMR, final

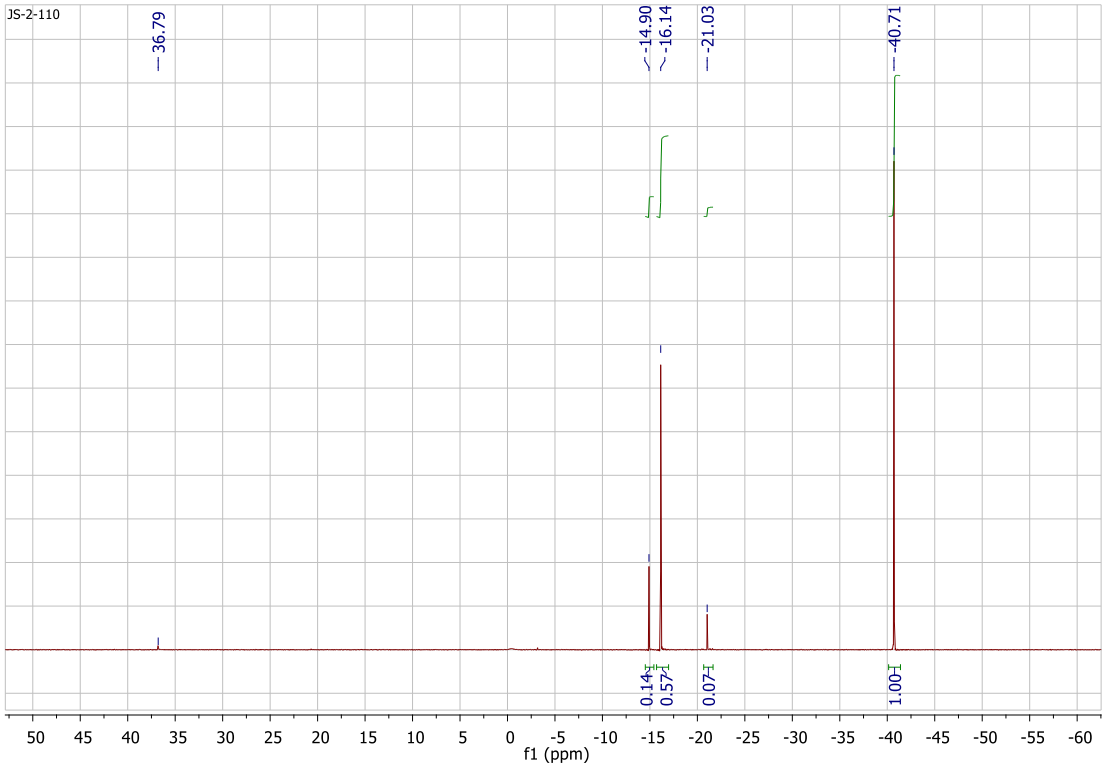

Figure S59: $B(C_6F_5)_3$ + Ph_2PH + 4-trifluromethyl styrene + N_2 at 100 °C for 18 hours, ^{1}H NMR, final

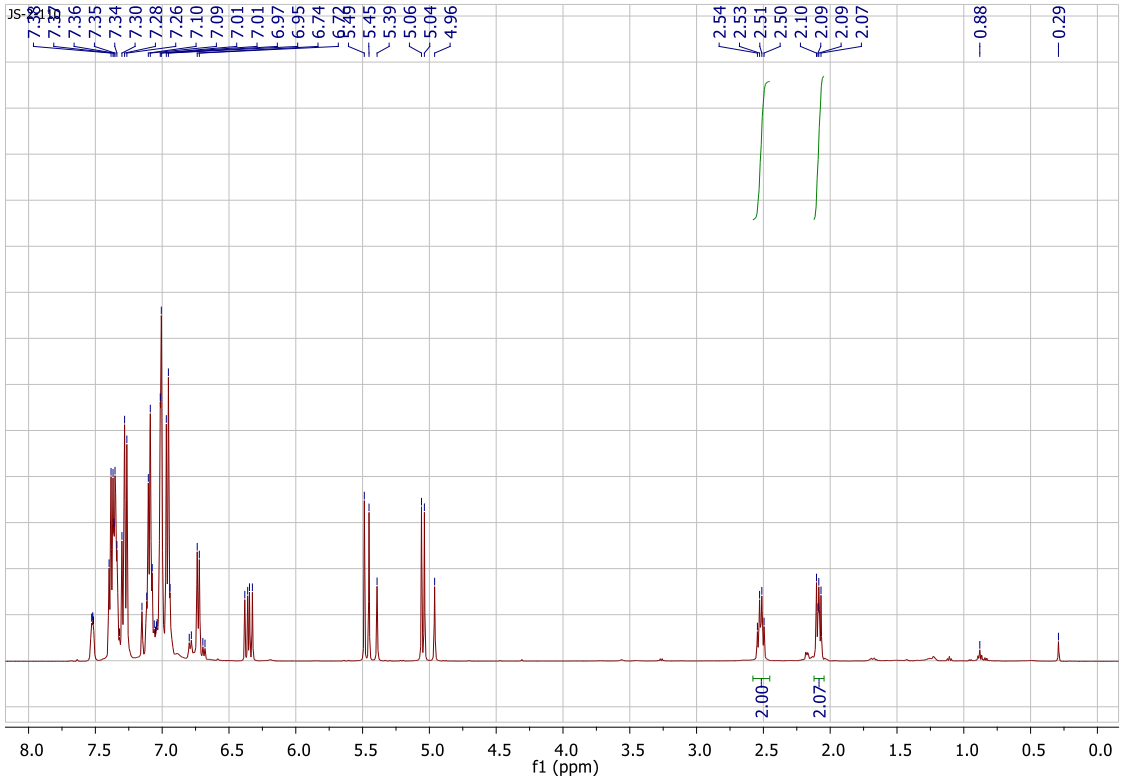

Figure S60: $B(C_6F_5)_3$ + Ph_2PH + acrylonitrile + N_2 at 100 °C for 18 hours, ^{31}P NMR, final

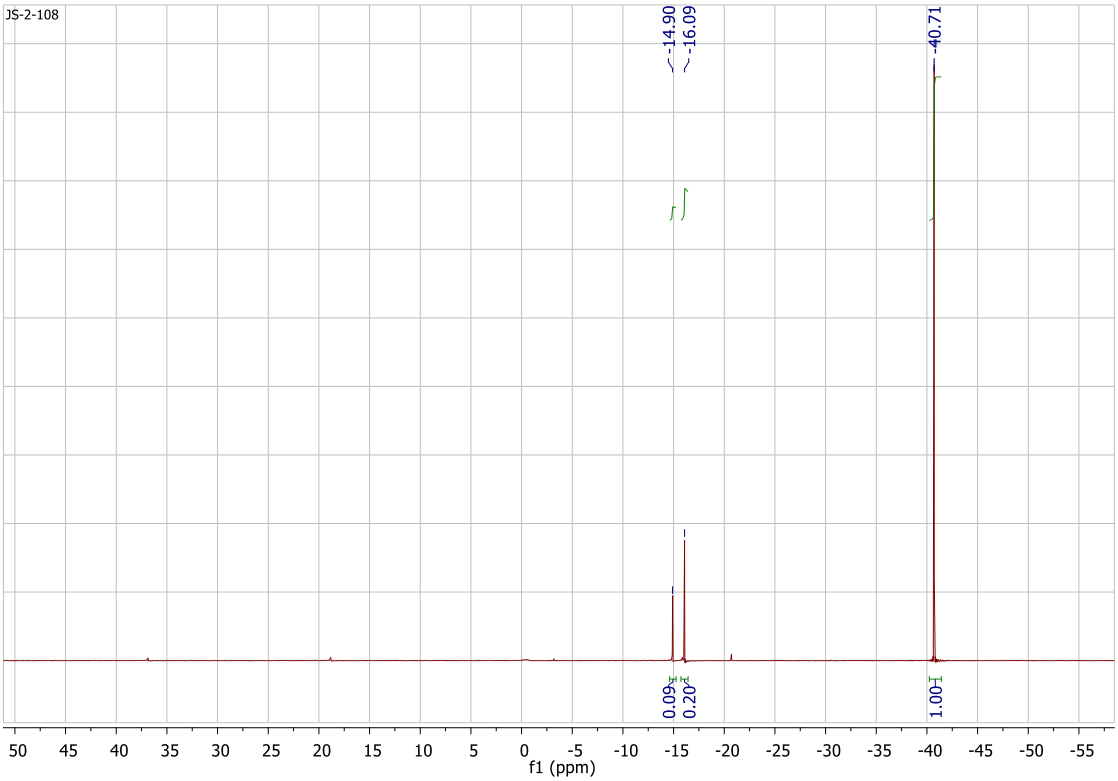

Figure S61: $B(C_6F_5)_3$ + Ph_2PH + acrylonitrile + N_2 at 100 °C for 18 hours, ^{1}H NMR, final

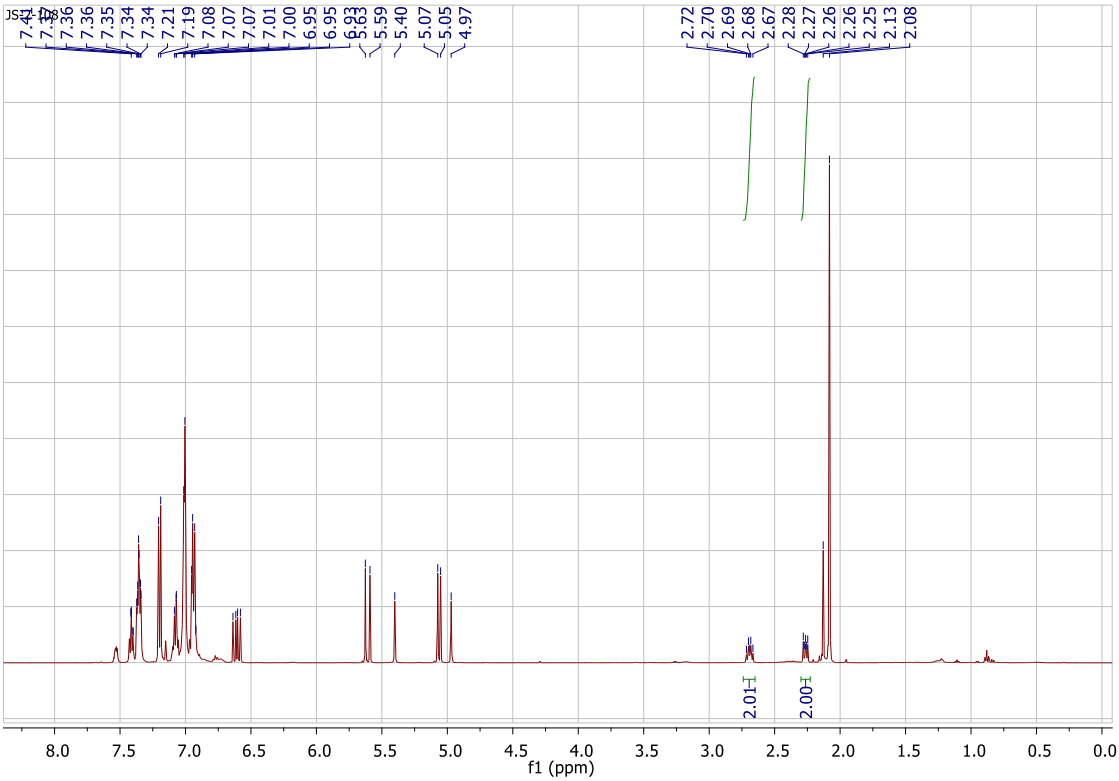

Figure S62: $B(C_6F_5)_3$ + Ph_2PH + 2-vinyl pyridine + N_2 at 100 °C for 18 hours, ^{31}P NMR, final

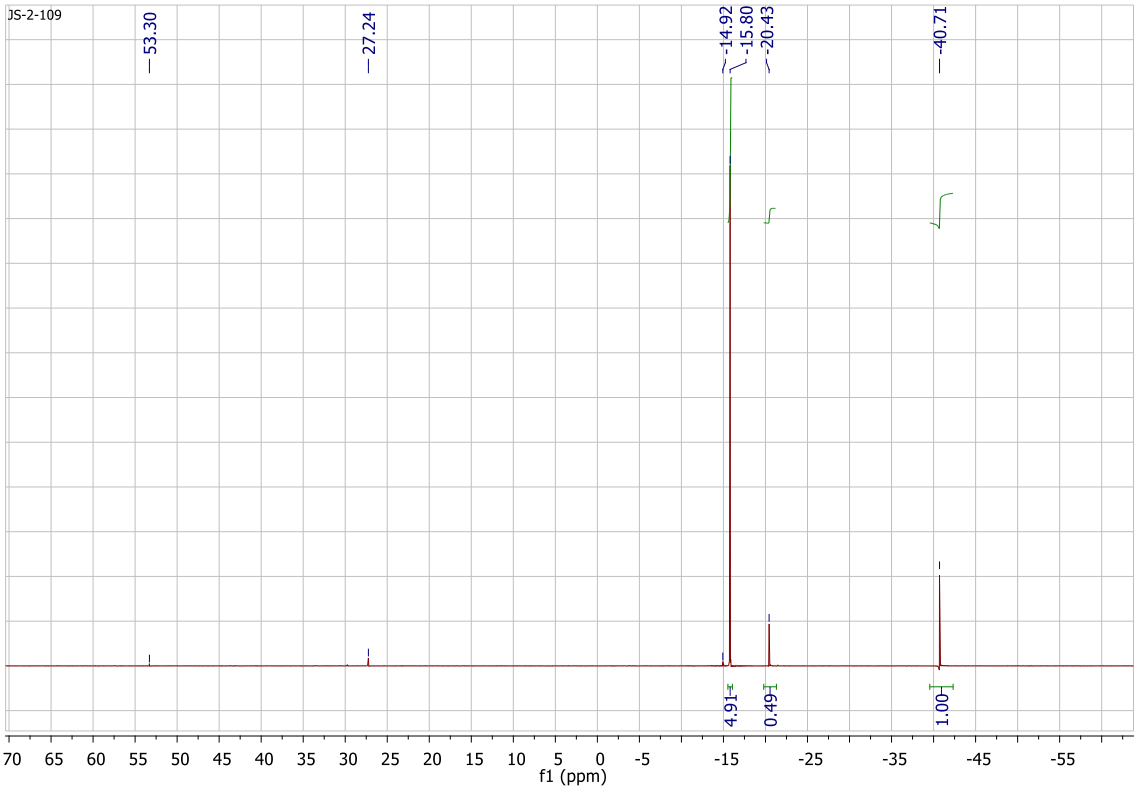

Figure S63: $B(C_6F_5)_3$ + Ph_2PH + 2-vinyl pyridine + N_2 at 100 °C for 18 hours, ^{1}H NMR, final

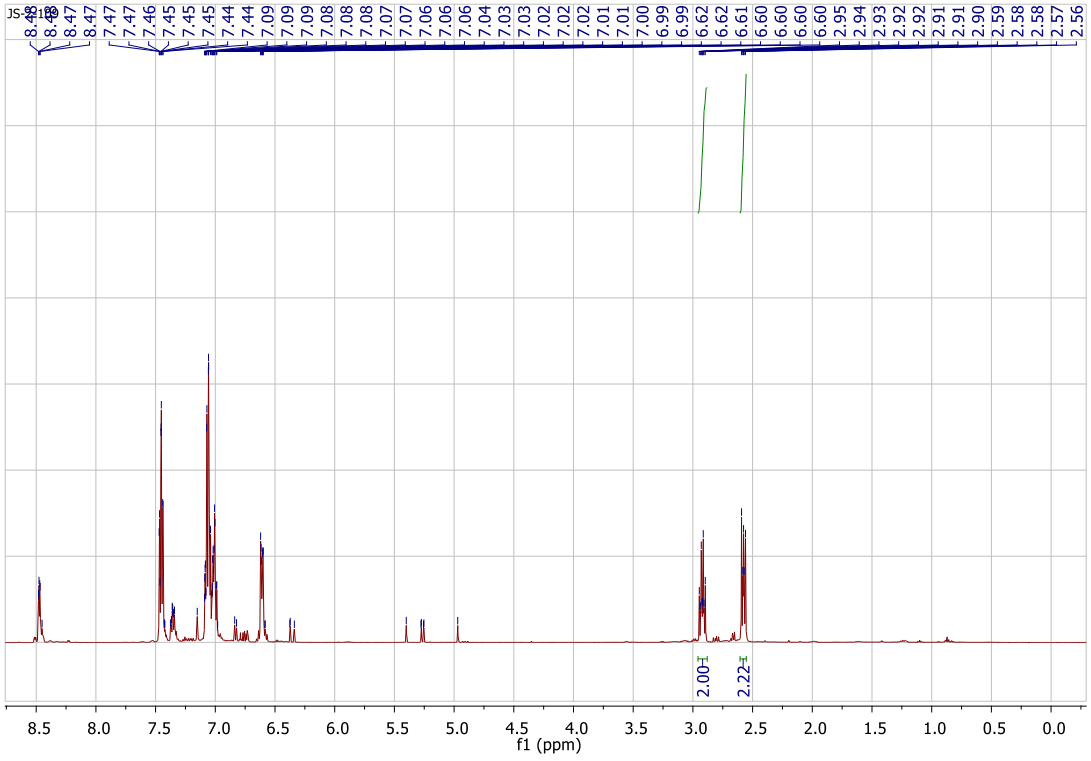

Figure S64: $B(C_6F_5)_3$ + Ph_2PH + vinyl ethyl ether + N_2 at 100 °C for 18 hours, ^{31}P NMR, final

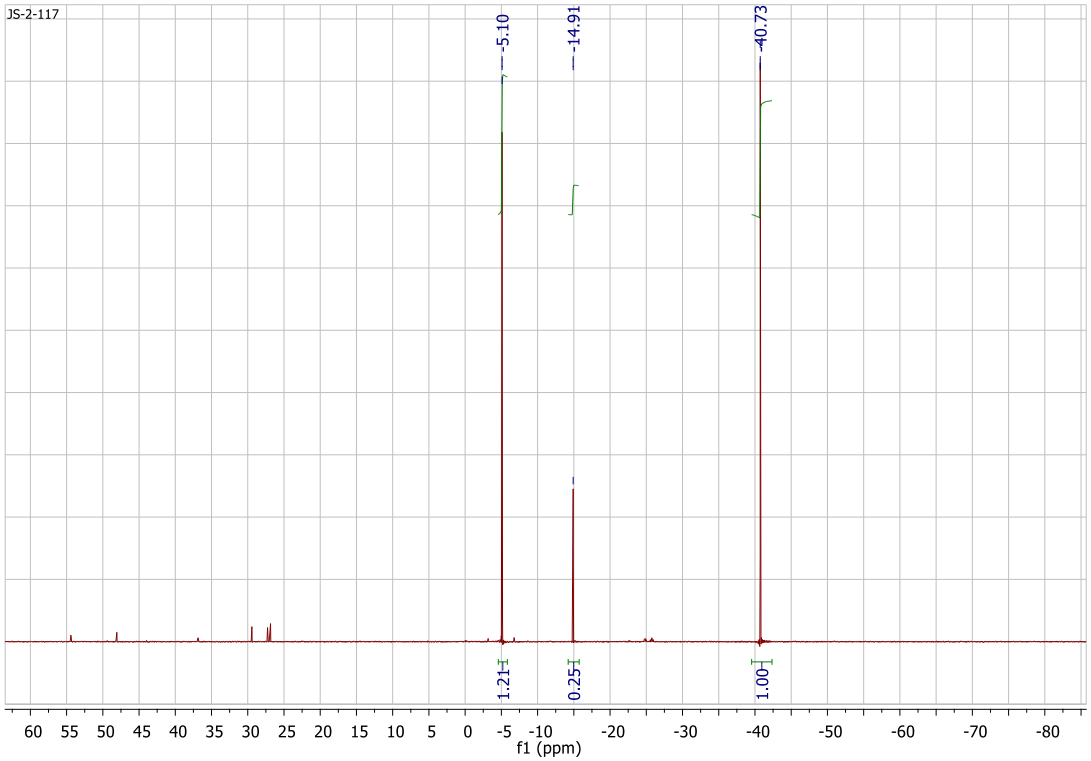

Figure S65: $B(C_6F_5)_3$ + Ph_2PH + vinyl ethyl ether + N_2 at 100 °C for 18 hours, ^{1}H NMR, final

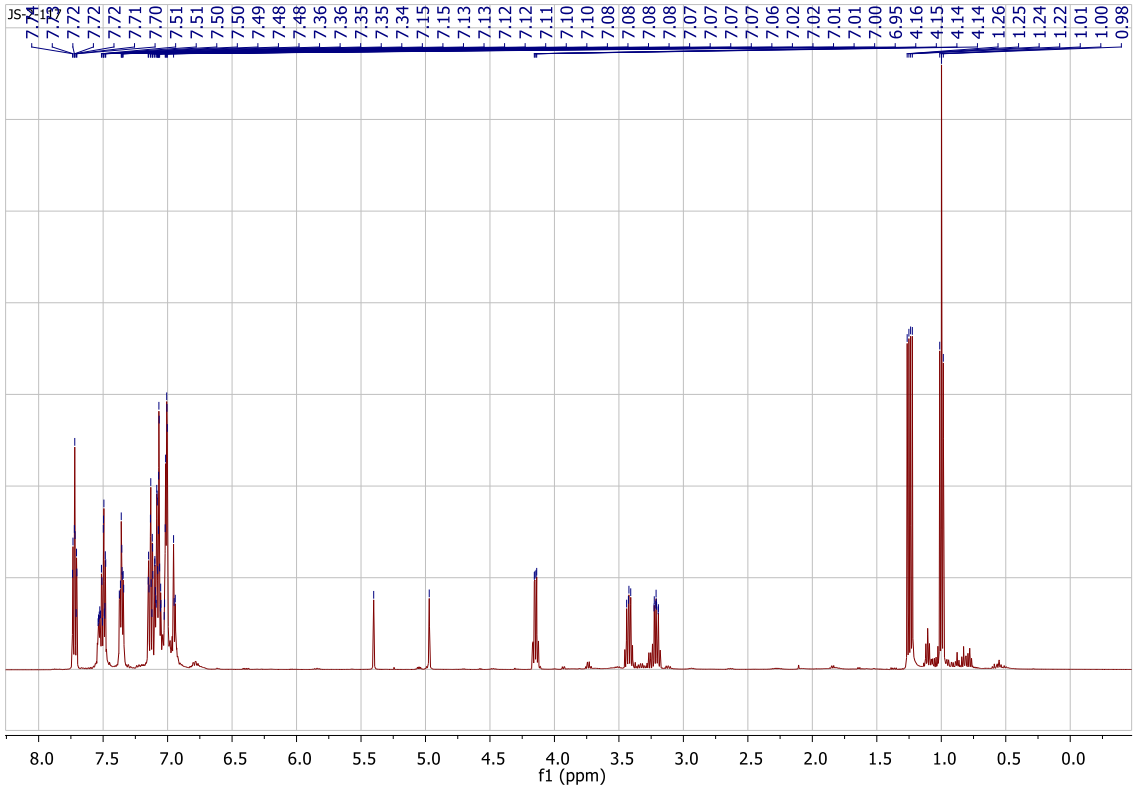

Figure S66: $B(C_6F_5)_3$ + Ph_2PH + ethyl acrylate + N_2 at 100 °C for 18 hours, ^{31}P NMR, final

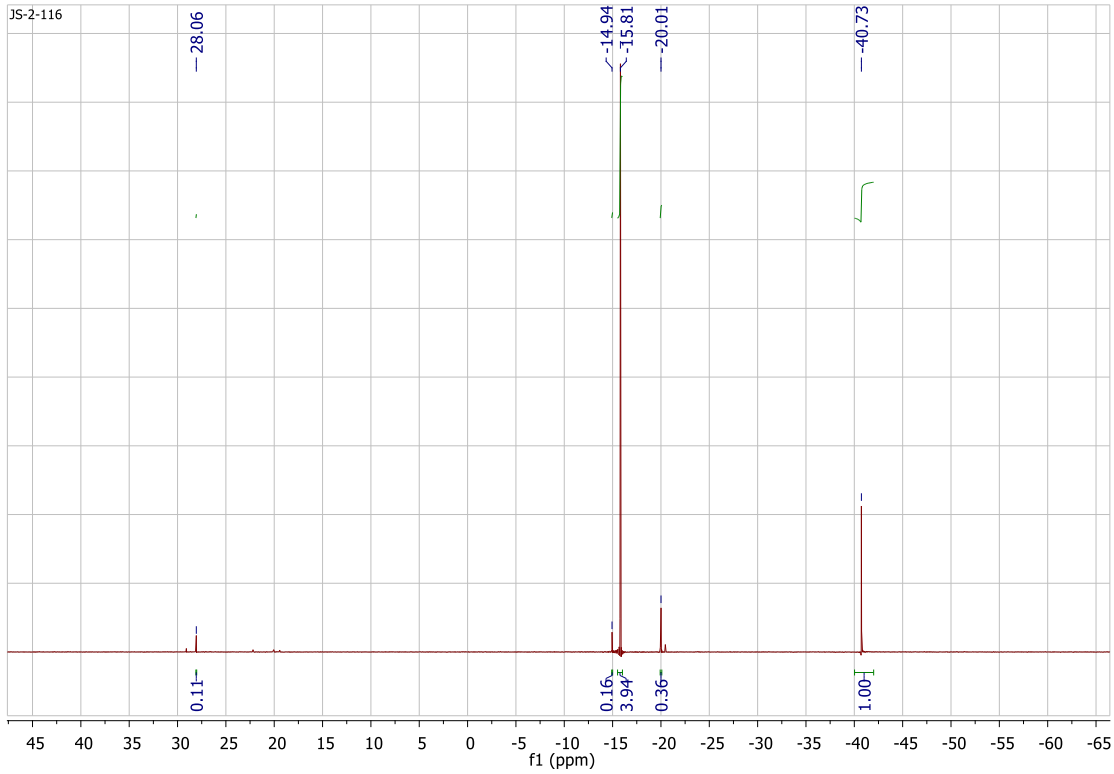

Figure S67: $B(C_6F_5)_3$ + Ph_2PH + ethyl acrylate + N_2 at 100 °C for 18 hours, ^{1}H NMR, final

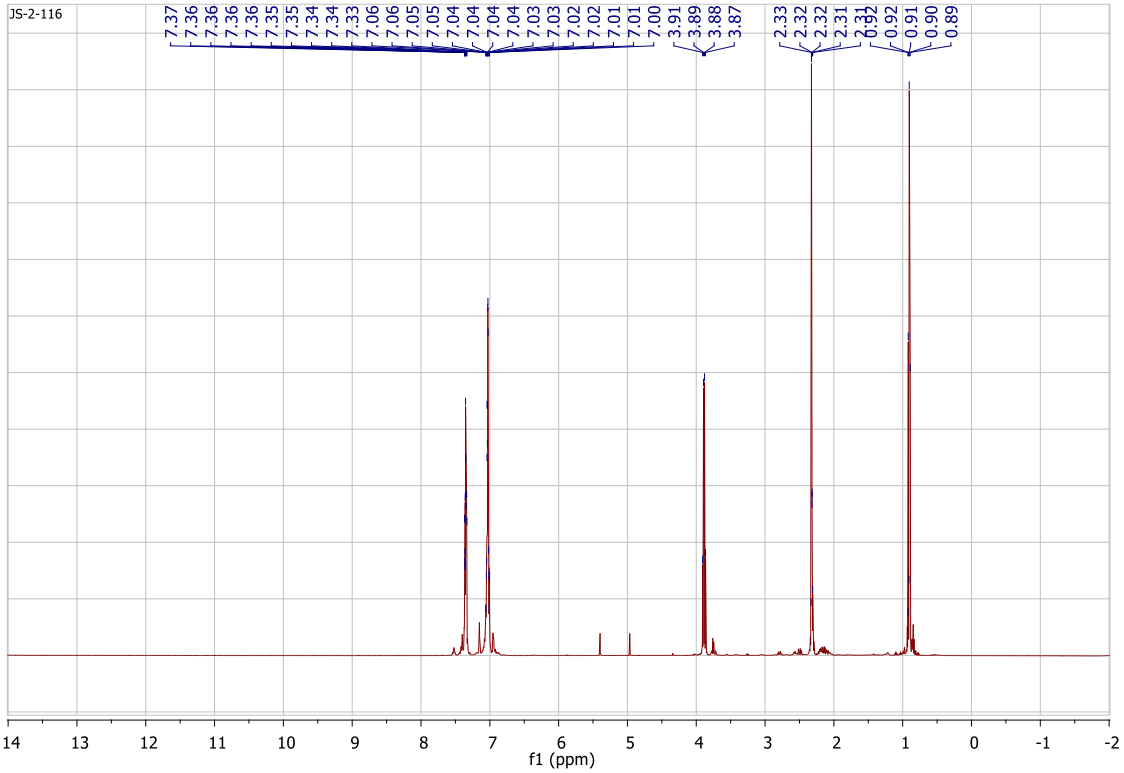

Figure S68: $Cp^*_2SnCl_2$ + Ph_2PH + Ph_2PD + Styrene + H_2, ^{31}P NMR, final

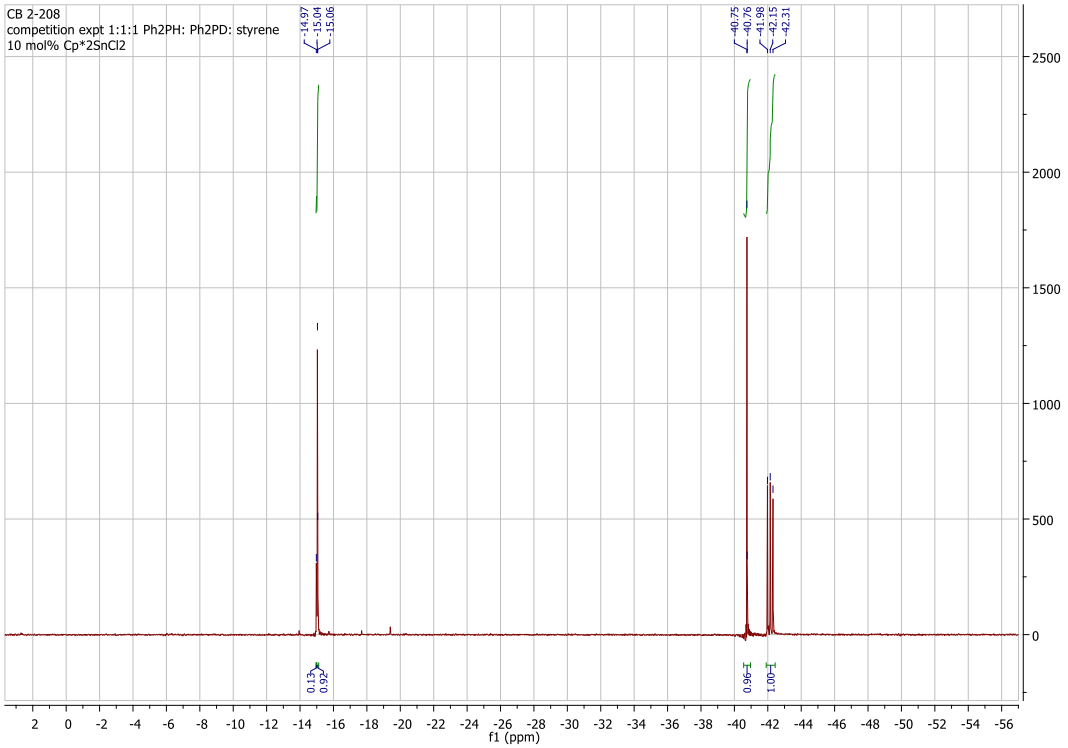

Figure S69: $Cp^*_2SnCl_2$ + Ph_2PH + Ph_2PD + Styrene + H_2, ^{1}H NMR, final

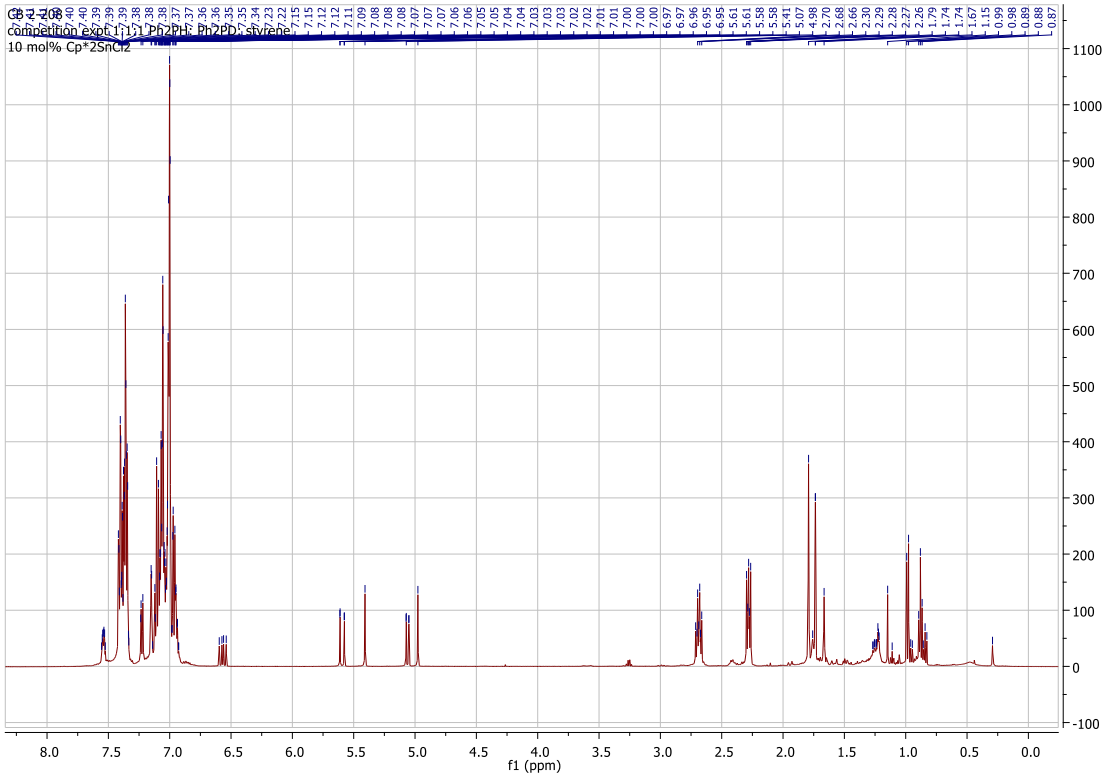

Figure S70: Ph_2PH + styrene + N_2 at 100 °C for 18 hours, ^{31}P NMR, final

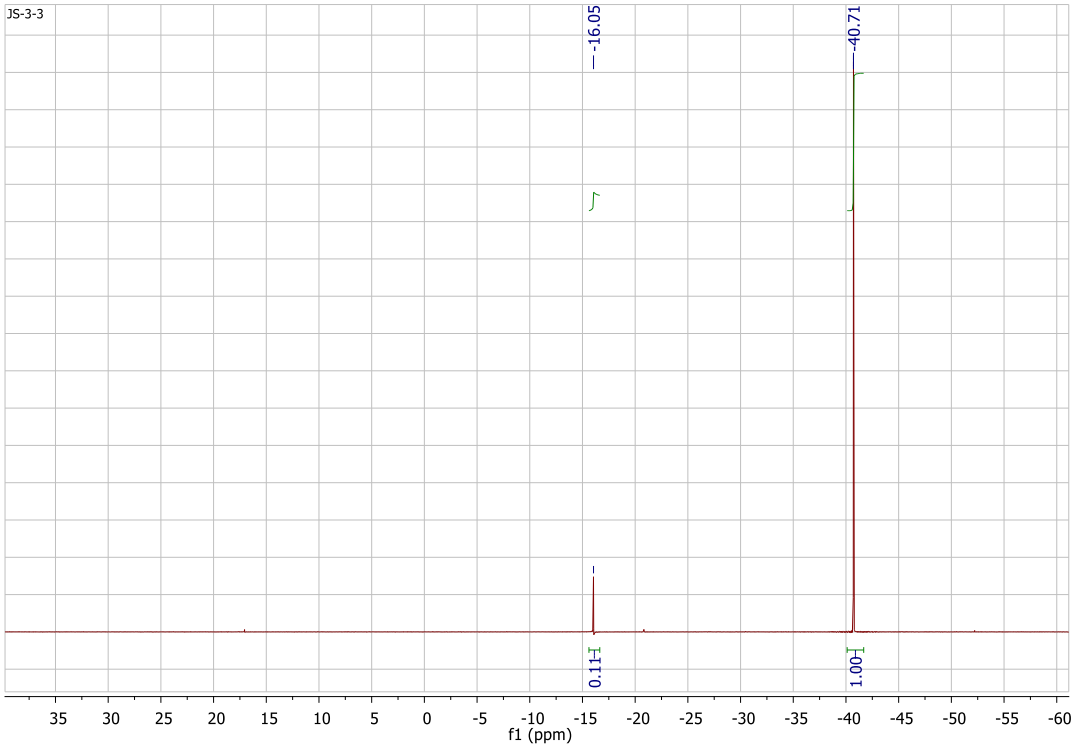

Figure S71: Ph_2PH + styrene + N_2 at 100 °C for 18 hours, ^{1}H NMR, final

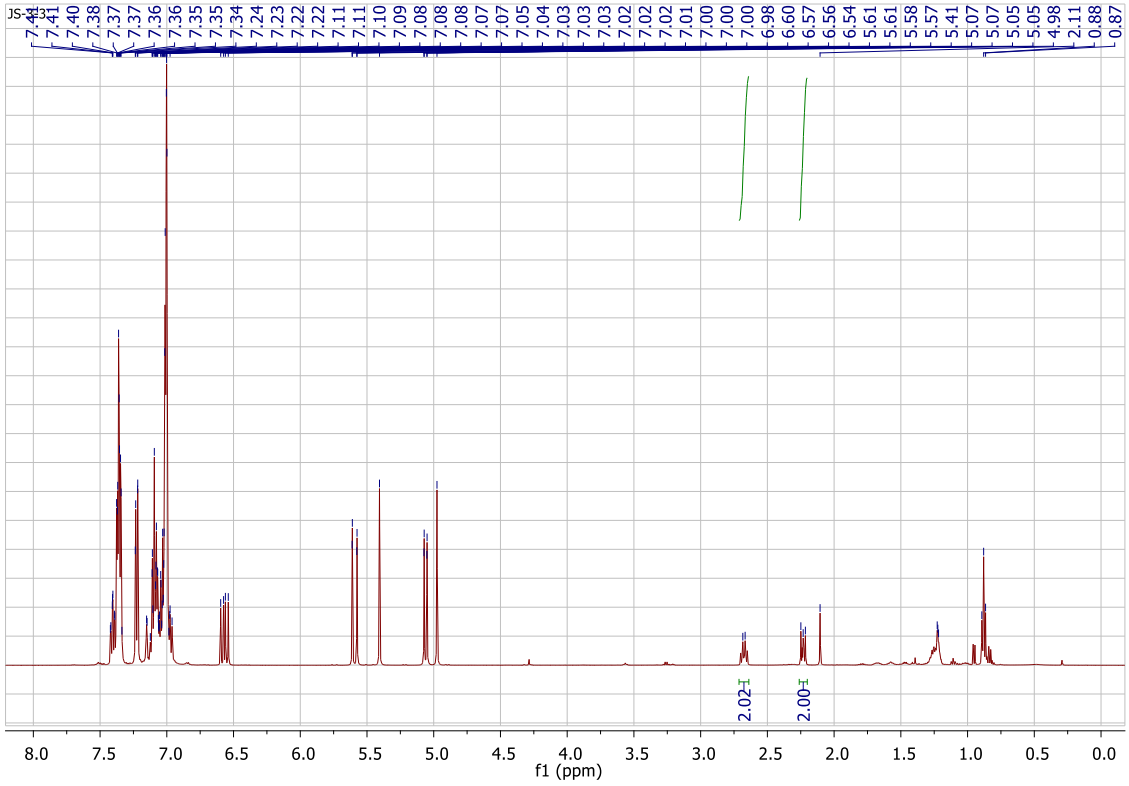

Figure S72: Ph_2PH + 4-bromo styrene + N_2 at 100 °C for 18 hours, ^{31}P NMR, final

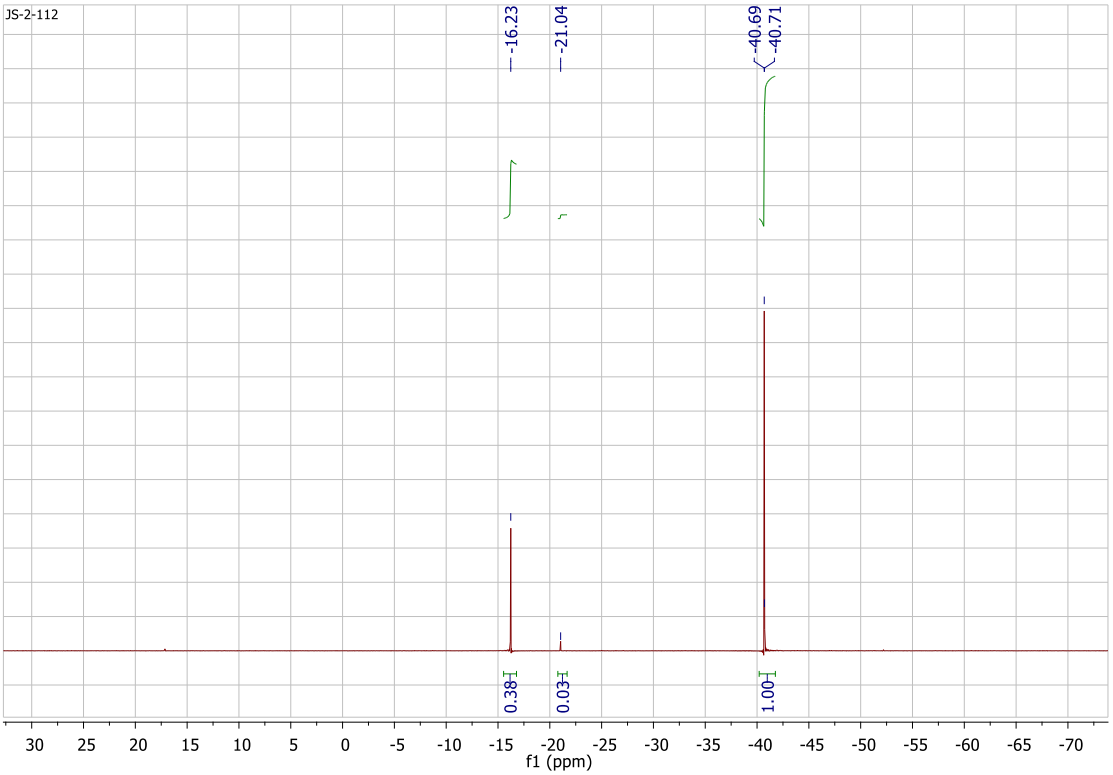

Figure S73: Ph_2PH + 4-Bromo Styrene + N_2 at 100 °C for 18 hours, ^{1}H NMR, final

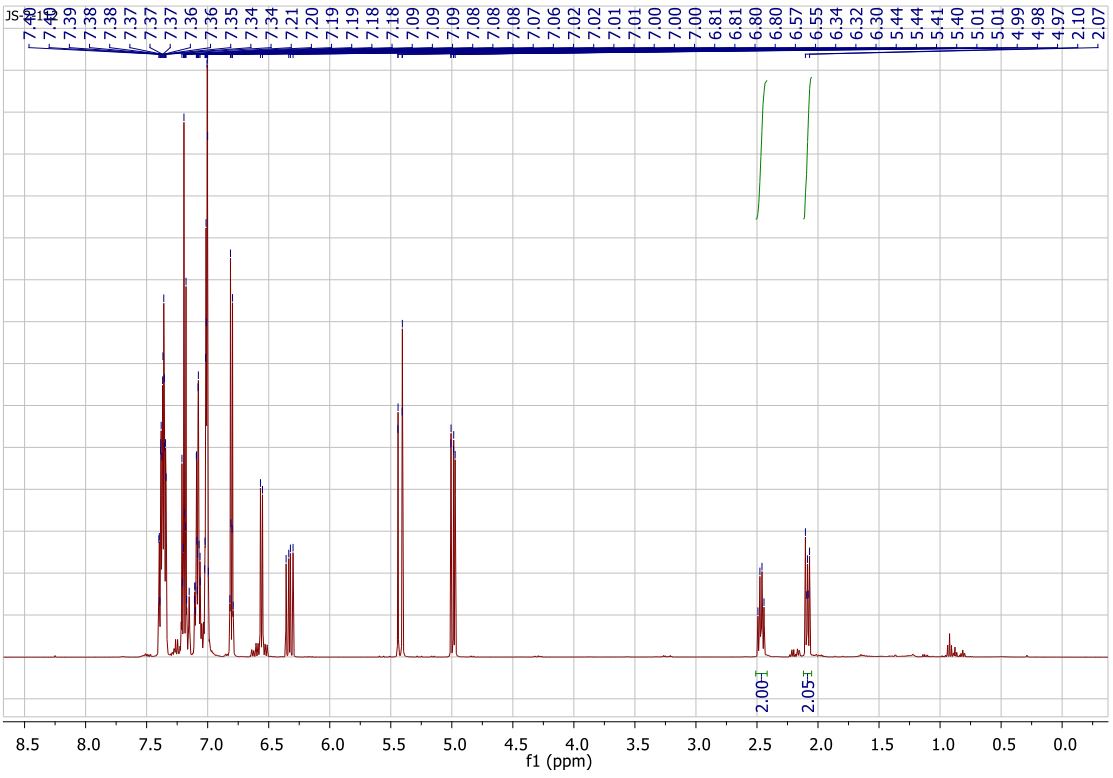

Figure S74: Ph_2PH + 4-methyl styrene + N_2 at 100 °C for 18 hours, ^{31}P NMR, final

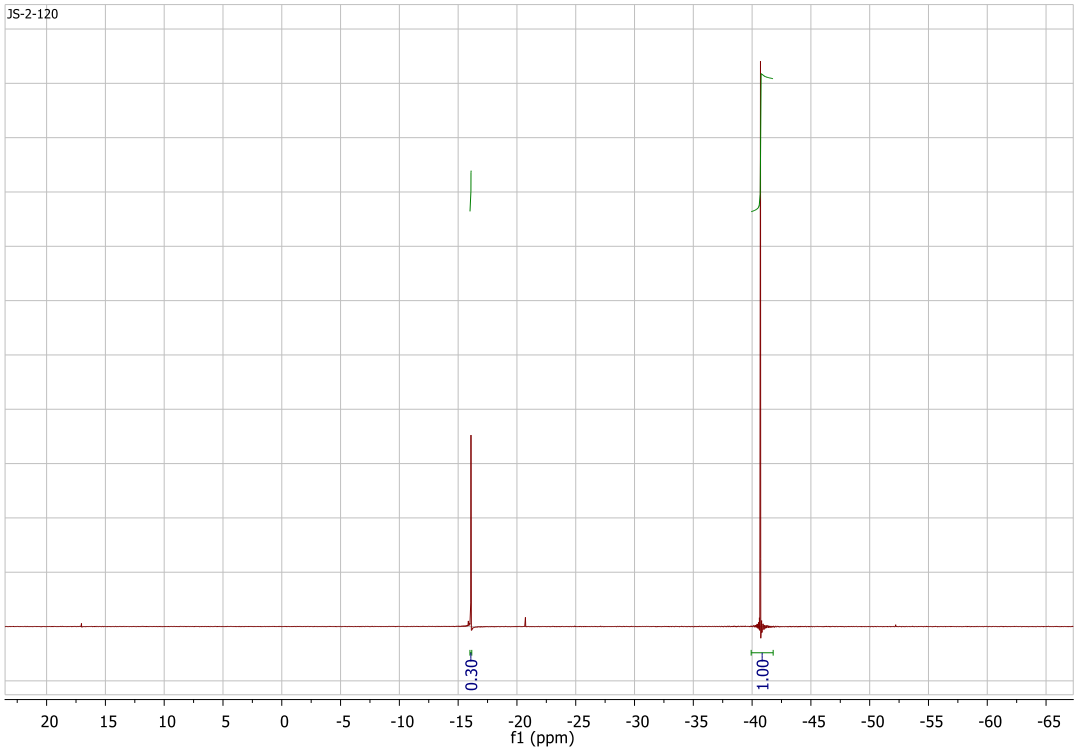

Figure S75: Ph_2PH + 4-methyl styrene + N_2 at 100 °C for 18 hours, ^{1}H NMR, final

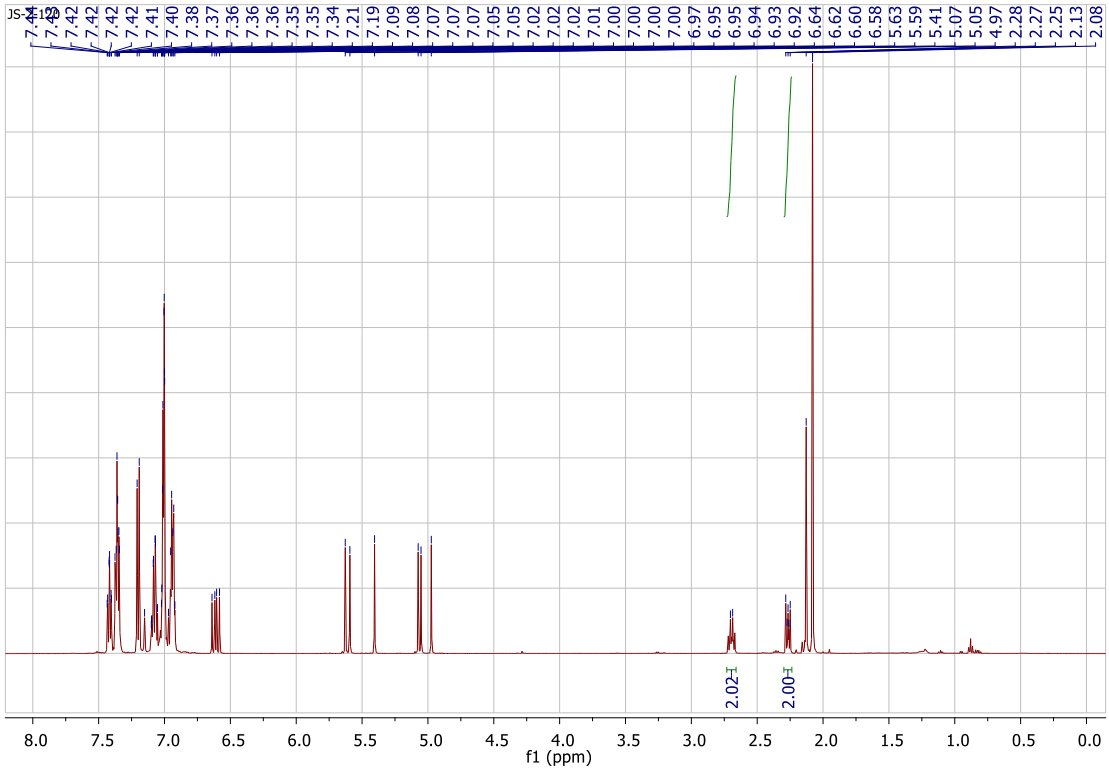

Figure S76: Ph_2PH + 4-trifluromethyl styrene + N_2 at 100 °C for 18 hours, ^{31}P NMR, final

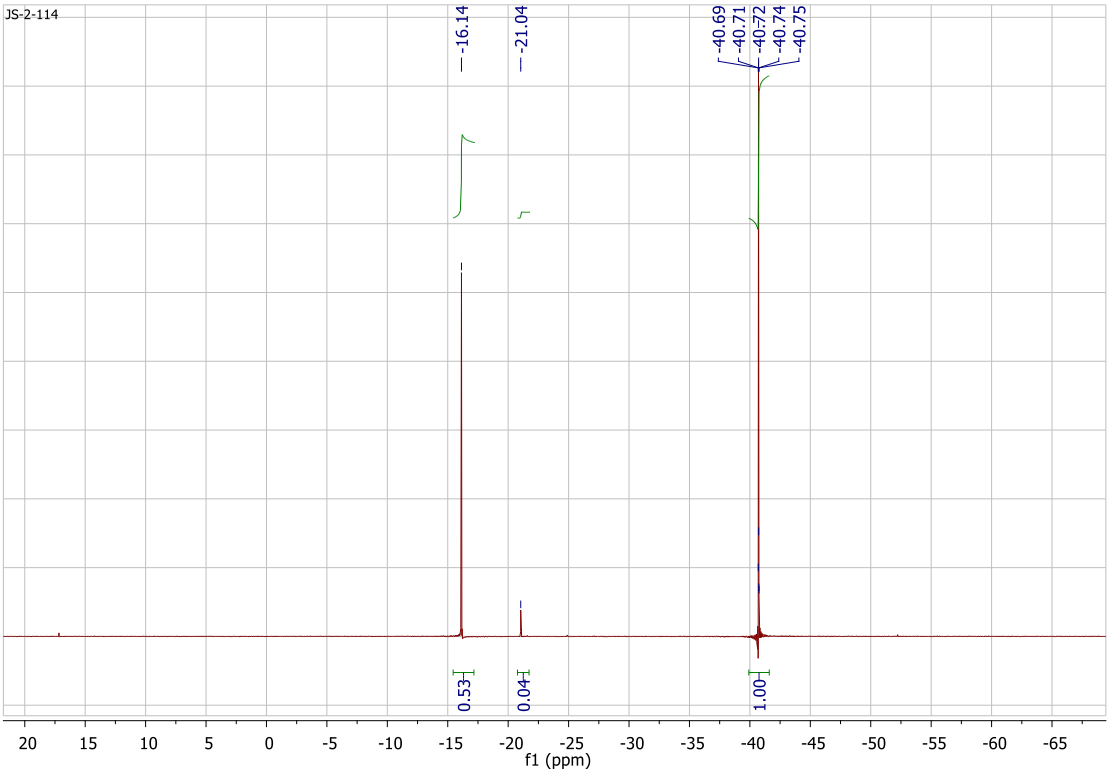

Figure S77: Ph_2PH + 4-trifluromethyl styrene + N_2 at 100 °C for 18 hours, ^{1}H NMR, final

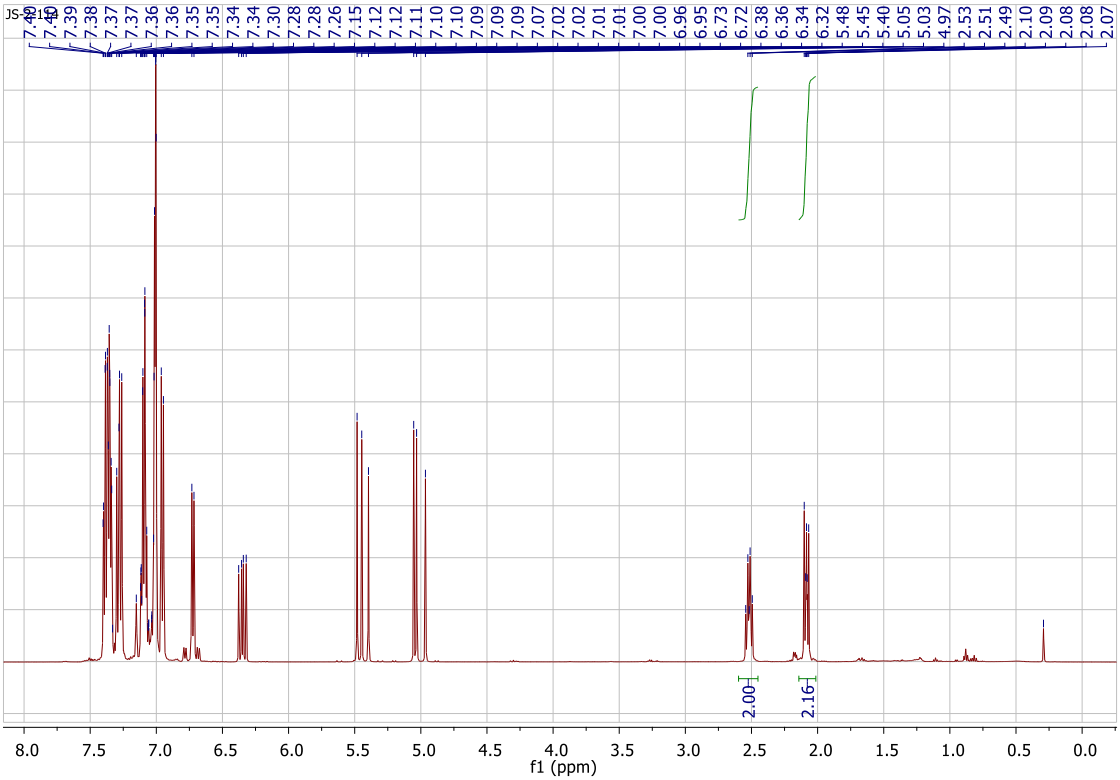

Figure S78: Ph_2PH + acrylonitrile + N_2 at 100 °C for 18 hours, ^{31}P NMR, final

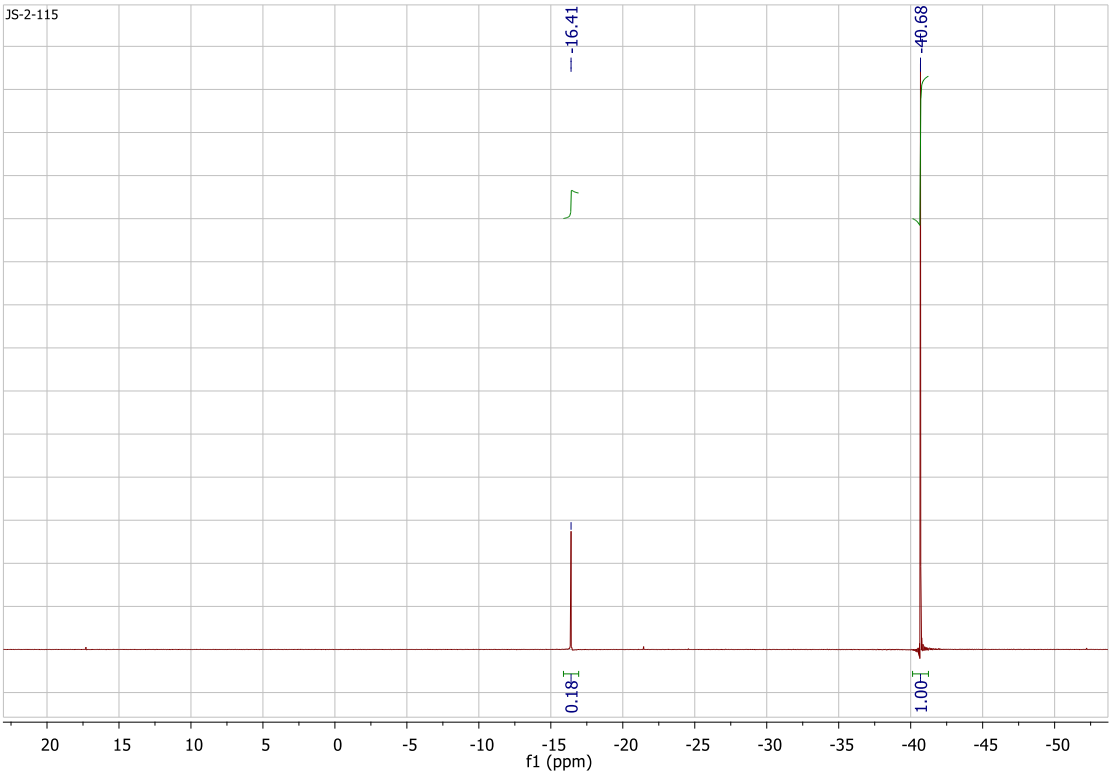

Figure S79: Ph_2PH + acrylonitrile + N_2 at 100 °C for 18 hours, ^{1}H NMR, final

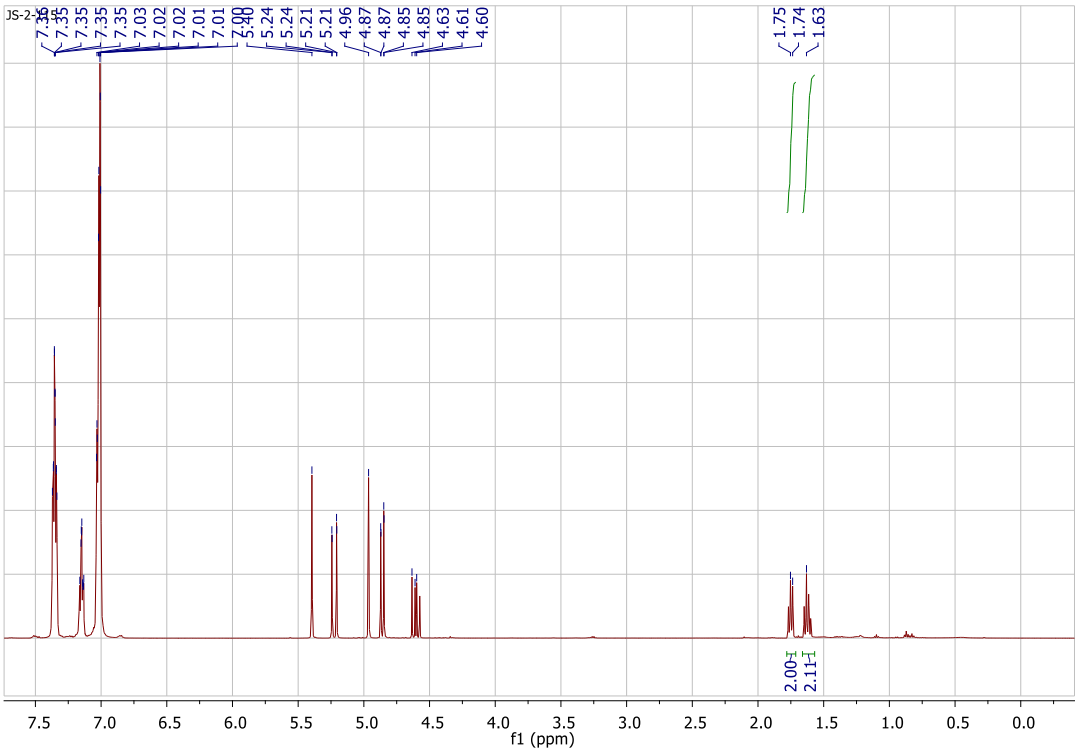

Figure S80: Ph_2PH + 2-vinyl pyridine + N_2 at 100 °C for 18 hours, ^{31}P NMR, final

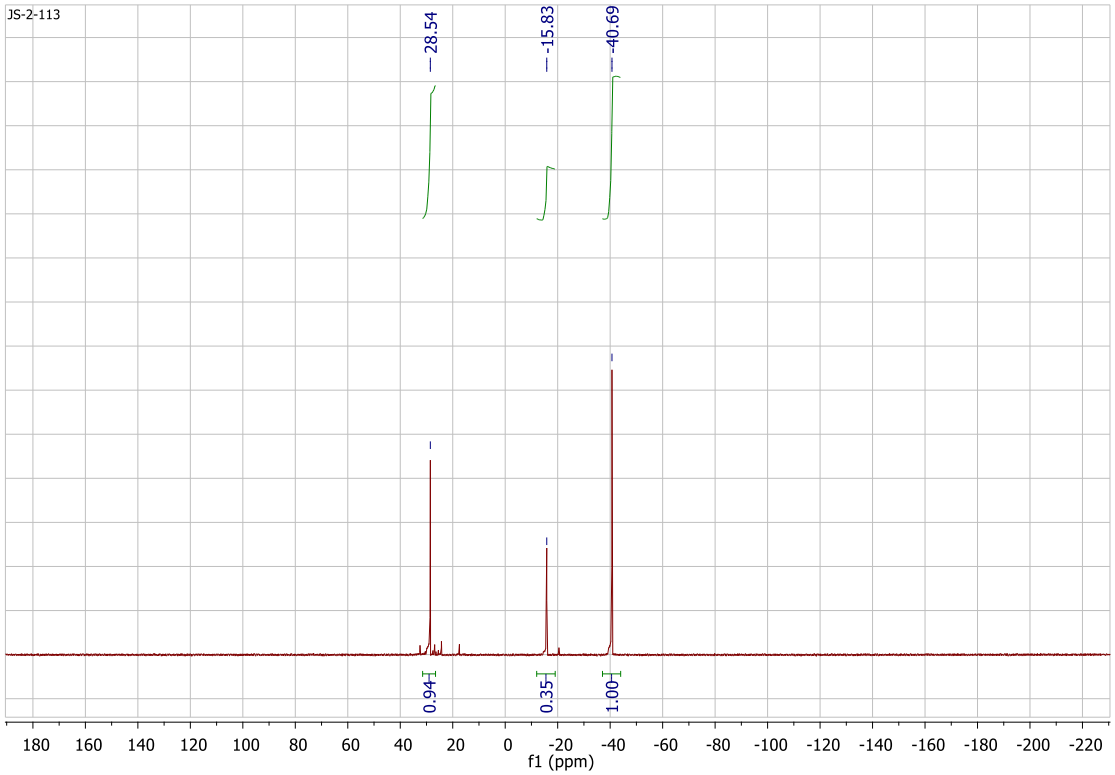

Figure S81: Ph_2PH + 2-vinyl pyridine + N_2 at 100 °C for 18 hours, ^{1}H NMR, final

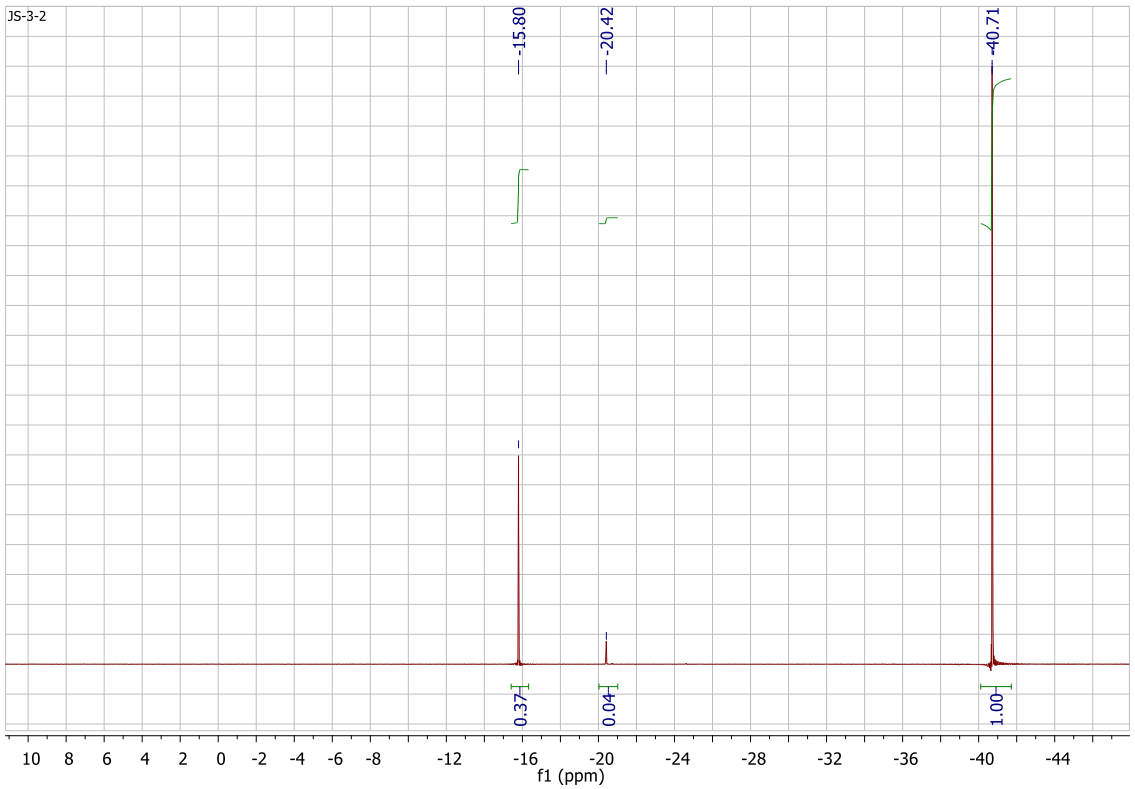

Figure S82: Ph_2PH + vinyl ethyl ether + N_2 at 100 °C for 18 hours, ^{31}P NMR, final

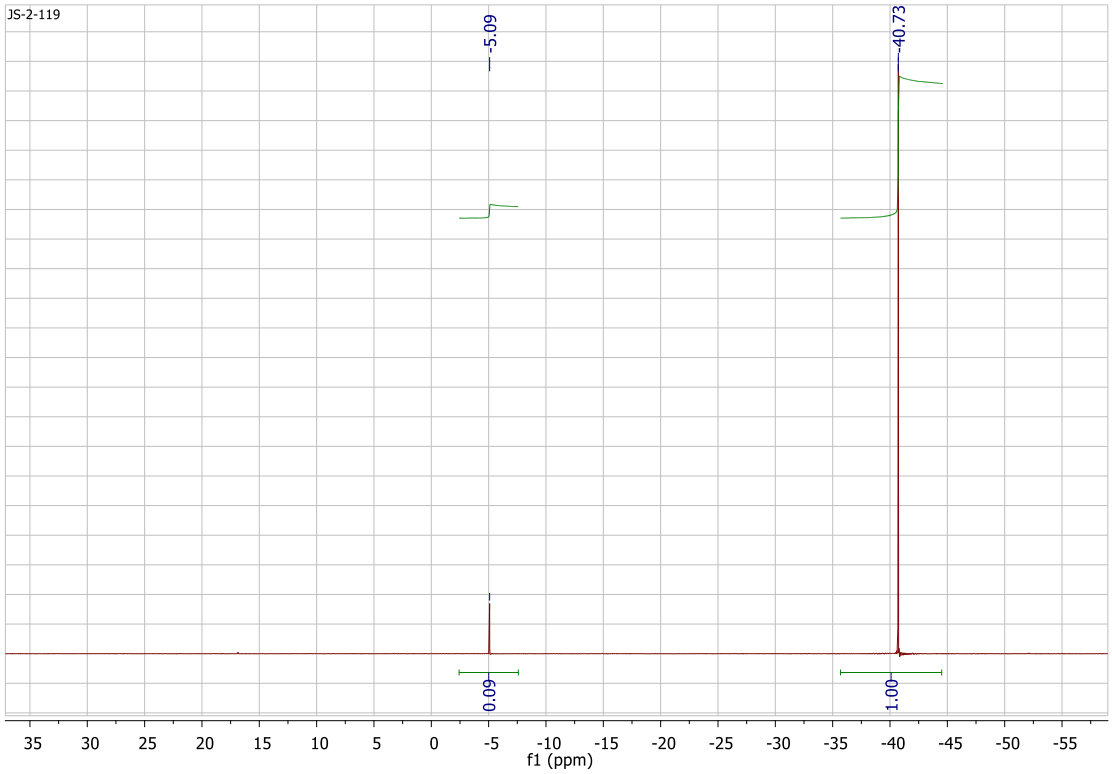

Figure S83: Ph_2PH + vinyl ethyl ether + N_2 at 100 °C for 18 hours, ^{1}H NMR, final

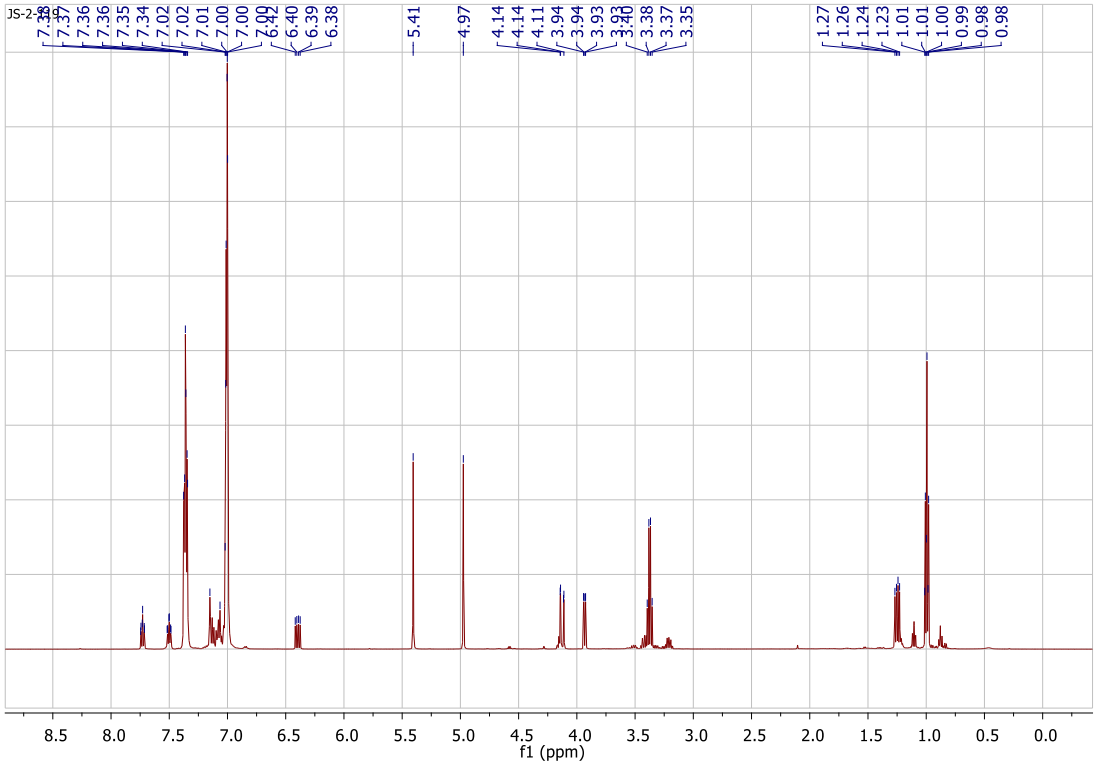

Figure S84: Ph_2PH + ethyl acrylate + N_2 at 100 °C for 18 hours, ^{31}P NMR, final

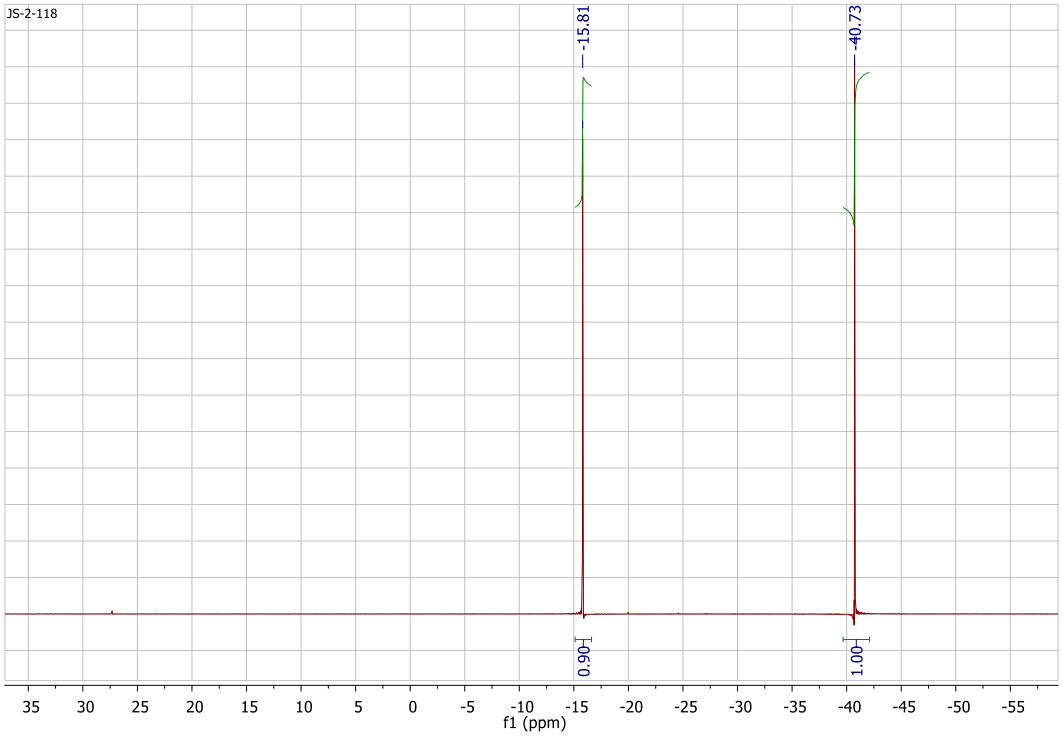

Figure S85: Ph_2PH + ethyl acrylate + N_2 at 100 °C for 18 hours, ^{1}H NMR,