Supporting information for: Activation of gaseous PH_3 with low coordinate diaryltetrylenes

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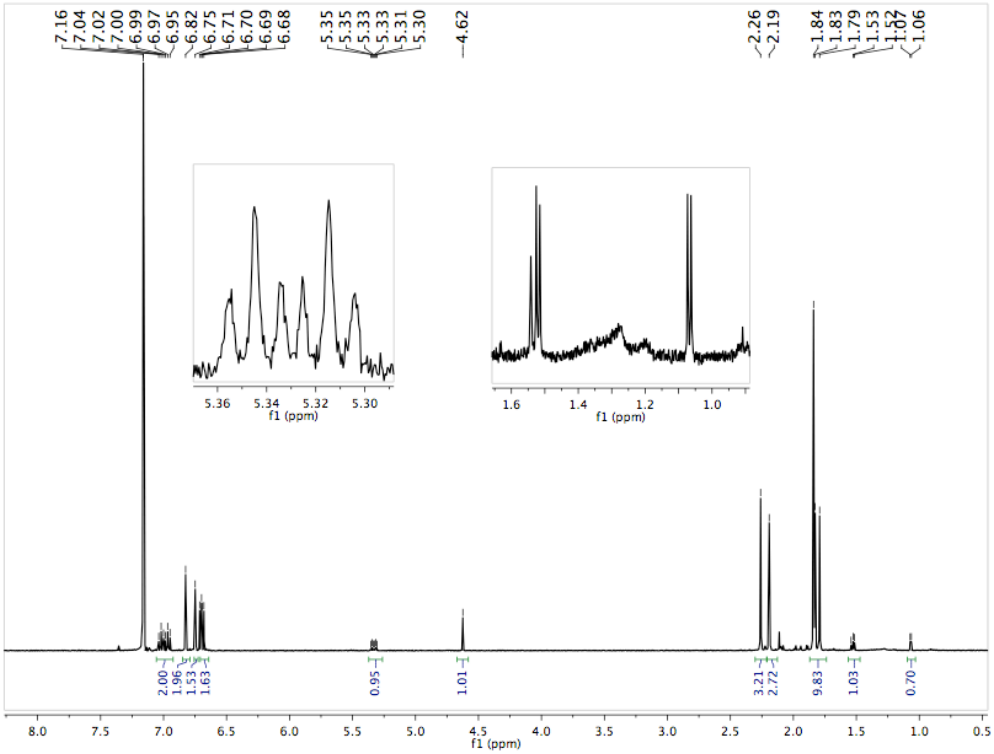

Figure S-1: Proton NMR spectrum of compound **1** showing the presence of the $GeAr_2H_2$ impurity (δ_H = 4.62 GeH_2; 25% relative to **1**). Insets show the hydride signals of **1**.

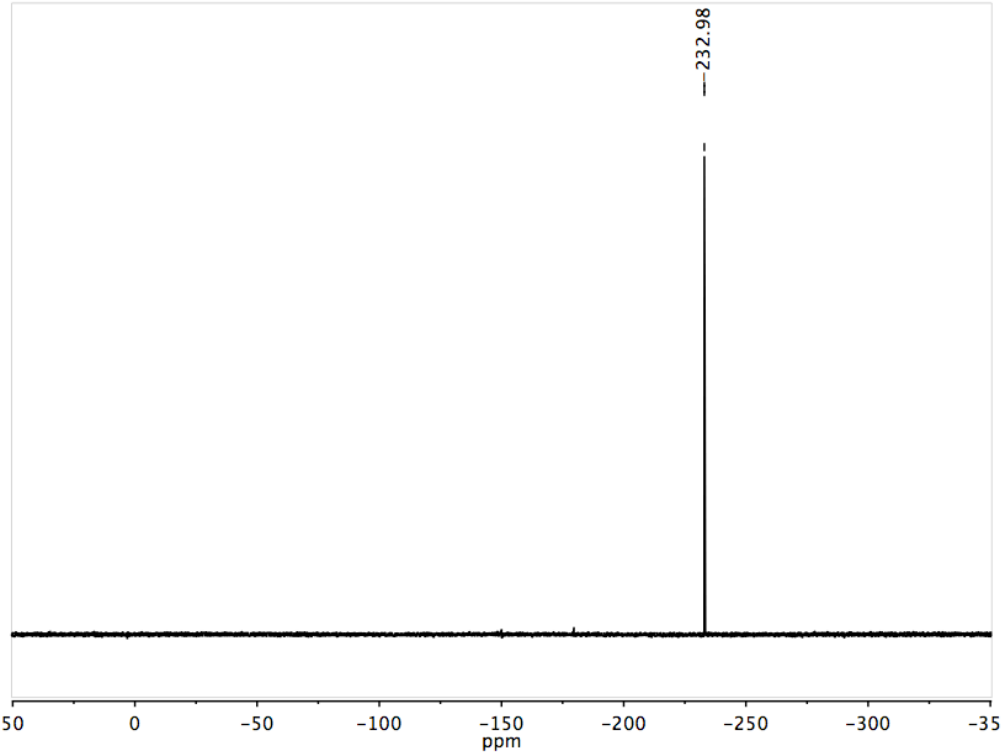

Figure S-2: Phosphorus-31 NMR spectrum of compound **1**

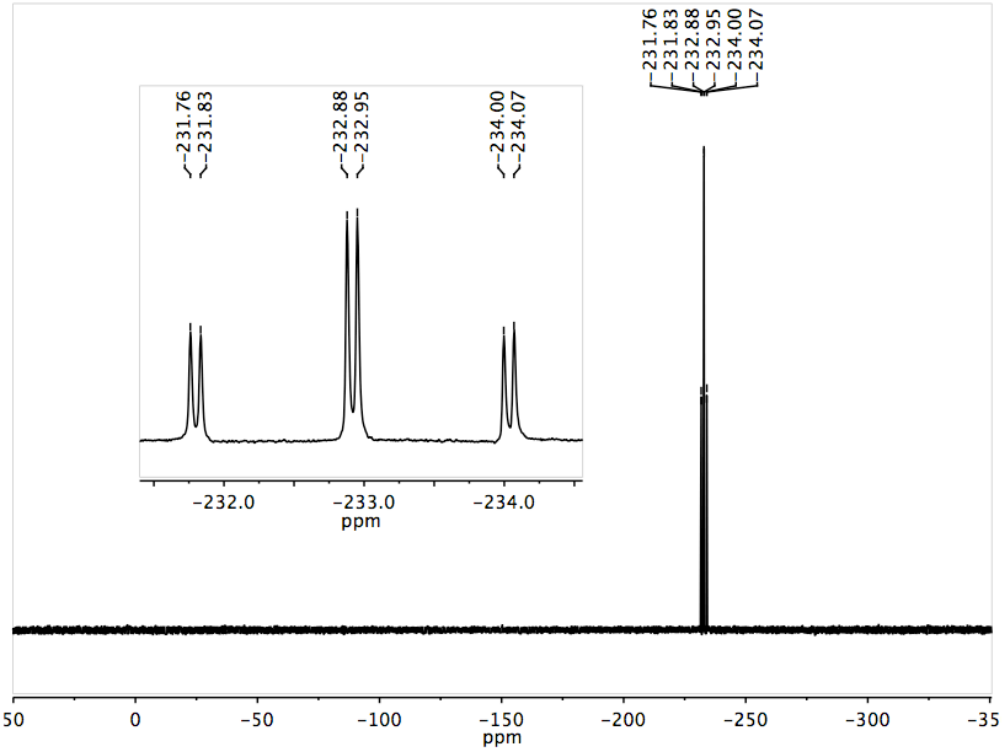

Figure S-3: Proton coupled phosphorus-31 NMR spectrum of compound **1**

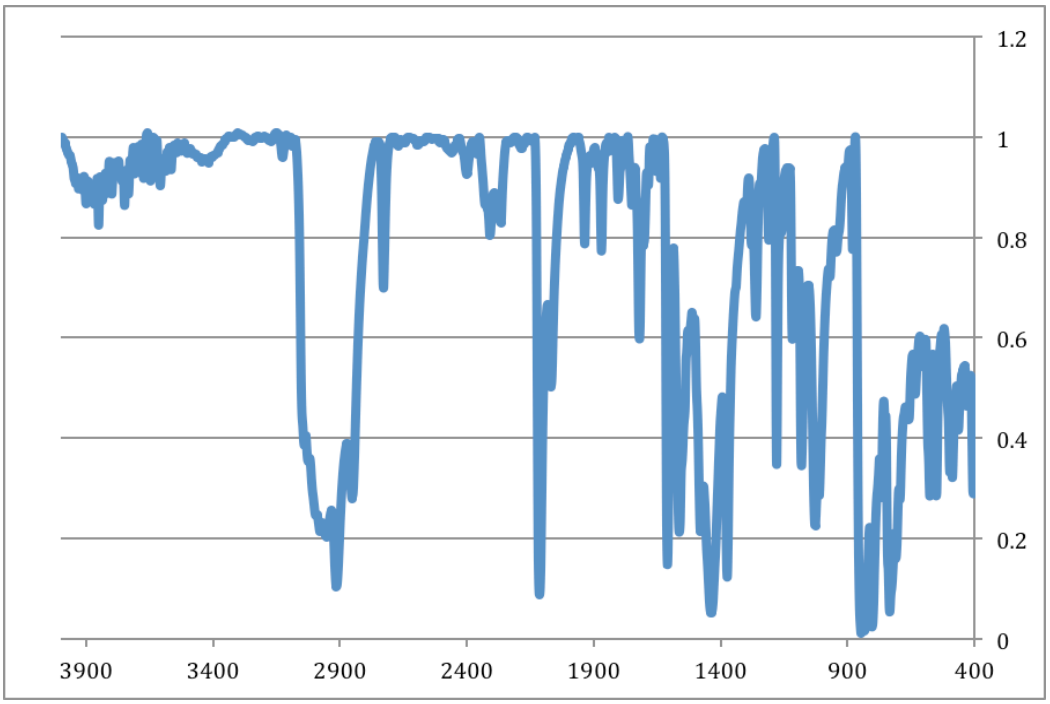

Figure S-4: FT-IR spectrum of compound **1** showing the presence of the $GeAr_2H_2$ impurity (ν = 2115 cm^{-1})

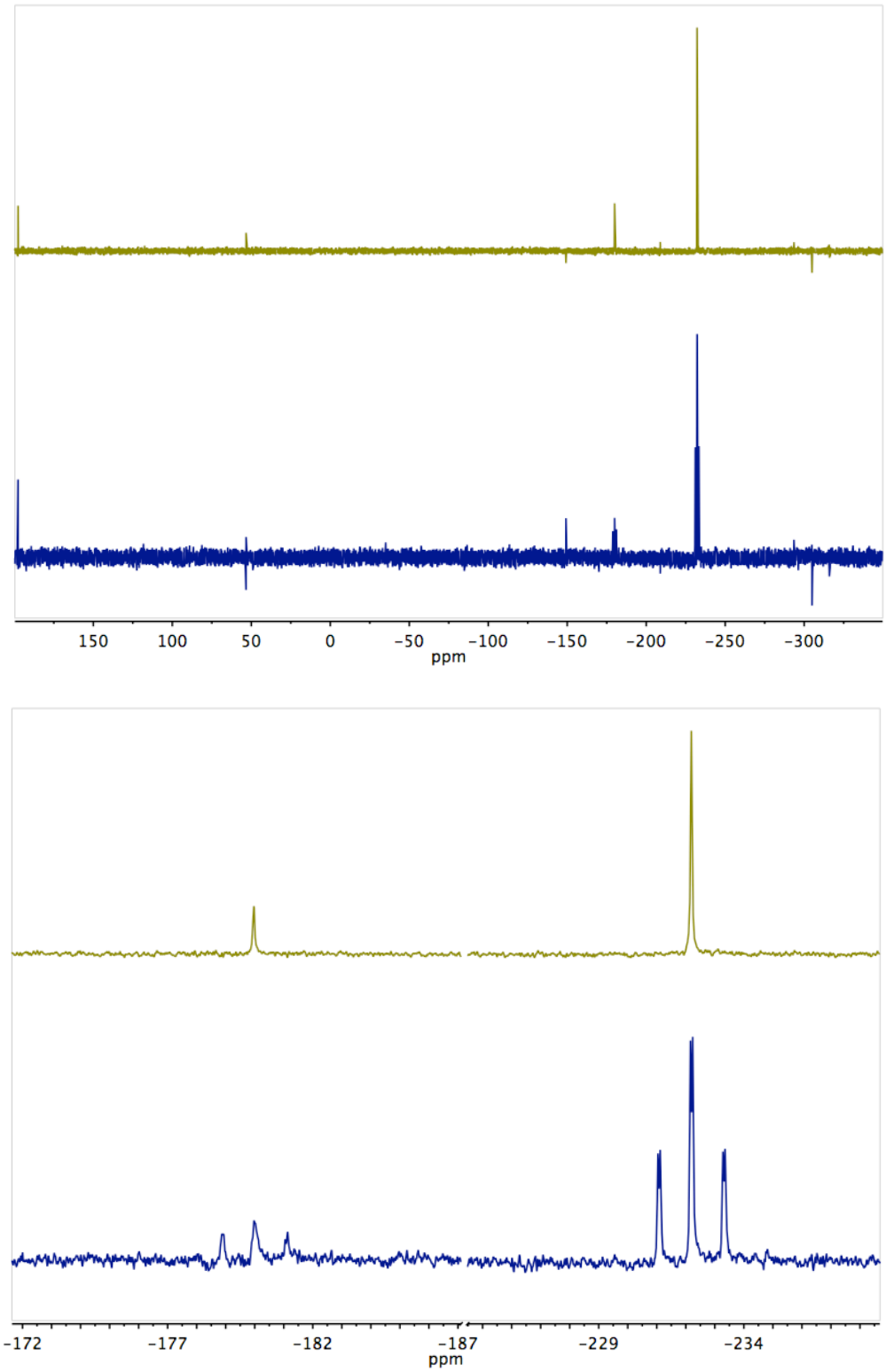

Figure S-5: Full and zoomed stack plots of the Phosphorus-31 NMR spectra (top: proton decoupled, bottom: proton coupled) of the crude reaction mixture of $GeAr_2$ and phosphine.

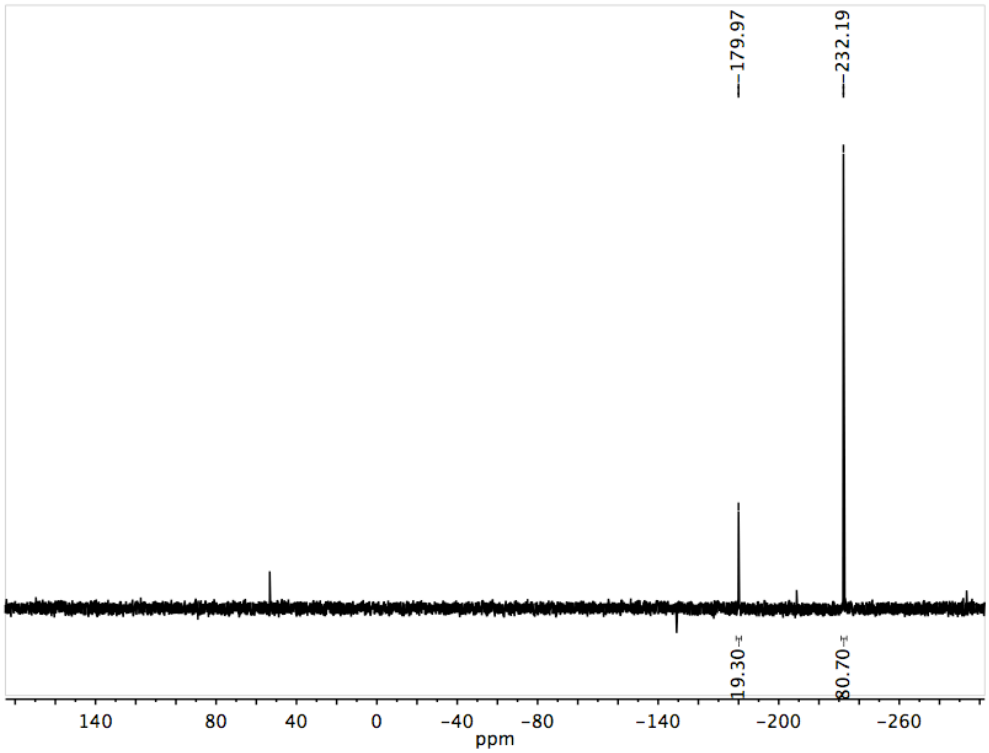

Figure S-6: Phosphorus-31 NMR spectrum of the redissolved solids from the crude reaction mixture of $GeAr_2$ and phosphine showing the ratio of the products.

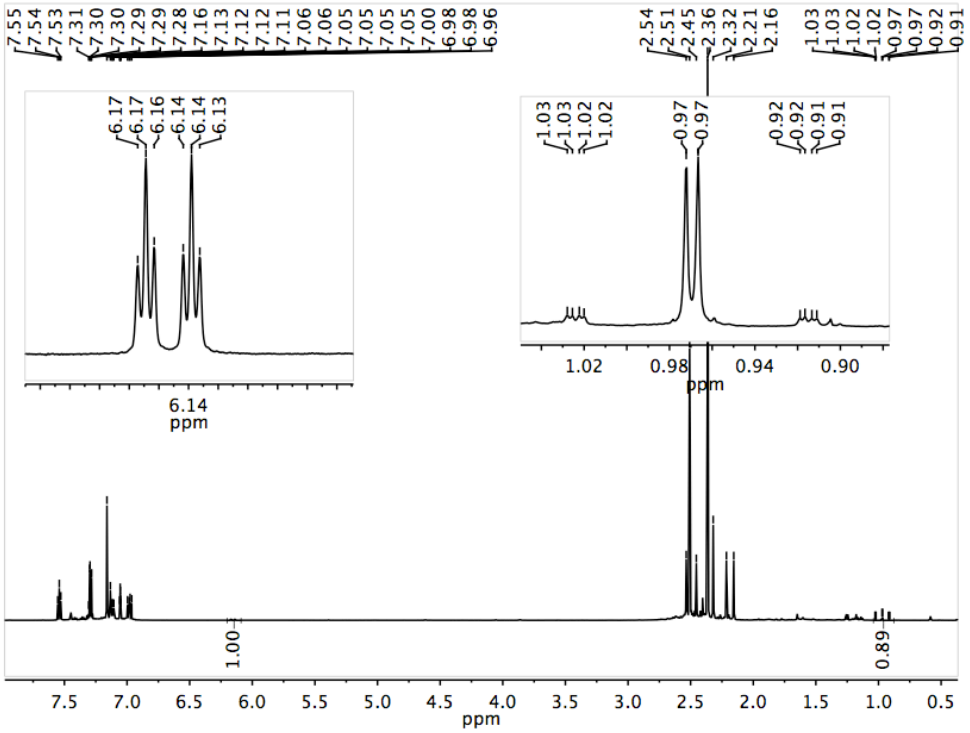

Figure S-7: Proton NMR spectrum of the crude solids containing both compound **3** and **4** after attempted separation. Insets show hydride signals attributable to compound **3**.

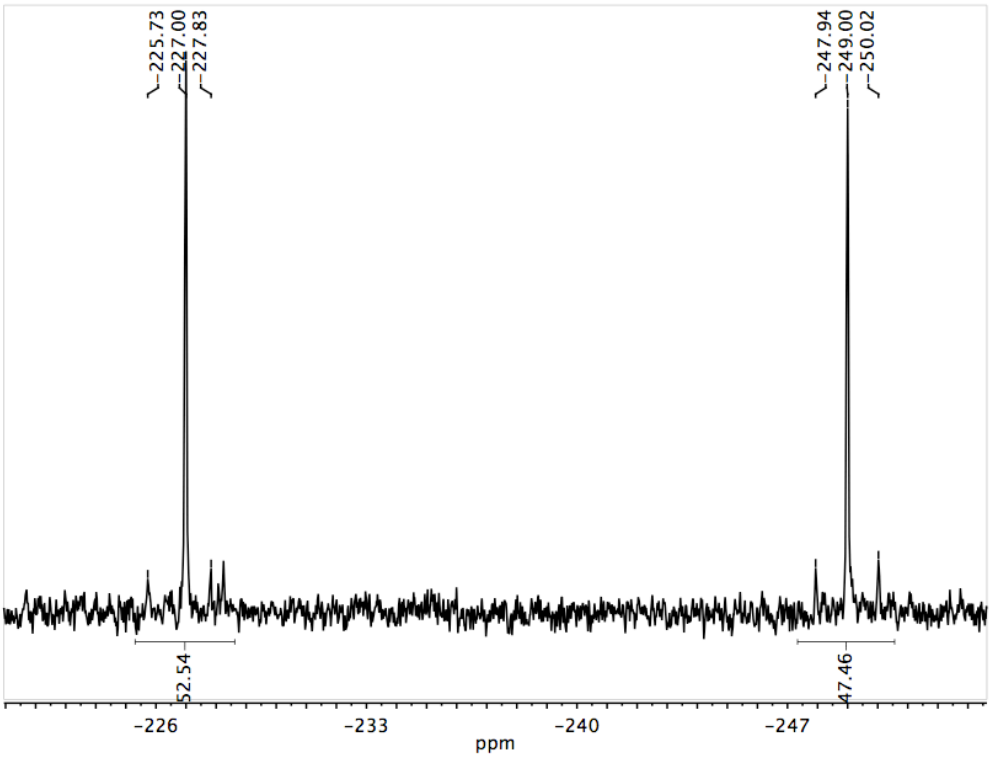

Figure S-8: Phosphorus-31 NMR spectrum of the solids obtained after attempted separation of **3** and **4** from crude reaction mixture of $SnAr_2$ and phosphine.

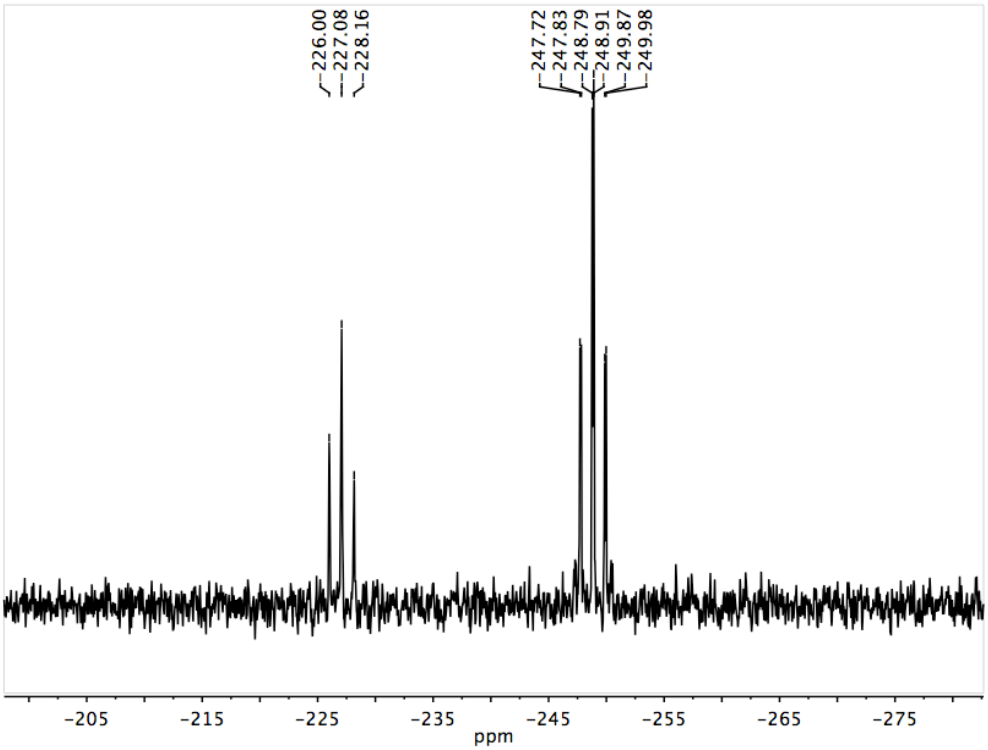

Figure S-9: Proton coupled phosphorus-31 NMR spectrum of the solids obtained after attempted separation of **3** and **4** from crude reaction mixture of $SnAr_2$ and phosphine.

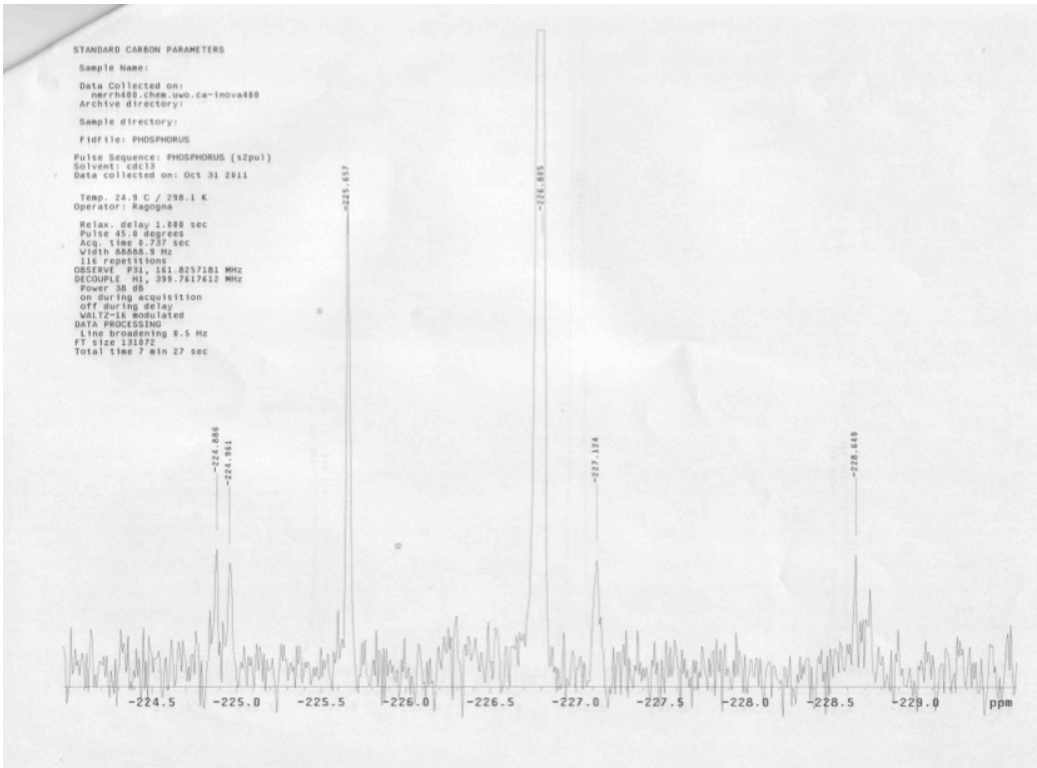

Figure S-10: Phosphorus-31 NMR spectrum focused on the signal attributed to compound **4** highlighting the tin-117 and tin-119 satellites

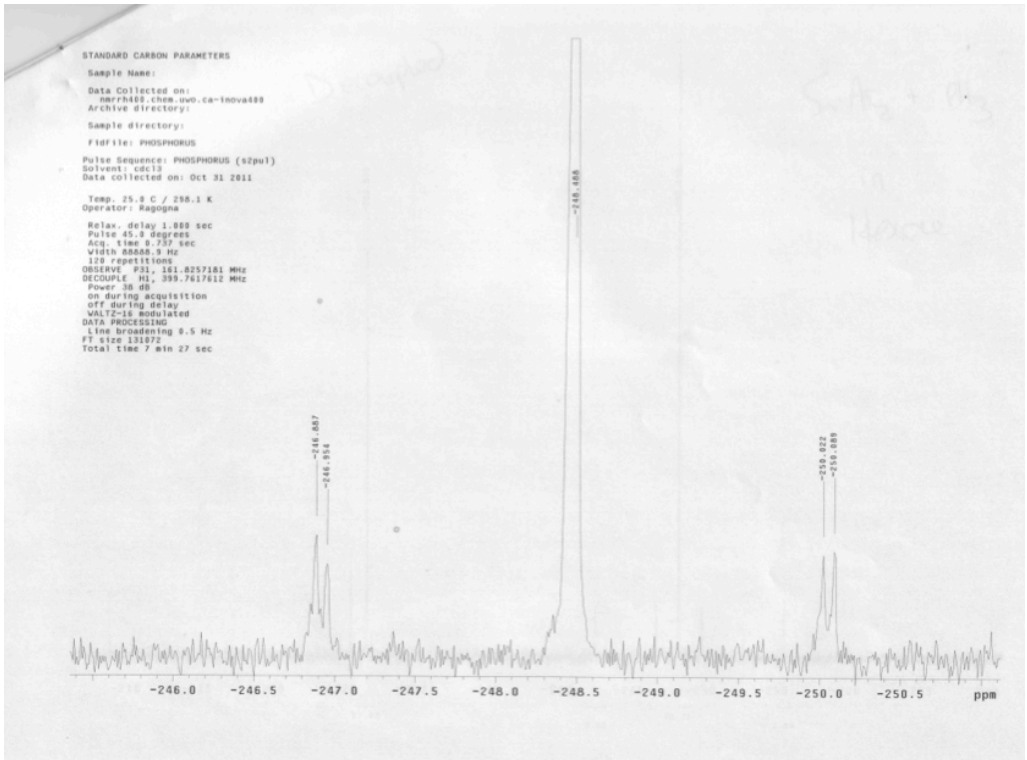

Figure S-11: Phosphorus-31 NMR spectrum focused on the signal attributed to compound **3** highlighting the tin-117 and tin-119 satellites

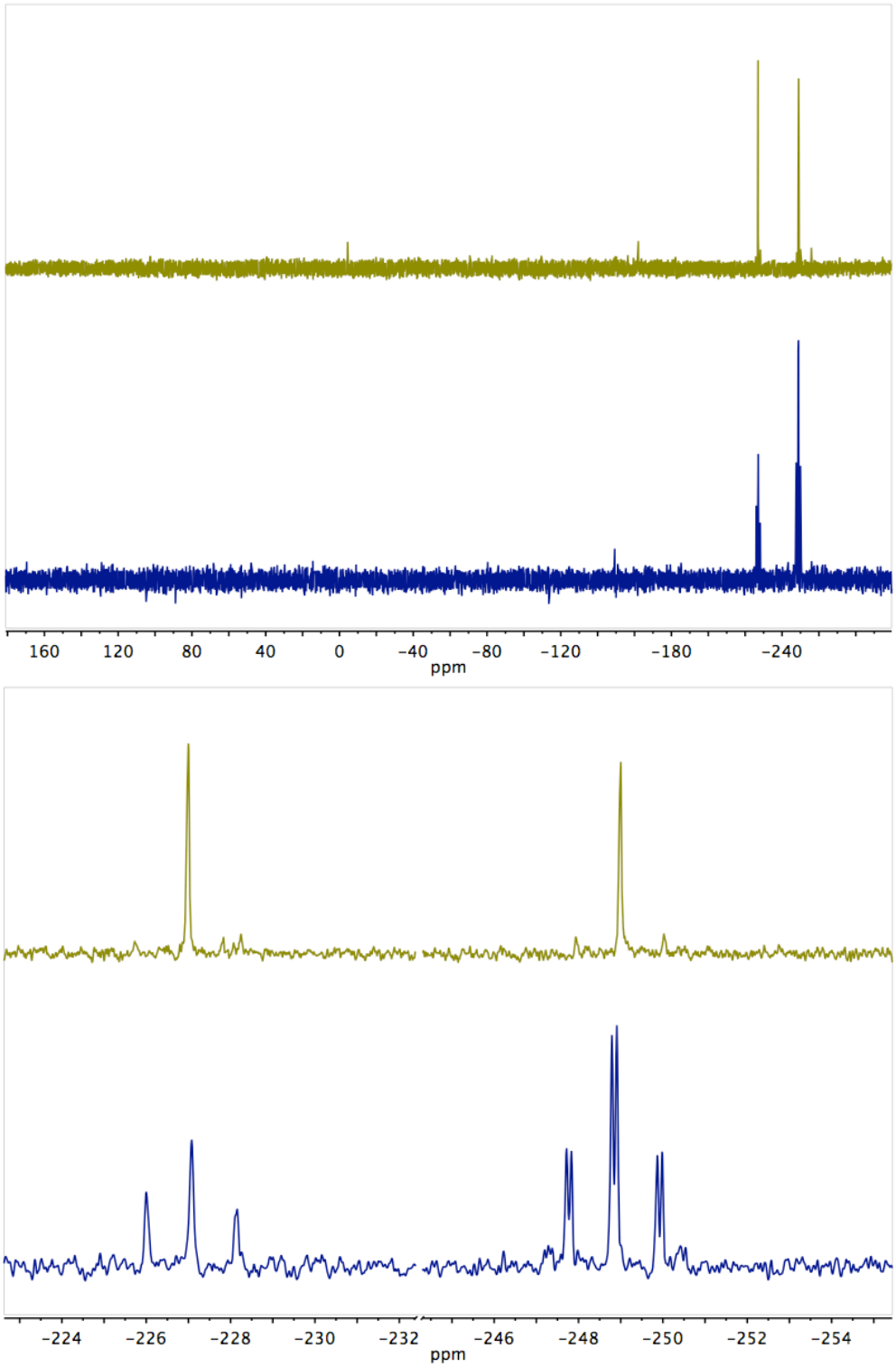

Figure S-12: Full and zoomed stack plots of the Phosphorus-31 NMR spectra (top: proton decoupled, bottom: proton coupled) of the solids obtained after attempted separation of **3** and **4** from the crude reaction mixture of $SnAr_2$ and phosphine.

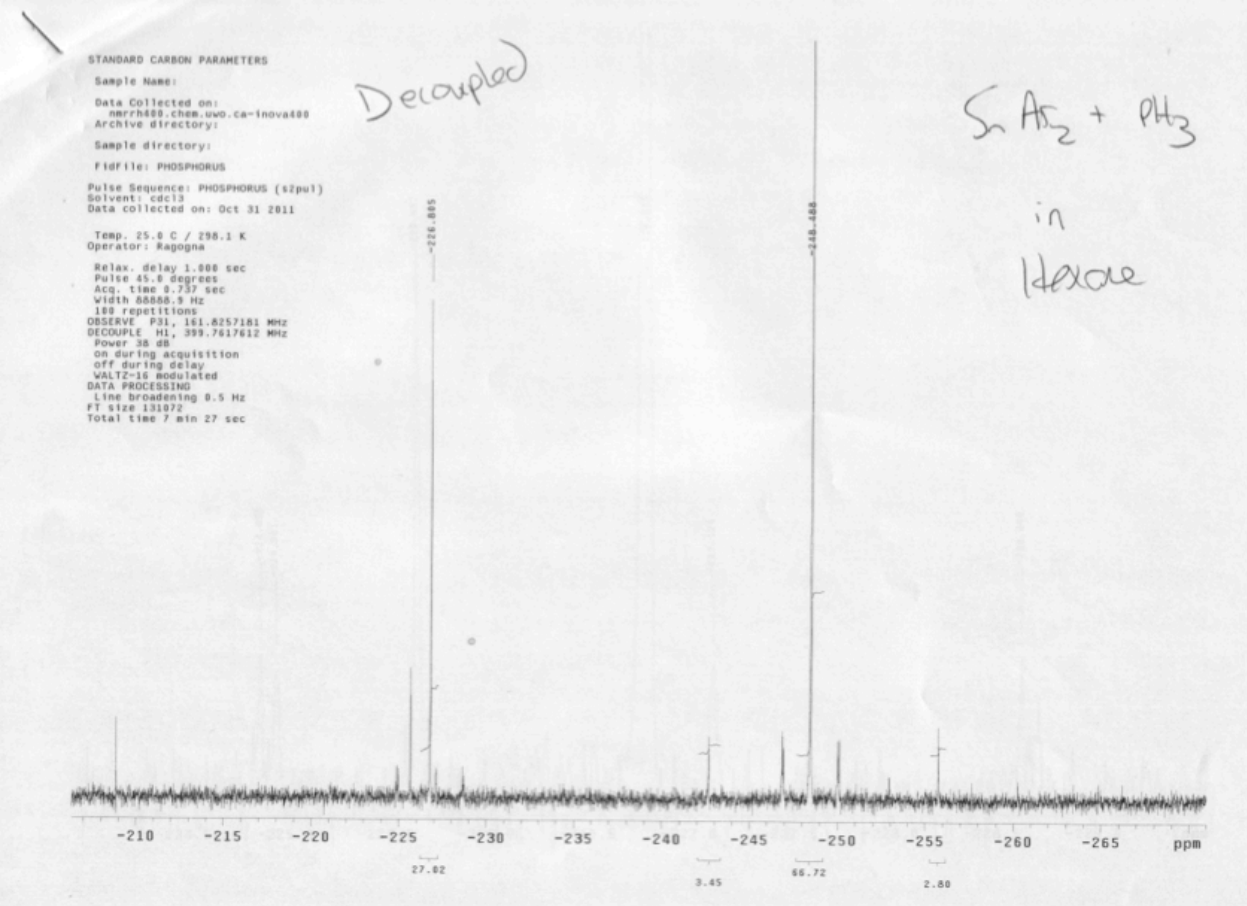

Figure S-13: Phosphorus-31 NMR spectrum of the redissolved solids from the crude reaction mixture of $SnAr_2$ and phosphine showing the ratio of the products.

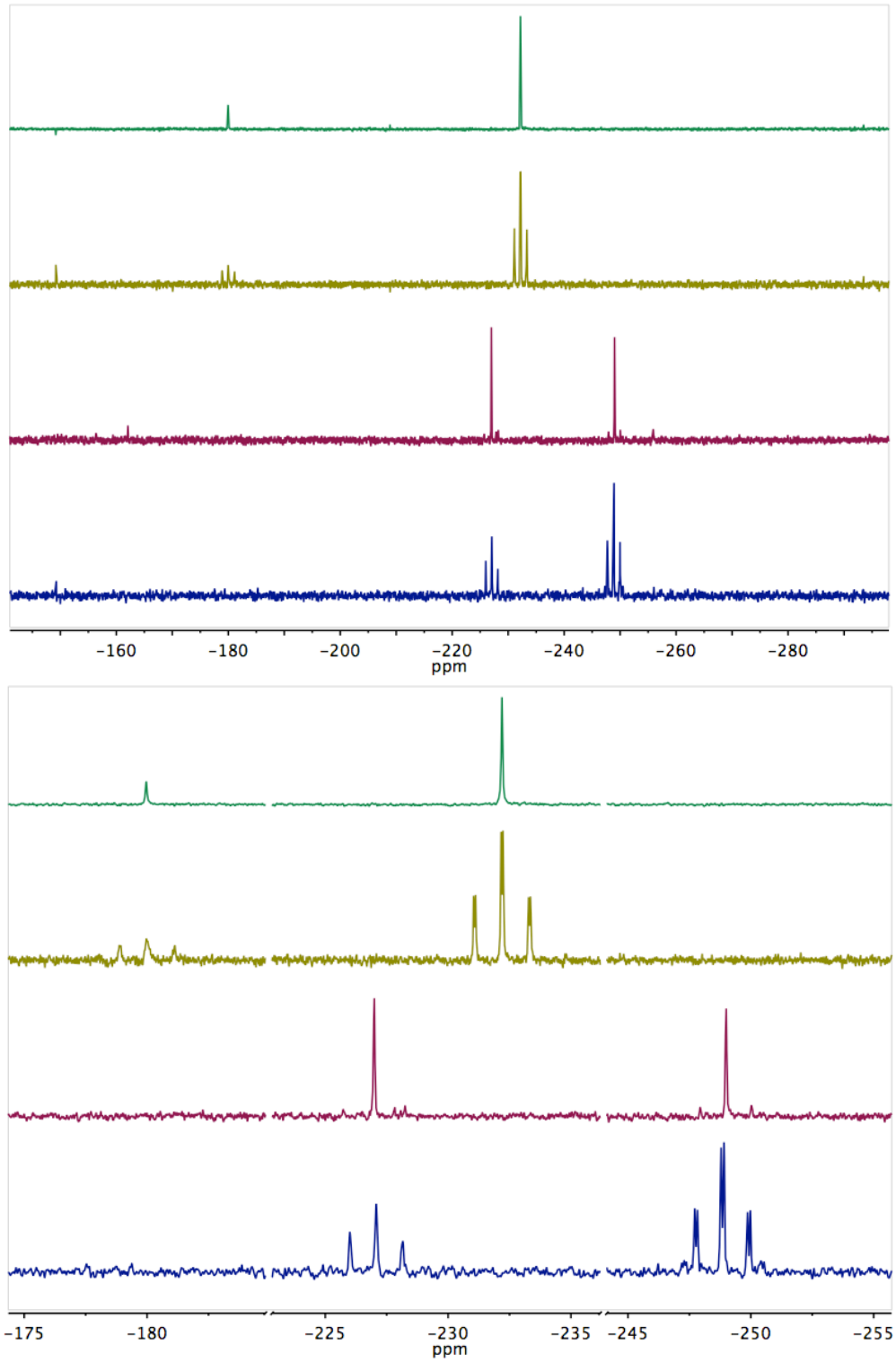

Figure S-14: Full and zoomed stack plots of the Phosphorus-31 NMR spectra (top: proton decoupled, bottom: proton coupled) of the crude reaction mixture of $GeAr_2$ (top two spectra) and $SnAr_2$ (bottom two spectra) with phosphine.

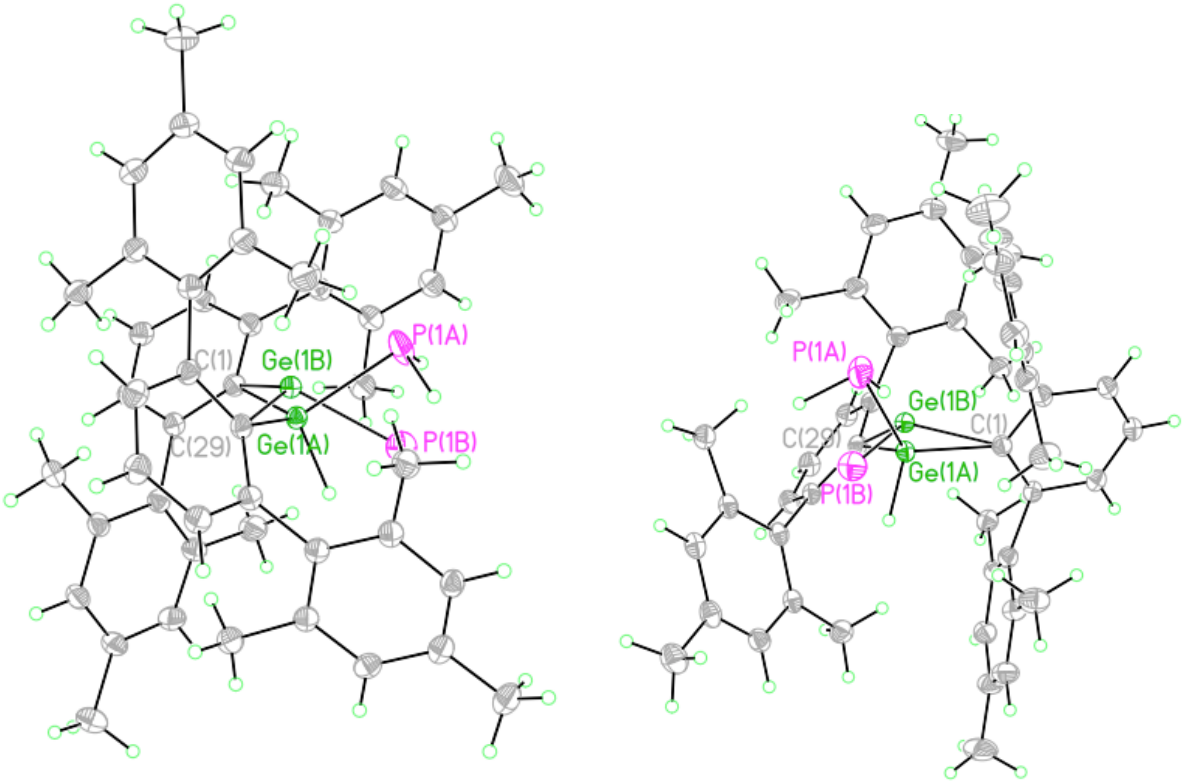

Figure S-15: ORTEP diagrams of the solids-state structure of **1** highlighting the disorder of the germanium and phosphorus atoms (91:9 A:B occupancy ratio). Ellipsoids are drawn to 50% probability and all hydrogen atoms are shown.