

# UC Davis

## UC Davis Previously Published Works

### Title

Correction to “Synthesis, Structure, and Spectroscopy of the Biscarboranyl Stannylenes (bc)Sn·THF and K<sub>2</sub>[(bc)Sn]<sub>2</sub> (bc = 1,1′(ortho-Biscarborane)) and Dibiscarboranyl Ethene (bc)CH = CH(bc)”

### Permalink

<https://escholarship.org/uc/item/4mg7p682>

### Journal

Organometallics, 42(16)

### ISSN

0276-7333

### Authors

Phung, Alice C  
Fettinger, James C  
Power, Philip P

### Publication Date

2023-08-28

### DOI

10.1021/acs.organomet.3c00319

### Copyright Information

This work is made available under the terms of a Creative Commons Attribution License, available at <https://creativecommons.org/licenses/by/4.0/>

Peer reviewed

# Correction to “Synthesis, Structure, and Spectroscopy of the Biscarboranyl Stannylenes (bc)Sn·THF and $K_2[(bc)Sn]_2$ (bc = 1,1′(ortho-Biscarborane)) and Dibiscarboranyl Ethene (bc)CH=CH(bc)”

Alice C. Phung, James C. Fettingter, and Philip P. Power\*

*Organometallics* 2023, 42 (13), 1649–1657. DOI: [10.1021/acs.organomet.3c00190](https://doi.org/10.1021/acs.organomet.3c00190)



Cite This: *Organometallics* 2023, 42, 2319–2320



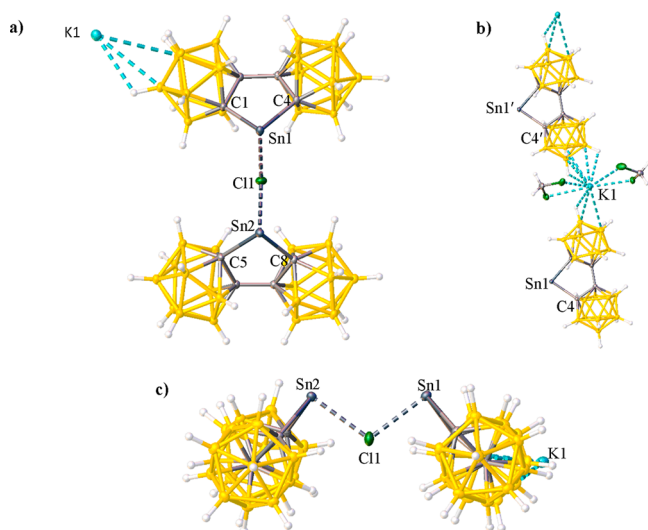
Read Online

ACCESS |

Metrics & More

Article Recommendations

In the original title publication the compound **2** was reported to have the formula  $K_2[(bc)Sn]_2$  (bc=1,1′-bis(ortho-



**Figure 1.** Thermal ellipsoid plot (50%) of **2**. (a) View of **2** to show coordination positions of K1 and Cl1. The  $CH_2Cl_2$  solvent molecules are not shown for clarity. (b) Expanded view of **2** to show coordination of K1. (c) View of **2** to show coordination of Cl1.  $CH_2Cl_2$  solvent molecules are not shown for clarity. Selected bond lengths (Å) and angles (deg): C1–Sn1 = 2.276(3), C4–Sn1 = 2.309(3), C5–Sn2 = 2.288(4), C8–Sn2 = 2.289(3), Cl1–Sn1 = 2.5868(8), Cl1–Sn2 = 2.5874(8), C1–Sn1–C4 = 81.69(11), C5–Sn2–C8 = 81.86(12), Sn1–Cl1–Sn2 = 106.98(3), C1–Sn1–Cl1 = 88.27(7), C4–Sn1–Cl1 = 94.11(7), C5–Sn2–Cl1 = 92.62(7), C8–Sn2–Cl1 = 90.91(7).

biscarborane)). But a re-examination and re-refinement of the X-ray crystallographic data for **2** indicate that the correct formula is  $[(bc)Sn]_2KCl$ . As reported earlier, one of the  $K^+$  ions acts as a countercation which is coordinated to the B–H vertices of the bc cage, but the second  $K^+$  ion, which was said to bridge the two tin atoms in the original report, has been reformulated as a  $Cl^-$  ion, thereby forming a Sn–Cl–Sn bridging unit between two (bc)Sn moieties, as in the  $\{(bc)Sn-\mu-Cl-Sn(bc)\}^-$  anion, as

well as lowering the *R* value from 2.43% to 2.23%. Organotin complexes containing a Sn–Cl–Sn moiety typically have bridging Sn–Cl distances in the range 2.540(2)–2.967(1) Å,<sup>1–10</sup> and this fragment of compound **2** features Sn–Cl bond distances of 2.5868(8) and 2.5874(8) Å, which are at the lower end of the above range. The relatively short Sn–Cl distances in **2** indicate a strong interaction between the two ions, but whether this is a consequence of the rigid structure or electron-withdrawing influence of the bc ligand is not apparent. The drawings in Figure 1 below illustrate the corrected X-ray crystal formula for compound **2**, and Figure 1c in particular clearly illustrates the bridging atom as  $Cl^-$  seems more chemically sensible than when the species is formulated with a bridging  $K^+$  cation.

## ACKNOWLEDGMENTS

We thank Prof. Igor Sivaev for alerting us to this error.

## REFERENCES

- (1) Chorley, R. W.; Hitchcock, P. B.; Jolly, B. S.; Lappert, M. F.; Lawless, G. A. Crystalline Binuclear Cis- and Trans-Chlorotin(II) Amides  $[Sn(\mu-Cl)(NR_2)]_2$ , the Cis-1a  $\rightleftharpoons$  trans-1b Isomerisation for  $[NR_2 = NCMe_2(CH_2)_3CMe_2]$ , and the X-Ray Structures of 1a and of Trans- $[Sn(\mu-Cl)\{N(SiMe_3)_2\}]_2$ . *J. Chem. Soc., Chem. Commun.* **1991**, 1302–1303.
- (2) Peng, Y.; Fischer, R. C.; Merrill, W. A.; Fischer, J.; Pu, L.; Ellis, B. D.; Fettingter, J. C.; Herber, R. H.; Power, P. P. Substituent Effects in Ditetrel Alkyne Analogues: Multiple vs. Single Bonded Isomers. *Chem. Sci.* **2010**, 1 (4), 461.
- (3) Hitchcock, P. B.; Lappert, M. F.; Wang, Z.-X. A Contribution to 1-Azapentadienylmetal Chemistry: Si, Sn(II), Fe(II) and Co(II) Complexes. *J. Organomet. Chem.* **2009**, 694, 3762–3767.
- (4) Tang, Y.; Felix, A. M.; Zakharov, L. N.; Rheingold, A. L.; Kemp, R. A. Syntheses and Structural Characterization of a Monomeric Tin(II)

Published: August 10, 2023



Diamide and a Novel Chlorotin(II) Amide Trimer. *Inorg. Chem.* **2004**, *43*, 7239–7242.

(5) Eichler, B. E.; Pu, L.; Stender, M.; Power, P. P. The Synthesis and Structure of Sterically Encumbered Terphenyl Tin(II) Halide Derivatives: Simultaneous Existence of Monomers and Dimers in the Crystalline Phase. *Polyhedron* **2001**, *20*, 551–556.

(6) Eaborn, C.; Hitchcock, P. B.; Smith, J. D.; Sözerli, S. E. Synthesis and Crystal Structures of the Compounds  $[\text{Sn}\{\text{C}(\text{SiMe}_2\text{Ph})_3\}\text{Cl}]_2$ ,  $[\text{Pb}\{\text{C}(\text{SiMe}_3)_3\}\text{Cl}]_3$ , and  $[\text{M}\{\text{C}(\text{SiMe}_3)_2(\text{SiMe}_2\text{OMe})\}\text{Cl}]_2$  (M = Sn or Pb). *Organometallics* **1997**, *16*, 5653–5658.

(7) Watson, I. C.; Ferguson, M. J.; Rivard, E. Zinc-Mediated Transmetalation as a Route to Anionic *N*-Heterocyclic Olefin Complexes in the p-Block. *Inorg. Chem.* **2021**, *60*, 18347–18359.

(8) Keil, P. M.; Hadlington, T. J. Accessing Cationic Tetrylene-Nickel(0) Systems Featuring Donor–Acceptor E–Ni Triple Bonds (E = Ge, Sn). *Chem. Commun.* **2022**, *58*, 3011–3014.

(9) Khan, S.; Gopakumar, G.; Thiel, W.; Alcarazo, M. Stabilization of a Two-Coordinate  $[\text{GeCl}]^+$  Cation by Simultaneous  $\sigma$  and  $\pi$  Donation from a Monodentate Carbodiphosphorane. *Angew. Chem., Int. Ed.* **2013**, *52*, 5644–5647.

(10) Pu, L.; Phillips, A. D.; Richards, A. F.; Stender, M.; Simons, R. S.; Olmstead, M. M.; Power, P. P. Germanium and Tin Analogues of Alkynes and Their Reduction Products. *J. Am. Chem. Soc.* **2003**, *125*, 11626–11636.