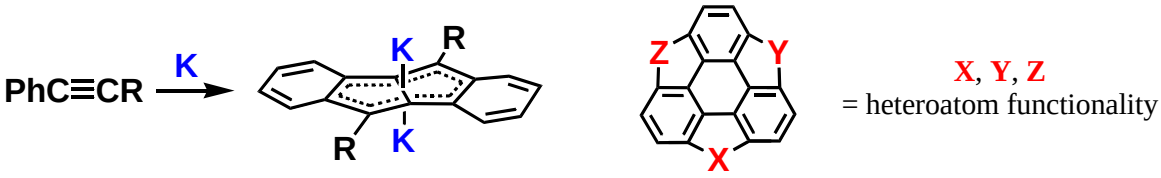
Dibenzopentalenes and Heterasumanenes

Masaichi Saito
masaichi@chem.saitama-u.ac.jp

Department of Chemistry, Graduate School of Science and Engineering, Saitama University, Shimo-okubo, Sakura-ku, Saitama-city, Saitama, 338-8570, JAPAN

It is well know that reduction of phenylacetylenes with lithium afford 1,4-dilithio-1,3-butadienes.[1] We have long utilized 1,4-dilithio-1,3-butadienes as key precursors for the synthesis of novel π-electron systems containing heavy group 14 atoms. In this presentation, starting from our previous investigation on the aromaticity of tin- and lead-bearing carbon ring compounds,[2] we report on the unexpected formation of dibenzopentalenes by the reduction of phenylsilylacetylene with lithium or potassium.[3] We also mention the synthesis and photophysical properties of heterasumanenes,[4] heteroatom-substituted versions of sumanene,[5] which is a partial structure of C_{60}.



[1] (a) Smith, L. I.; Hoehn, H. H. *J. Am. Chem. Soc.* **1941**, *63*, 1184; (b) Evans, A. G.; Evans, J. C.; Emes, P. J.; Phelan, T. J. *J. Chem. Soc. B* **1971**, 315.
[2] (a) Saito, M.; Haga, R.; Yoshioka, M.; Ishimura, K.; Nagase. S. *Angew. Chem., Int. Ed.* **2005**, *44*, 6553; (b) Saito, M.; Kuwabara,T.; Kambayashi, C.; Yoshioka, M.; Ishimura, K.; Nagase, S. *Chem. Lett.* **2010**, *39*, 700; (c) Saito, M.; Sakaguchi, M.; Tajima, T.; Ishimura, K.; Nagase, S.; Hada, M. *Science* **2010**, *328*, 339; (d) Saito, M. *Coord. Chem. Rev.* **2012**, *256*, 627; (d) Kuwabara, T.; Guo, J. D.; Nagase, S.; Minoura, M.; Herber, R. H.; Saito, M. *Organometallics* **2014**, *33*, 2910.
[3] (a) Saito, M.; Nakamura, M.; Tajima, T.; Yoshioka, M. *Angew. Chem., Int. Ed.* **2007**, *46*, 1504; (b) Saito, M.; Nakamura, M.; Tajima, T. *Chem. Eur. J.* **2008**, *14*, 6062; (c) Saito, M.; Hashimoto, Y.; Tajima, T.; Ishimura, K.; Nagase, S.; Minoura, M. *Chem. Asian J.* **2012**, *7*, 480; (d) Kuwabara, T.; Ishimura, K.; Sasamori, T.; Tokitoh, N.; Saito, M. *Chem. Eur. J.* **2014**, *20*, 7571.
[4] (a) Saito, M.; Tanikawa, T.; Tajima, T.; Guo, J. D.; Nagase, S. *Tetrahedron Lett.* **2010**, *51*, 672; (b) Tanikawa, T.; Saito, M.; Guo, J. D.; Nagase, S. *Org. Biomol. Chem.* **2011**, *9*, 1731; (c) Tanikawa, T.; Saito, M.; Guo, J. D.; Nagase, S.; Minoura, M. *Eur. J. Org. Chem.* **2012**, 7135; (d) Saito, M.; Furukawa, S.; Kobayashi, J.; Kawashima, T. *Chem. Rec.* in press.
[5] Sakurai, H.; Daiko, T.; Hirao, T. *Science* **2003**, *301*, 1878.