Properties of Dimetallene Dianions Bearing Triptycyl Framework

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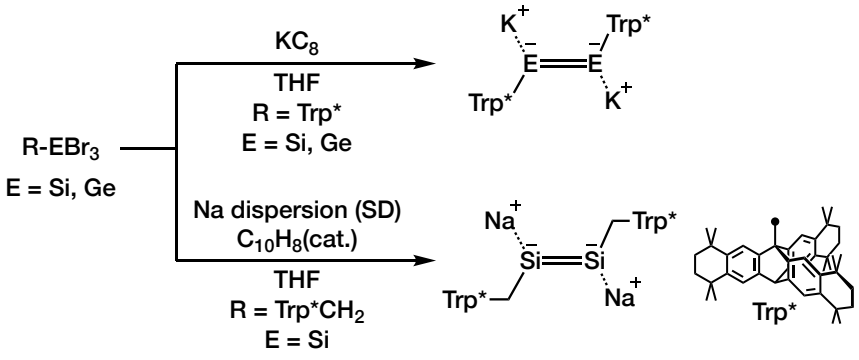
Keywords: *Triptycene, Dimetallene, Disilene, Dianion, X-ray Crystallographic Analysis*

Heavier analog of vinyl anion, dimetallenides[1] (dimetallene monoanions) can be utilized as building blocks for double bondes between group 14 elements. Dimetallene dianions are assumed to have a potential role of introducing two functional groups into the E=E bond. However, synthetic examples[2] are so limited due to their high reactivity and lack of suitable stynthetic routes.

We have developed the aliphatic steric protection group having triptycyl framework and extended its peripheral position (Trp*). Dipotassiodisilene and -digermene ($K_2[Trp^*{}_2E_2]$, E = Si, Ge) were synthesized by taking advantage of Trp* groups. In addition, we also have synthesized the disilene dianion bearing 9-triptycylmethyl framework $[Na_2(Trp^*CH_2Si)_2]$ which can provide the larger space on the Si=Si bond moiety than Trp*-substituted disilene dianions. In this presentation, we report the synthesis and properties of these compounds.

The reaction of Trp^*EBr_3 (E = Si, Ge) with KC_8 yielded the corresponding $K_2[Trp^*{}_2E_2]$ as the thermally stable red crystals, respectively. Each structure was determined by X-ray crystallographic analysis and revealed the effective steric protection of Trp* groups around E=E double bond moiety. Disodiodisilene bearing Trp^*CH_2 groups was synthesized by the reduction of $Trp^*CH_2SiBr_3$ with sodium dispersion (SD) in the presence of naphthalene as a catalyst. X-ray crystallographic analysis revealed the larger reaction space around Si=Si bond moiety. The details of the structural properties of dimetallene dianions will be discussed.



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