

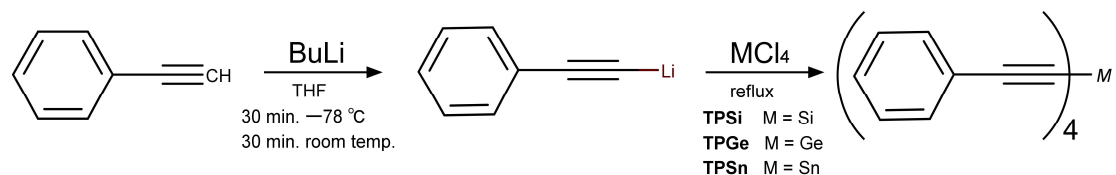
The Synthesis and Properties of Group 14 Element Compounds Bearing Four Phenylethynyl Groups

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In these decades, unsaturated carbon-carbon bonds which are bonded to group 14 elements have attracted huge attention by their high applicability to various reactions, such as new dendrimers and metallole compounds. This is because these compounds usually show the exclusive interaction between σ^* orbital of group 14 elements and the π^* orbital of carbon-carbon multiple bonds. The aim of this study is to elucidate the optical properties of tetraphenylethynyl analogs, which have the σ^* - π^* interaction between silicon atom and carbon-carbon triple bonds, and also the reactivities to illustrate the possibilities of further reactions.

The anions of ethynyl benzene, which were prepared by *n*-butyllithium¹, were reacted with group 14 metal chloride², such as SiCl₄, GeCl₄ and SnCl₄, to afford tetrakis(phenylethynyl)silane, tetrakis(phenylethynyl)germane and tetrakis(phenylethynyl)stannane, respectively. The red shift of UV-vis absorption maxima and emission peak in the silicon analog indicate the existence of the interactions between σ^* orbital of group 14 elements and π^* orbital of the carbon-carbon bond. In addition, the reduction of the silicon analog by lithium naphthalenide³ will be also reported.



1) Eisch, J.J et al. *Eur. J. Org. Chem.*, **2015**: 7384-7394. 2) Wrackmeyer et al. vol. 65, no. 6, **2010**: 725-744. 3) Tamao et al. *J. Am. Chem. Soc.* **1994**, 116, 26, 11715–11722.