

Principal Researcher	Takayuki Kawashima			Number of Reserchers	4	
Research Institution • Department • Title	Professor, Department of Chemistry, Graduate School of Science, The University of Tokyo			Location of Institution	Bunkyo-ku, Tokyo	
Title of Project	Development of novel ligands occupying the specified positions and their application to the synthesis of new hypervalent compounds					
Abstract of Research Project	<p>The object of this study is to develop novel ligands which occupy the specific positions of hypervalent main group compounds on the basis of the steric and electronic stabilization effects, and synthesize the hypervalent compounds with novel frameworks by use of these ligands. Mainly, we will develop several ligands for pentacoordinate main-group-element compounds, such as the planar tridentate ligand which occupies two apical positions and one equatorial position, the tetradentate ligands which occupy three equatorial positions and one apical position, the bulky dendrimer-type ligand which occupies the equatorial position, and the dithiocarboxylato ligand which bridges two highly coordinate main-group elements. Since the properties of the bonds between the highly coordinate atom and the ligand are considerably influenced by the positions of the ligands, the use of these uniquely designed ligands in the hypervalent compounds makes the other ligands occupy the residual positions which are suitably situated to exhibit new bonding properties and novel reactivities. The construction of the novel hypervalent compounds bearing thermodynamically unfavorable configuration of the ligands or the extraordinarily activated ligands due to the bonding characters at the specified positions will also be achieved. The generality of the synthetic method employed here will allow us to investigate a series of hypervalent compounds bearing different main group elements with the same framework. Such systematic studies are expected to contribute significantly to the development of a new paradigm in organoelemental chemistry.</p>					
References	<p>1. J. Kobayashi, K. Goto, T. Kawashima, M. W. Schmidt, and S. Nagase, "Synthesis, Structure, and Bonding Properties of 5-Carbaphosphatranes: A New Class of Main Group Atrane" <i>J. Am. Chem. Soc.</i>, 124, 3703-3712 (2002).</p> <p>2. T. Kawashima, K. Hoshiba, and N. Kano, "Synthesis, Structure, and Reactions of a Tricoordinate 1,2-Iodoxetane" <i>J. Am. Chem. Soc.</i>, 123, 1507-1508 (2001).</p>					
Term of Project	Fiscal years 2003-2007 . (5years)					
Budget Allocation (in thousand of yen)	FY2003	FY2004	FY2005	FY2006	FY2007	TOTAL
	23,100	16,400	14,700	13,500	14,700	82,400
Homepage Address	<a href="http://www.chem.s.u-tokyo.ac.jp/hetero/index.html">http://www.chem.s.u-tokyo.ac.jp/hetero/index.html</a>					