

## 四面体および平面四角形型構造を有する鉄(II)ビス(シリル)錯体の合成と触媒作用

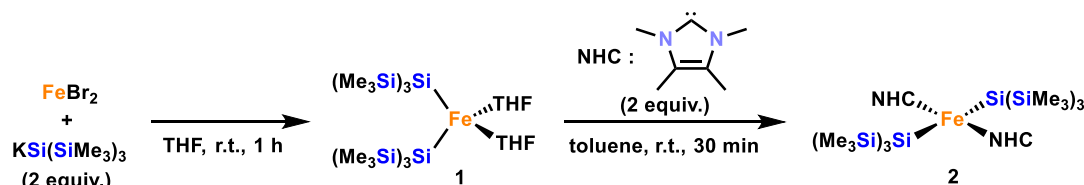
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Synthesis of Iron (II) Bis(silyl) Complexes Having Tetrahedral or Square Planar Coordination Geometries and Their Application in Catalytic Hydrosilylation (<sup>1</sup>*School of Engineering, and* <sup>2</sup>*Institute of Industrial Science, The University of Tokyo*) ○Leon Ishii<sup>1</sup>, Minesato Nakagawa<sup>1</sup>, Yusuke Sunada<sup>1,2</sup>

We have described the synthesis of a series of iron complexes bearing the organosilyl ligands and their application in catalytic reduction reactions. For example, we recently found that coordinatively unsaturated iron (II) bis(silyl) complex,  $\text{Fe}\{\text{Si}(\text{SiMe}_3)_3\}_2(\text{THF})_2$  (**1**) can be facily synthesized by the reaction of silyl anion,  $\text{KSi}(\text{SiMe}_3)_3$ , with 0.5 equivalents of  $\text{FeBr}_2$  in THF. It has also been clarified that complex **1** functions as a highly active catalyst in the hydrosilylation of carbonyl compounds<sup>1)</sup>. In this study, iron (II) bis(silyl) complex **2** having a square planar structure was synthesized by the reaction of **1** with 2 equivalents of *N*-heterocyclic carbene (NHC). Subsequently, iron (II) bis(silyl) complexes consisting of chelating organosilyl ligands with both tetrahedral or square planar coordination geometries were also synthesized by the reactions of  $\text{FeBr}_2$  with the corresponding silyl dianions. Furthermore, the catalytic activities of them toward hydrosilylation were also investigated.

**Keywords** : Silyl Complexes; ; Iron Catalysts; Hydrosilylation

当研究室では、有機ケイ素配位子を有する3d金属錯体の合成と触媒としての応用に関する研究を行っている。最近、シリルアニオンと臭化鉄とのsalt metathesisにより、配位不飽和な鉄(II)ビス(シリル)錯体**1**が簡便に合成でき、錯体**1**がカルボニル化合物のヒドロシリル化反応における高活性な触媒として機能することを明らかにしている<sup>1)</sup>。本研究では、まず、錯体**1**と2当量のNHCとの反応により、平面四角形型の幾何構造を有する鉄(II)ビス(シリル)錯体**2**の合成を行った。続いて、シリルジアニオンと臭化鉄との反応により、キレート型ケイ素配位子を持ち四面体型および平面四角形型の幾何構造を有する鉄(II)ビス(シリル)錯体の合成も行った。さらに一連の錯体のヒドロシリル化における触媒活性についても検討したので併せて報告する。



1) S. Arata, Y. Sunada, *Dalton Trans.*, **2019**, 48, 2891.