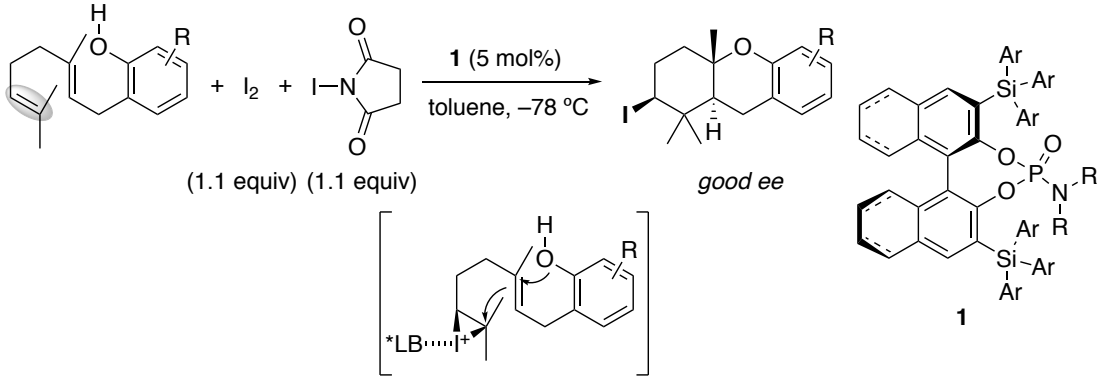
Enatioselective Iodocyclization of 2-Geranylarenols Induced by Chiral Amidophosphate Catalysts and Halo-Lewis Acids

([1]*Venture Business Laboratory, Nagoya University*, [2]*Graduate School of Engineering, Nagoya University*) ○Kazumasa Kon,[1] Yasutaka Tsuji,[2] Takahiro Horibe,[2] Kazuaki Ishihara[2]
Keywords: *Polyene Cyclization; Terpenoid; Lewis Base; Iodine; Cooperative Catalyst*

Optically active polycyclic terpenoids with halogen atoms are included in an important class of marine natural compounds due to the biological activity of these compounds. Halocyclization of polyenes simultaneously constructs several cyclic structures and chiral carbon centers, accompanying the introduction of the halogen atom. Therefore, this biomimetic cascade reaction is one of the most effective methods that synthesize the optically active polycyclic terpenoids with a halogen atom. Recently, our group[1)] and Yamamoto's group[2)] independently reported catalytic enantioselective bromocyclization of polyenes. However, catalytic enantioselective iodocyclization of polyenes have not been reported.

Previously, our group developed the enantioselective halocycloetherification involving 2-alkenylphenols induced by chiral amidophosphate catalyst.[3)] In this report, iodonation selectively occur with olefin nearest to phenol ring when 2-geranylphenol was used as a substrate. Here, to develop the effective catalyst for the enantioselective iodocyclization of 2-geranylarenols, we newly desinged more bulky chiral amidophosphate catalysts **1**. We envisioned that the more bulky **1** selectively caused the iodonation at the less hindered terminal olefin, followed by cyclization, to give the corresponding tricyclic products. The use of *N*-iodosuccinimide, which is a halo-Lewis acid with I_2 in the presence of 5 mol% of **1**, gave the corresponding tricyclic products in moderate yield with good enantioselectivity.



1) Sawamura, Y.; Ogura, Y.; Nakatsuji, H.; Sakakura, A.; Ishihara K. *Chem. Commun*. **2016**, *52*, 6068.
2) Samanta, R. C.; Yamamoto, H. *J. Am. Chem. Soc.* **2017**, *139*, 1460.
3) Lu, Y.; Nakatsuji, H.; Okumura, Y.; Yao, L.; Ishihara, K. *J. Am. Chem. Soc.* **2018**, *140*, 6039.