

S43-1 Transition metal-catalyzed [2+2+2] cycloaddition of alkynes with arynes or hetarynes

○Yoshihiro SATO¹

¹Fac. of Pharm. Sci., Hokkaido Univ.

A [2+2+2] cycloaddition of alkynes catalyzed by a transition-metal complex is useful for the construction of various aromatic rings. In recent years, arynes (e.g. benzyne) have been utilized as a substrate in the [2+2+2] cycloaddition,¹ and we have already reported a novel method for the synthesis of biaryls via Pd(0)-catalyzed [2+2+2] cycloaddition of diynes and arynes.² The reactivity of hetarynes, the analogues of arynes containing a hetero atom, has also received much attention, and Diels-Alder reactions of dienes with 2,3-pyridynes or with 3,4-pyridines have been already reported. However, the reactivity of hetarynes toward [2+2+2] cycloaddition has not been examined so far. Herein we report the first example of [2+2+2] cycloaddition of diynes and 3,4-pyridynes.³

- 1) (a) Peña, D.; Pérez, D.; Guitián, E.; Castedo, L. *J. Am. Chem. Soc.* **1999**, *121*, 5827. (b) Radhakrishnan, K.; Yoshikawa, E.; Yamamoto, Y. *Tetrahedron Lett.* **1999**, *40*, 7533.
- 2) (a) Sato, Y.; Tamura, T.; Mori, M. *Angew. Chem. Int. Ed.* **2004**, *43*, 2436. (b) Sato, Y.; Tamura, T.; Kinbara, A.; Mori, M. *Adv. Synth. Catal.* **2007**, *349*, 647.
- 3) (a) Iwayama, T.; Sato, Y. *Chem. Commun.* **2009**, 5245. (b) Iwayama, T.; Sato, Y. *Heterocycles* **2010**, in press.