SYNLETT Spotlight 4

This feature focuses on a reagent chosen by a postgraduate, highlighting the uses and preparation of the reagent in current research

Palladium(II) Acetate³

Compiled by Sang-Gyun Noh

Department of Chemistry, University of California at Berkeley, Berkeley, CA 94720, USA

Sang-Gyun Noh received his D.Phil from Kyungpook National University, under the supervision of Professor Yong-Tae Park. He is currently a visiting scholar with Professor K. P. C. Vollhardt at the University of California at Berkeley.

The X-ray structure of palladium(II) acetate reveals a trimeric molecule with approximate D_{3h} symmetry in which the Pd atoms are joined by acetate bridges.¹ The reactivity of the molecule varies depending on the nature of cocrystallizing solvent.² This reagent is stable, soluble in common organic solvents, and most often used as a catalyst precursor for Pd(0)-catalyzed processes.

Preparation:

1) Palladium(II) acetate can be obtained as brown crystals from the reaction of palladium(II) nitrate with acetic acid.³

2) It can also be prepared from metallic Pd by dissolving it in acetic acid containing nitric acid.³

Abstracts

A) An efficient procedure for the palladium-catalyzed oxidation of primary and secondary allylic and benzylic alcohols to aldehydes and lactones is achieved using O_2 gas as the stoichiometric oxidant.⁴

B) Acetals of acetophenones are directly synthesized by arylation of commercially available 2-ethenyloxyethanol and aryl triflates in the presence of a catalytic amount of **1** and DPPP.⁵

C) The *N*-Arylation of azoles and imines using DPPF-ligated palladium can be accomplished. Imines are markedly more reactive in these transformations.⁶

References

- Skapski, A. C.; Smart, M. L. *Chem. Commun.* **1970**, 658.
- Barton, D. H. R.; Khamsi, J.; Ozbalik, N.; Ramesh, M.; Sarma J. C. *Tetrahedron Lett.* **1989**, 30, 4661.
- Stephenson, T. A.; Morehouse, S. M.; Powell, A. R.; Heffer, J. P.; Wilkinson, G. *J. Chem. Soc.* **1965**, 3632; Hosokawa, T.; Miyagi, S.; Murahashi, S.; Sonoda, A. *J. Org. Chem.* **1978**, 43, 2752.
- Peterson, K. P.; Larock, R. C. *J. Org. Chem.* **1998**, 63, 3185.
- Larhed, M.; Hallberg, A. *J. Org. Chem.* **1997**, 62, 7858.
- Mann, G.; Hartwig, J. F.; Driver, M. S.; Fernandez-Rivas, C. *J. Am. Chem. Soc.* **1998**, 120, 827.