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## Effective dehydrogenation of alcohol catalyzed by iron complexes

Many methods of transition metal-catalyzed oxidation of alcohols have been developed using oxidants such as oxygen and hydrogen peroxide and hydrogen acceptors such as alkenes and acetones. Recently, oxidant-free and hydrogen acceptor-less dehydrogenation reaction of alcohols have been developed. However, all these catalysts reported to date are highly toxic and precious transition metals. We here, report an unprecedented iron-catalyzed dehydrogenation of alcohols in the absence of hydrogen acceptors. After various combinations of alcohols and iron complexes, we found that $(\eta^5\text{-}C_5H_5)Fe(CO)_2Cl$ has excellent catalytic activity for the oxidation of 2-pyridylmethanol derivatives to the corresponding dehydrogenative products with evolution of hydrogen gas. The catalytic activity of the iron complex was enhanced by the addition of 2 mol% of NaH-based on the alcohols. In particular, 2-pyridylbenzylalcohol was quantitatively converted to 2-benzoylpyridine. The hydrogenation could also be achieved even when the amount of the iron complex was reduced from 1 to 0.001 mol%. The highest turnover number achieved was 67000. A possible catalytic cycle will be discussed for the dehydrogenation of 2-pyridylmethanol derivatives catalyzed by $(\eta^5\text{-}C_5H_5)Fe(CO)_2Cl$ and NaH.

### Biography

Hiroshi Nakazawa has completed his PhD from Hiroshima University, Japan. After working at Tokyo Institute of Technology and at University of Utah as a Post-doctoral Research Fellow, he became a Research Associate at Hiroshima University in the year 1984. From 1994 to 1996, he was appointed as an Associate Professor of Institute for Molecular Science. In 2002, he became a Full Professor of Osaka City University, Japan. He received the Commendation for Science and Technology from the Ministry of Education of Japan in 2009 and the Award for Chemical Education from the Chemical Society of Japan in 2015.

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