

Past and Present Research Systems of Green Chemistry

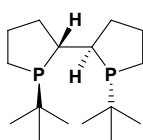
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Practical catalytic hydrogenation

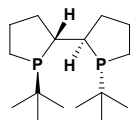
Xumu Zhang

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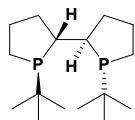
William Knowles, in his 2001 Nobel Lecture, described his 1960s and 70s work in developing asymmetric hydrogenation catalysts. Now, almost 40 years later, although major advances have been made (e.g. Professor Noyori's Nobel prize winning work in asymmetric hydrogenation), significant challenges still remain. On the one hand, this presentation describes innovation in asymmetric hydrogenation catalysis from both an academic and industrial perspective. It highlights recent advances and the commercialization processes regarding asymmetric hydrogenation. The broad array of asymmetric hydrogenation catalysts and their numerous applications for a variety of functional group hydrogenations will be reviewed. We will emphasize on the practical applications of asymmetric hydrogenation to make chiral pharmaceuticals and address unmet needs in asymmetric hydrogenation. The knowledge gained in this research can lead to "next generation" catalysts.



(*S,S',R,R'*)-TangPhos



(*S,S',R,R'*)-TanaPhos



(*S,S',R,R'*)-TanaPhos

Biography

Xumu Zhang was born in 1961 in Hubei Province, China. He received his BS degree in chemistry (1982) from Wuhan University, China, and MS in chemistry (1985) from the Chinese Science Academy, Fuzhou, China, under the supervision of Professor Jiayi Lu. He received his PhD in chemistry in 1992 from Stanford University under the guidance of James P. Collman. He then carried out Postdoctoral work at Stanford for two years. In 1994, he joined the department of chemistry at The Penn State University as an Assistant Professor of chemistry. In 1999, he was promoted to an Associate Professor of chemistry. In 2003, he was promoted to Professor of chemistry. In 2007, he moved to The State University of New Jersey as Distinguished Professor. His research interests include the development of new chiral ligands for asymmetric catalysis, the investigation of asymmetric hydrogenation and carbon-carbon bond-forming reactions, the synthesis of biologically active compounds, and the discovery of new synthetic methods.

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