Asymmetric Pd-NHC* Catalysed C(sp³)-H Activation

E. Peter Kündig*
Department of Organic Chemistry, University of Geneva,
30 Quai Ernest Ansermet, 1211 Geneva, Switzerland
Email: peter.kundig@unige.ch, Web: http://www.unige.ch/sciences/chiorg/kundig/home

Chiral Pd-NHC* complexes catalyze the intramolecular arylation of amides to give highly enantiomerically enriched 3,3-disubstituted oxindoles.\textsuperscript{1,2} Structural studies show that conformational locking to minimize allylic strain is the key for understanding the role of the stereodirecting elements of these ligands.

The same metal ligand combination is also successful in asymmetric coupling reactions involving C(sp³)-H bonds. Highly enantioenriched indolines are accessible using either preformed- or in situ-generated catalysts. Remarkably, excellent asymmetric recognition of enantiotopic C-H bonds in unactivated methylene units has been realized.\textsuperscript{3} Most recent discoveries are regiodivergent reactions with cases where a enantiomers are transformed into structurally different indoline products of very high enantiomeric purity. Detailed DFT calculations rationalize the outcome of the reactions and shed light on C(sp³)-H activation of methyl- and methylene groups.

![Chemical structures](image)

References
E. Peter Kündig

1971 Dipl. Chem. Federal Institute of Technology (ETH), Zurich, Switzerland
1975 Ph.D. Dept of Chemistry, University of Toronto, Canada
1975-1977 Postdoc, University of Bristol, UK
1977-1983 Assistant Professor, School of Chemistry, University of Geneva, Switzerland
1983-1990 Associate Professor, School of Chemistry, University of Geneva, Switzerland
1990-2012 Full Professor, School of Chemistry, University of Geneva, Switzerland
2012- Emeritus Professor, University of Geneva, Switzerland

2005 Chair OMCOS 13, Geneva

Awards & Honors
1986 Werner Prize, Swiss Chemical Society
2007 - EUCHEMS Award (European Association for Chemical and Molecular Sciences)

Visiting Professorships:
- Germany: University of Münster, BASF/University of Heidelberg (CaRLa)
- India: IIT Bombay
- Japan: University of Nagoya, Osaka Prefecture University
- China: Peking University

President Swiss Chemical Society, Member of the Platform Chemistry Board, Swiss Academy of Science