ORGANOMETALLIC CHEMISTRY

C-C, C-N, C-O Couplings

- Special Ligand Systems for any Application
- High Yield at low Palladium Loadings
- Custom-Made Solutions for Industrial Scale

Precious Metal Catalysis on Large Scale – Clean and Affordable Solutions made by Euticals

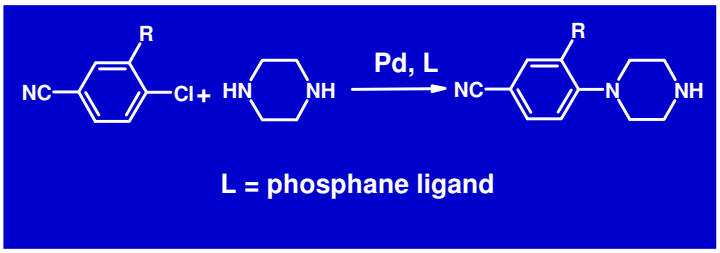
Euticals has developed unique approaches to biaryl synthesis based on Suzuki and Grignard coupling reactions. Our proprietary two-phase Suzuki coupling process offers easy recycling of palladium and, even more important, an efficient way to remove palladium traces in the product without the need for complicated purification procedures. Usually levels below 10 ppm are reached in a single product isolation step. In this process, Euticals applies tailor-made ligands which are available at commercial scale. Our research activities have focused on optimization of coupling reactions for many years, and we have reached a level of experience that gives us the opportunity to use aryl chlorides instead of bromides or even iodides as starting materials in many applications. The catalyst loadings can be reduced to levels that make precious metal coupling reactions an affordable alternative even on large scale.

It is the combination of our ligands and reaction expertise that allows the synthesis of compounds with a broad scope of substitution patterns.

For the production of aryl halides, arylpyridines, other arylheterocycles, aryl, alkyl and heteroaryl boronic acids, Euticals can take advantage of a huge technology portfolio to provide customers with a solution for a complete synthetic strategy towards biaryls, aryl-vinyl or even aryl-alkyl coupling products.

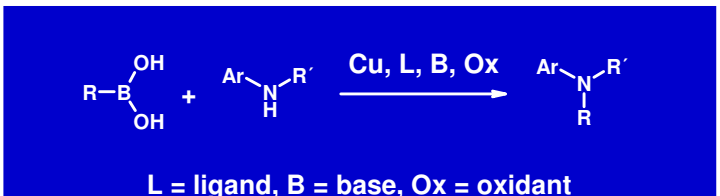
C-N and C-O Coupling – New Technologies taken to Industrial Level

C-N and C-O coupling remain two of the most challenging tools in organic synthesis. On laboratory scale, the use of complicated ligand systems, high metal loads or complex reaction mixtures may be tolerable. For industrial applications, especially for pharmaceutical targets, this is not the case. At Euticals we continuously work on improved protocols to provide our customers with technically feasible solutions, even for challenging synthetic steps. We have developed a special type of highly polar ligands which typically give very high yields in C-N coupling reactions and, in addition, allow the easy removal of palladium from the product. This approach gives us access to high-purity complex amines.



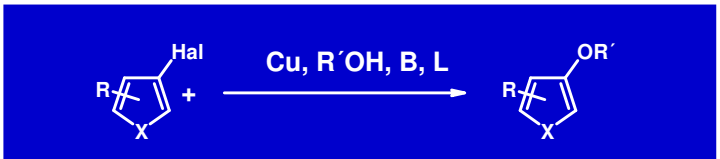
L = phosphane ligand

In some cases, the “Buchwald-Hartwig” approach does not serve to yield the desired amine. As the world leader in the manufacture of specialty boronic acids, Euticals also has technologies available to furnish C-N bonds via oxidative coupling of boronic acids and amines leading to an even greater portfolio of secondary and tertiary amines as well as nitrogen containing heterocycles.



L = ligand, B = base, Ox = oxidant
R, R´ = aryl, alkenyl, alkyl or Ar--N--R´ = heterocycle

In addition, we have a sound experience in further metal catalysed applications, such as formation of C-O bonds and C-C bonds via C-H activation having produced compounds via these routes on multi-hundred kg scale.



L = ligand, B = base
X = NH, O, S

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