MCAT-53™ Catalyst

The catalyst that takes Green Chemistry to a new level.

An Efficient and versatile Ru formato catalyst for C-C coupling in water.

-No acid

-No co-solvent

-No surfactant

-No oxidants

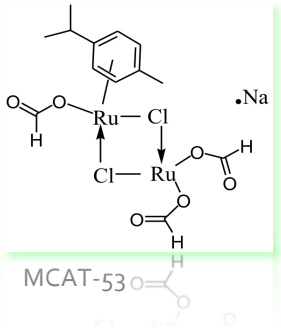
-No ligands

Chicago Discovery Solutions' proprietary and patented catalyst MCAT-53 ™i is made for CH activated C-C coupling reactions. No need to add acid, co-solvent, surfactant, oxidants or ligands or perform additional steps for activation of the catalyst.

Traditional metal- catalyzed cross-coupling reactions are regularly conducted in polar, aprotic solvents such as *N*-methylpyrrolidinone (NMP), dimethylformamide (DMF) or dimethylacetamide (DMAc) (1, 2). These solvents are undesirable because of their toxicity and disposal costs.

MCAT-53™ is a ruthenium based solid air stable catalyst that has been recently discovered by the scientists of Chicago Discovery Solutions LLC., USA. It has been tentatively assigned as having chemical formula as Ru_2Cl_2(p-cymene) $(HCOO)_2$. HCOONa or Ru_2Cl_2(p-cymene) $(HCOO)_3Na$.

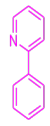
In contrast to Pd and other metal catalyzed C-H activated C-C coupling reactions, ruthenium based MCAT-53 achieves C–H-activated C–C coupling in water under ligand-free conditions, requiring no oxidants (such as copper (II) salts and silver (I) salts, or benzoquinone) and no acid. The catalyst is tailor made to work in DI/ distilled water. Only a base such as potassium carbonate may be occasionally required.



MCAT-53

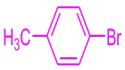
This air-stable and bench-stable catalyst, MCAT-53 has been tested for carbon - carbon bond formation in water on substrates such as aryl oxazolines, benzoquinolines and phenyl pyridines (see reference-3). These are core building blocks for pharmaceuticals and agro-chemicals.


2-Phenyl Oxazoline

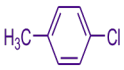

2-Phenyl Pyridine


Benzo(h) quinoline

Bromides, chlorides and heavily sub-stituted halides can work smoothly under the catalytic conditions. Some of the examples are given below:



4-Bromo toluene

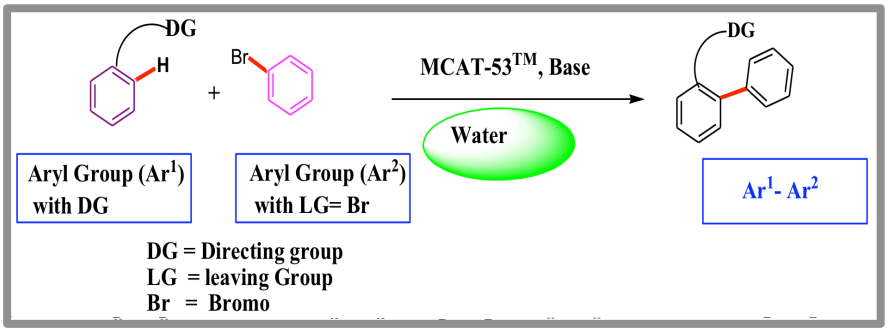


4-chloro toluene

Bromobenzene

This first of its class, bench- and air-stable, MCAT-53™ will find wide utility in cost-effective and greener alternatives in pharmaceutical and manufacturing processes.

Please contact us for more information about MCAT-53 catalyst.



References

1. Fischmeister and Doucet. *Green Chem.*, 2011, 13, 741-753.

2. Constable et al. *Green Chem.*, 2007, 9, 411-420.

3.PCT application PCT application WO / US 2014/059281,

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