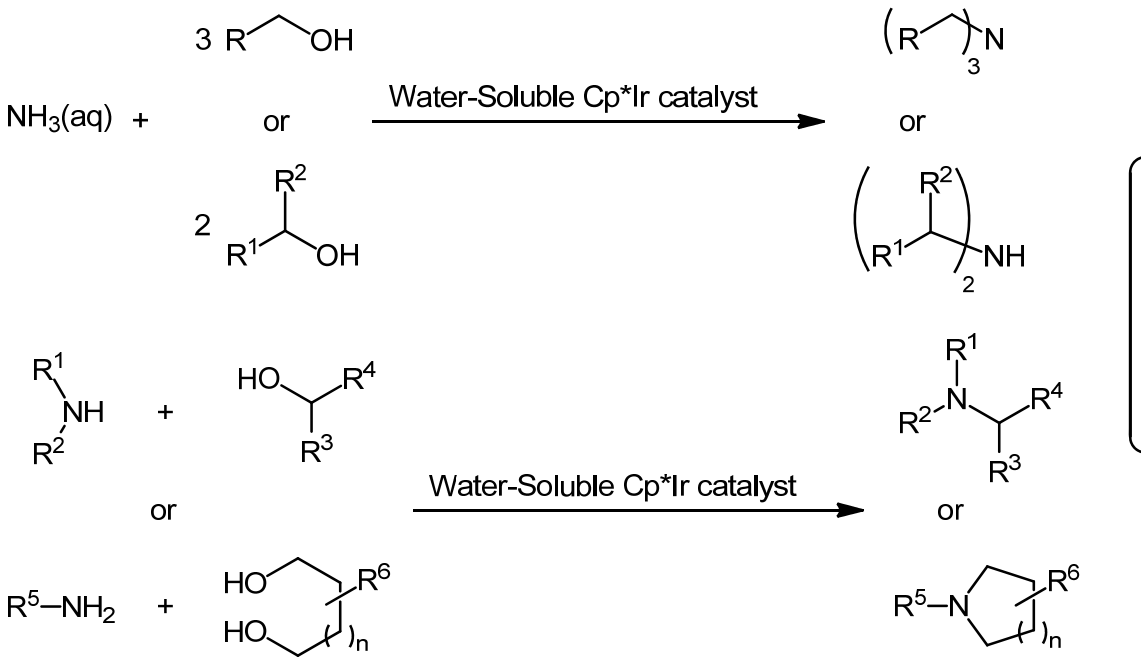
Iridium Catalyst for Multialkylation of Aqueous Ammonia with Alcohols

Kanto Reagents

Development of effective methods for preparing amines is an important task, since amine compounds are useful in a wide range of applications such as pharmaceuticals, agricultural materials, functionalized materials, and starting materials for resins.

We Kanto Chemical launched Ir catalyst developed by Emeritus Prof. Ryohei Yamaguchi and Prof. Ken-ichi Fujita of Kyoto University for amine syntheses. With this Ir catalyst, alkylated amine compounds can be obtained by the reaction of ammonia or amine compounds with alcohols as the alkylating reagents using water as a solvent in the air.



Water-Soluble Cp*Ir catalyst

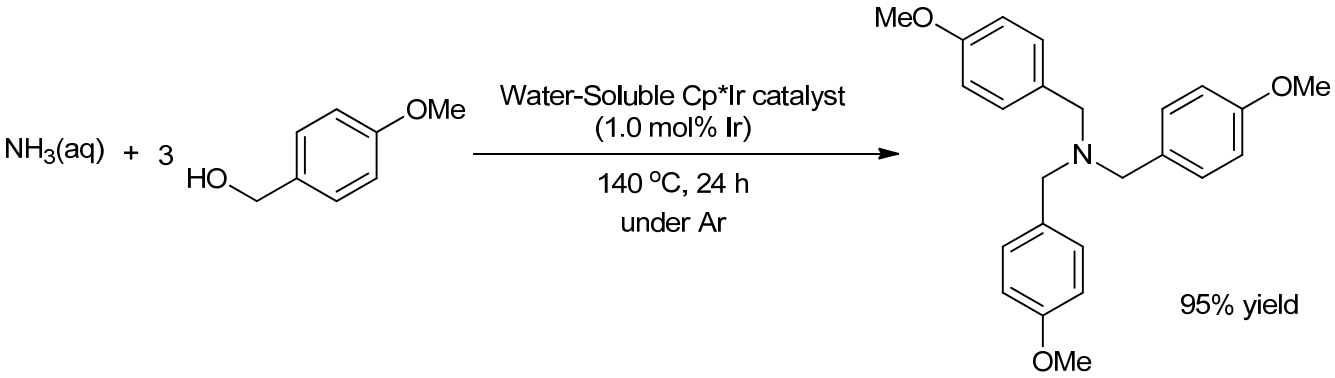
List of product

Product	Product number	Package
Triammine(pentamethylcyclopentadienyl)iridium(Ⅲ) diiodide **CAS：1254038-11-3** **FW：632.34**	**40092-68**	**100 mg**
	40092-95	**500 mg**

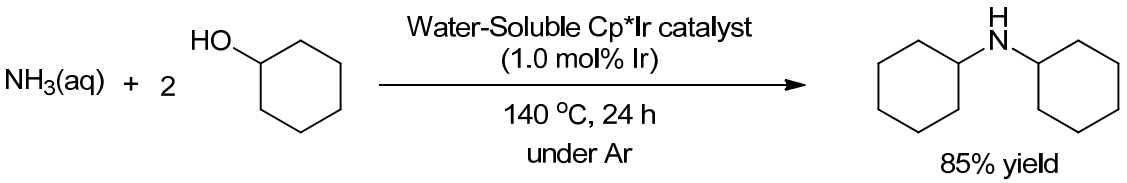
Advantages of this reaction

- Reactions using water as a solvent in the air
- High atom economy
- Reactions with the recycled catalyst

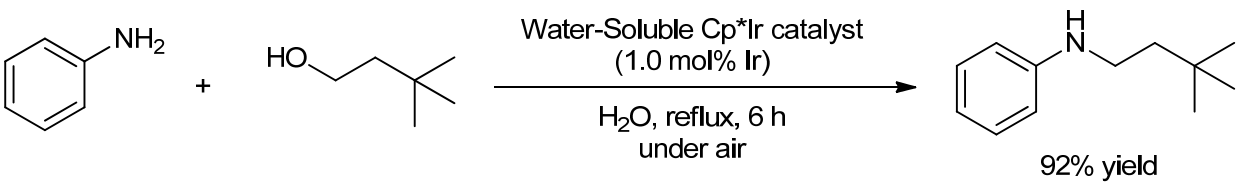
Reaction 1 (reaction of aqueous ammonia with the primary alcohol)[1)]



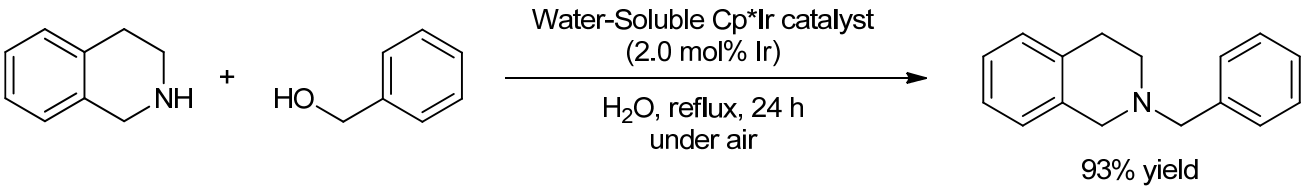
Reaction 2 (reaction of aqueous ammonia with the secondary alcohol)[1)]



Reaction 3 (reaction of the primary amine with the primary alcohol)[2)]

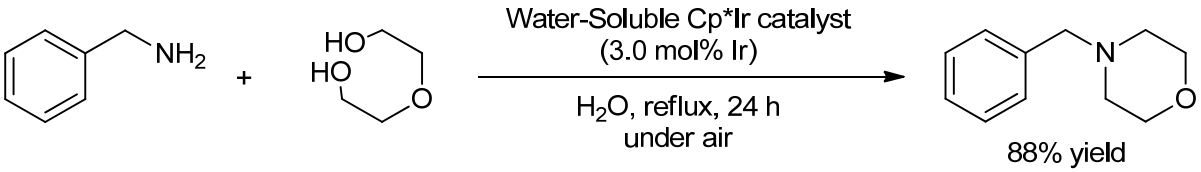


Reaction 4 (reaction of the secondary amine with the primary alcohol)[2)]



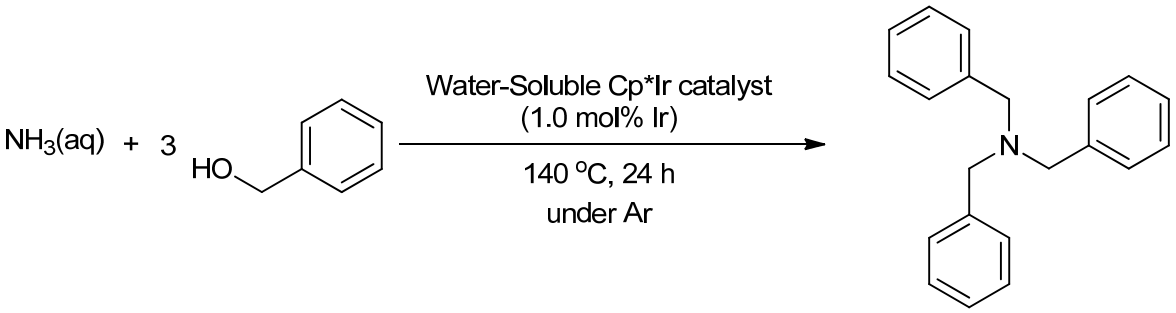
93% yield

Reaction 5 (reaction of the primary amine with the diol)[2)]



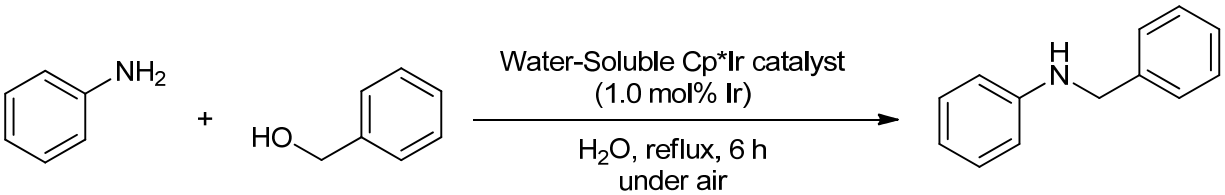
88% yield

Repeated reactions 1 with the recycled catalyst (reaction of aqueous ammonia with the primary alcohol)[1)]



1st run	GC yield: 100%
2nd run	98%
3rd run	95%

Repeated reactions 2 with the recycled catalyst (reaction of the primary amine with the primary alcohol)[2)]



1st run	GC yield: 98%
2nd run	95%
3rd run	90%

References

1)Kawahara, R.; Fujita, K.; Yamaguchi, R. *J. Am. Chem. Soc.* **2010**, *132*, 15108.
2)Kawahara, R.; Fujita, K.; Yamaguchi, R. *Adv. Synth. Catal.* **2011**, *353*, 1161.

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