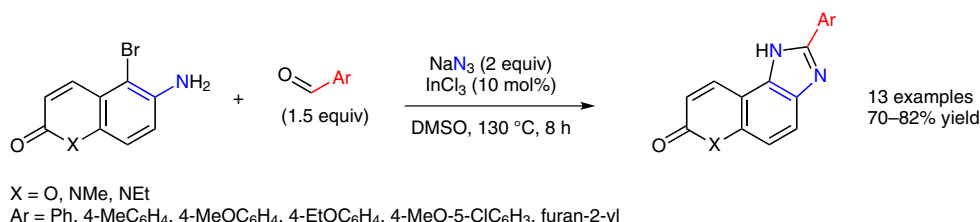


Synthesis of Fused Imidazole–Chromenone and –Quinolone Derivatives



Significance: Reported is the indium chloride catalyzed synthesis of fused chromenone- and quinolone-imidazole systems by the reaction of aromatic 2-amino bromides with sodium azide. The reaction benefits from operational simplicity, reasonable reaction times, and good yields. In addition, it also enjoys the usual benefits of multicomponent reactions, such as good atom economy and reduced reaction times over a linear sequence. Although two mechanisms are proposed, no evidence of mechanism or potential intermediates is provided.

Book: R. D. Larsen, In *Science of Synthesis*, Vol. 15; D. StC. Black, Ed.; Georg Thieme Verlag: Stuttgart, New York, **2005**, 551–660.

Comment: The imidazole structure is often utilized in medicinal chemistry as a drug-design strategy due to its association with a variety of biological activities, as outlined in the introduction to the current report. Likewise, chromenones and quinolones are components of a large number of biologically active compounds and there are a variety of methods for their synthesis (see Book below). The current work provides a method for the fusion of these two important ring systems. The reaction was optimized with respect to catalyst (reaction failed in the absence of catalyst), catalyst loading, solvent, and temperature. The use of indium(III) chloride proved decisive in achieving good yields, as the copper catalysts used in similar work (Y. Kim, M. R. Kumar, N. Park, Y. Heo, S. Lee *J. Org. Chem.* **2011**, 76, 9577) gave only modest yield. The substrate scope of the reaction was modestly studied with respect to the aromatic aldehyde and demonstrated that electron-rich aldehydes provided good yields, but those with electron-withdrawing groups gave only complex mixtures of products. The reaction was unsuitable for aliphatic aldehydes.

Category

Synthesis of
Heterocycles

Key words

indium(III) chloride

chromenones

quinolones

multicomponent
reaction