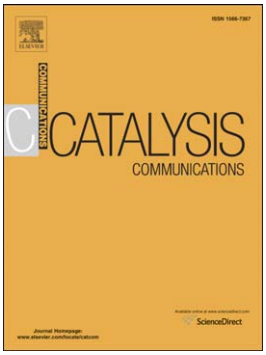

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Activation of aryl chlorides in water for Suzuki coupling with a hydrophilic salen-Pd(II) catalyst

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ABSTRACT

For exploiting aqueous condition, we have designed a simple water-soluble palladium Schiff-base catalyst for Suzuki-Miyaura reactions of aryl halides with arylboronic acids. The reactions could be performed in neat water with aryl bromides and iodides at room temperature and with aryl chlorides at 100^{o}C. Good-to-excellent yields of cross-coupling products were obtained with a diverse range of aryl halides including heteroaryl halides. Interestingly, the homogeneous catalyst could be conveniently recycled with aryl bromides or chlorides for at least four times, although a progressive decrease in the product yields were noticed.

***Keywords*:** Water-soluble catalyst, Suzuki–Miyaura reaction, Schiff-base, Aryl chloride, Aqueous media

1. Introduction

The palladium-catalyzed Suzuki-Miyaura reaction has become one of the most powerful methods for generating diversified biaryls which are used as building blocks for the synthesis of fine chemicals, functional materials and industrial starting materials [1]. During the past two decades an exponential rise in the number of publications has been seen in the Suzuki-Miyaura reactions [2-4]. Incidentally, majority of the reported works dealt with catalytic systems that are usually successful for aryl bromides or iodides [5,6]. On the contrary, highly active catalysts for efficient activations of aryl chlorides are still limited. Since the first report of activations of aryl chloride in Suzuki reaction in 1998 [7], many research groups viz. Fu [8], Kwong [9,10], Buchwald [11,12] Sarkar [13], Hong [14], Lee [15], Rajabi [16], and others [17,18] are constantly involved in developing novel catalysts for aryl chloride activations.

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