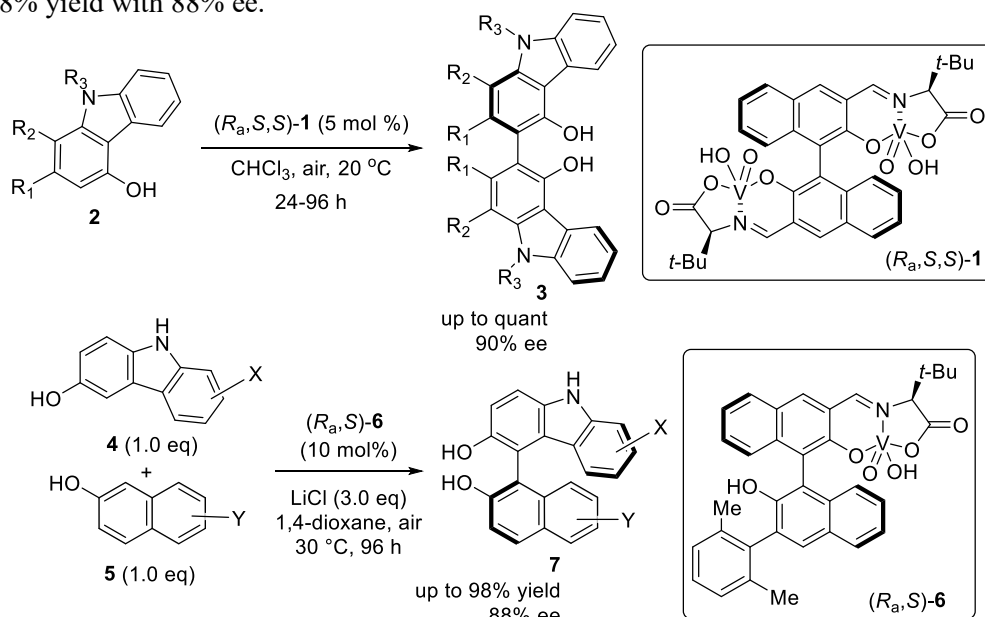


A Chiral Vanadium(V) Complex-Catalyzed Enantioselective Oxidative Coupling of Hydroxycarbazoles

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Axially chiral dimeric hydroxycarbazoles are attracting attention from many researchers owing to their potential such as chiral ligands or pharmaceuticals. However, a few reports address the enantioselective processes because of their high reactivity resulting in over-oxidation reactions.¹ Herein, we report enantioselective oxidative-coupling of hydroxycarbazoles.² Under air atmosphere, dinuclear vanadium catalyst (*R_a,S,S*)-**1** promoted the oxidative coupling of 4-hydroxycarbazoles **2** without formation of any side products, affording the homo-coupling products **3** in excellent yields with up to 90% ee. In this work, the first enantioselective oxidative hetero-couplings of 3-hydroxycarbazoles **4** with 2-naphthols **5** will also be discussed.³ The reaction of **4** and **5** in the ratio of one to one with 10 mol % of chiral mononuclear vanadium catalyst (*R_a,S*)-**6**⁴ gave the hetero-coupling products **7** in up to 98% yield with 88% ee.



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