

Original Use of Electrochemistry to Generate Divalent Samarium Reagents for Electrosynthetic and Catalytic Applications

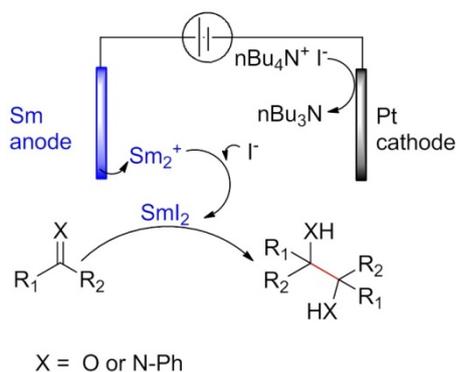
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The application of divalent samarium compounds as reducing agents in organic synthesis found remarkable developments since the pioneering works by Kagan in the chemistry of samarium diiodide (SmI_2)^[1a]. This reagent is synthesized in THF at room temperature under inert atmosphere by organic oxidation. Thus, 1,2-diiodoethane, molecular iodine or diiodomethane could be used efficiently as oxidants.^[1b,c] It's also possible to use sonication or microwaves for rapid preparations of SmI_2 . However, the major limitations, which prevent industrial developments for synthetic applications, remain the large amounts of solvents and the drastic inert atmosphere required. In this context, we have developed new electrochemical *in situ* preparation of SmI_2 by direct oxidation of "sacrificial" samarium anode.



The established procedure offers the possibility to synthesize various other Sm(II) based complexes. The electrogenerated Samarium complexes were characterized by electrochemical measurements and UV-vis analysis. This alternative route for the *in situ* synthesis of Sm(II) species is particularly efficient and can be carried out with routine methods under simple galvanostatic mode. The beneficial effects of this new methodology in terms of reactivity and solvent economy have

been highlighted in various C-C bond forming reactions mediated by SmI_2 as reducing reagent.^[3]

Its efficient application encouraged us to pursue our investigations for the development of a catalytic version based on the use of an inert electrode^[3] in order to avoid the use of metals additives required for the regeneration of the samarium divalent active reagent.^[4]

References:

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