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Sassari, 9-13 Settembre 2013
Campus Universitario Via Vienna

Active-Alkali Metal Promoted Reductive Desulfurization of Dibenzothiophene and its Hindered Analogues

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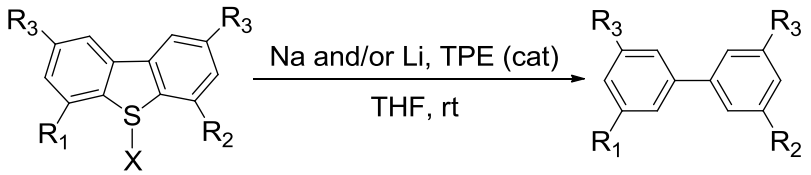
Reductive desulfurisation of organic compounds is of importance both in organic synthesis and in industry. Benzo- and dibenzothiophenes are between the most abundant sulphur containing impurities in crude oils, and their desulfurization is a mandatory issue in the production of non polluting fuels. Following our interest in the development of efficient alkali metal-mediated synthetic procedures [1] and alternative protocols for the chemical transformation of widespread environmental contaminants [2] we wish to report here on the effectiveness of sodium and lithium metals, in the presence of catalytic amounts of tetraphenylethylene (TPE), in promoting the reductive desulfurization of dibenzothiophene, as well as of the corresponding sulfone and sulfoxide.



R_1, R_2 = H, CH_3
R_3 = CH_3, Ph
X = double lone pairs, O, O_2

This simple methodology was applied to the synthesis of several substituted biphenyls, thus realizing a connection between the directing properties of the sulphur atom of dibenzothiophene and the efficiency of 1,2-dianions of tetraphenylethane as homogenous electron-transfer reagents [3].

[1] Azzena, U.; Dettori, G.; Mascia, I.; Pisano, L.; Pittalis, M. *Tetrahedron* **2007**, *63*, 11998-12006.
[2] Azzena, U.; Pittalis, M. *Tetrahedron*, **2011**, *67*, 3360-3362.
[3] Pittalis, M.; Azzena, U., Pisano, L. *Tetrahedron* **2013**, *69*, 207-211.