Pergamon

Tetrahedron Letters, Vol. 35, No. 20, pp. 3301-3302, 1994
Elsevier Science Ltd
Printed in Great Britain
0040-4039/94 $6.00+0.00

0040-4039(94)E0545-9

Convenient Preparation of (*R*)- and (*S*)-1-(2-amino-3-iodo)propanol Derivatives from (*S*)-Serine: Application in Radical Addition Reactions

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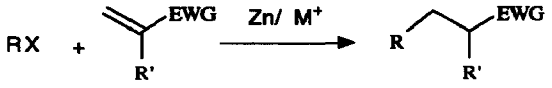
Key words: (*S*) serine, radical, Zn/Cu couple, electro reduction.

Abstract: An efficient three step synthesis of the (*R*)- and (*S*)-1-(2-amino-3-iodo)propanol derivatives **4** and **7** from (*S*) serine is proposed. Their use in radical reactions is illustrated.

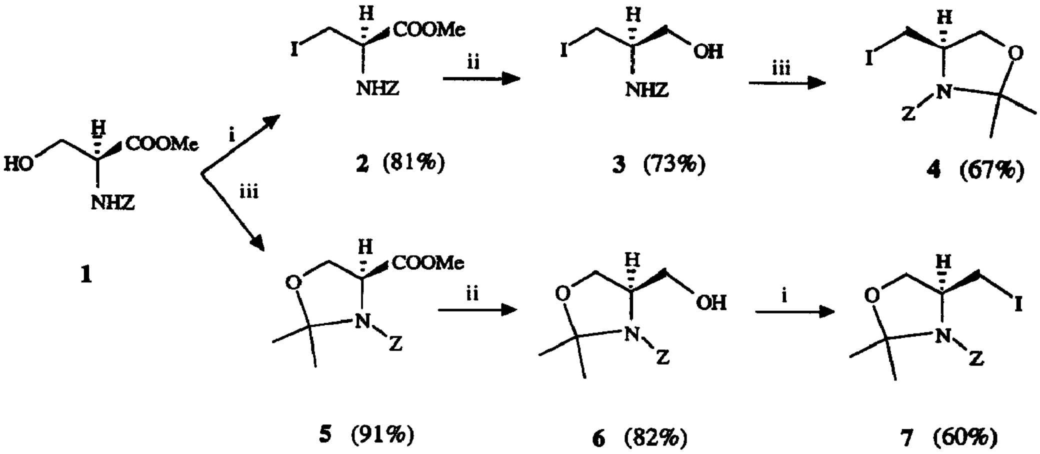
Radical reactions, which in general do not need sophisticated experimental conditions and have high functional group compatibility, are playing an increasing role in a number of synthetic schemes targeting various complex molecules of natural origin.[1]



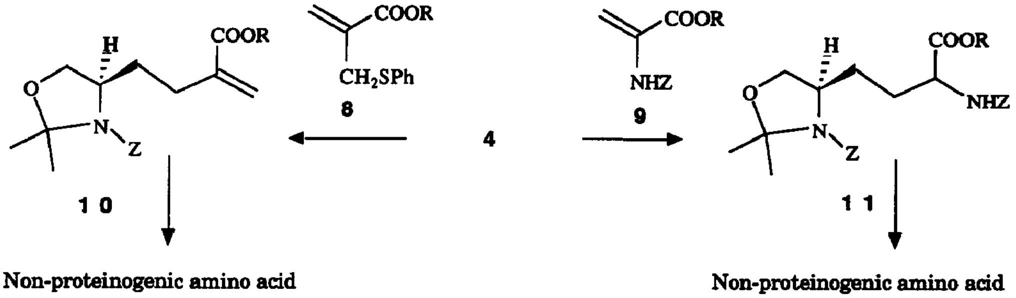
Interestingly, when a mixture comprising an alkyl iodide and a small excess of an electron deficient olefin is put in the presence of a bimetallic couple (Zn/Cu^+, Zn/Fe^{3+}) the above addition reaction can be observed.[2] We felt that such a procedure might be used for the asymmetric preparation of 1,2-aminoalcohols which could be further oxidized to give non-proteinogenic amino acids. In this respect one can notice that (*S*)-serine (and its more costly (*R*)-enantiomer) has served in several elegant preparative procedures leading either to a variety of such compounds or to useful chiral synthons.[3,4]

Herein we disclose, as shown in Scheme 1, that the (*S*)-serine derivative **1** can serve as a common starting material for a simple and efficient preparation of both enantiomers **4** $[\alpha]_D$ - 8.5 and **7**[4] $[\alpha]_D$ + 8.4 (lit[4] + 10.6, CH_2Cl_2), which are of general synthetic interest.

Subsequently,we have examined the behaviour of such compounds under the zinc/copper addition reaction conditions.[2a] Thus, compound **4** was combined with olefins **8** and **9** to give derivatives **10** and **11** in 50 and 65% yield, respectively (Scheme 2).



Scheme 1: ***Reagents*****: i) methyltriphenoxyphosphonium iodide, DMF, rt, 4h; ii) $NaBH_4$, LiCl, THF, rt, 5h; iii) 2,2-dimethoxypropane, TsOH, benzene, reflux, 0.5h.**



Scheme 2

Further application of this synthetic methodology using the above (*S*)-serine originating compounds will be reported in due course.

Acknowledgments Financial support (to E. J. M. & A. D. S.) by the Departamento de Química, Universidade Federal de Juiz de Fora, Juiz de Fora, M. G., Brazil (Programa R.H.A.E./C.N.Pq.) is gratefully acknowledged.

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(*Received in France* 17 *February* 1994; *accepted* 17 *March* 1994)