# One-pot Procedure to Prepare 2-Pyridil-2-oxazolines

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## INTRODUCTION

Economical and efficient synthetic design of optically active chiral ligands for highly enantioselective transformations continue to be one of the most challenging tasks in asymmetric synthesis.[1] The 2-oxazoline ring can be found in biologically active natural products and pharmaceuticals. In addition their chiral derivatives are widely used as ligands or chiral pools in asymmetric synthesis.[2]

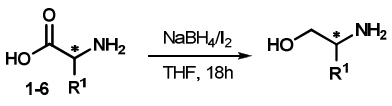
There are a myriad of reactions and transformations stereoselectivilly-assisted by chiral oxazolines as for instance lactone synthesis, cyclopropanation, aziridination, Diels-Alder cycloaddition, allylic substitution, among others.[3]

In face of its large application, the development of practical, economically attractive as well as environmental benign methods to prepare 2-oxazolines is constantly desirable.[4]

In this work we describe a one-pot procedure to prepare 2-pyridil-2-oxazolines by reacting 2-cyanopyridine with chiral amino alcohols catalyzed by zinc acetate under pressure.

## RESULTS AND DISCUSSION

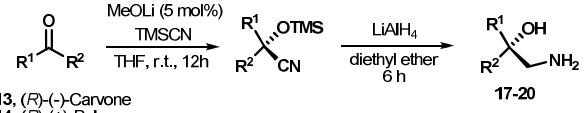
Amino alcohols **7**-**12** were prepared from the corresponding amino acids by known procedure as shown in scheme 1.[5]




**7**, $R^1$= $CH(CH)_3CH_2CH_3$ (75%)
**8**, $R^1$= $CH_2CH(CH_3)_2$ (73%)
**9**, $R^1$= $(CH_2)_2SCH_3$ (65%)
**10**, $R^1$= $CH_2C_6H_5$ (72%)
**11**, $R^1$= $C_6H_5$ (68%)
**12**, $R^1$= $CH(CH_3)_2$ (94%)

**Scheme 1 –** Reduction of amino acids.

Amino alcohols derived from terpene ketones **13**-**16**, were prepared by sequential conversion of the ketone into the corresponding diastereoisomeric optically active cyanohydrins followed by reduction with $LiAlH_4$ according scheme 2.[6]



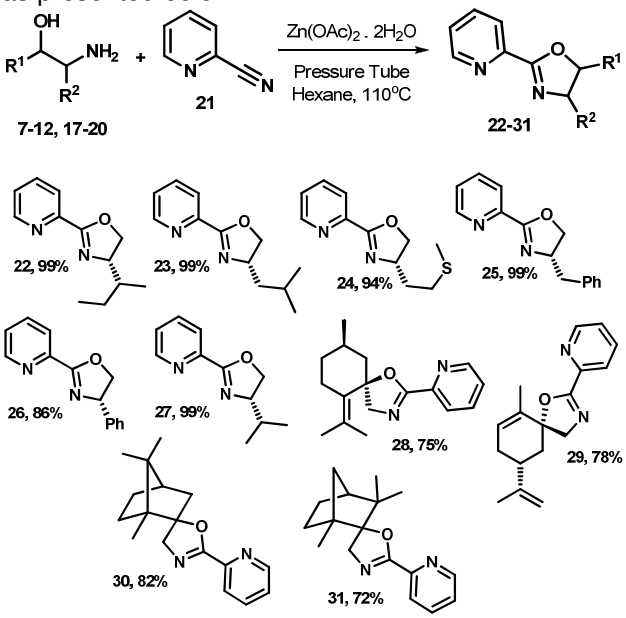

**13**, (*R*)-(-)-Carvone
**14**, (*R*)-(+)-Pulegone
**15**, (*R*)-(+)-Camphor
**16**, (*R*)-(-)-Fenchone

**17-20**

(overall yield range: 77-80%)

**Scheme 2 –** Preparation of the amino alcohols.

We found that heating the amino alcohol and 2-cyanopyridine in hexane and catalytic amount (2 mol%) of zinc acetate, results in the corresponding 2-pyridil-2-oxazoline in reasonable to excellent yield as presented below.




**Scheme 3** – Synthesis of 2-pyridil-2-oxazolines

## CONCLUSION

In conclusion, we have developed a straightforward procedure to prepare 2-pyridil-2-oxazolines. Afterward, these chiral ligands will be employed as asymmetric inductors for asymmetric synthesis.

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FAPESP CAPES CNPq

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