

# Synthesis of enantiopure fused bithiazolidines and thiazolidinyloxazolidines.

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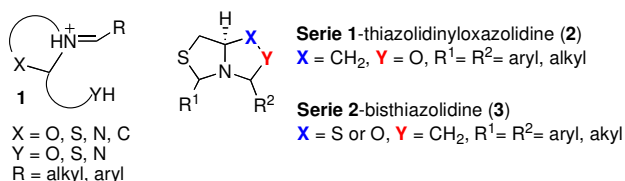
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## INTRODUCTION

Among the different possible methods leading to nitrogen-containing heterocycles, iminium ion cyclization is a widely used process. Cyclic iminium ions of general structure **1** (Figure 1), bearing a nucleophilic tether with a suitable located oxygen, sulfur or nitrogen, are important building blocks for the preparation of synthetically and biologically relevant condensed heterocycles.<sup>1</sup>

Figure 1. Cyclic iminium ion **1**, compounds **2** and **3**.

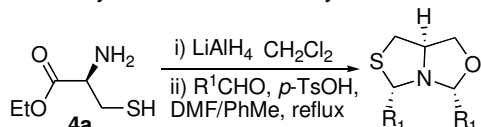


The present work describes our findings in the synthesis of enantioenriched new fused thiazolidinyloxazolidines (**2**) and bithiazolidines (**3**) via the generation of cyclic iminium ions (Figure 1).

## RESULTS AND DISCUSSION

The thiazolidinyloxazolidines **2** were prepared by a 2-step sequence using a modified protocol published previously.<sup>2</sup> Syn-bicycles **2a-d**, were obtained in good yields and high enantiomeric excess, see Table 1.

Table 1. Synthesis of thiazolidinyloxazolidines **2a-d**



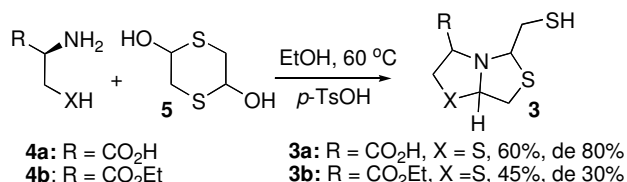
Compound	R <sup>1</sup>	Yield (%)	de % <sup>1</sup>
<b>syn-2a</b>	Ph	89	99
<b>syn-2b</b>	<i>p</i> -ClPh	86	98
<b>syn-2c</b>	<i>p</i> -NO <sub>2</sub> Ph	89	99
<b>syn-2d</b>	CO <sub>2</sub> Et	60	98

de: diastereomeric excess, determined by <sup>1</sup>H NMR.

Compounds **3** were obtained by heating **4a** or **4b** in the presence of the dimeric aldehyde **5**, in acidic media, see Figure 2. Smooth decomposition of dithiane **5** led to the formation of 2-mercaptoacetaldehyde. The reaction of two molecules of aldehyde in the presence of aminothiols **4a,b**, led to the formation of fused bithiazolidines **3a,c**. Interestingly when we use **4b** as starting material, the diastereomeric excess was higher than when we use ester **4a**, see Figure 2.

The double cyclization process led to bicycle **3** via iminium ion formation. Further studies in the serie 2 are being carried out in order to study the scope and limitations of this methodology.

Figure 2. Synthesis of fused bithiazolidines **3**



## CONCLUSION

The results presented herein provide evidence for the versatility of N acyliminium ions for the synthesis of new bicyclic compounds not easily accessed by other routes. This structure represents new enantiomerically pure scaffolds; and we can envision their application in organocatalysis, new materials or medicinal chemistry.

## ACKNOWLEDGEMENTS

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## REFERENCES

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