

Towards Catalytic Foldamers: Thiazole-based Pyrrolidine Monomers as Organocatalysts in Enantioselective Transformations

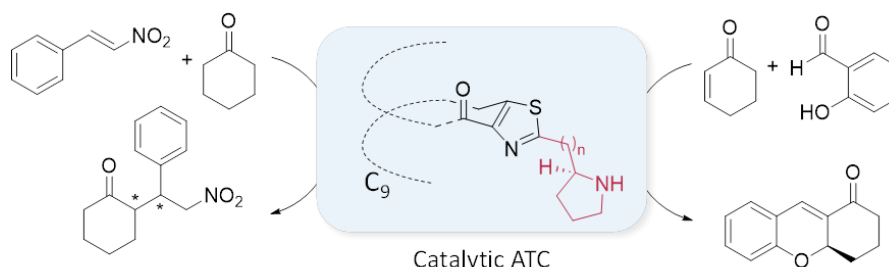


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In the field of ecofriendly chemical transformations, considerable attention has been paid to organocatalytic processes to achieve carbon-carbon bond forming reactions. In such a context, great achievements have been reached following a bioinspired approach in constructing catalytic sites from short artificial folded oligomers (so call foldamers).¹ Over the last years, our group have explored a class of heterocyclic γ -peptides built around a thiazole ring, named ATCs (4-amino(methyl)-1,3-thiazole-5-carboxylic acids), adopting a highly stable helix structure.² Recently, these γ -peptides have been validated as synthetically tractable platforms for a nitro-Michael addition reaction.³ In a natural extension of the undertaken studies, we now intend to further investigate the catalytic abilities of our objects. In addition to the optimization of the nitro-Michael addition reaction, we explored a more challenging reaction, consisting in the oxa-Michael aldol addition reaction between salicylaldehyde and cyclohexanone.⁴ We herein report the design and synthesis of catalytic ATCs and the optimizations of the reaction conditions. By transposing this preliminary work to the corresponding catalytic ATC-based γ -peptide foldamers, we intend to increase the chiral induction of the transformation.



References

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