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Book of Abstracts

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of Thessaloniki

A NOVEL ROUTE FOR THE SYNTHESIS OF 2,3-DIARYLXANTHONES

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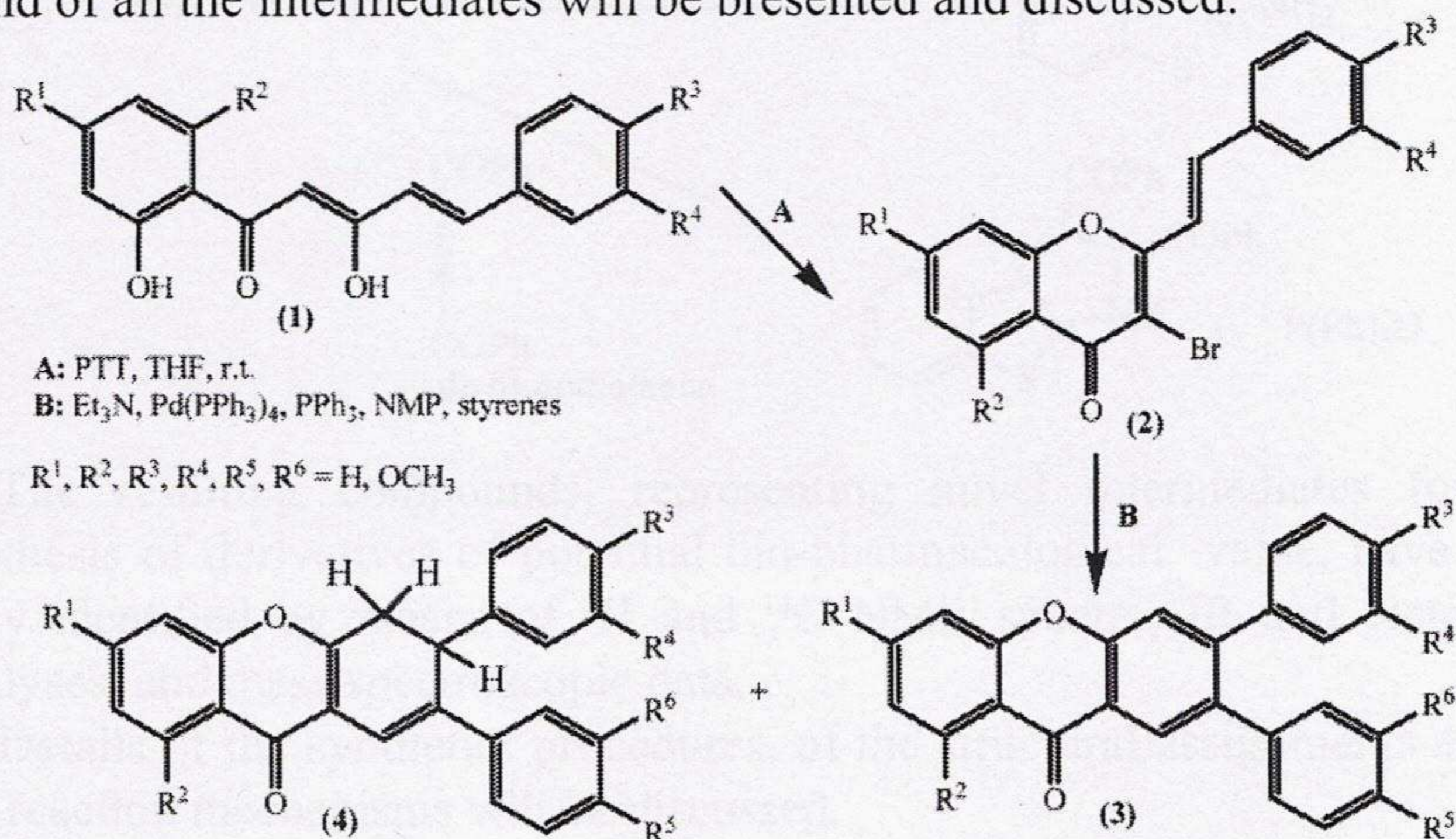
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Chemically, xanthenes are oxygenated heterocyclic compounds with the dibenzo- γ -piron nucleus [1]. Natural derivatives have several types of substituents in different positions of their nucleus, which can be associated to the pharmacological properties presented by this class of compounds [2].

Xanthenes bearing aryl substituents are scarce and no natural derivatives have been reported with the 2,3-diaryl substitution pattern. Recently, we have reported the synthesis of several 2,3-diaryl xanthenes, starting from 3-bromo-2-styrylchromone [3].

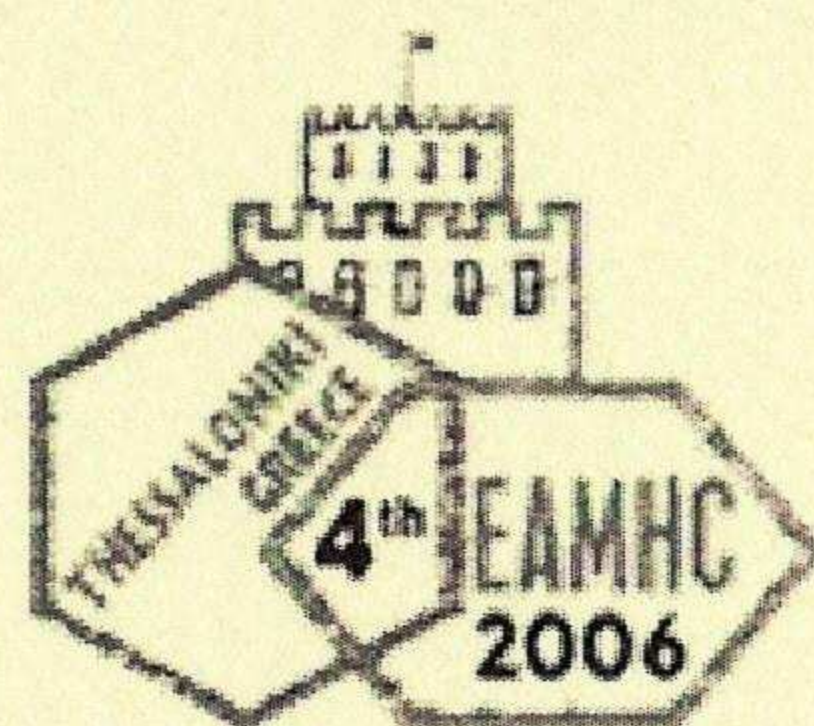
In this communication we report a new route for the synthesis of 2,3-diaryl xanthenes, starting from 1,5-diphenyl-2,4-pentadiene-1-ones **1**. Selective bromination of **1**, followed by a cyclodehydration reaction, yields the 3-bromo-2-styrylchromones **2**. Applying Heck conditions to the reaction of 3-bromo-2-styrylchromones **2** with styrenes, leads to the formation of 2,3-diaryl xanthenes **3** and a minor compound, the 2,3-diaryl-3,4-dihydroxanthones **4**, a semi-oxidized intermediate of the final xanthenes [4].

Experimental procedures and spectroscopic characterization of xanthenes **3** and of all the intermediates will be presented and discussed.



Acknowledgements: Thanks are due to the University of Aveiro, FCT and FEDER for funding the Organic Chemistry Research Unit and the project POCI/QUI/58835/2004. One of us (C.M.M. Santos) is also grateful to PRODEP 5.3 for financial support.

- [1] K. Hostettman, M. Hostettman, in *Methods in Plant Biochemistry*, Vol. 1 – Plant Phenolics, Ed. P. M. Dey, J. B. Harbone, Academic Press, **1989**, pp. 493.
- [2] a) M. M. M. Pinto, M. E. Sousa, M. S. J. Nascimento, *Curr. Med. Chem.*, **2005**, *12*, 2517. b) M. Riscoe, J. X. Kelly, R. Winter, *Curr. Med. Chem.*, **2005**, *12*, 2539.
- [3] A. Fougerousse, E. Gonzalez, R. Brouillard, *J. Org. Chem*, **2000**, *65*, 583.
- [4] C.M. M. Santos, A. M. S. Silva, J. A. S. Cavaleiro, *Synlett*, **2005**, 3095.



4th Eurasian Meeting on Heterocyclic Chemistry (Bioactive Heterocycles)



Thessaloniki, August 27-31, 2006
Greece

To whom it may concern

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President of the Organizing Committee

INTRODUCTION

Chemically, xanthenes are oxygenated heterocyclic compounds with a dibenzo- γ -pirone nucleus [1]. Natural derivatives have several types of substituents in different positions of their nucleus, which can be associated to the pharmacological properties presented by this class of compounds [2]. Xanthenes bearing aryl substituents are scarce and no natural derivatives have been reported with the 2,3-diaryl substitution pattern. Recently, we have reported the synthesis of several 2,3-diaryl xanthenes, starting from 3-bromo-2-methylchromone.

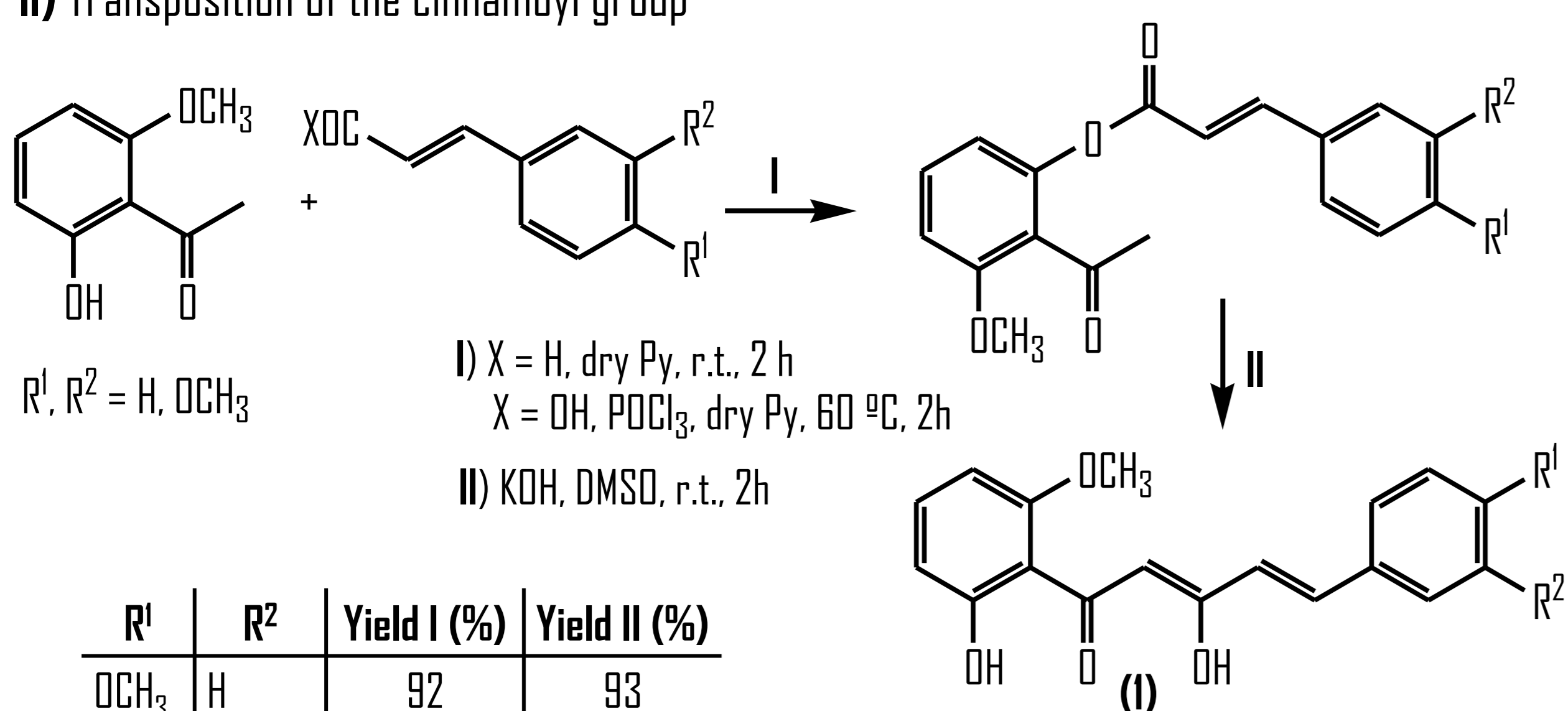
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OUR RESULTS

1. PREPARATION OF 1,5-DIPHENYL-2,4-PENTADIENE-1-ONES (1)

The preparation of 1,5-diphenyl-2,4-pentadiene-1-ones (**1**) involves two steps:

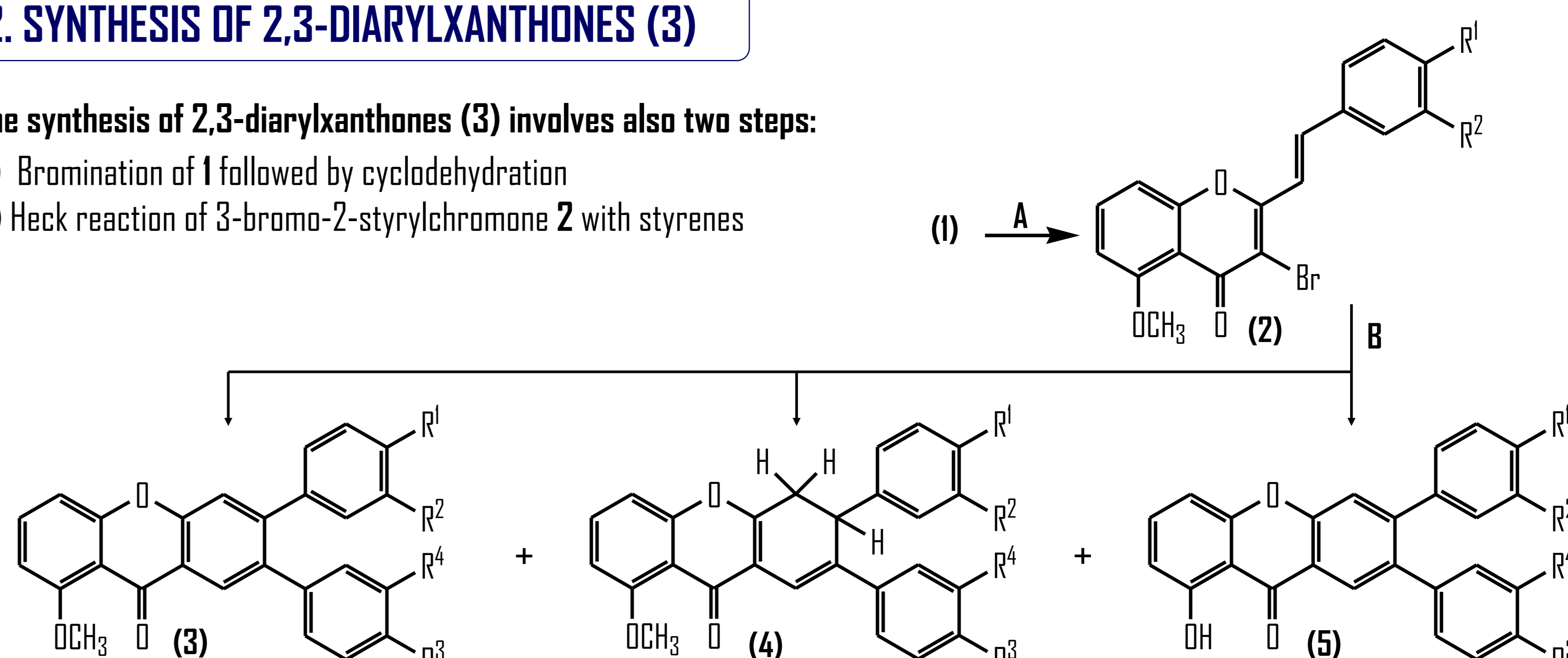
- I) Cinnamylation of a 2'-hydroxyacetophenone
- II) Transposition of the cinnamoyl group



2. SYNTHESIS OF 2,3-DIARYLXANTHONES (3)

The synthesis of 2,3-diaryl xanthenes (**3**) involves also two steps:

- A) Bromination of **1** followed by cyclodehydration
- B) Heck reaction of 3-bromo-2-styrylchromone **2** with styrenes

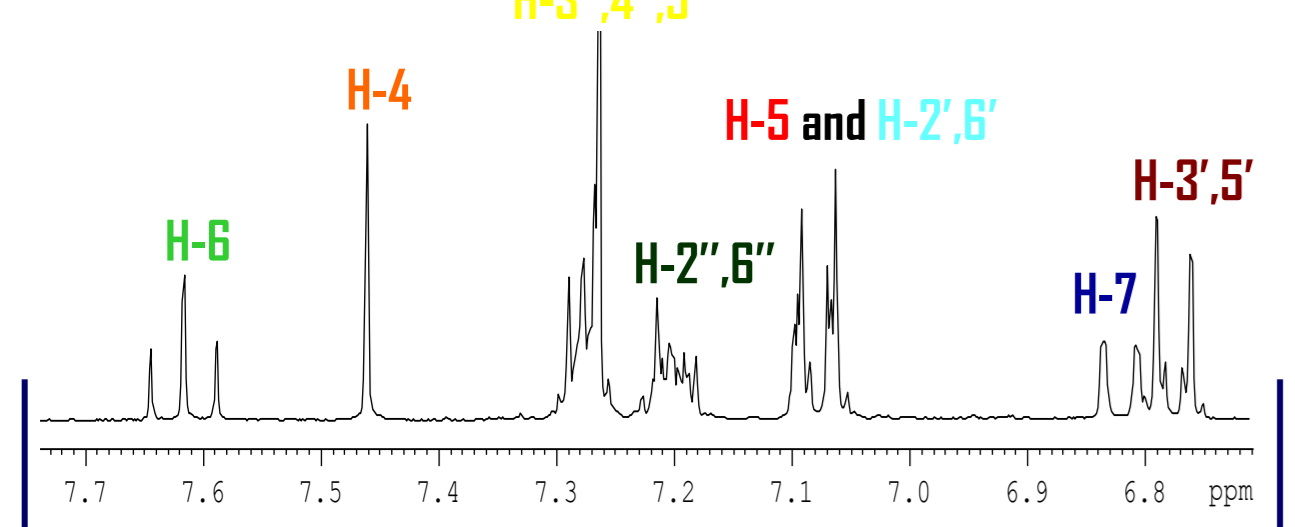
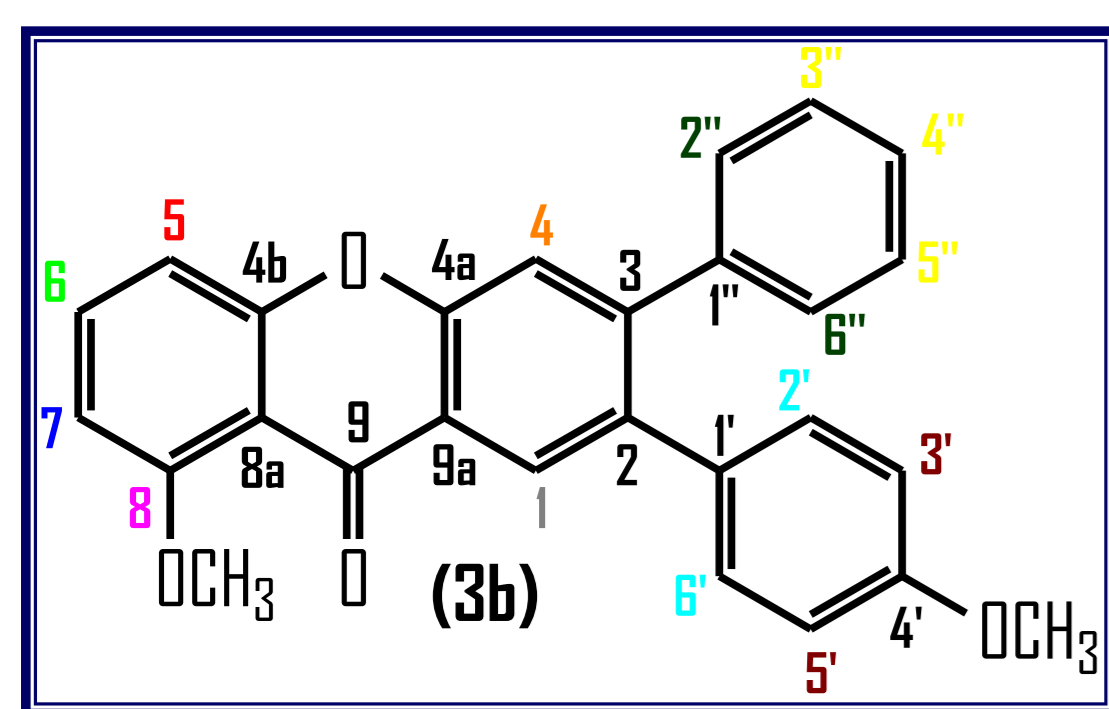


A: 1.5 eq. PTT, THF, r.t., 12 h
B: 1 eq. Et₃N, 0.05 eq. Pd(PPh₃)₄, 0.1 eq. PPh₃, NMP, styrenes, reflux, 3h

R ¹	R ²	Yield 2 (%)
OCH ₃	H	69
OCH ₃	OCH ₃	58

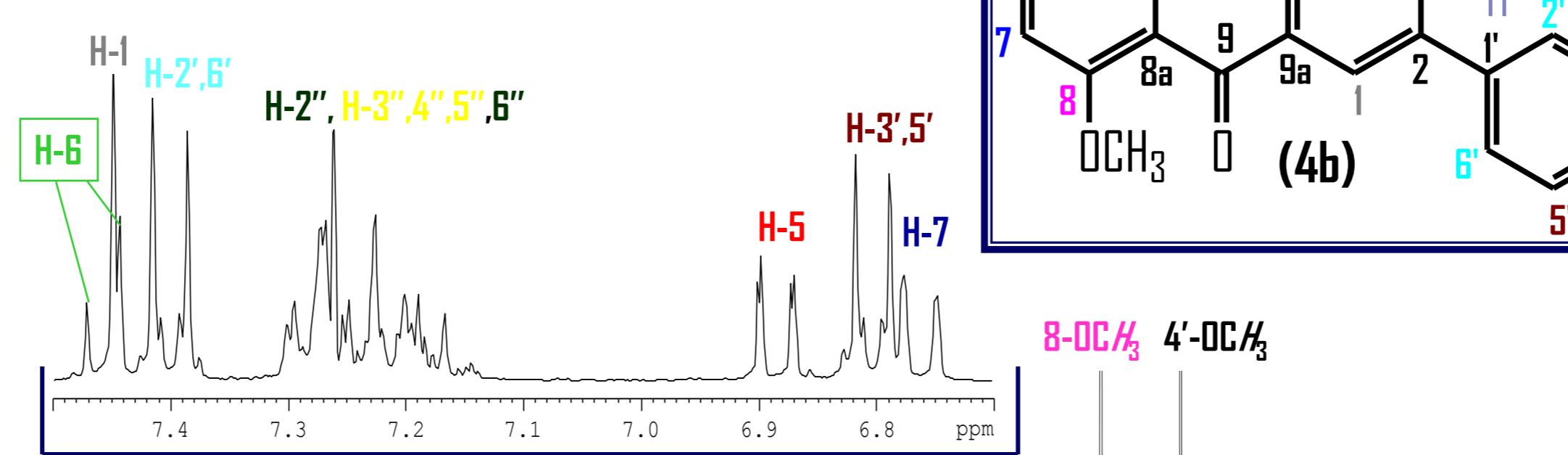
R ¹	R ²	R ³	R ⁴	Yield 3 (%)	Yield 4 (%)	Yield 5 (%)
a	H	H	H	47	12	12
b	H	H	OCH ₃	24	35	5
c	H	H	OCH ₃	22	5	2
d	OCH ₃	OCH ₃	H	21	13	7
e	OCH ₃	OCH ₃	OCH ₃	31	13	5

STRUCTURAL ELUCIDATION

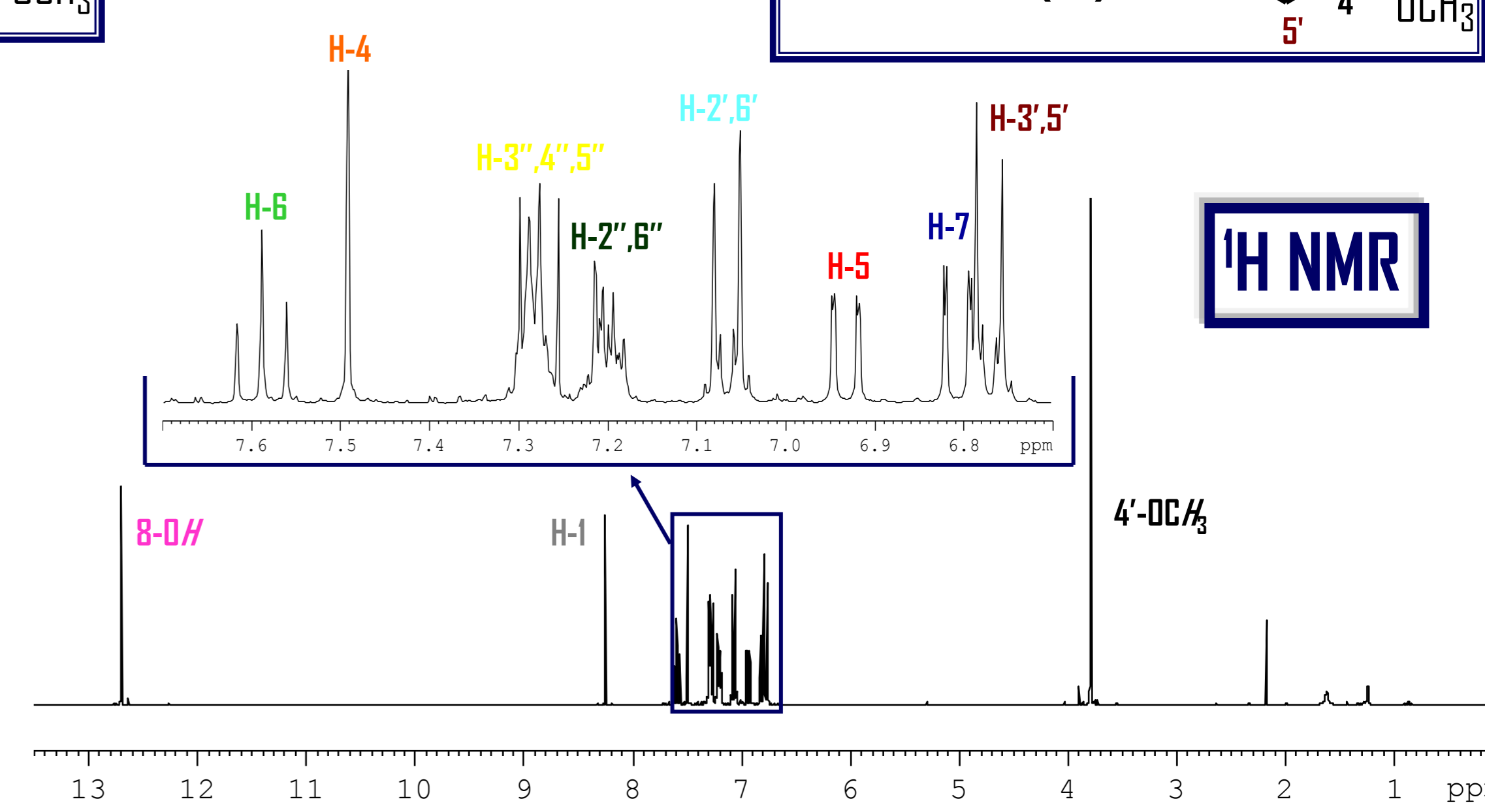
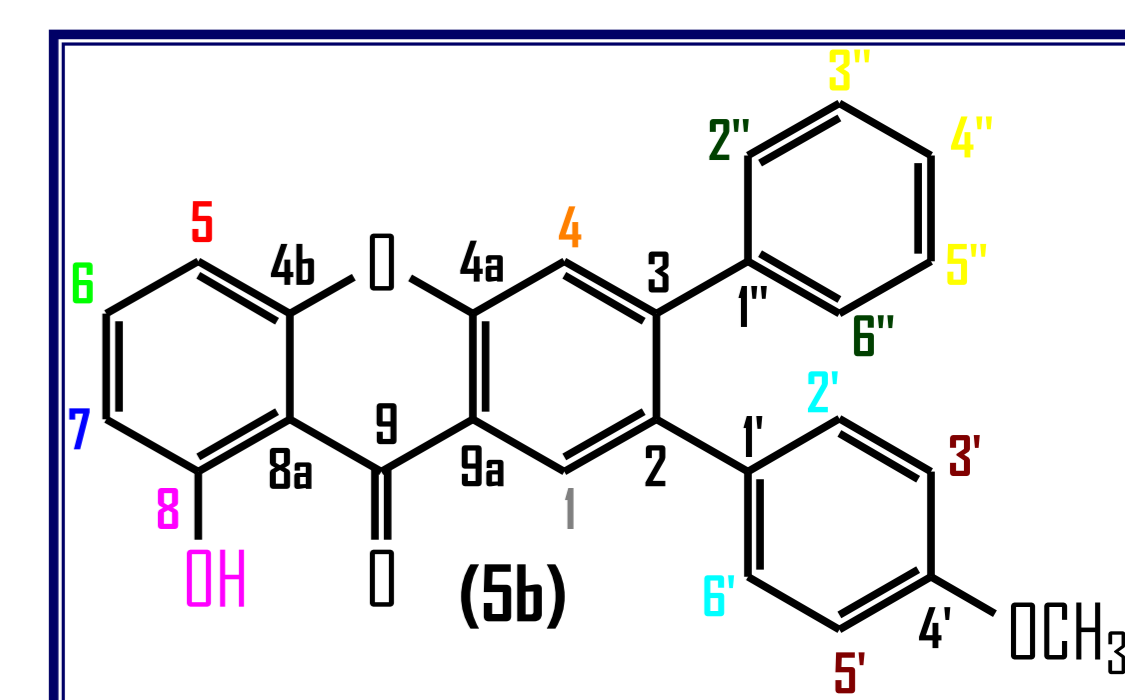


¹H NMR

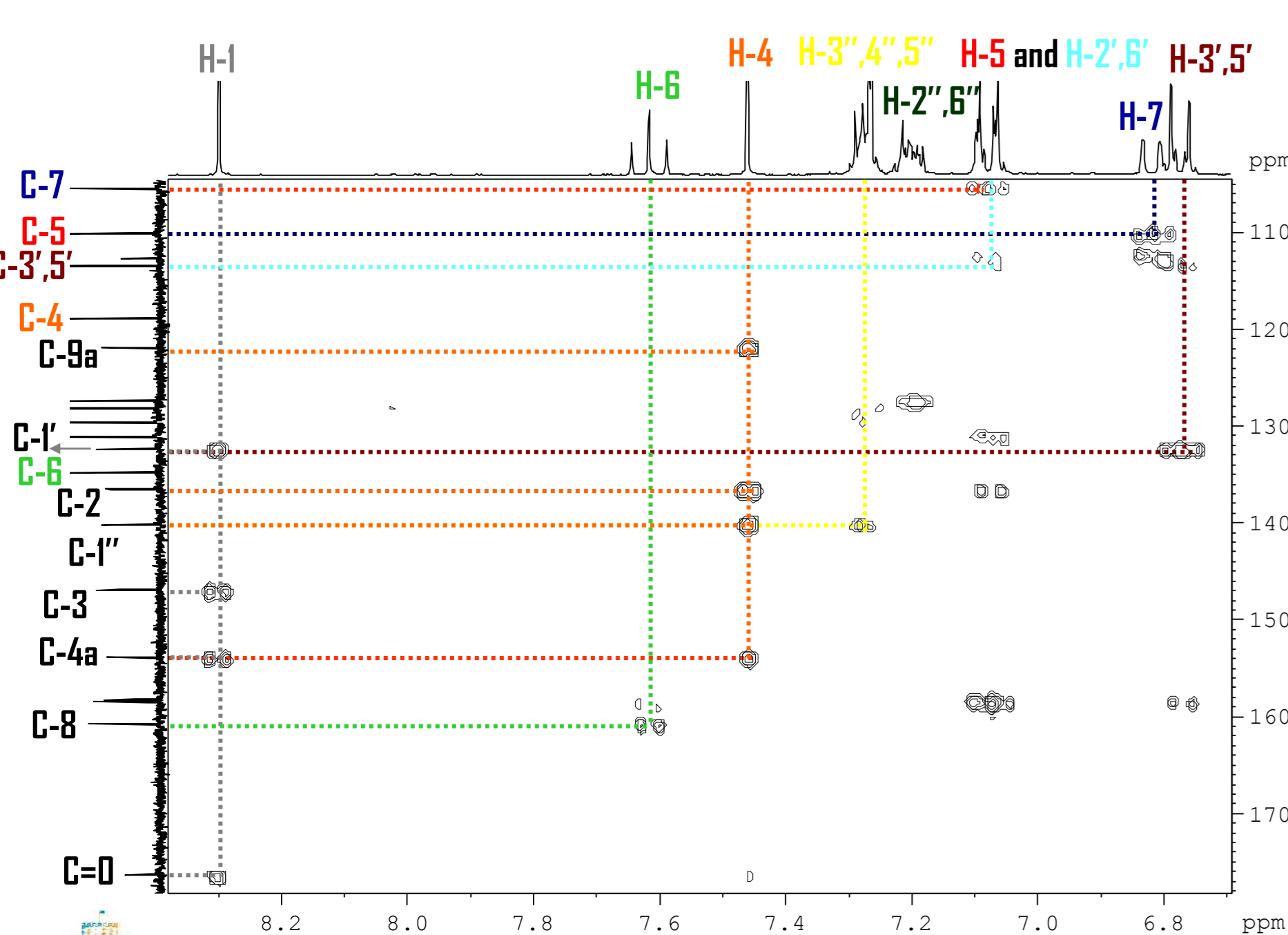
¹H NMR



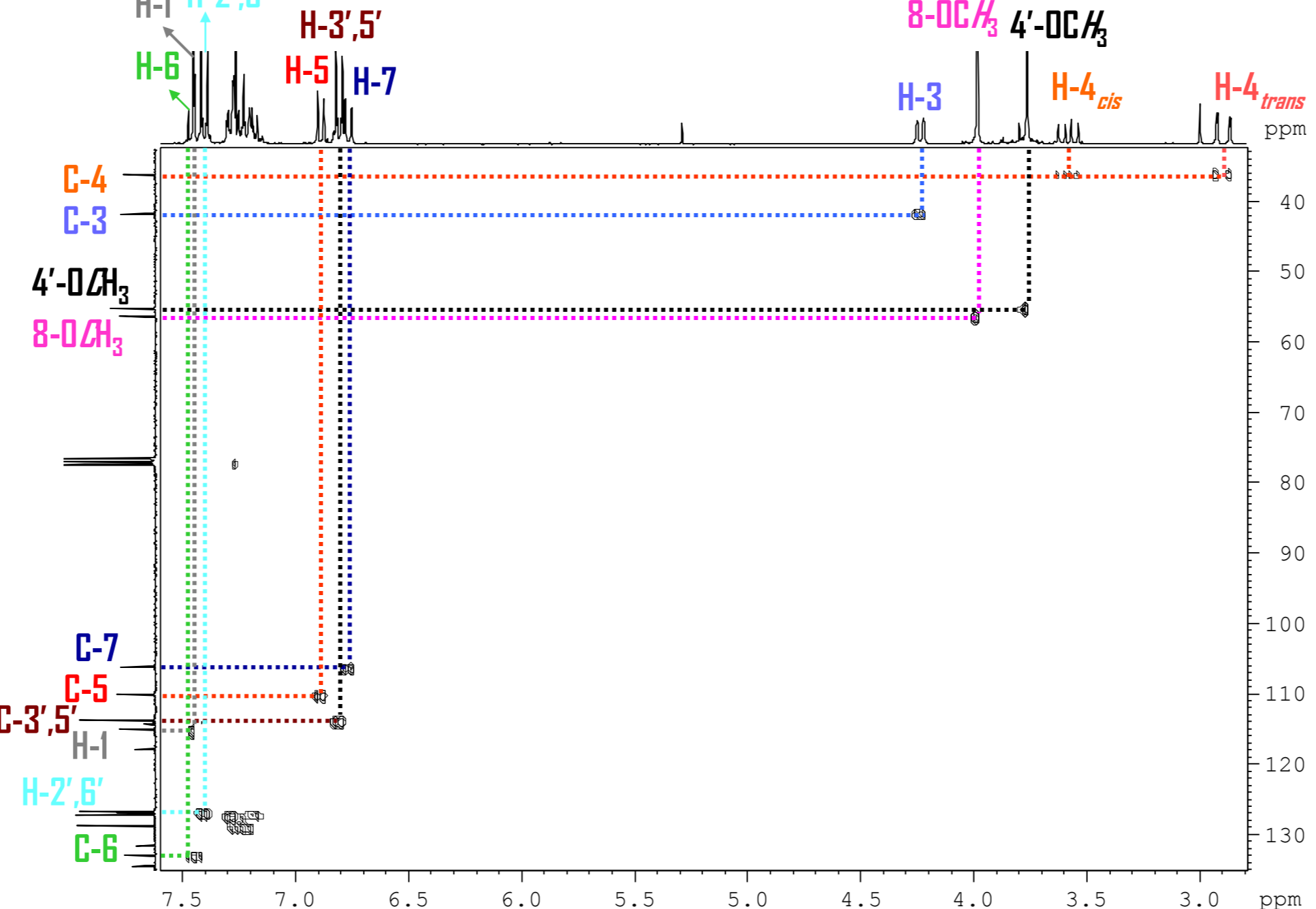
ppm



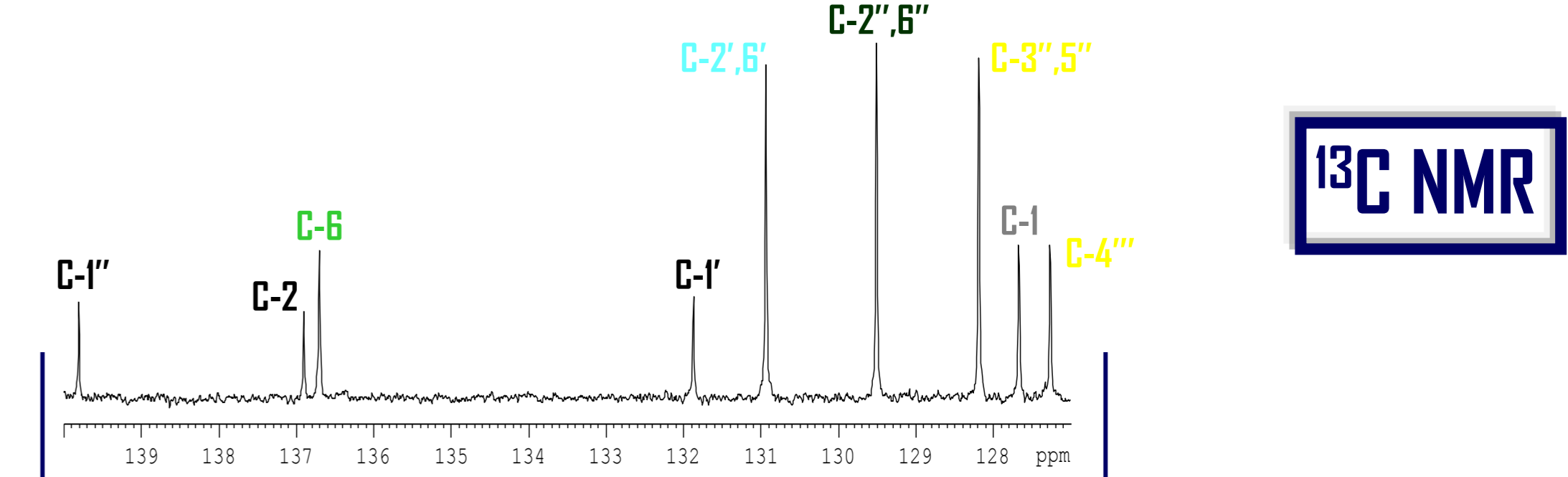
¹H NMR



HMBC



HSQC



¹³C NMR

ACKNOWLEDGEMENTS

Thanks are due to the University of Aveiro, FCT and FEDER for funding the Organic Chemistry Research Unit and the project POCI/QUI/59284/2004. One of us (C.M.M. Santos) is also grateful to PRODEP 5.3 for financial support.

REFERENCES

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