

SYNTHESIS AND STRUCTURAL CHARACTERIZATION OF NOVEL

ACYLHYDRAZONE DERIVATIVES

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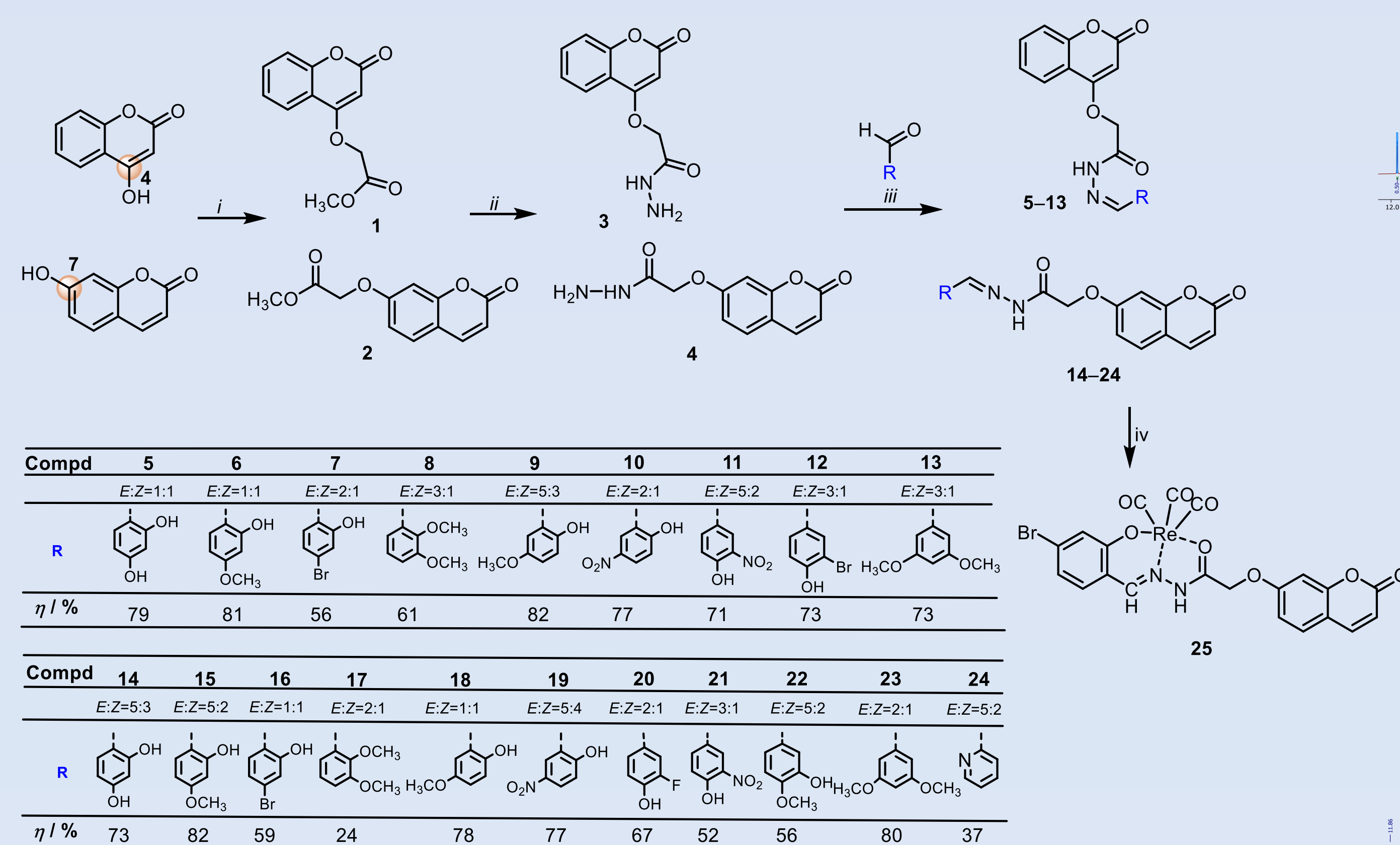
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INTRODUCTION

- Coumarins are considered one of the most important groups of heterocyclic compounds due to their wide range of biological activities. Due to the exceptional ability of structural modification, coumarins represent an attractive scaffold for development of new biologically active compounds.^{1,2}
- Hydrazones play an important role in the formation of carbon–nitrogen and nitrogen–heteroatom bonds due to their versatility as synthons, providing versatile approaches to the synthesis of nitrogen-containing heterocyclic compounds.³
- Herein, a series of novel coumarin-based *O*-acylhydrazone derivatives was synthesized to identify compounds with potential antitumor and antiviral activities and to evaluate their suitability as ligands for the preparation of rhenium(I) coordination complexes.

SYNTHESIS



Scheme 1. Reagents and conditions: (i) methylchloroacetate, K₂CO₃, DMF, 60 °C; (ii) hydrazine monohydrate, EtOH, 80 °C; (iii) EtOH, 80 °C; (iv) pentacarbonylchlororhenium(I), triethylamine, 65 °C

CONCLUSION

- 4-*O*-acylcoumarin 1 and 7-*O*-acylcoumarin 2 were synthesized by acylation of 4-hydroxycoumarin and 7-hydroxycoumarin, respectively, with methyl chloroacetate in the presence of a base.
- Coumarin-4-oxyacetohydrazide 3 and coumarin-7-oxyacetohydrazide 4 were prepared by reaction of corresponding 4-*O*-acylcoumarin 1 and 7-*O*-acylcoumarin 2 with hydrazine monohydrate in ethanol.
- Reaction of hydrazides 3 and 4 with variously substituted benzaldehydes in ethanol afforded *O*-acylhydrazone derivatives of 4-coumarin substituted derivatives 5–13 and 7-substituted derivatives 14–24 as mixtures of *E*- and *Z*-isomers.
- The complex 25 was synthesized by the reaction of the 7-*O*-acylhydrazone derivative of coumarin 16 and rhenium(I) pentacarbonyl chloride in the presence of a base.
- The structures of synthesized compounds were confirmed by ¹H- and ¹³C-NMR spectroscopy, as well as by two-dimensional techniques including NOESY and HSQC.

REFERENCES

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- I. Sokol *et al.* *Future Med Chem.* 13 (2021) 1865.
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SPECTROSCOPIC CHARACTERIZATION

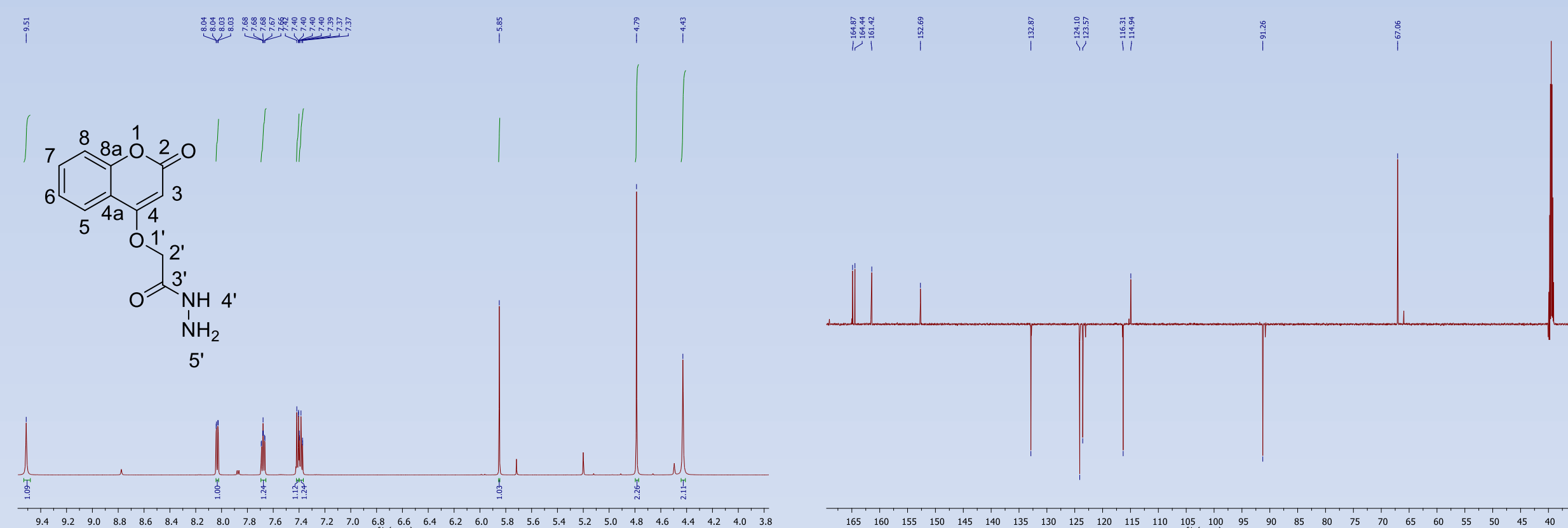


Figure 1. ¹H and ¹³C-NMR spectra of compound 3

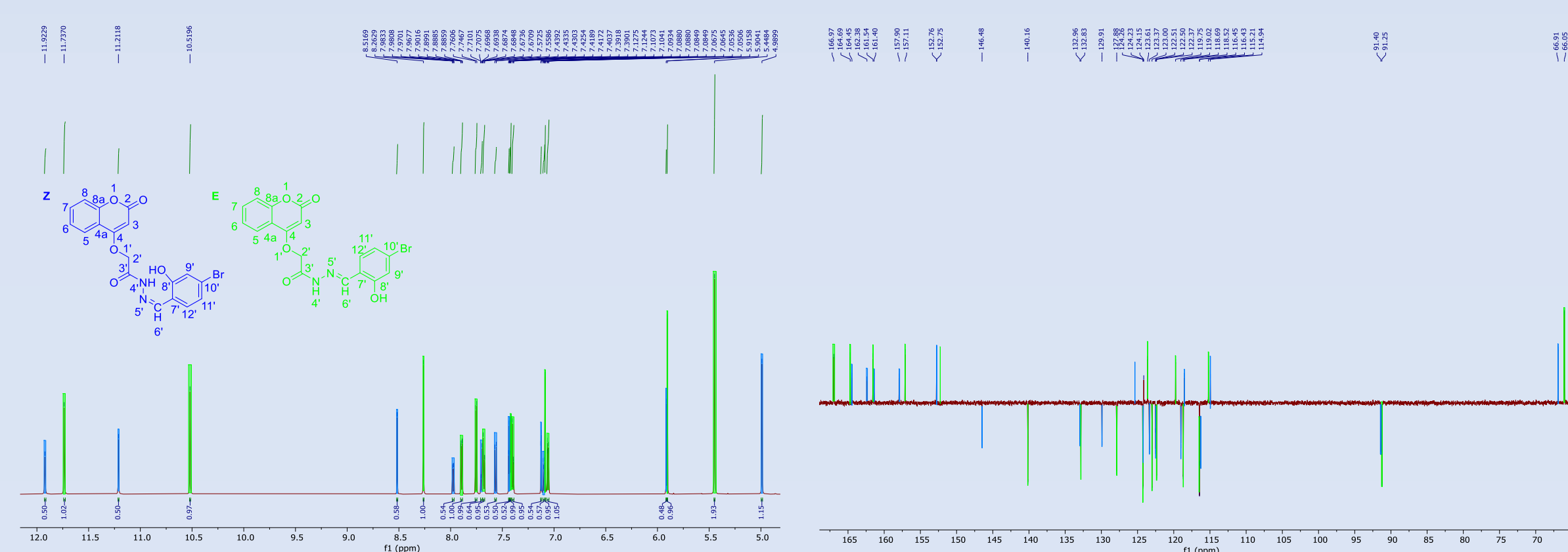


Figure 2. ¹H and ¹³C-NMR spectra of compound 7 (*E* : *Z* = 2 : 1)

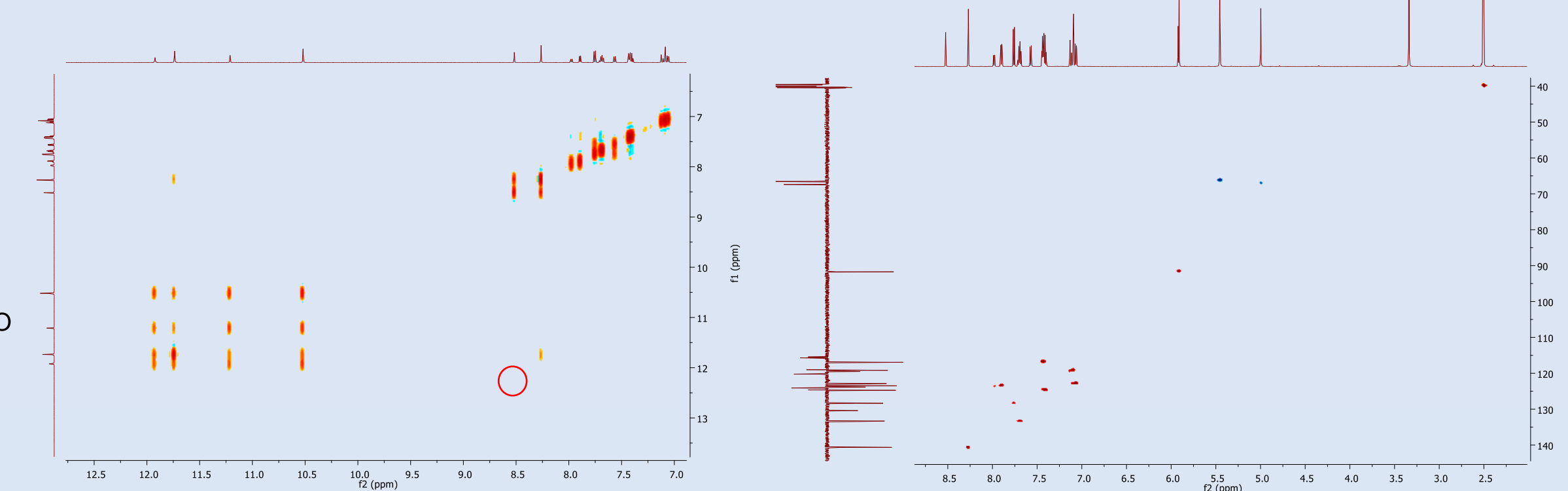


Figure 3. NOESY and HSQC spectra of compound 7

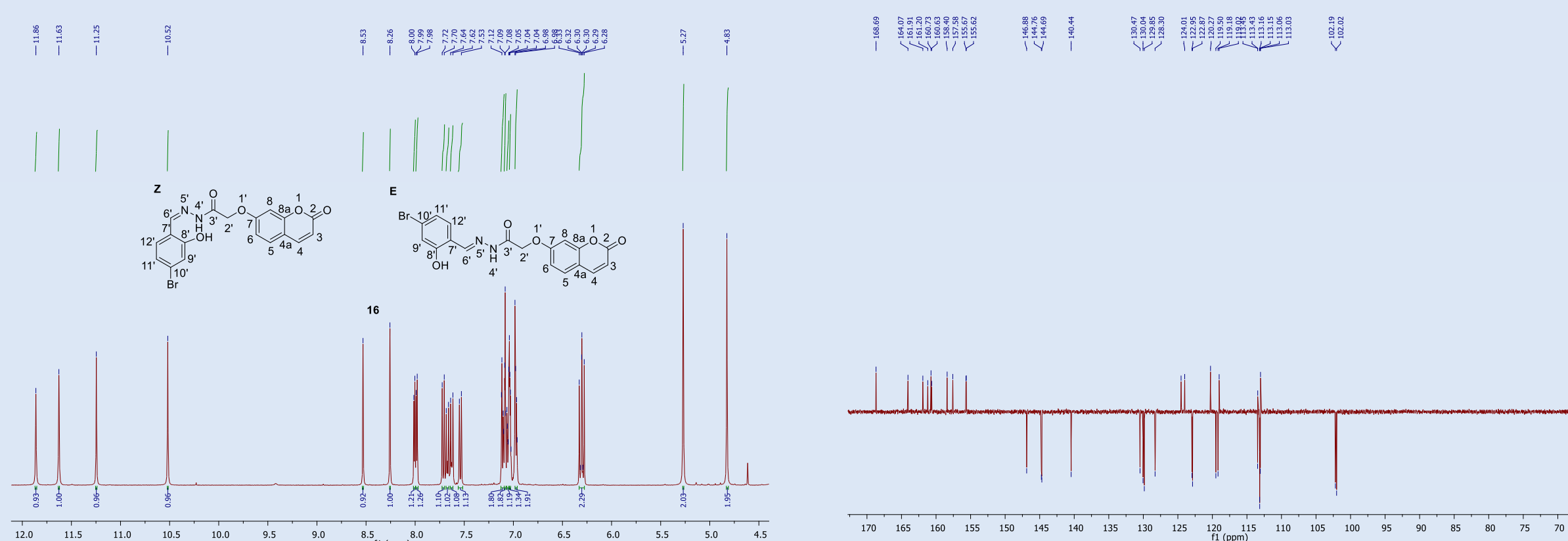


Figure 4. ¹H and ¹³C-NMR spectra of compound 16 (*E* : *Z* = 1 : 1)

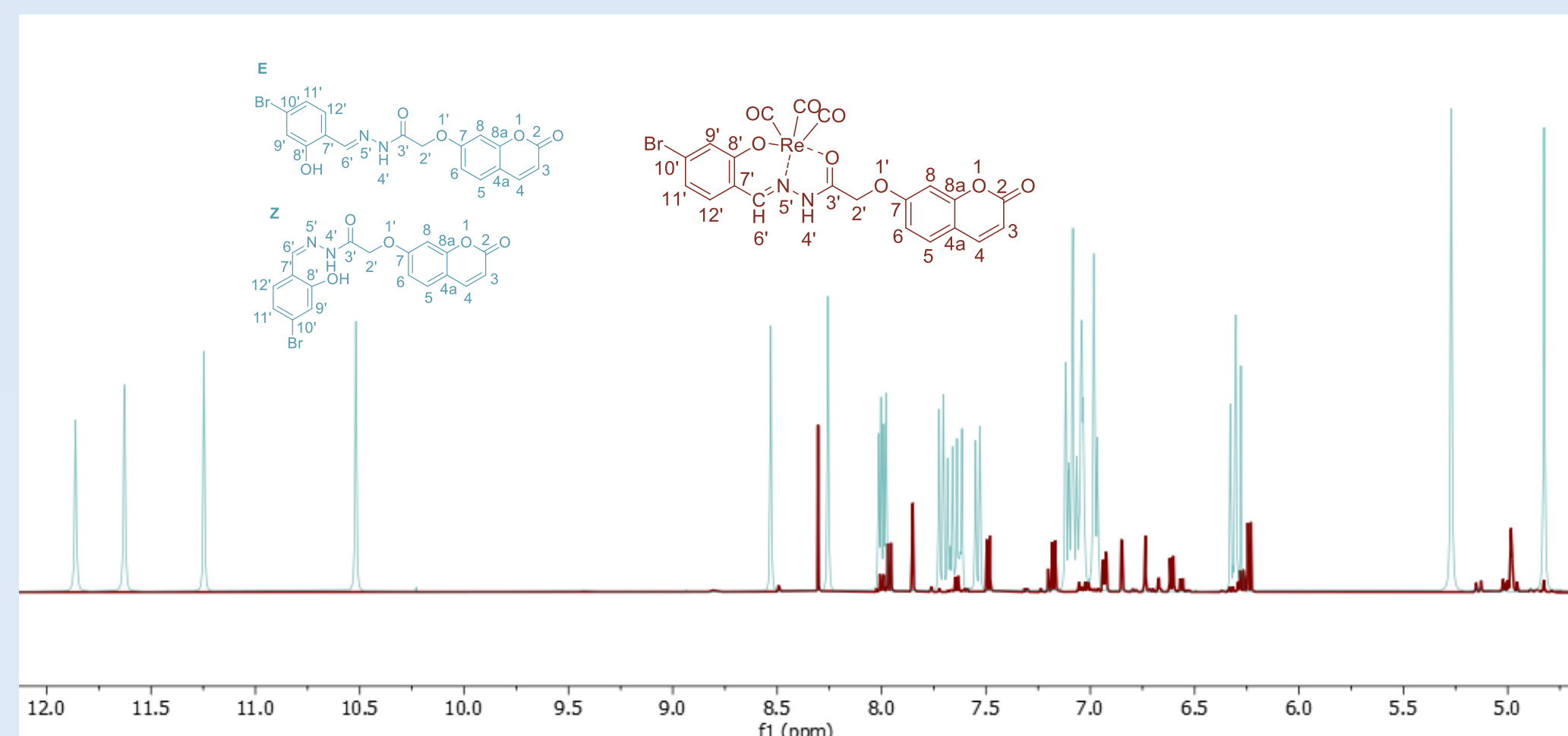


Figure 5. Overlapped ¹H-NMR spectra of compounds 16 and 25

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