

Highly efficient and mild Gold (I) catalyzed synthesis of 3,8-diarylidene-2,7-dioxaspiro[4.4]nonane-1,6-diones

Antonia Iazzetti¹, Dario Allevi¹, Andrea Calcaterra^{2,*}, Giancarlo Fabrizi², Antonella Goggiamani², Giulia Mazzocanti², Alessio Sferrazza^{2,†}, Rosanna Verdiglione², Valeria Vergine²

¹ Dipartimento di Scienze Biotechnologiche di Base Cliniche Intensivologiche e Perioperatorie, Università Cattolica del Sacro Cuore, Campus di Roma, Largo Francesco Vito 1, 00168 Rome, Italy

² Department of Chemistry and Technology of Drugs, Sapienza – University of Rome, P.le Aldo Moro 5, 00185 Rome, Italy

[†] Alessio Sferrazza is currently a research scientist at IRBM S.p.A., Medicinal Chemistry Department, Via Pontina km 30, n. 600, 00071 Pomezia (Rome), Italy

* Correspondence: Andrea Calcaterra, e-mail: andrea.calcaterra@uniroma1.it

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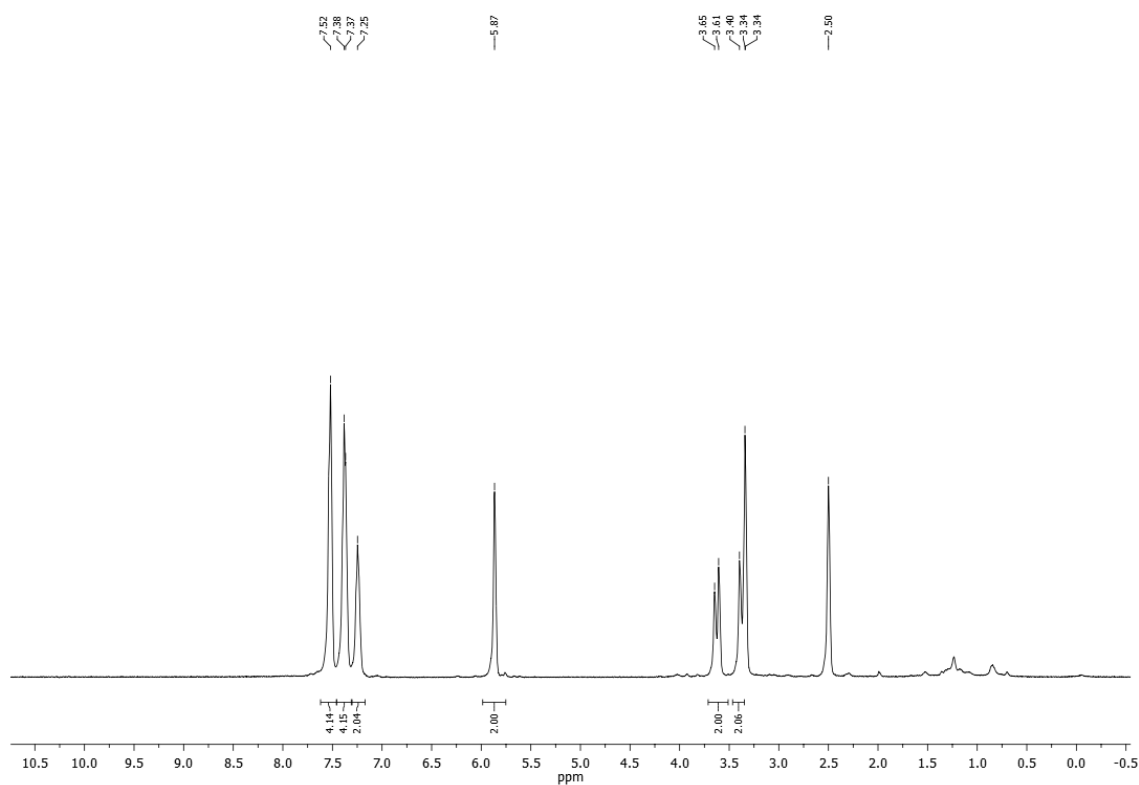


Figure S1. ¹H NMR of 3,8-dibenzylidene-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5a**).

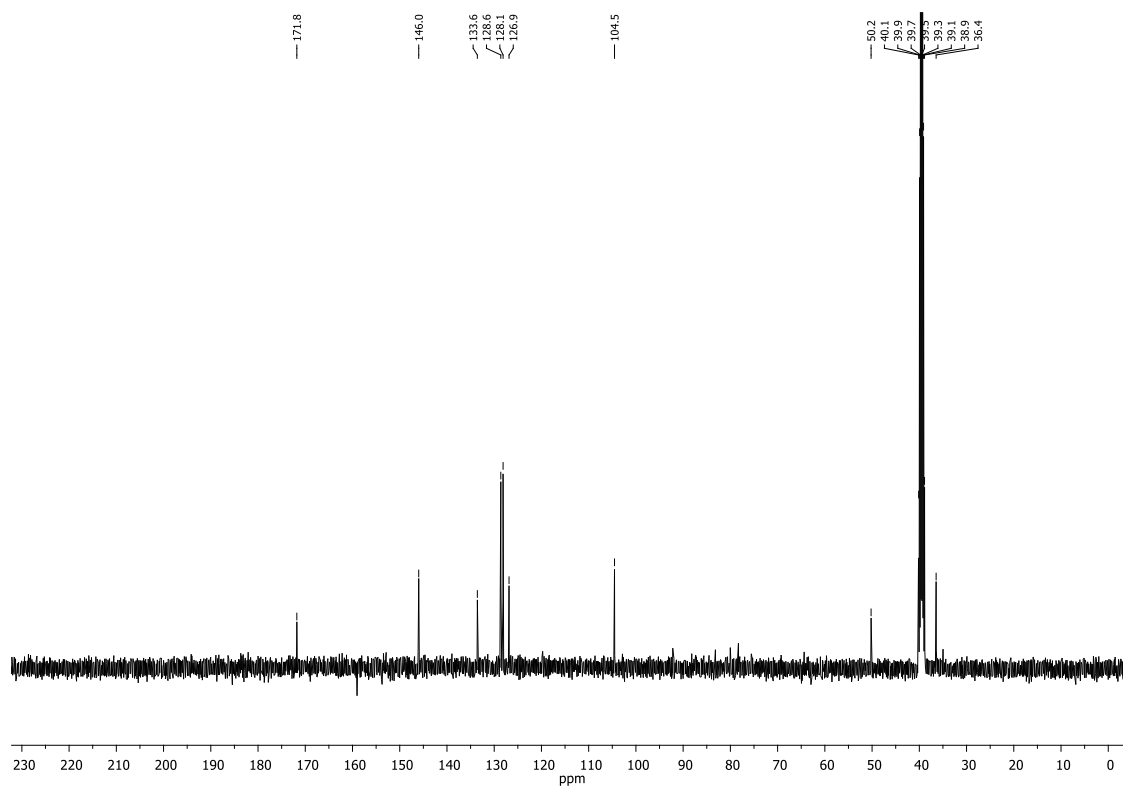


Figure S2. ¹³C NMR of 3,8-dibenzylidene-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5a**).

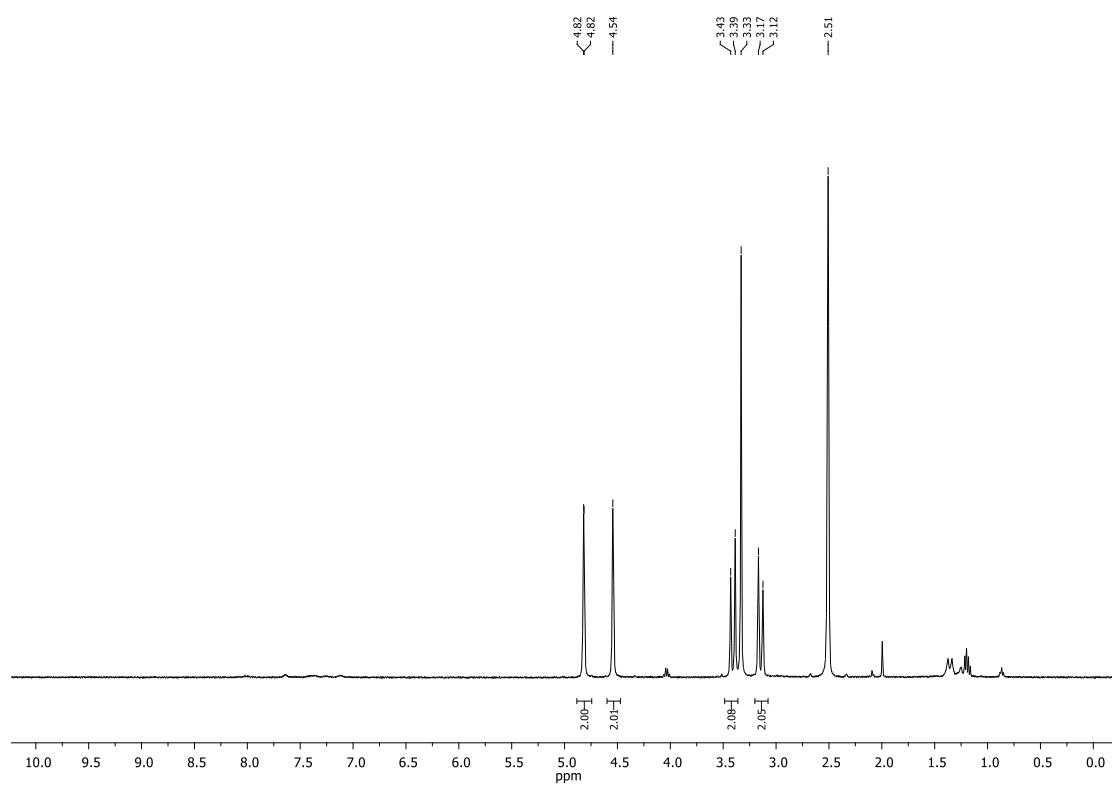


Figure S3. ¹H NMR of 3,8-dimethylene-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5b**).

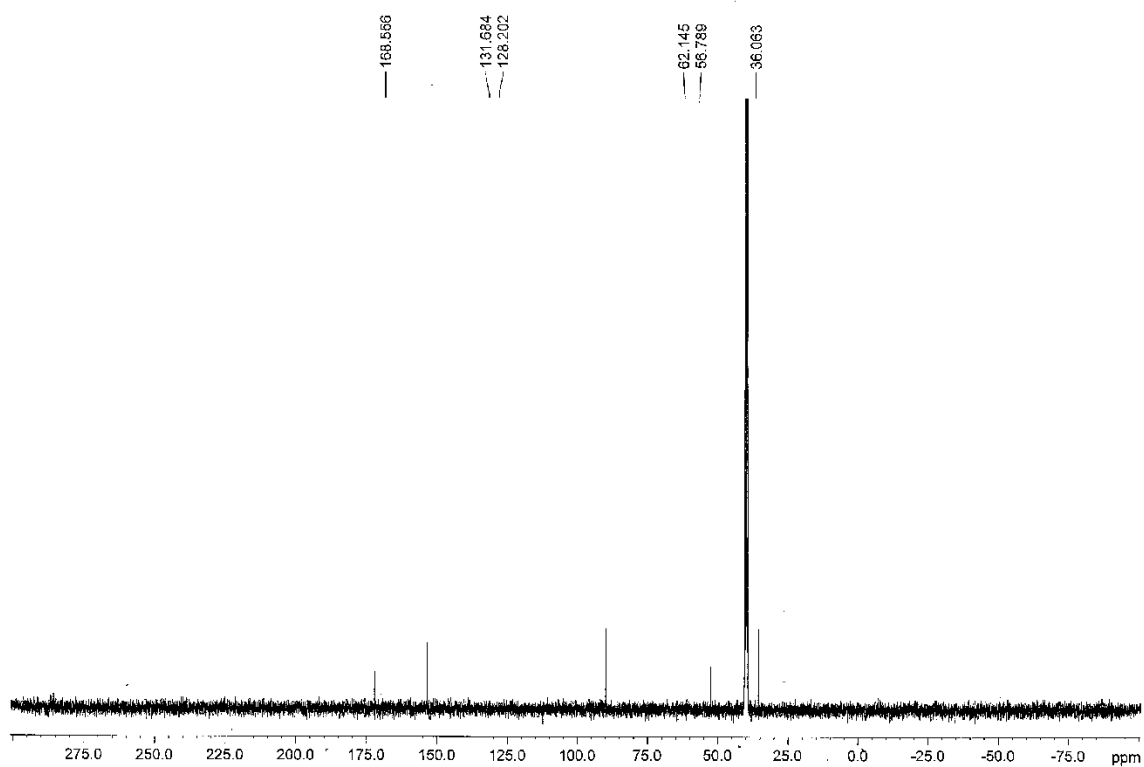


Figure S4. ¹³C NMR of 3,8-dimethylene-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5b**).

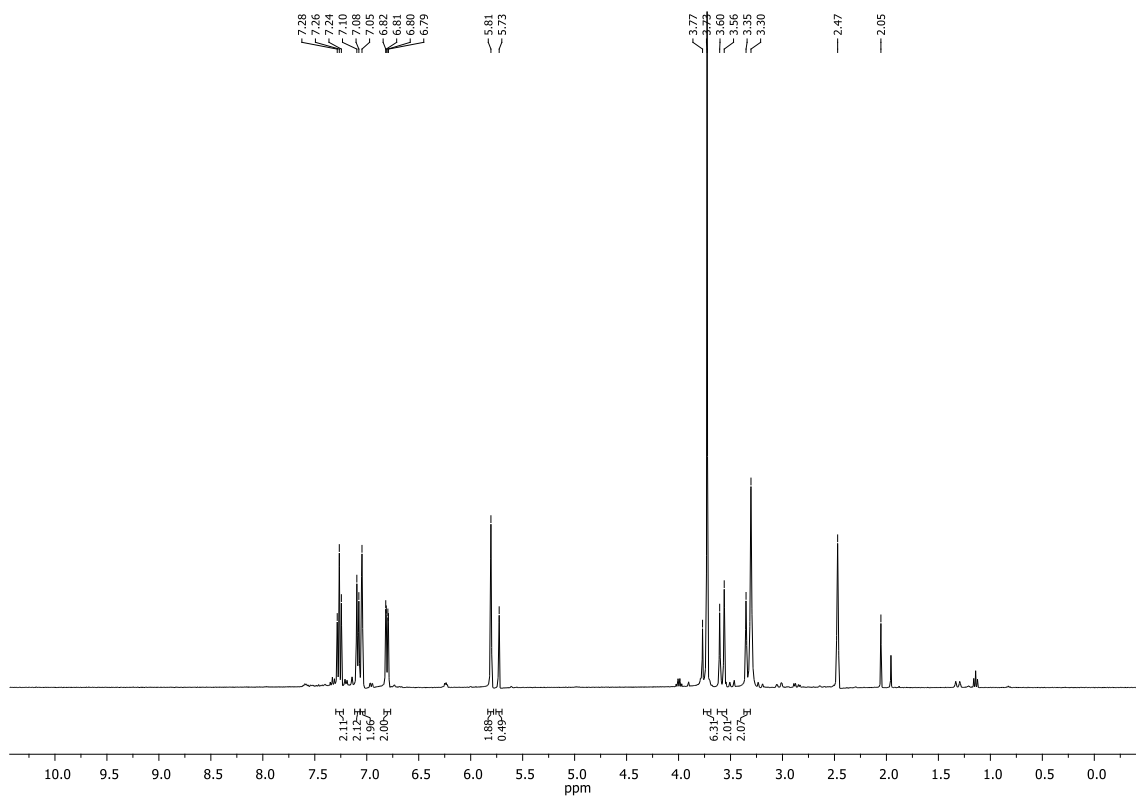


Figure S5. ¹H NMR of 3,8-bis(4-methoxybenzylidene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5c**).

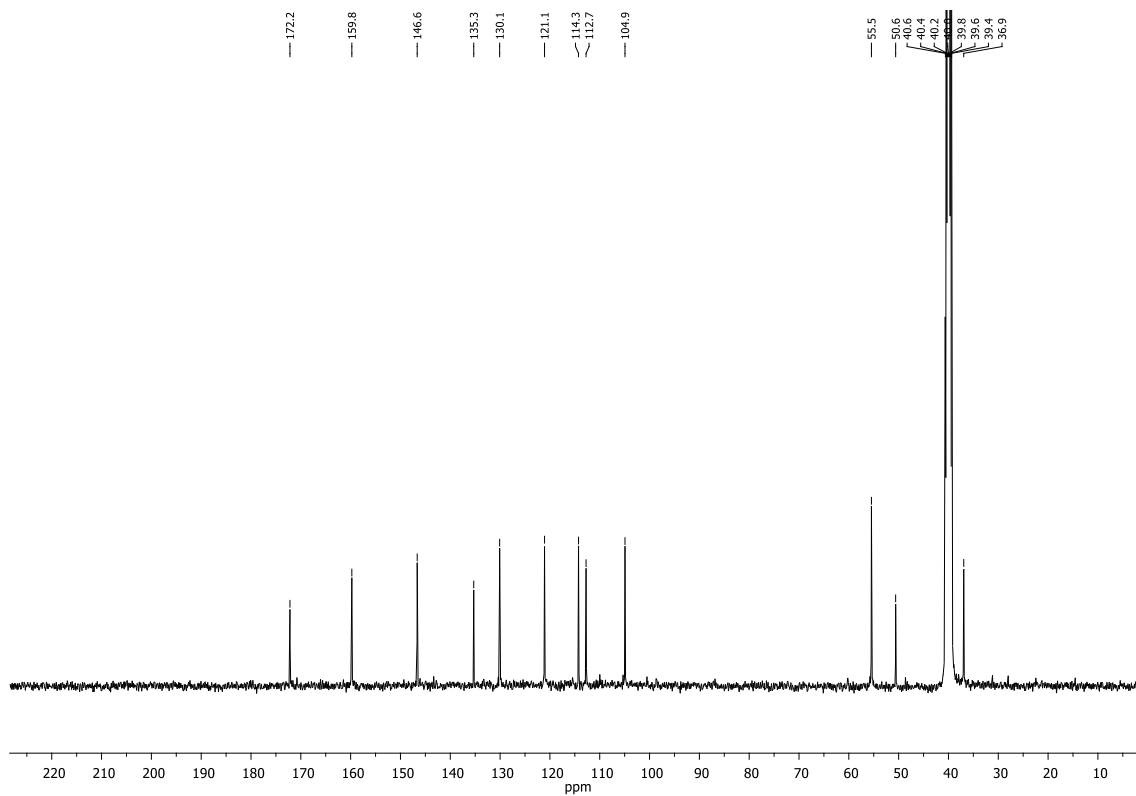


Figure S6. ¹³C NMR of 3,8-bis(4-methoxybenzylidene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5c**).

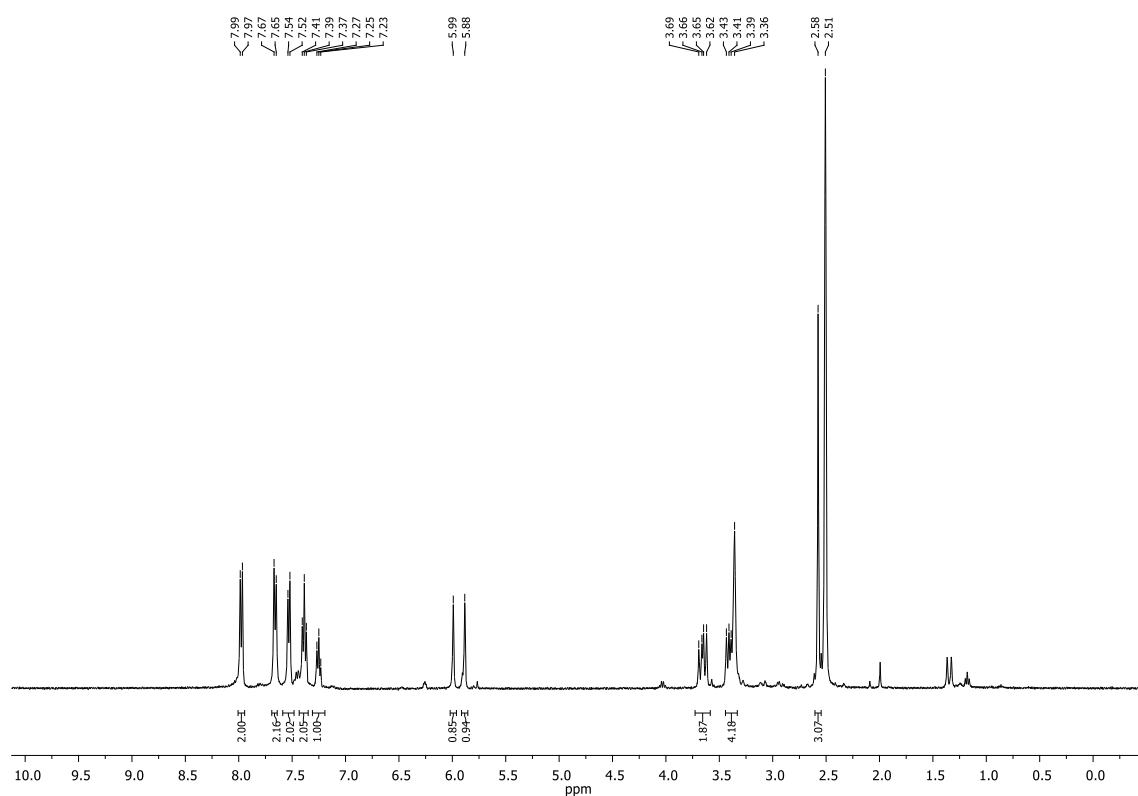


Figure S7. ¹H NMR of 3-benzylidene-8-(3-methoxybenzylidene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5d**).

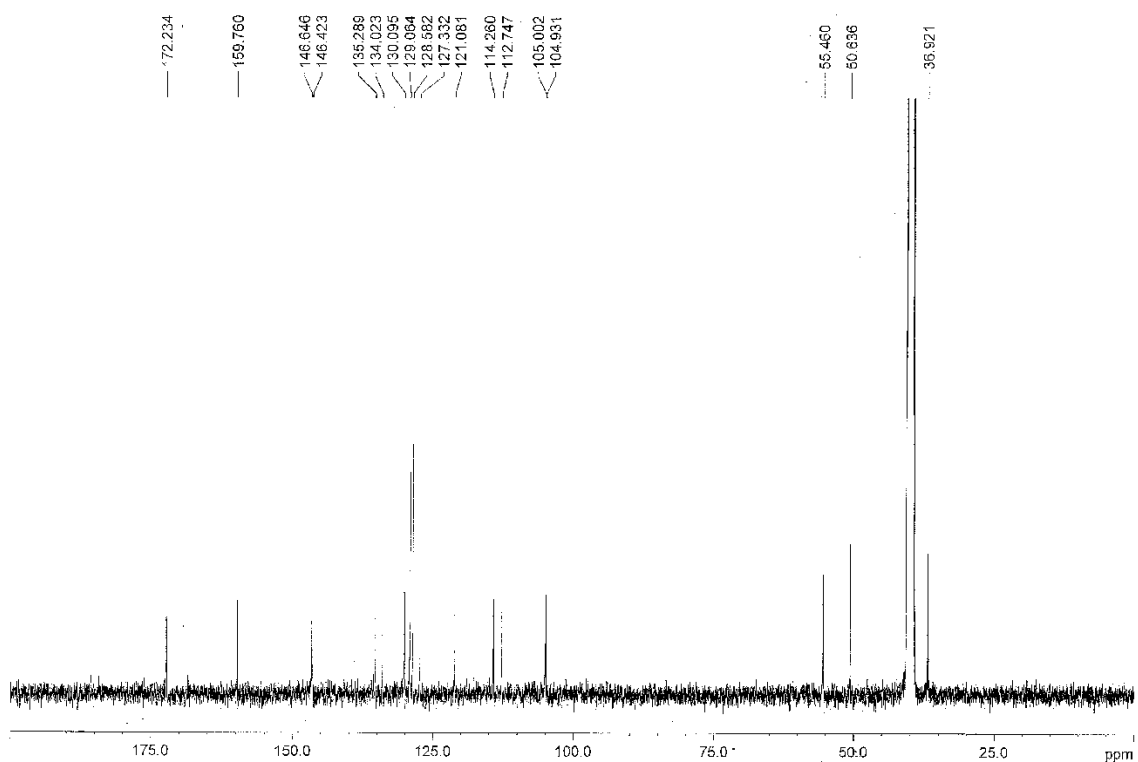


Figure S8. ¹³C NMR of 3-benzylidene-8-(3-methoxybenzylidene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5d**).

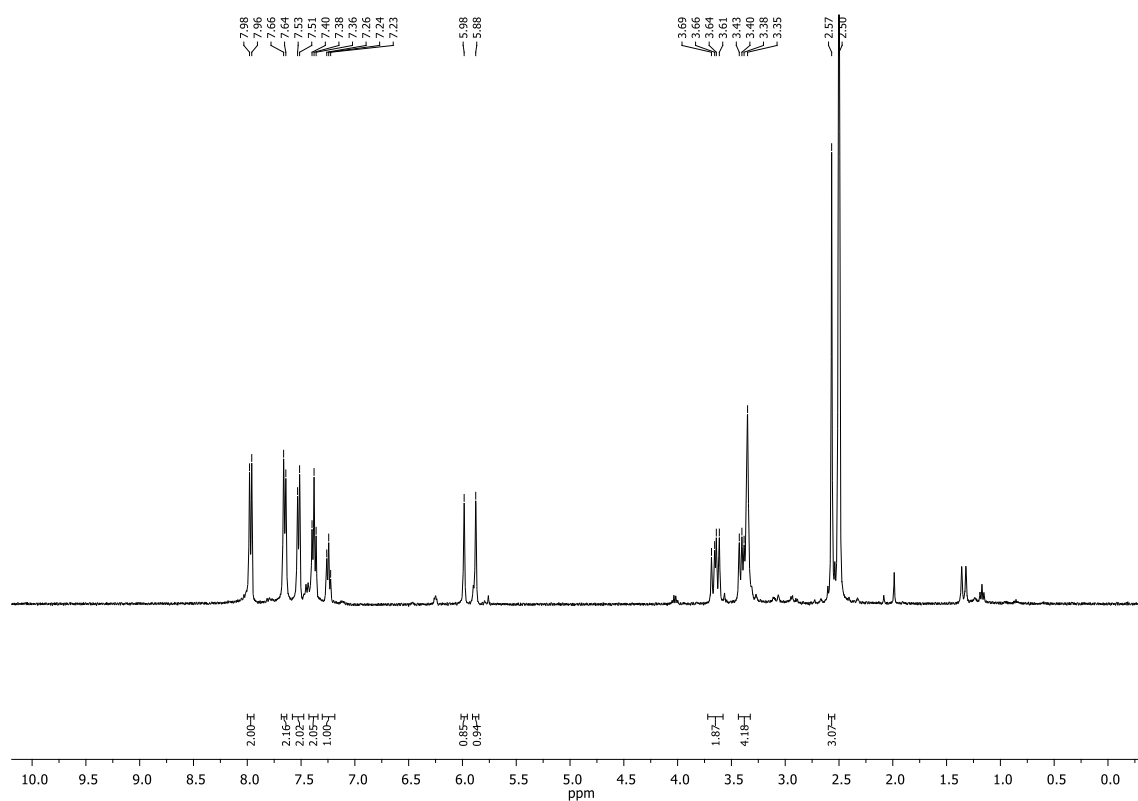


Figure S9. ¹H NMR of 3-(4-acetylbenzylidene)-8-benzylidene-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5e**).

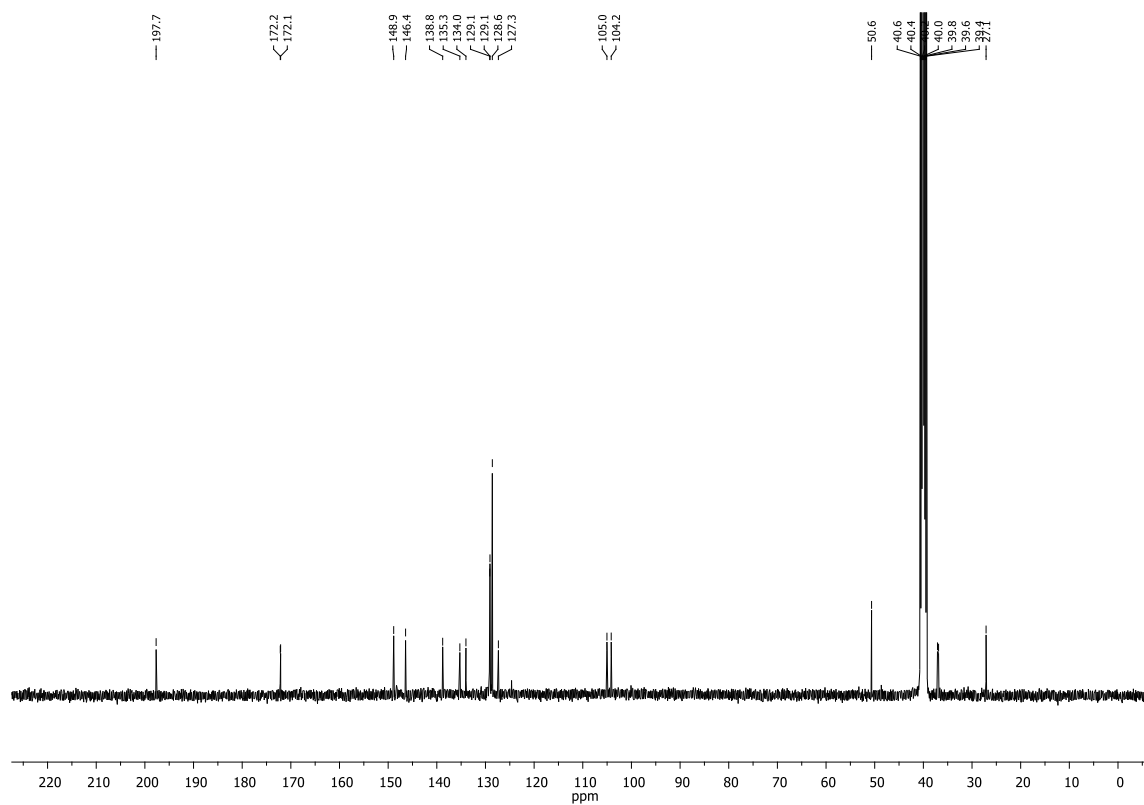


Figure S10. ¹³C NMR of 3-(4-acetylbenzylidene)-8-benzylidene-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5e**).

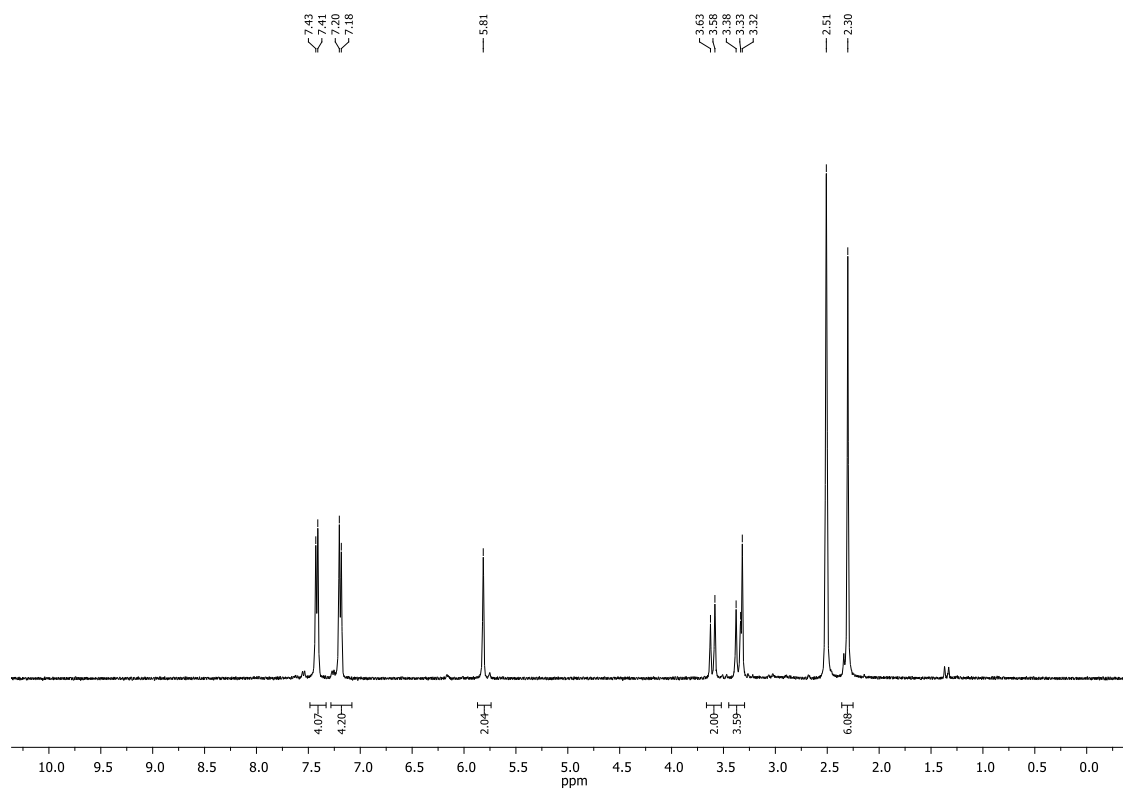


Figure S11. ¹H NMR of 3,8-bis(4-methylbenzylidene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5f**).

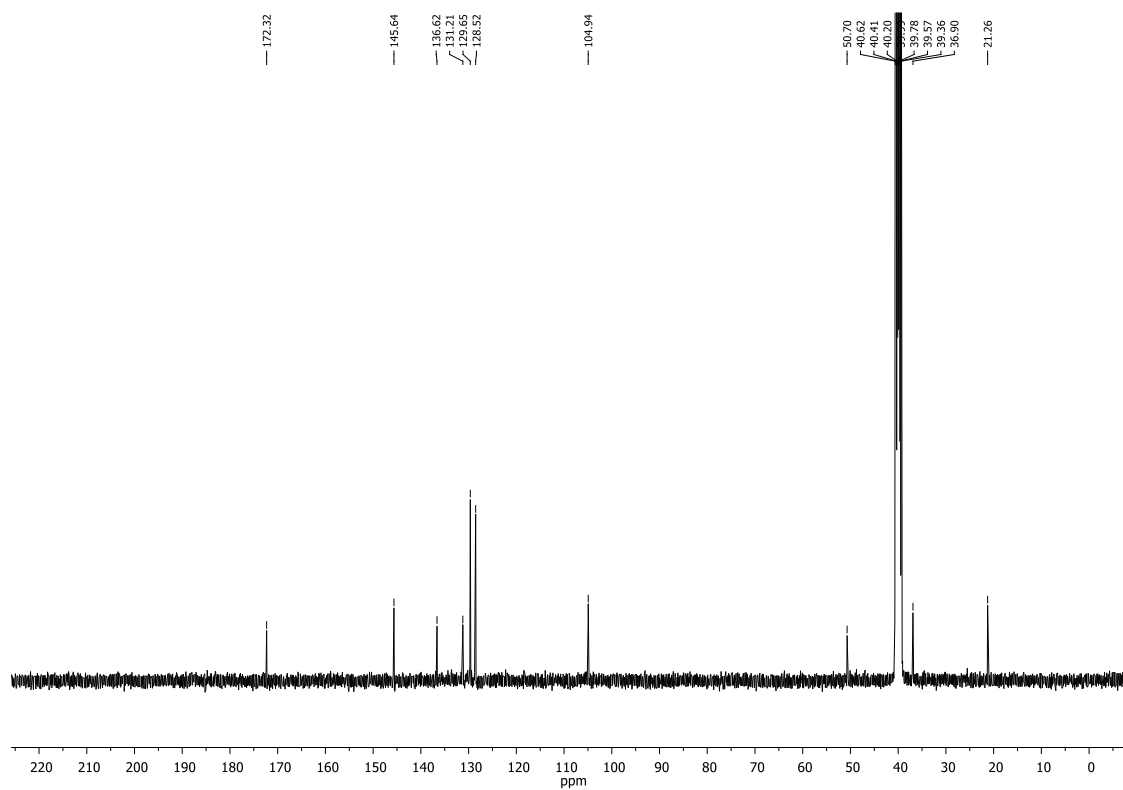


Figure S12. ¹³C NMR of 3,8-bis(4-methylbenzylidene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5f**).

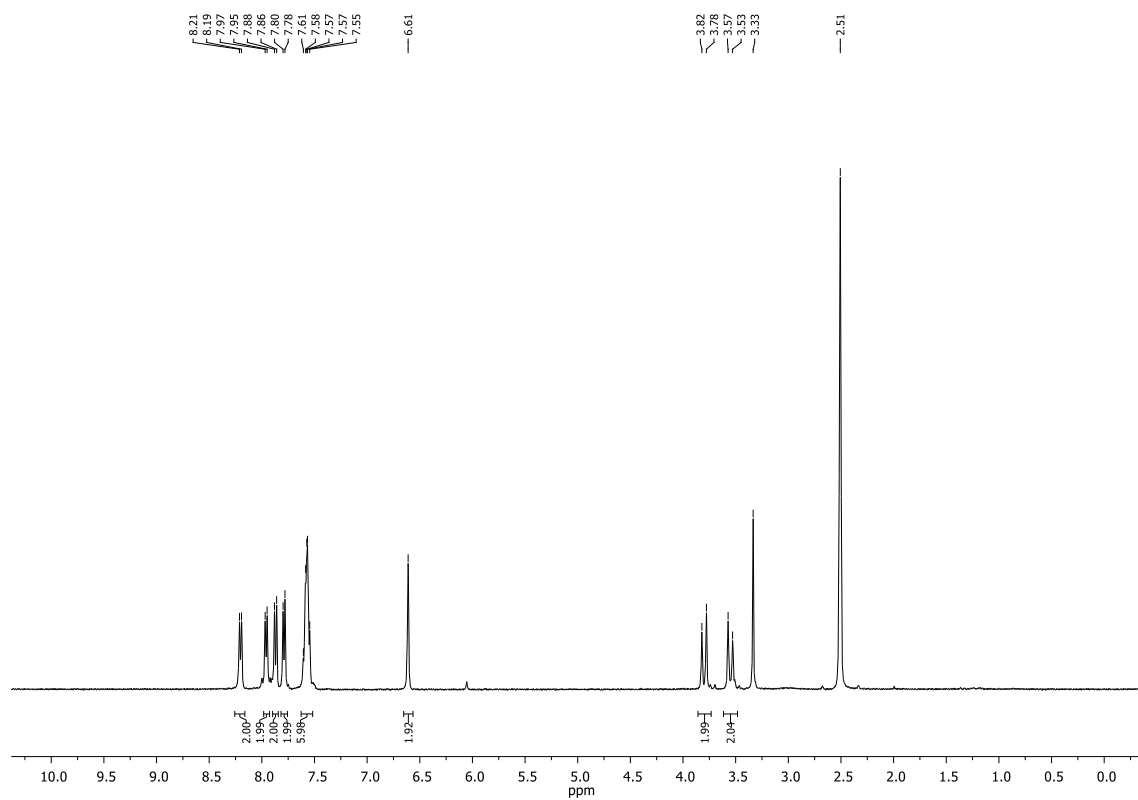


Figure S13. ¹H NMR of 3,8-bis(naphthalen-1-ylmethylene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5g**).

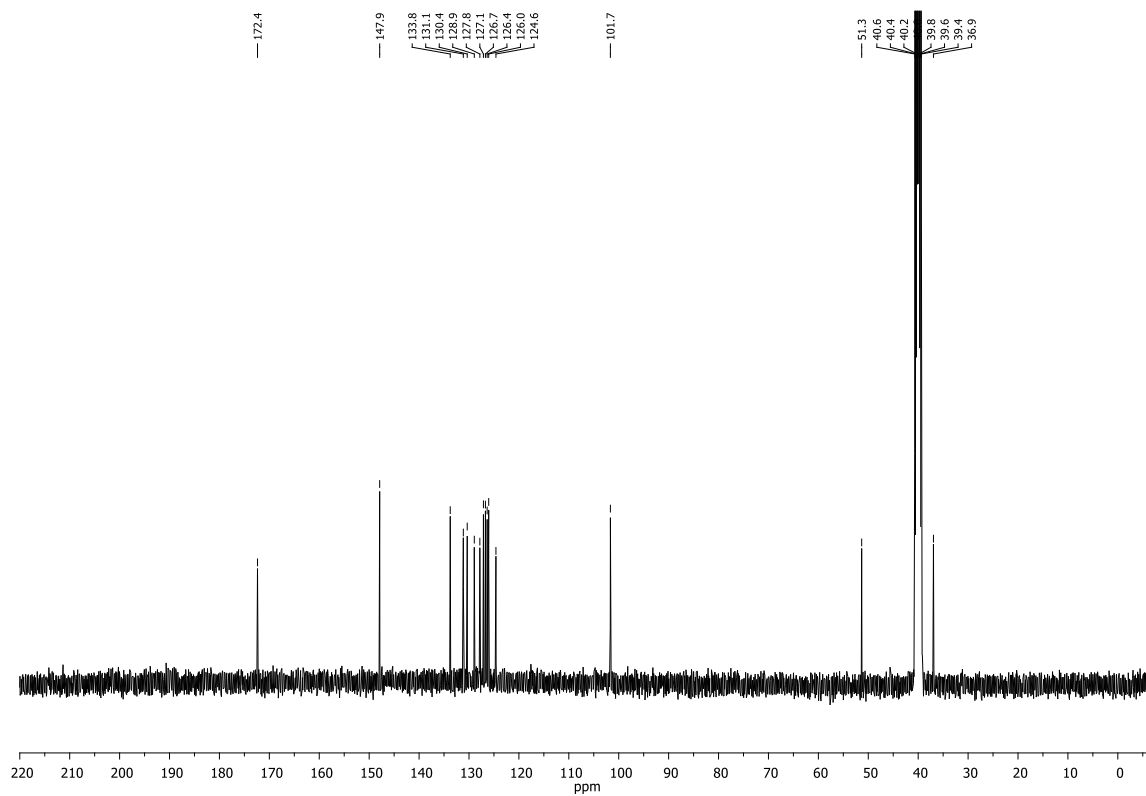


Figure S14. ¹³C NMR of 3,8-bis(naphthalen-1-ylmethylene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5g**).

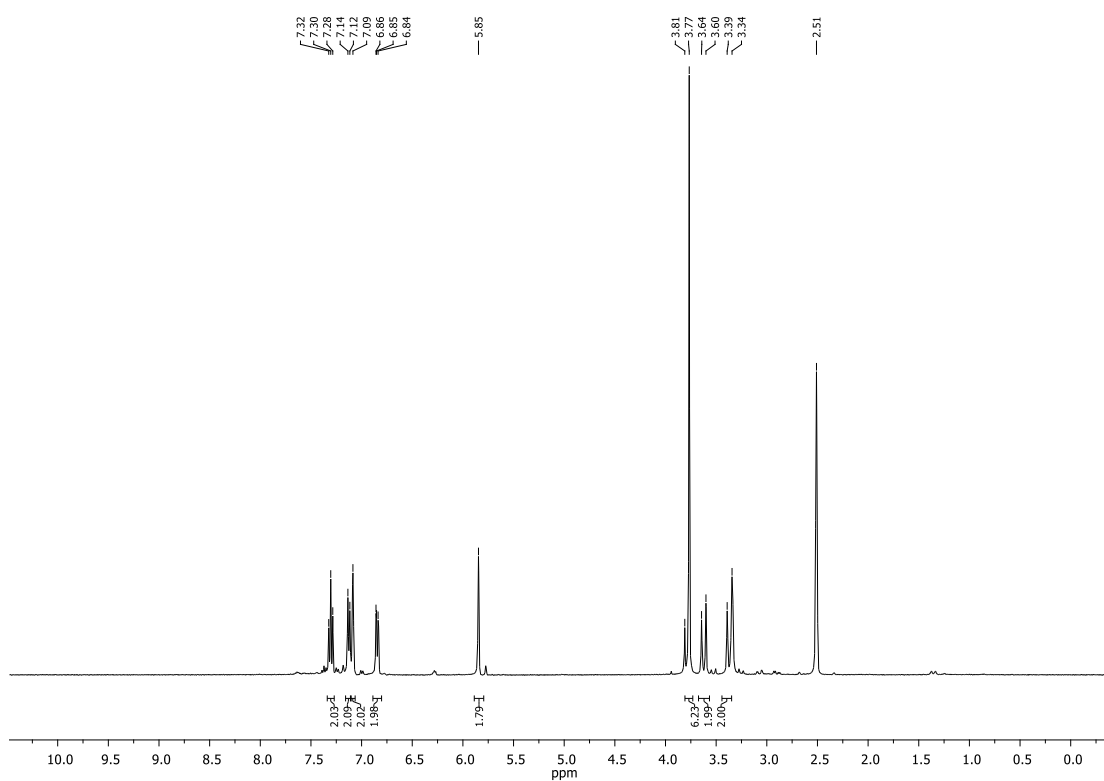


Figure S15. ¹H NMR of 3,8-bis(3-methoxybenzylidene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5h**).

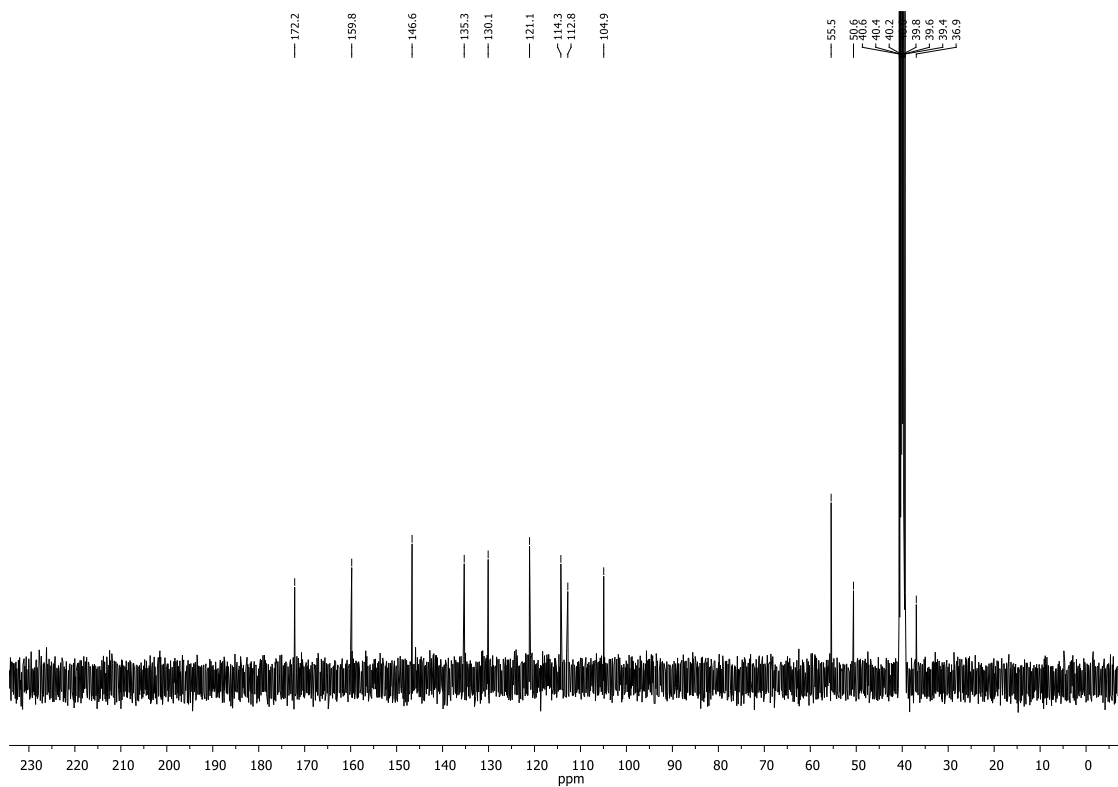


Figure S16. ¹³C NMR of 3,8-bis(3-methoxybenzylidene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5h**).

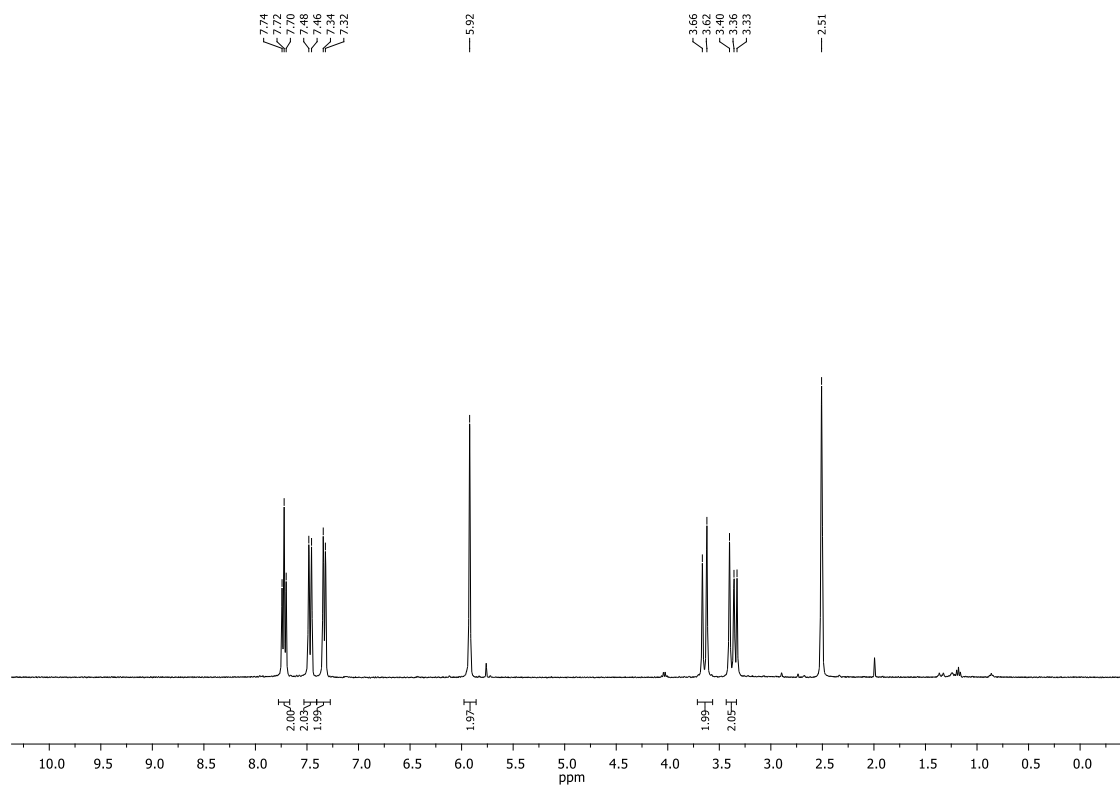


Figure S17. ¹H NMR of 3,8-bis(4-bromo-3-fluorobenzylidene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5i**).

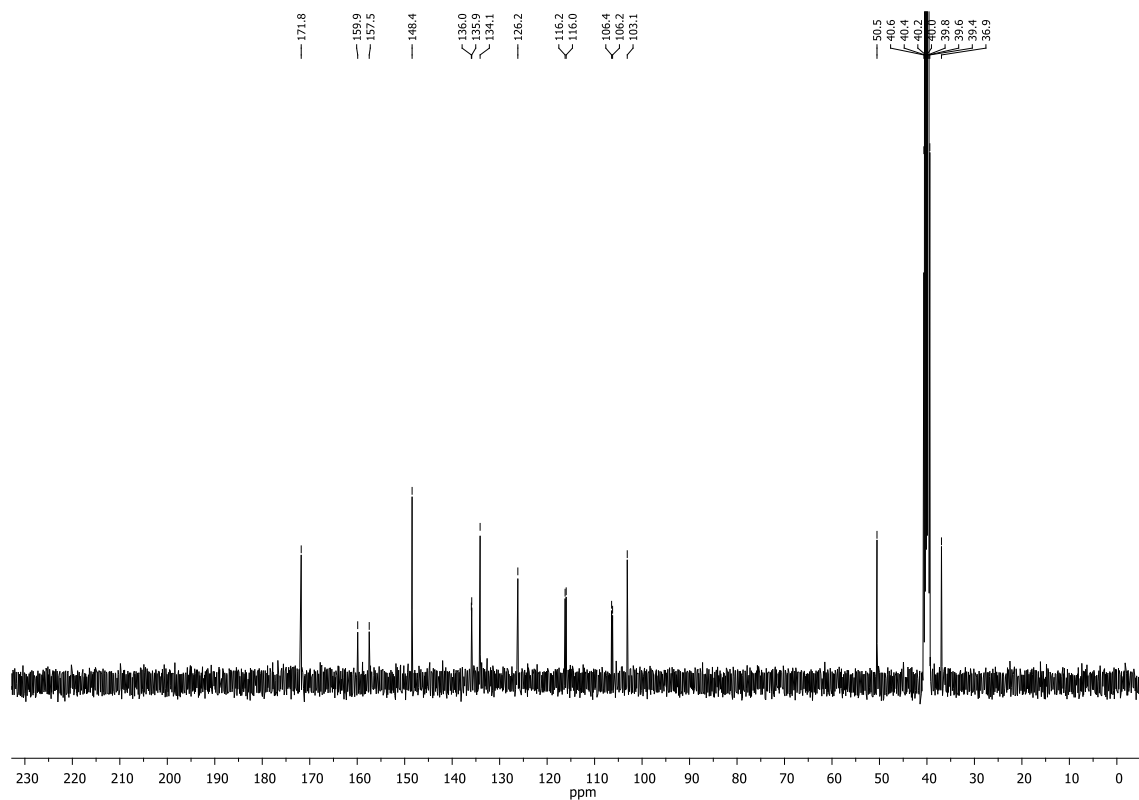


Figure S18. ¹³C NMR of 3,8-bis(4-bromo-3-fluorobenzylidene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5i**).

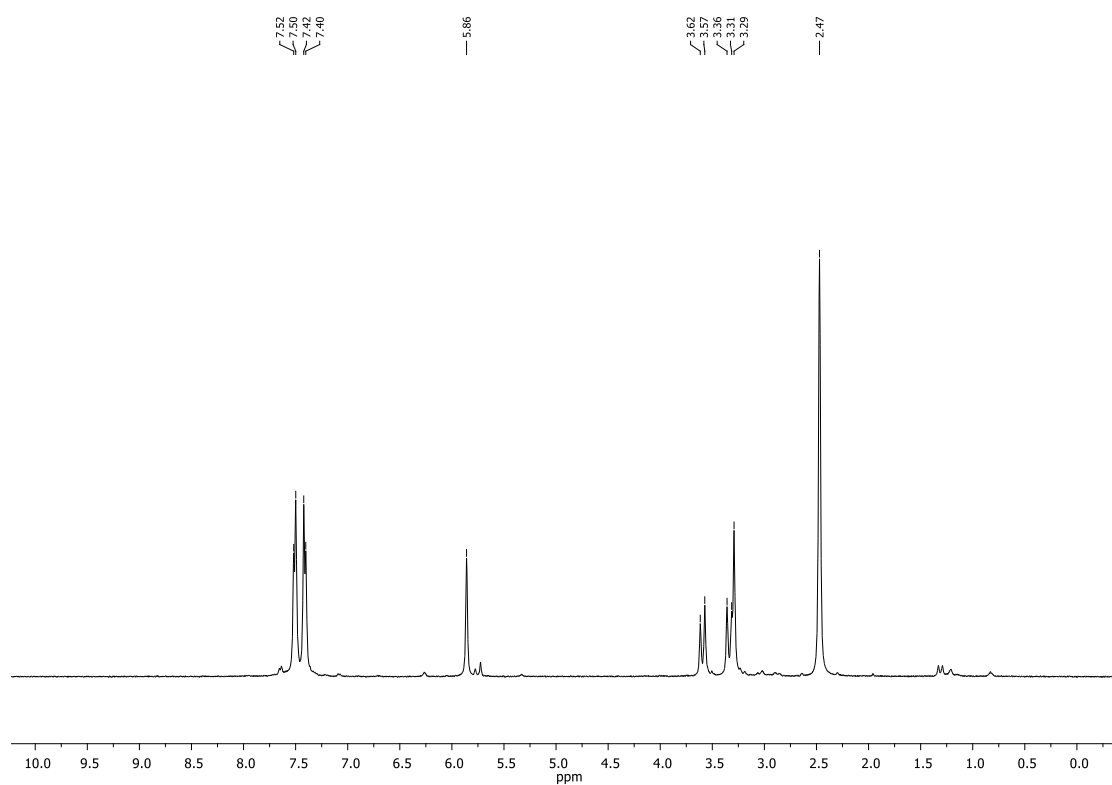


Figure S19. ^1H NMR of 3,8-bis(4-chlorobenzylidene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5j**).

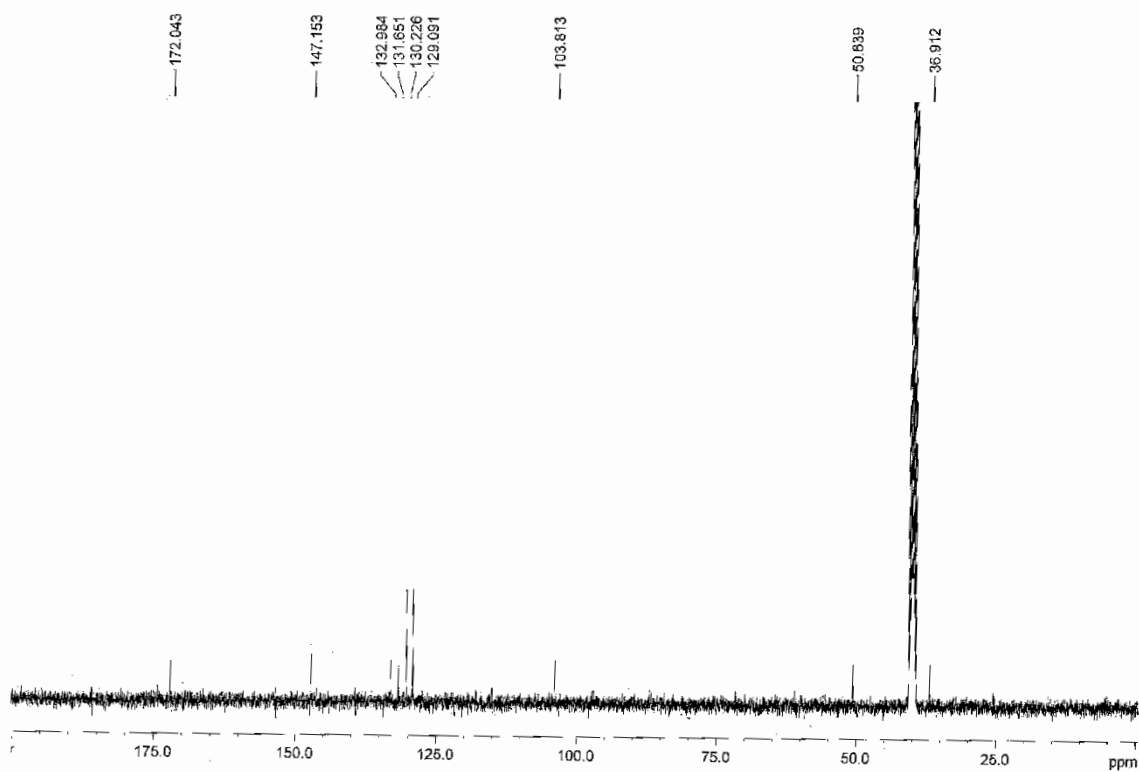


Figure S20. ^{13}C NMR of 3,8-bis(4-chlorobenzylidene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5j**).

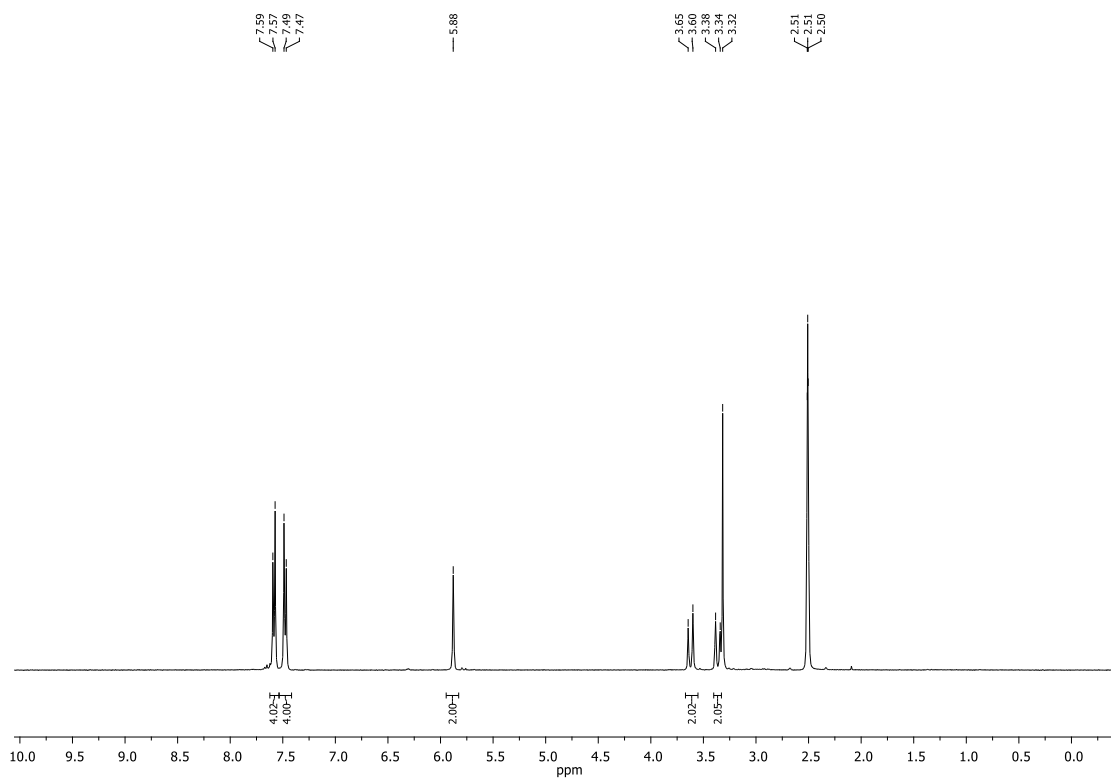


Figure S21. ¹H NMR of 3,8-bis(4-bromobenzylidene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5k**).

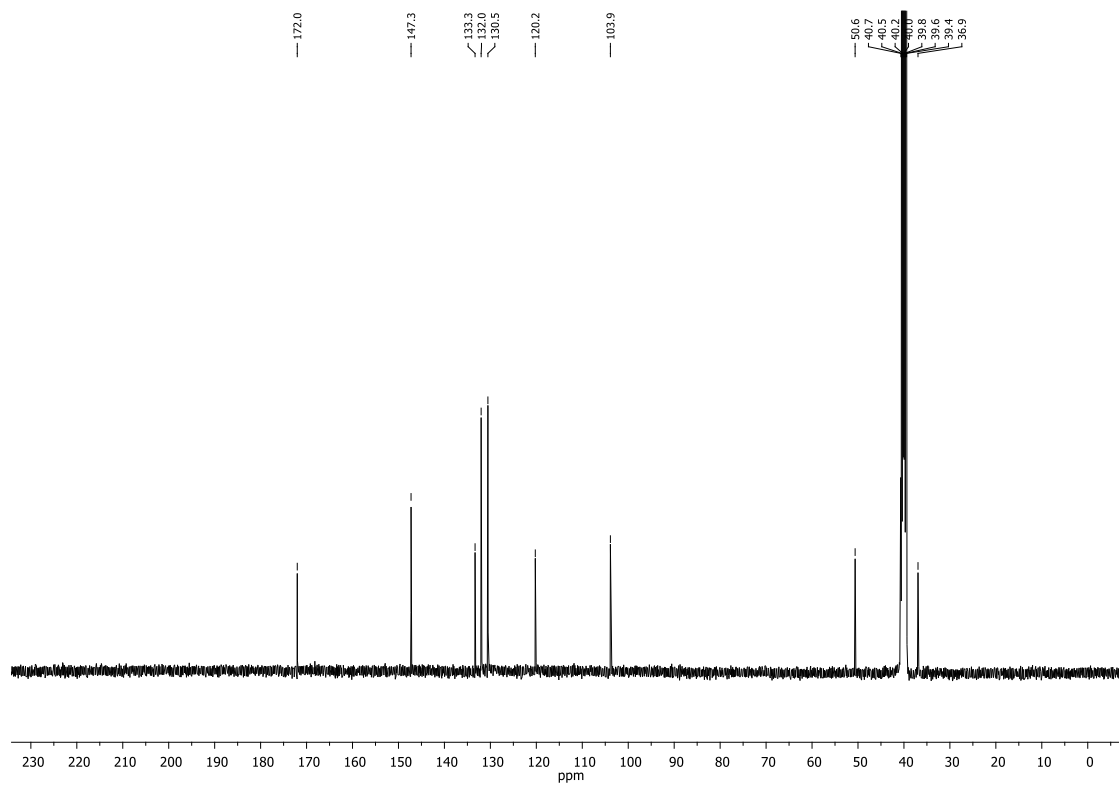


Figure S22. ¹³C NMR of 3,8-bis(4-bromobenzylidene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5k**).

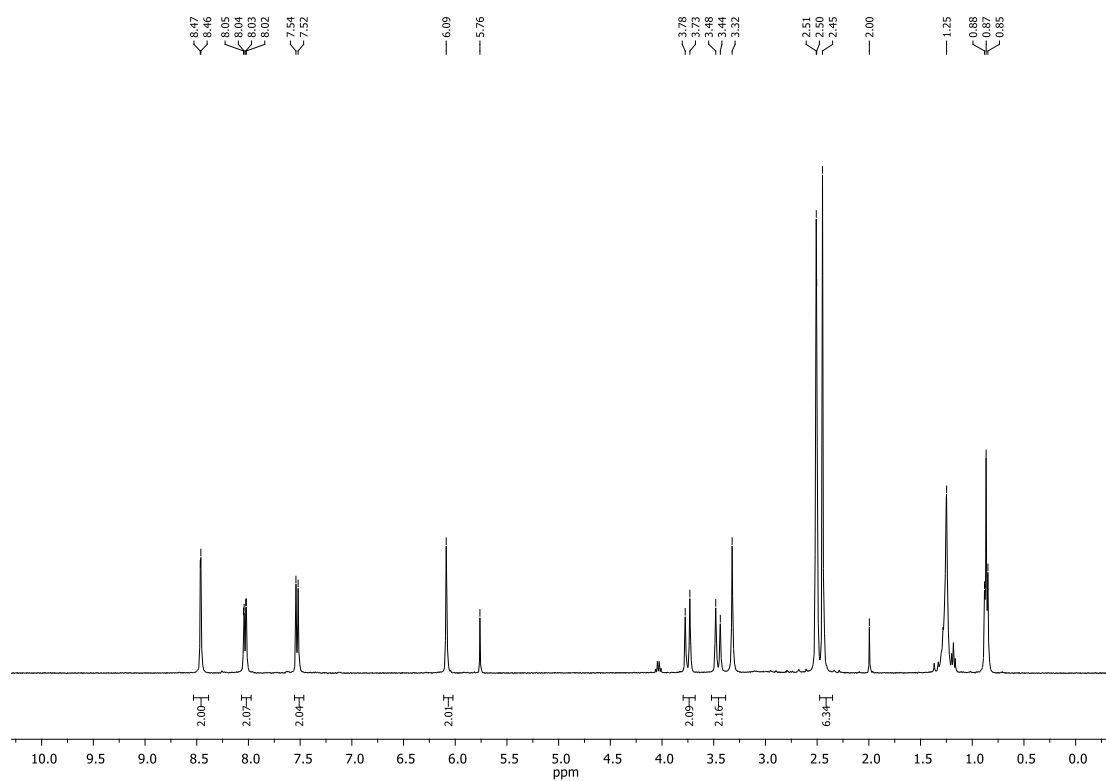


Figure S23. ¹H NMR of 3,8-bis(2-methyl-5-nitrobenzylidene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**51**).

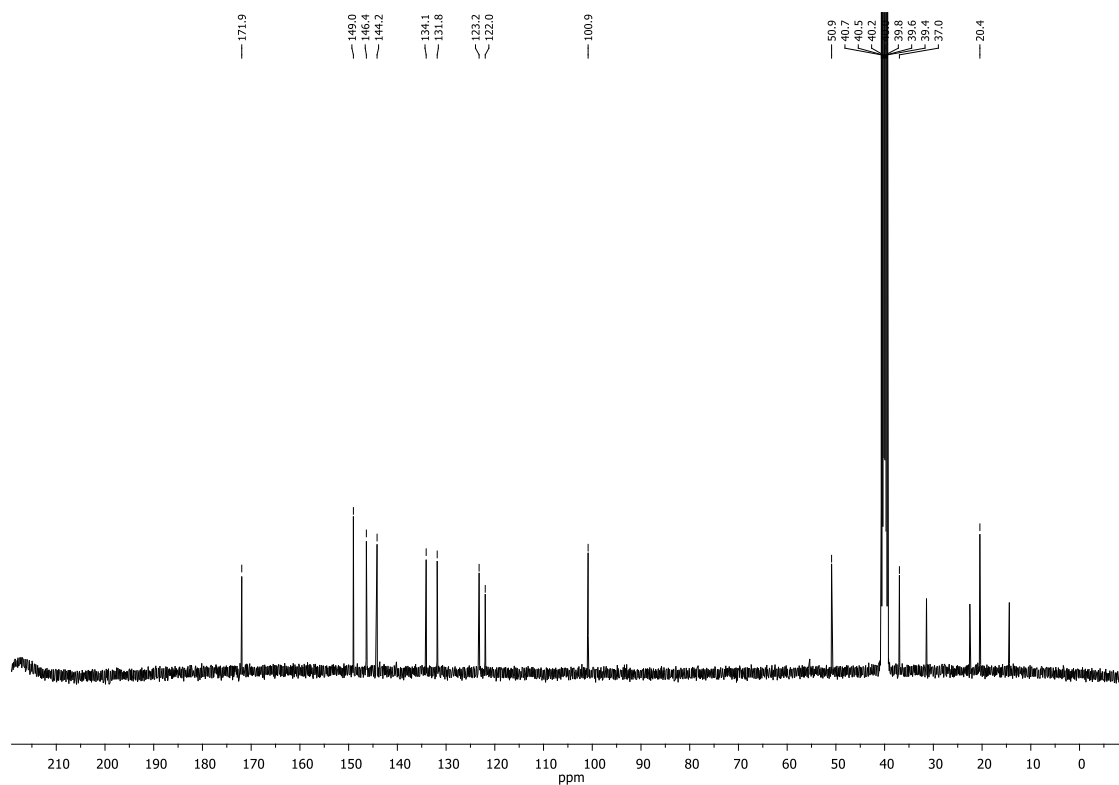


Figure S24. ¹³C NMR of 3,8-bis(2-methyl-5-nitrobenzylidene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**51**).

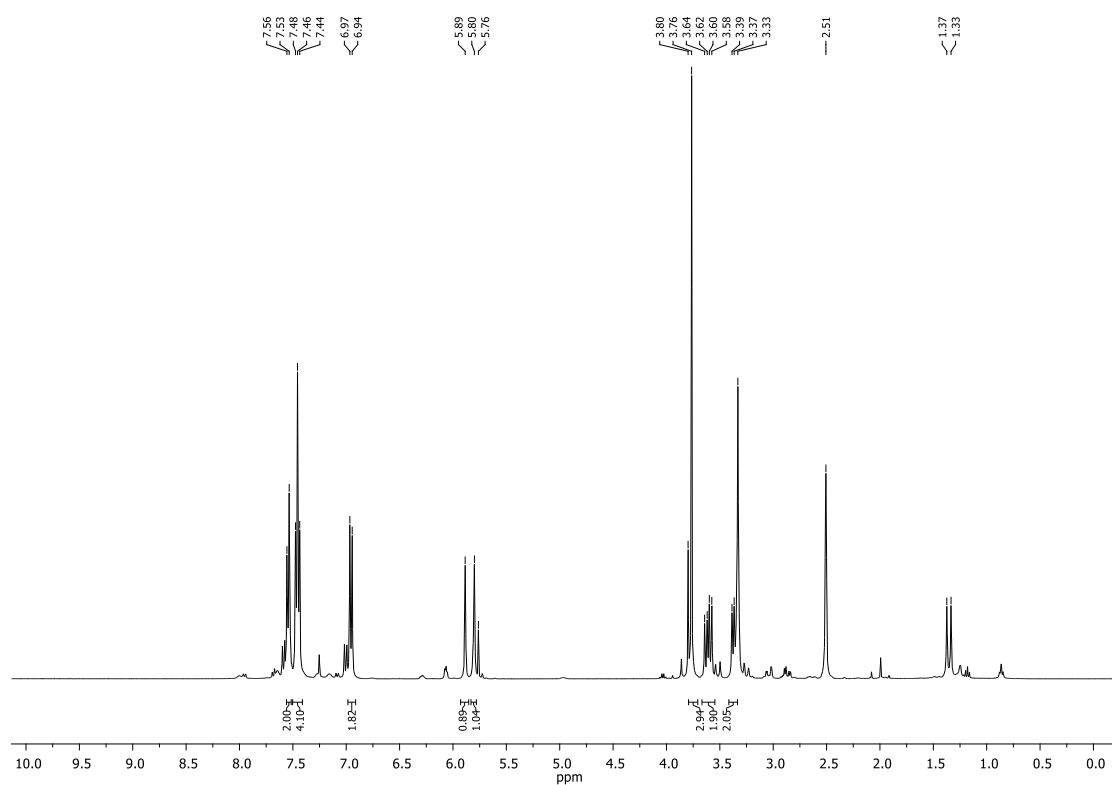


Figure S25. ¹H NMR of 3-(4-chlorobenzylidene)-8-(4-methoxybenzylidene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5m**).

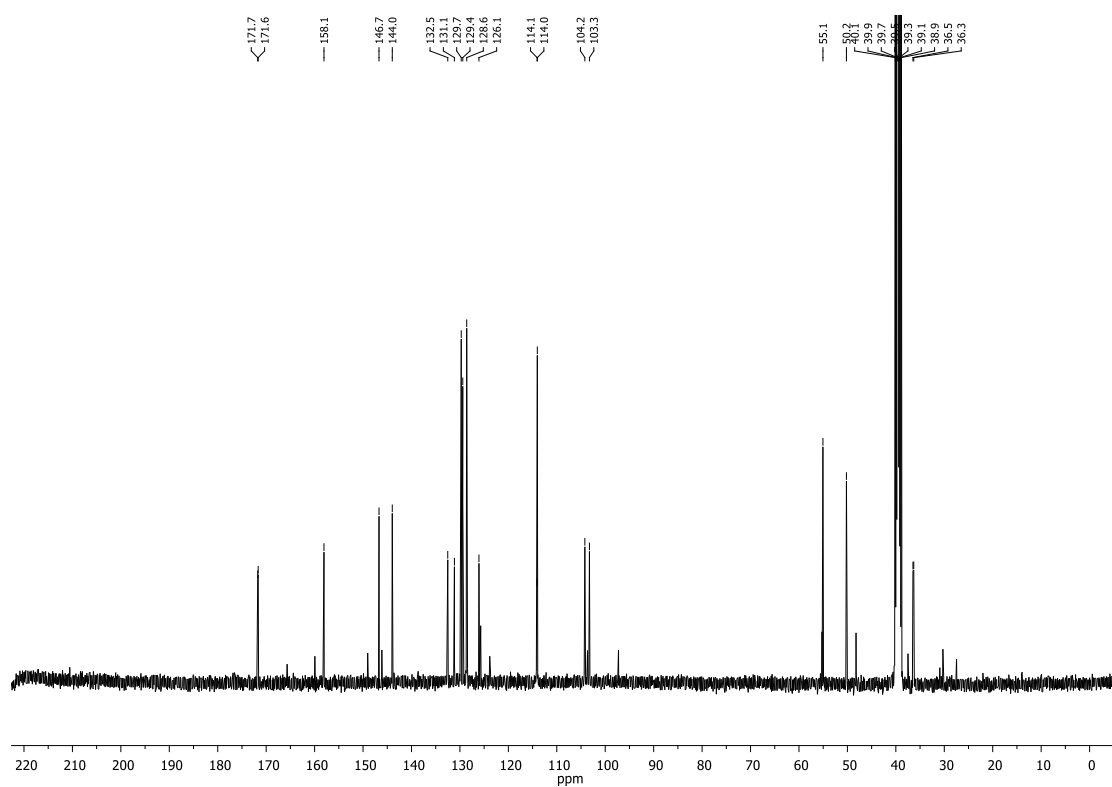


Figure S26. ¹³C NMR of 3-(4-chlorobenzylidene)-8-(4-methoxybenzylidene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5m**).

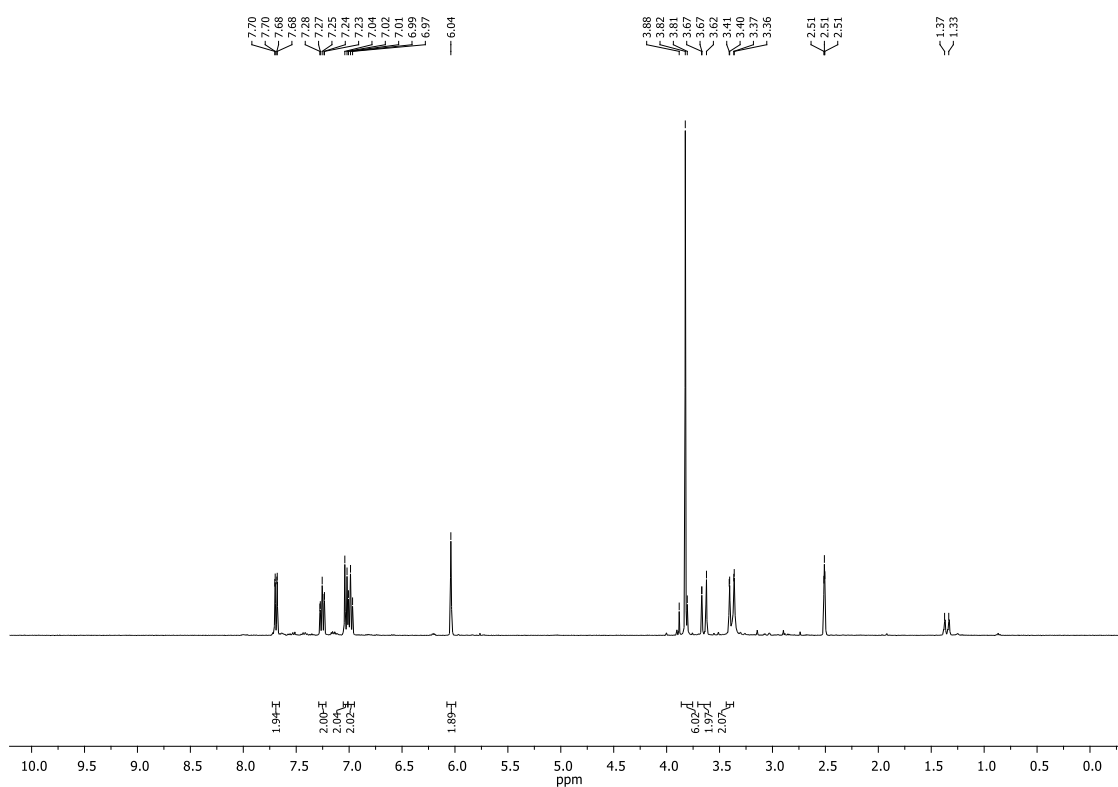


Figure S27. ¹H NMR of 3,8-bis(2-methoxybenzylidene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5n**).

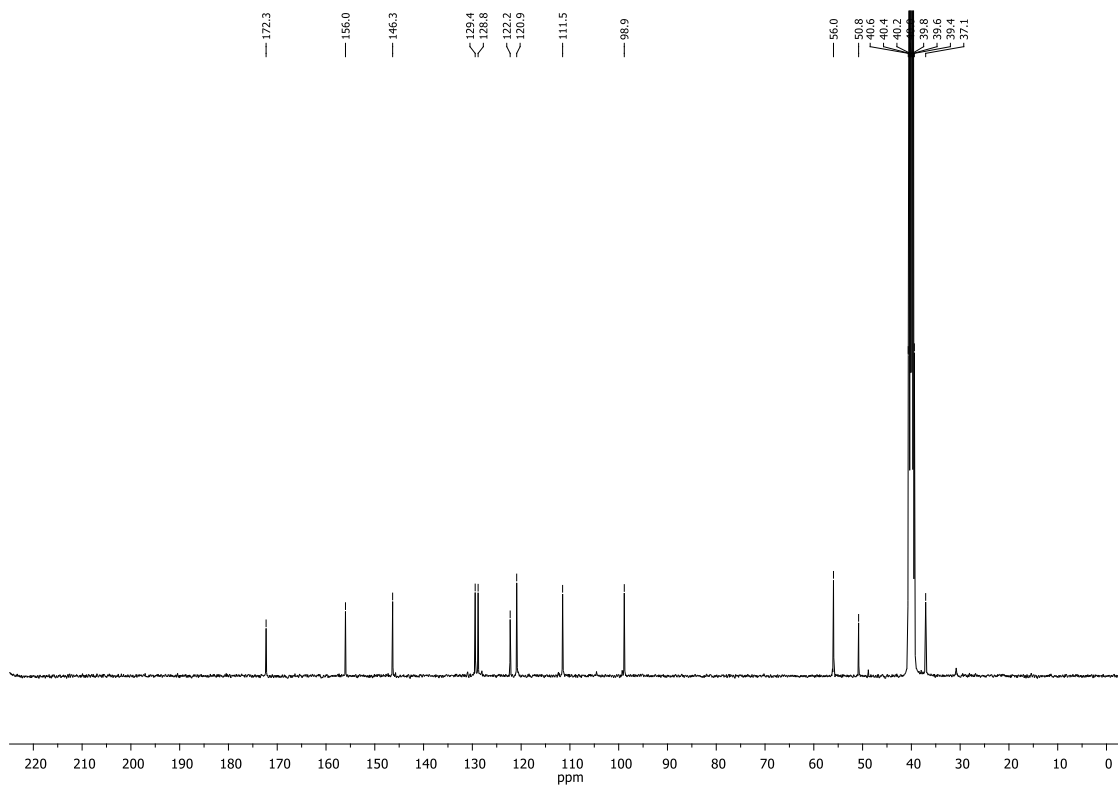


Figure S28. ¹³C NMR of 3,8-bis(2-methoxybenzylidene)-2,7-dioxaspiro[4.4]nonane-1,6-dione (**5n**).