Electronic Supplementary Material (ESI) for Organic & Biomolecular Chemistry
This journal is © The Royal Society of Chemistry 2011

6,6-Spiroimine Analogs of (–)-Gymnodimine A : Synthesis and Biological Evaluation on Nicotinic Acetylcholine Receptors

Leslie Duroure,[a] Thierry Jousseaume,[a] Rómulo Aráoz,[b] Elvina Barre,[a] Pascal Retailleau,[a]

Laurent Chabaud,[a*] Jordi Molgó,[b] and Catherine Guillou[a*]

a Centre de Recherche de Gif, Institut de Chimie des Substances Naturelles, CNRS, 1, Avenue de la Terrasse, 91198 Gif-sur-Yvette (France).

Fax: +33 (0)1 69 07 72 47; Tel: +33 (0)1 69 82 30 75

E-mail: guillou@icsn.cnrs-gif.fr, chabaud@icsn.cnrs-gif.fr

b Centre de Recherche de Gif, CNRS, Institut Fédératif de Neurobiologie Alfred Fessard FRC2118, Laboratoire de Neurobiologie et Développement, UPR 3294, 1 Avenue de la Terrasse, bâtiments 32-33, 91198-Gif sur Yvette cedex, France.

Fax: +33 (0)1 69 82 41 41; Tel: +33 (0)1 69 82 36 42

E-mail: Jordi.Molgo@inaf.cnrs-gif.fr

Supporting information

This journal is © The Royal Society of Chemistry 2011

Table of contents

This journal is © The Royal Society of Chemistry 2011

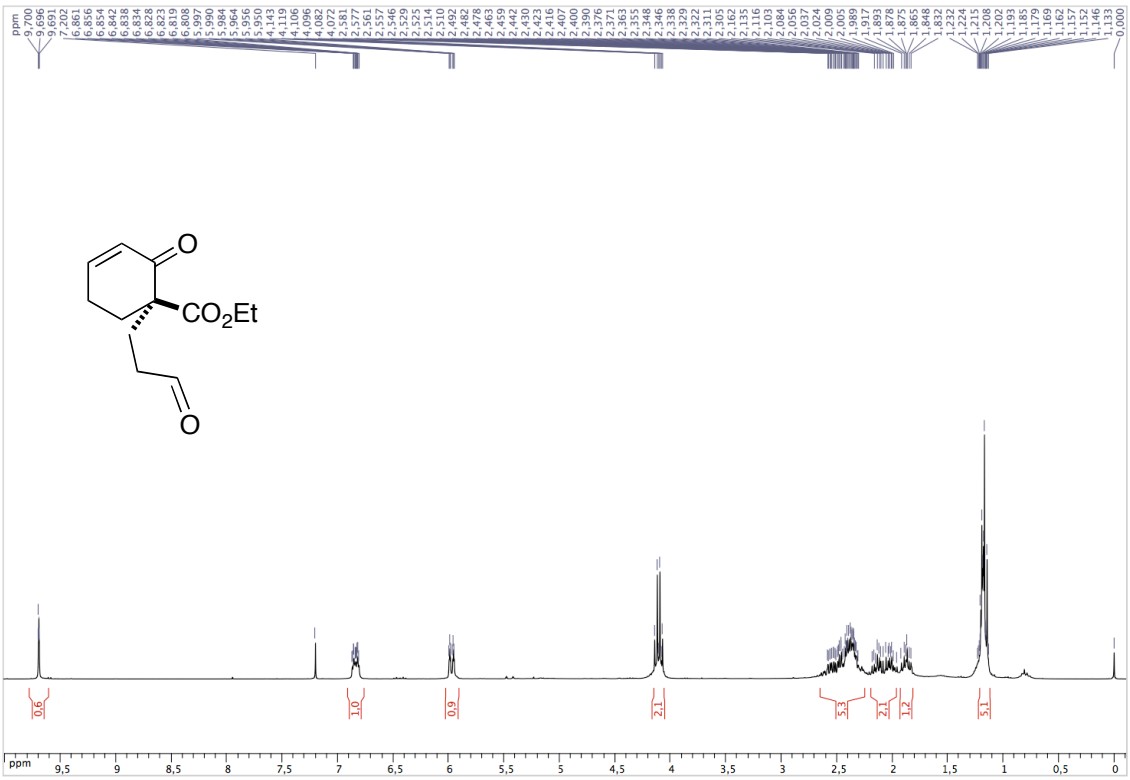
General methods

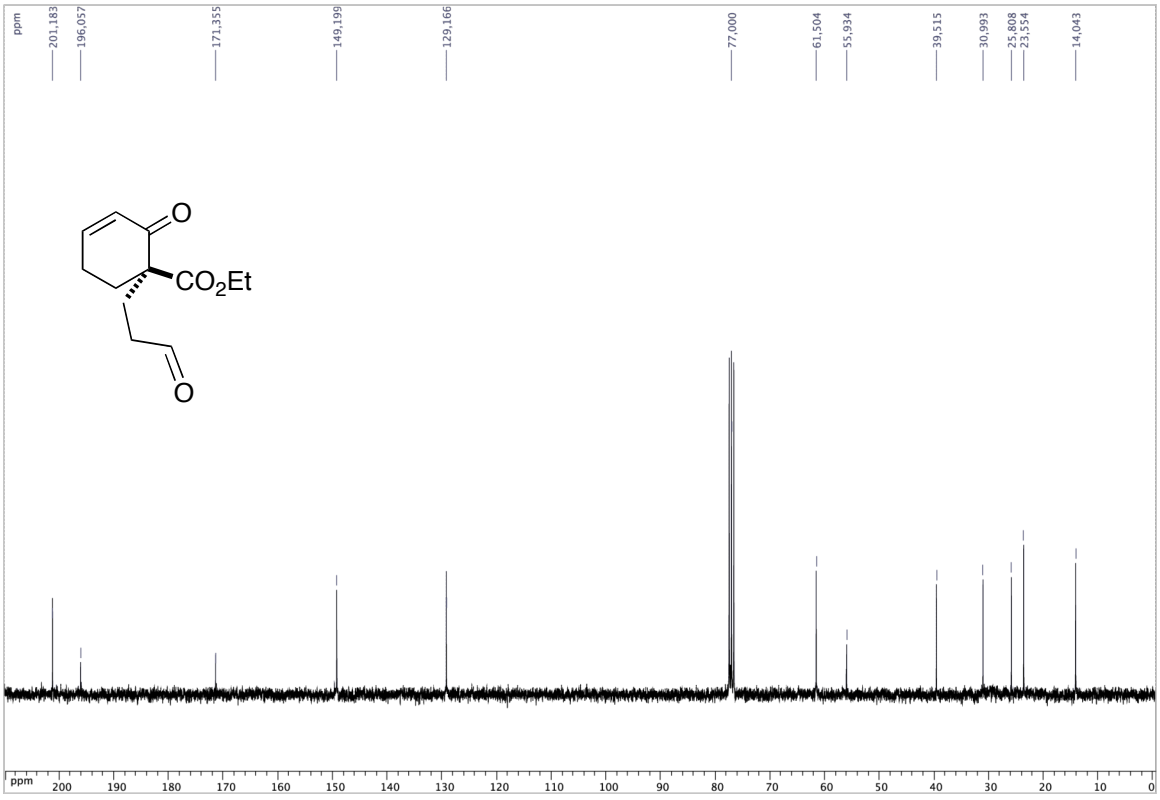
All reactions were carried out under argon with dry solvents unless otherwise noted. Reactions were monitored by thin-layer chromatography on Merck silica gel plates ($60F_{254}$) with a fluorescent indicator. Yields refer to chromatographically or crystalline pure compounds. All commercially available reagents were used without further purification. All solvents were dried and distilled before use; CH_2Cl_2 was distilled from P_2O_5, THF was distilled from sodium/benzophenone; methanol and ethanol were distilled from Mg/I_2, NEt_3 was distilled from KOH. All separations were carried out under flash chromatographic conditions on silica gel prepacked column Redi Sep (230-400 mesh) at medium pressure (20psi) by using a CombiFlash Companion. All new compounds gave satisfactory spectroscopic analyses (IR, ^{1}H NMR, ^{13}C NMR, HRMS). NMR spectra were determined on Brucker Avance-300 or on Brucker Avance-500. ^{1}H NMR spectra are reported in parts per million (δ) relative to residual solvent peak. Data for ^{1}H are reported as follows: chemical shift (δ ppm), multiplicity (s = singlet, d = doublet, t = triplet, q = quartet, sxt = sextet, dd = double-doublet, m = multiplet), coupling constant in Hz, and integration. ^{13}C NMR spectra were obtained Brucker Avance-300 (75.5 MHz) spectrometer and are reported in parts per million (δ) relative to the residual solvent peak. HRMS spectra were obtained on an E.S.I. TOF Thermoquest AQA Navigator spectrometer. Infrared (IR) (υ, cm^{-1}) spectra were recorded on a Fourier Perkin-Elmer Spectrum BX FT-IR. Melting points were measured in capillary tubes and are uncorrected.

^{1}H and ^{13}C NMR Spectra

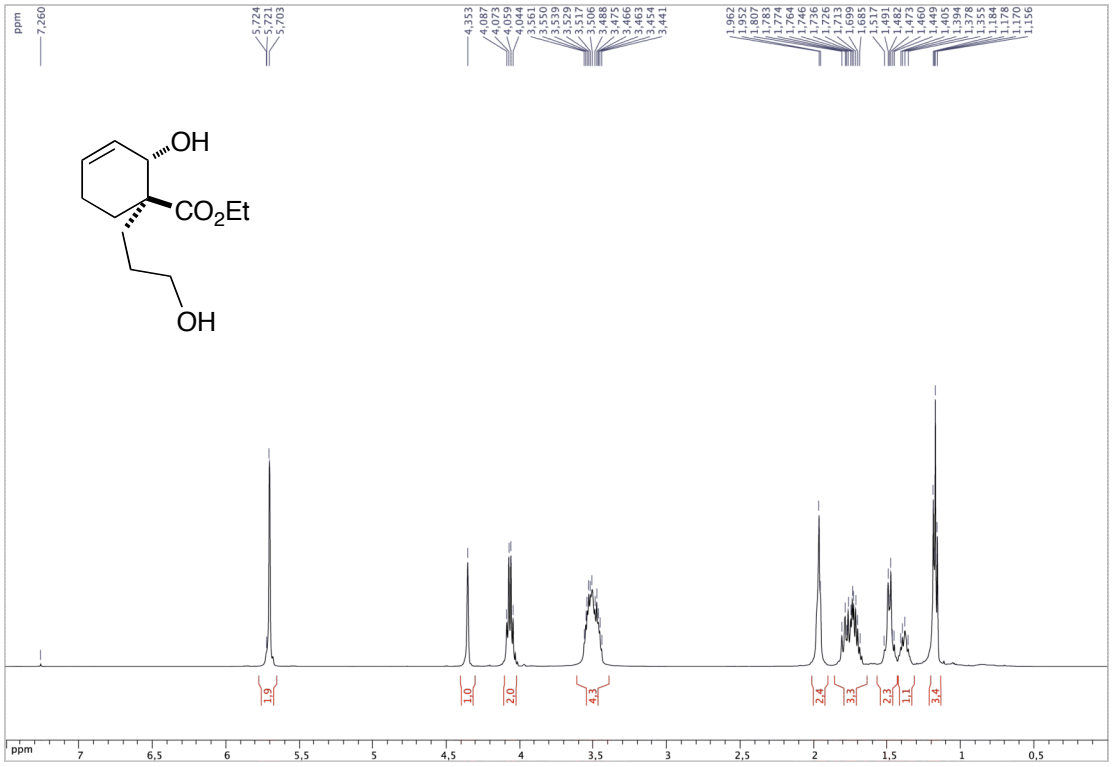
This journal is © The Royal Society of Chemistry 2011

(±)-ethyl 2-oxo-1-(3-oxopropyl)cyclohex-3-enecarboxylate **(3)**

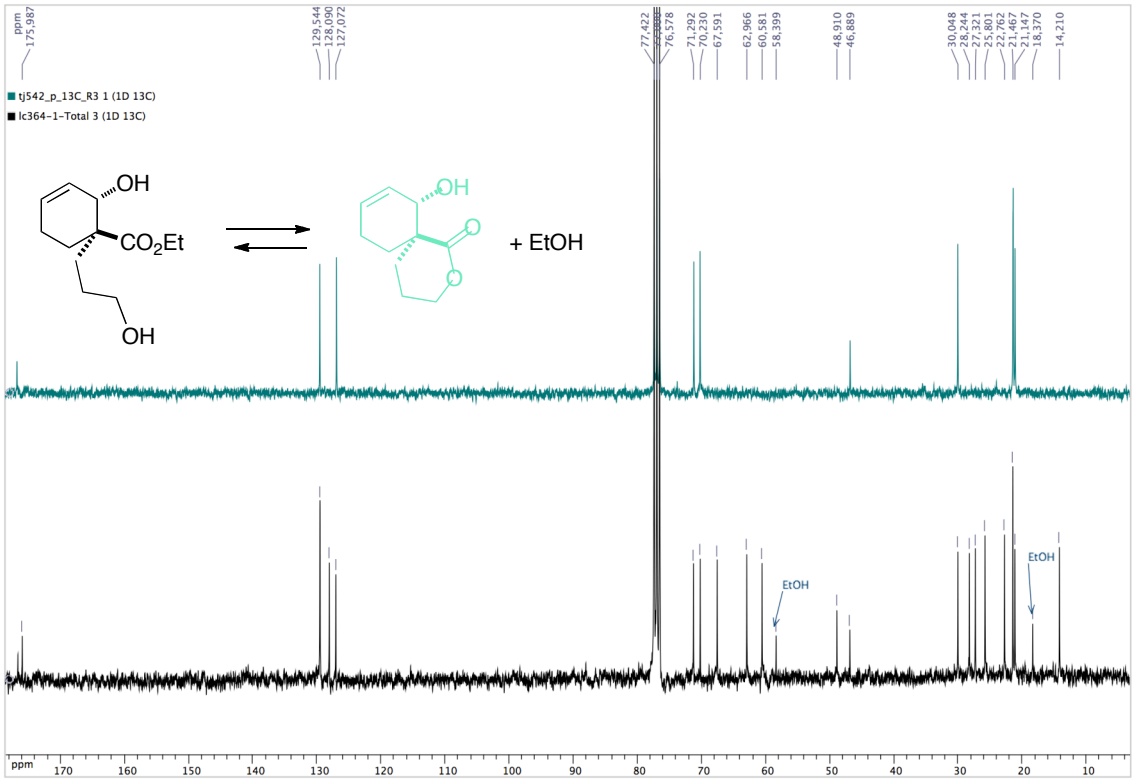




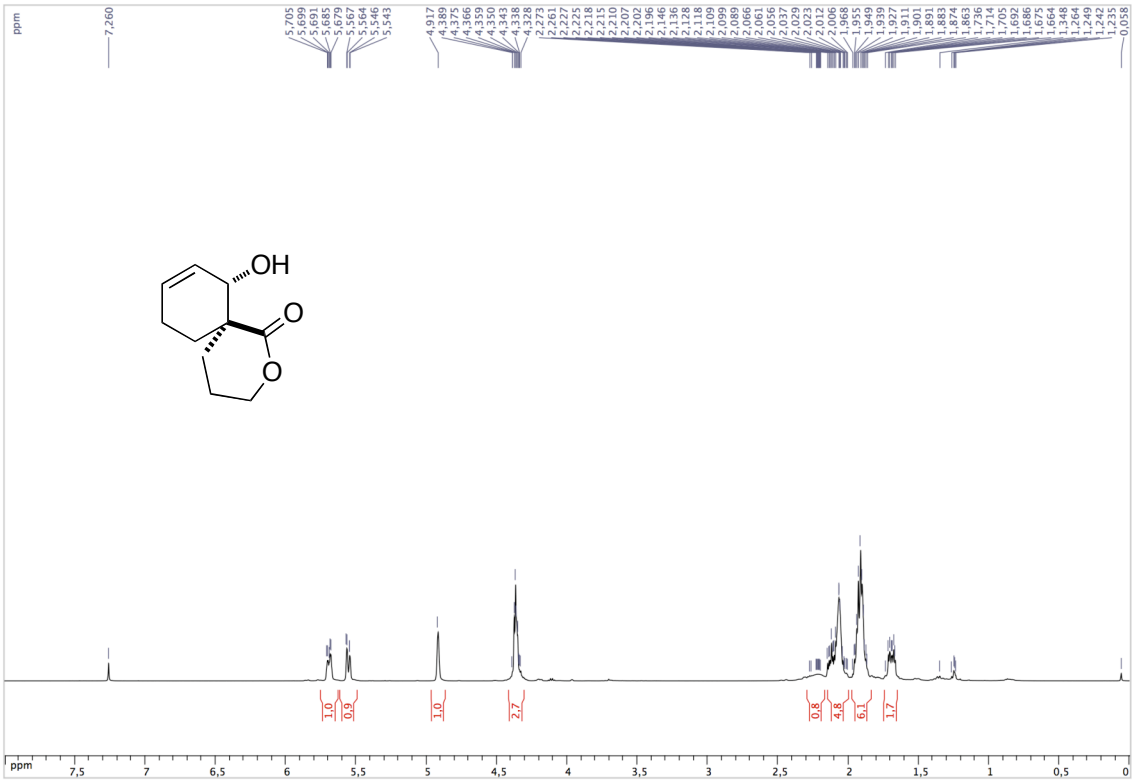
(+)-ethyl 2-hydroxy-1-(3-hydroxypropyl)cyclohex-3-enecarboxylate **(4)**

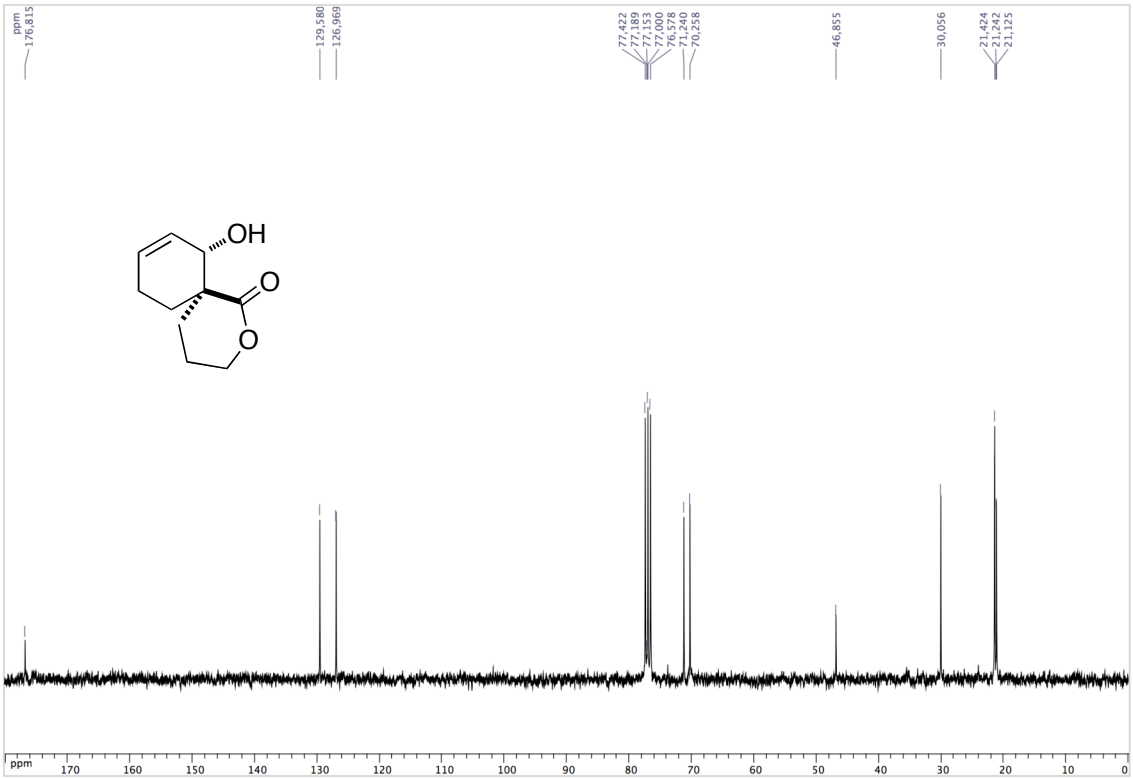


C13 – diol partially cyclizes into lactone upon standing in $CDCl_3$

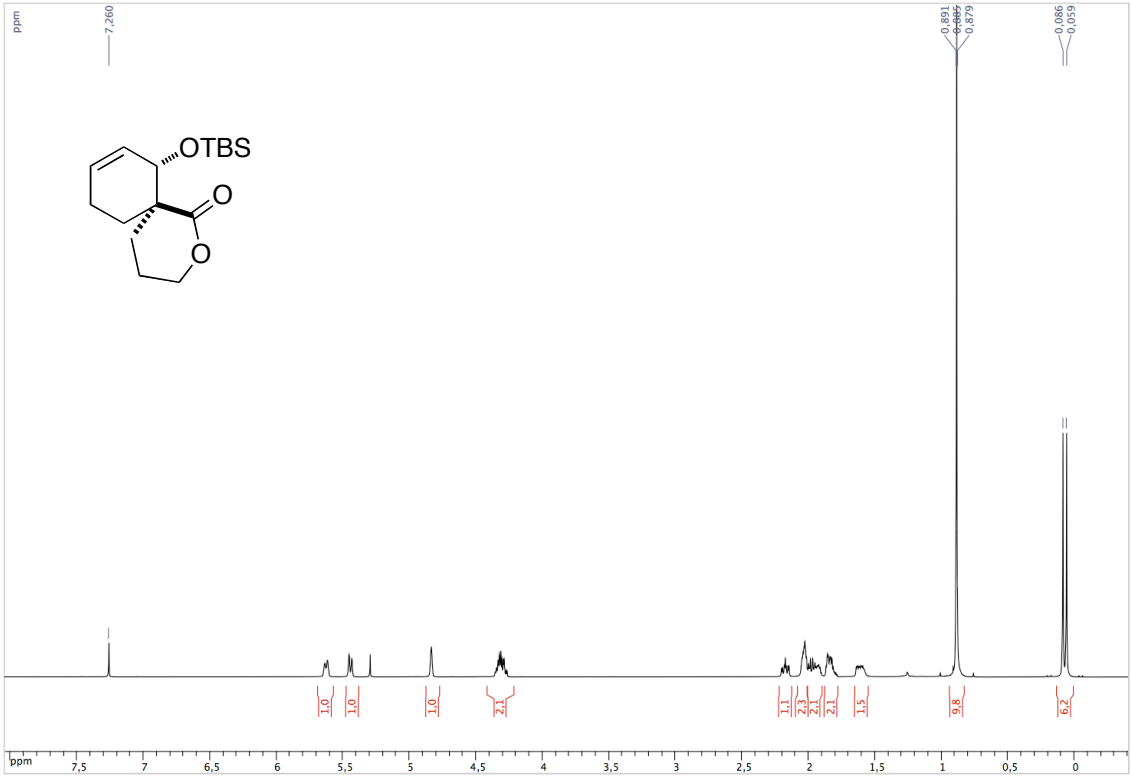


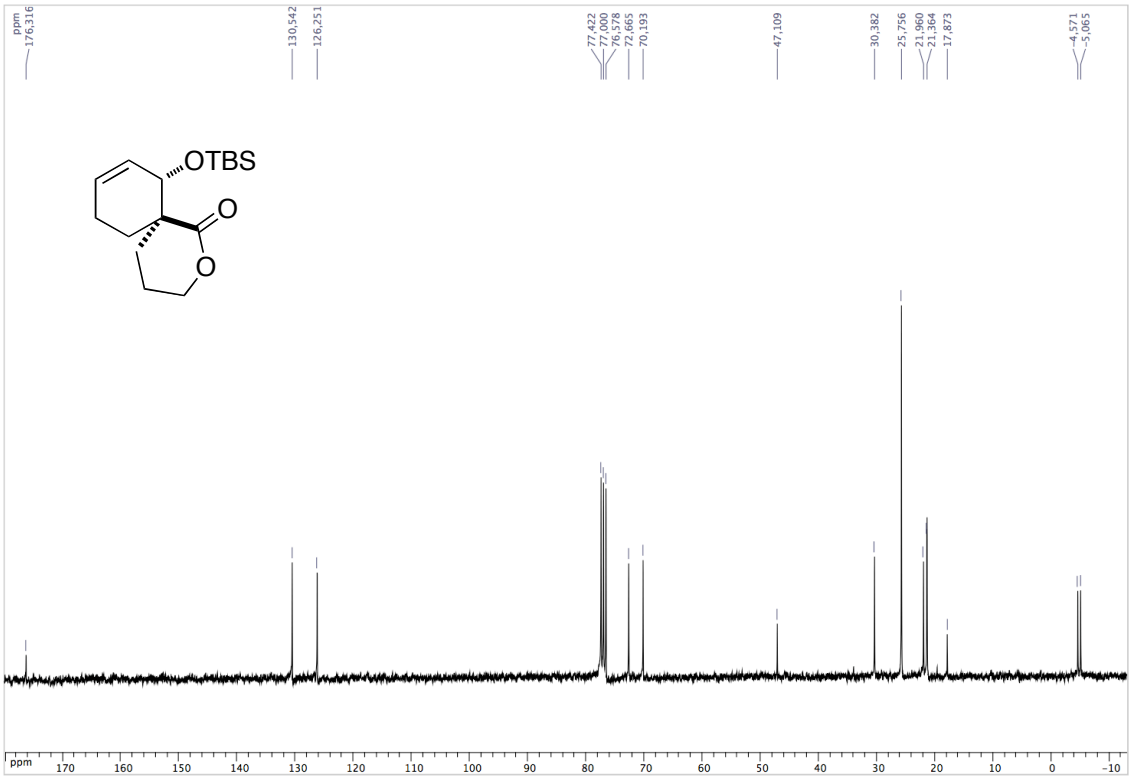
(+)-(6*R*,7*S*)-7-hydroxy-2-oxaspiro[5.5]undec-8-en-1-one **(5)**



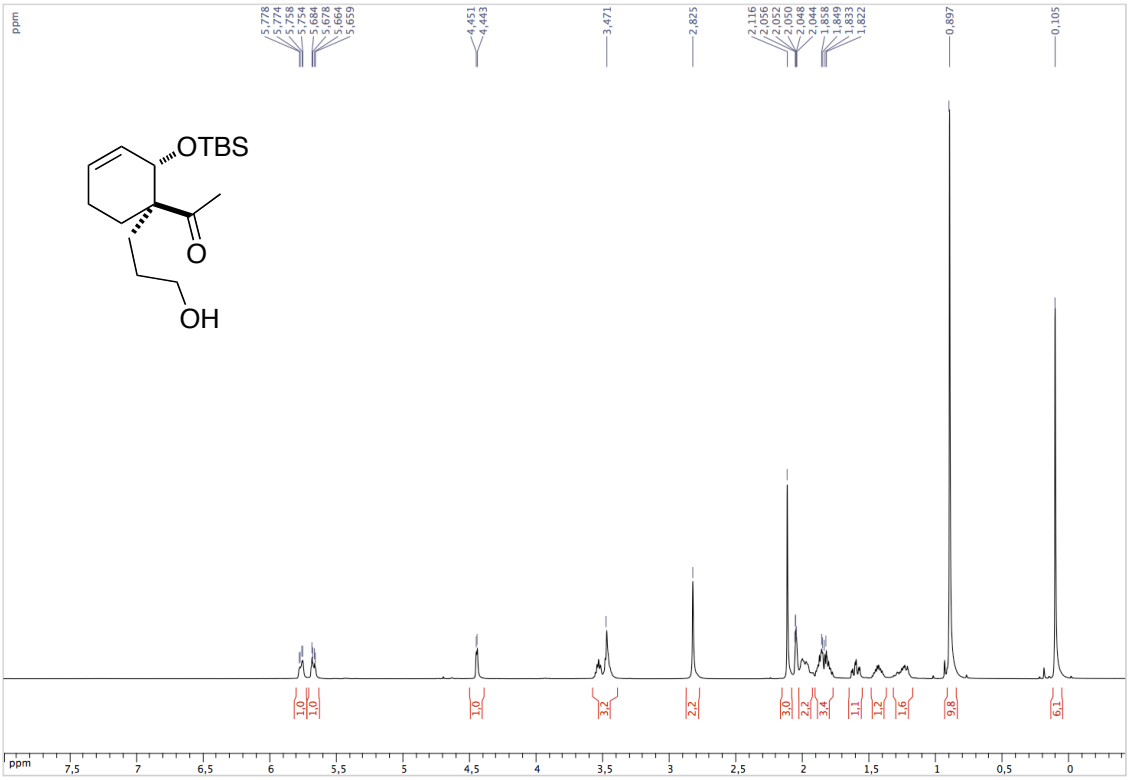


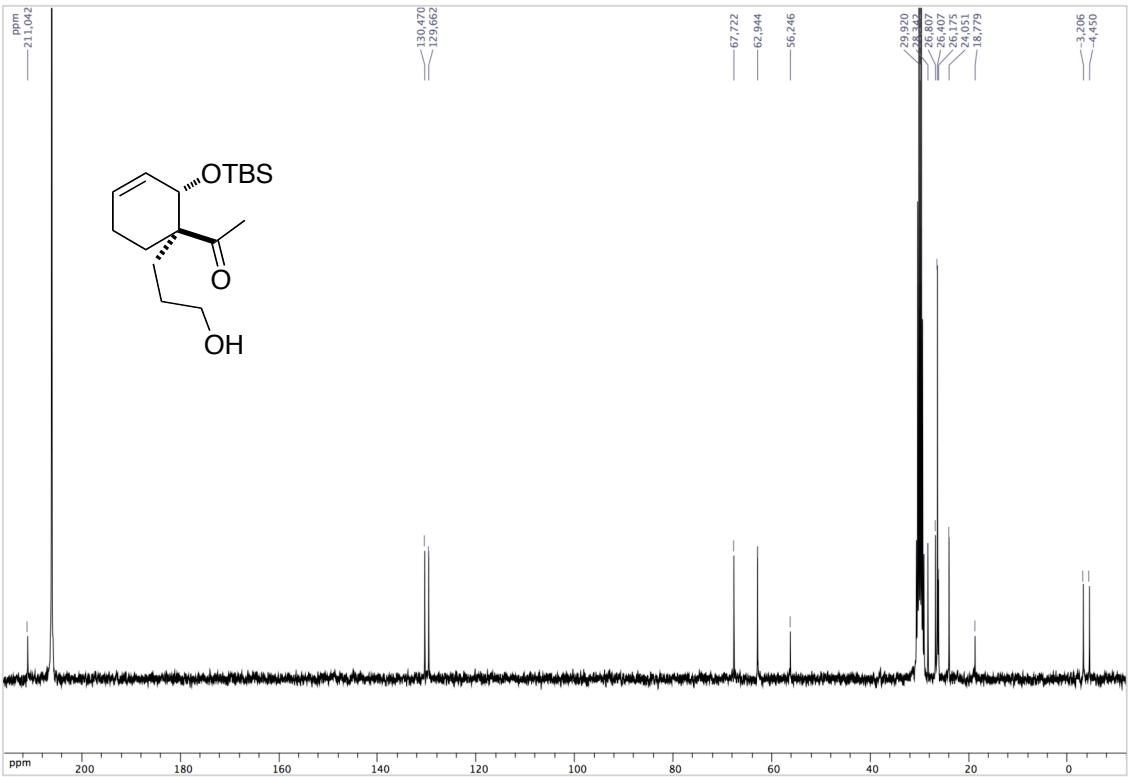
(+)-(6*R*,7*S*)-7-((*tert*-butyldimethylsilyl)oxy)-2-oxaspiro[5.5]undec-8-en-1-one **(6)**





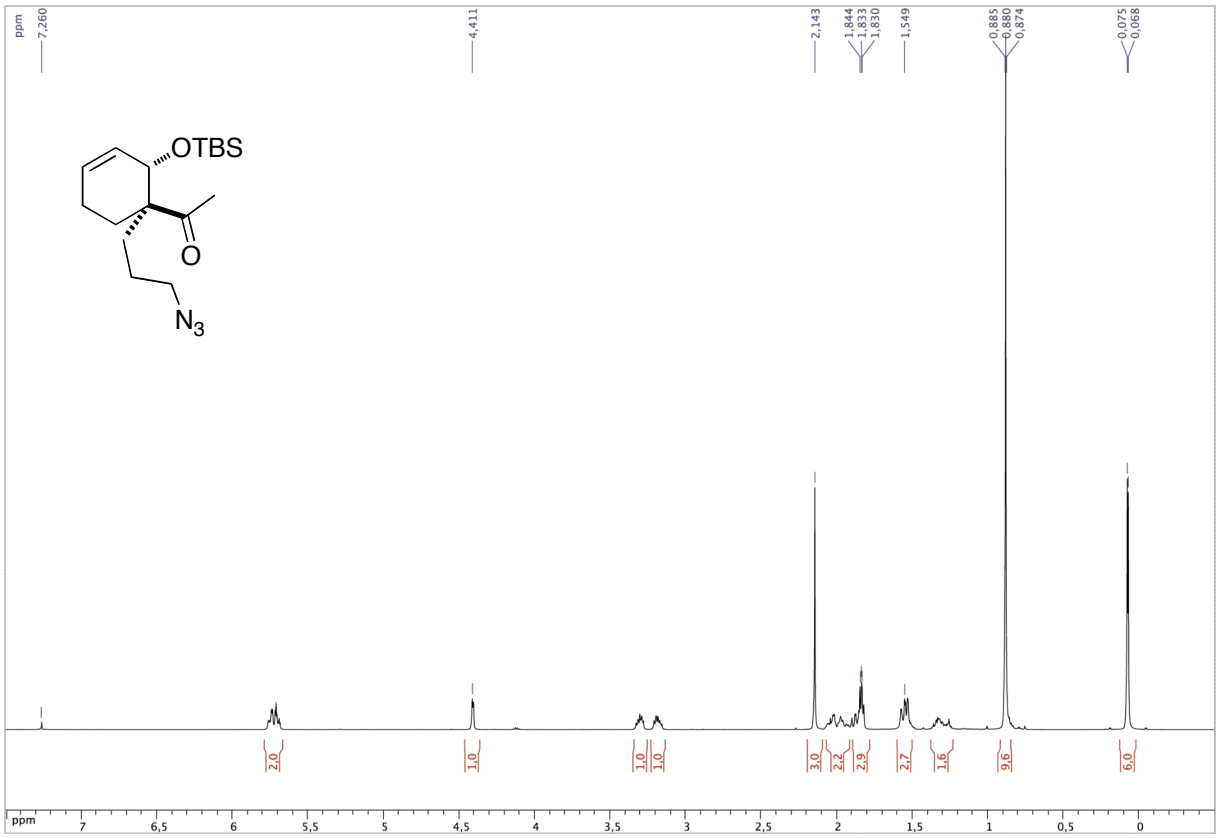
(+)-1-((1R,2S)-2-((tert-butyldimethylsilyl)oxy)-1-(3-hydroxypropyl)cyclohex-3-en-1-yl)ethanone **(7)**

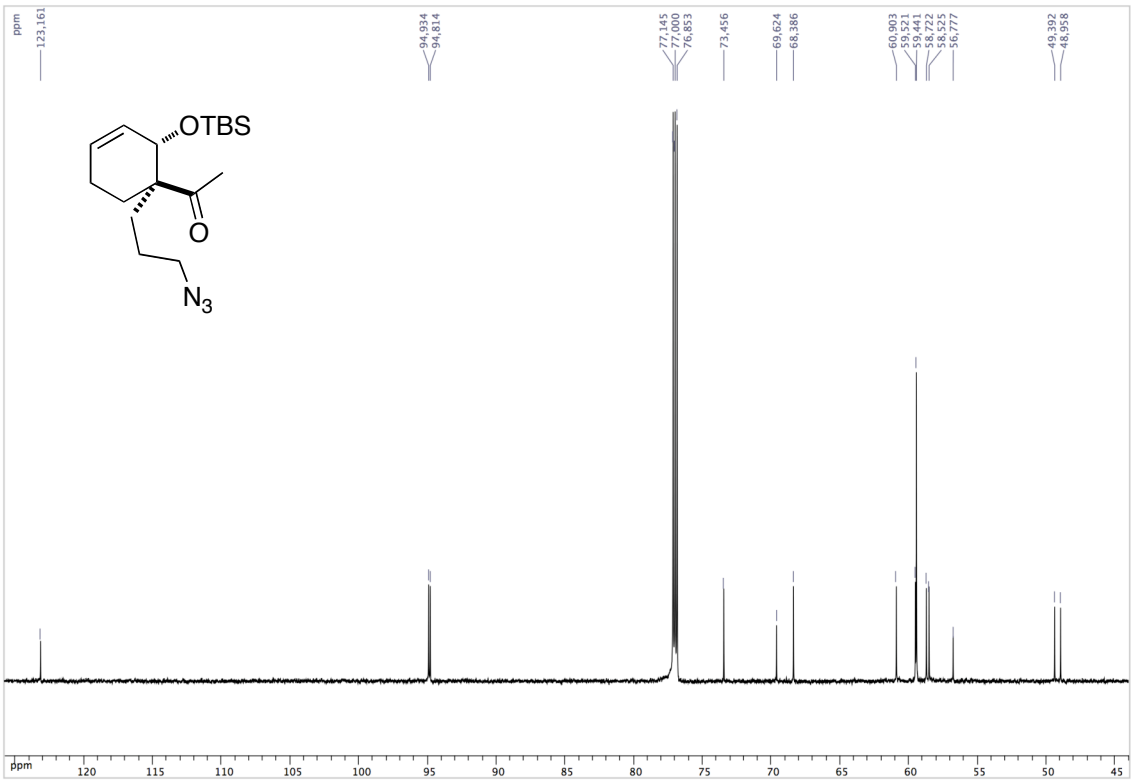




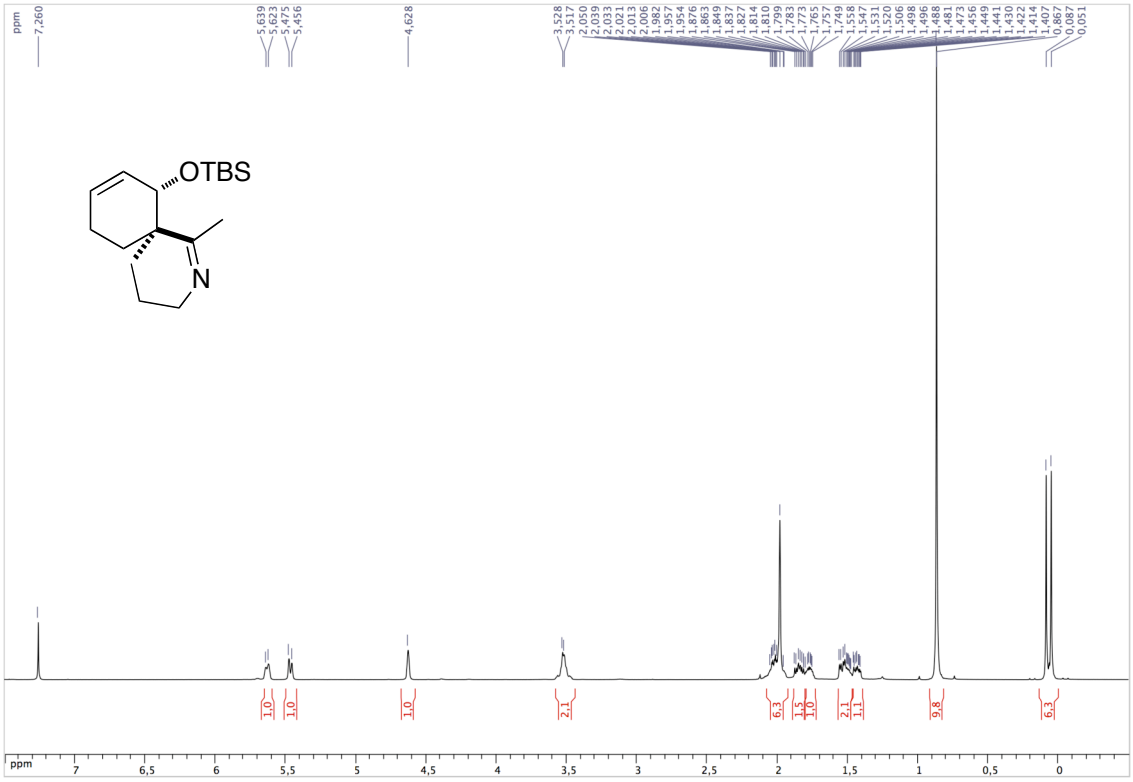
This journal is © The Royal Society of Chemistry 2011

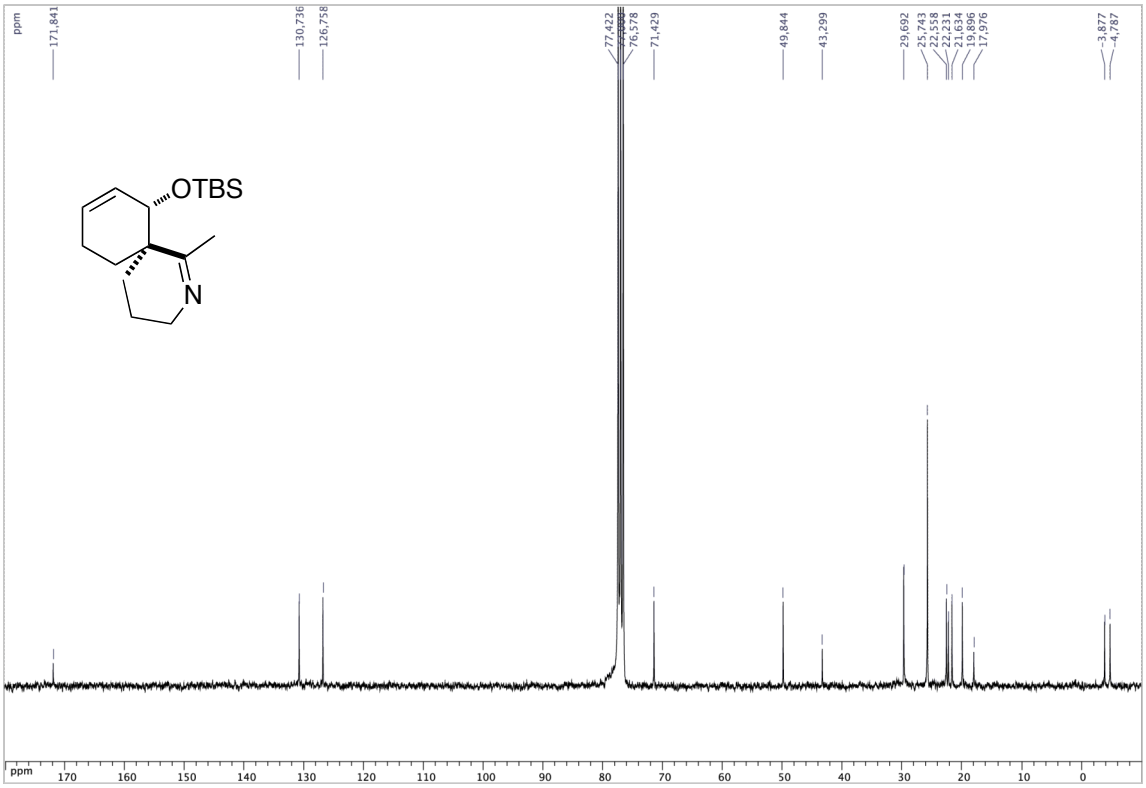
(+)-1-((1*R*,2*S*)-1-(3-azidopropyl)-2-((*tert*-butyldimethylsilyl)oxy)cyclohex-3-en-1-yl)ethanone **(8)**





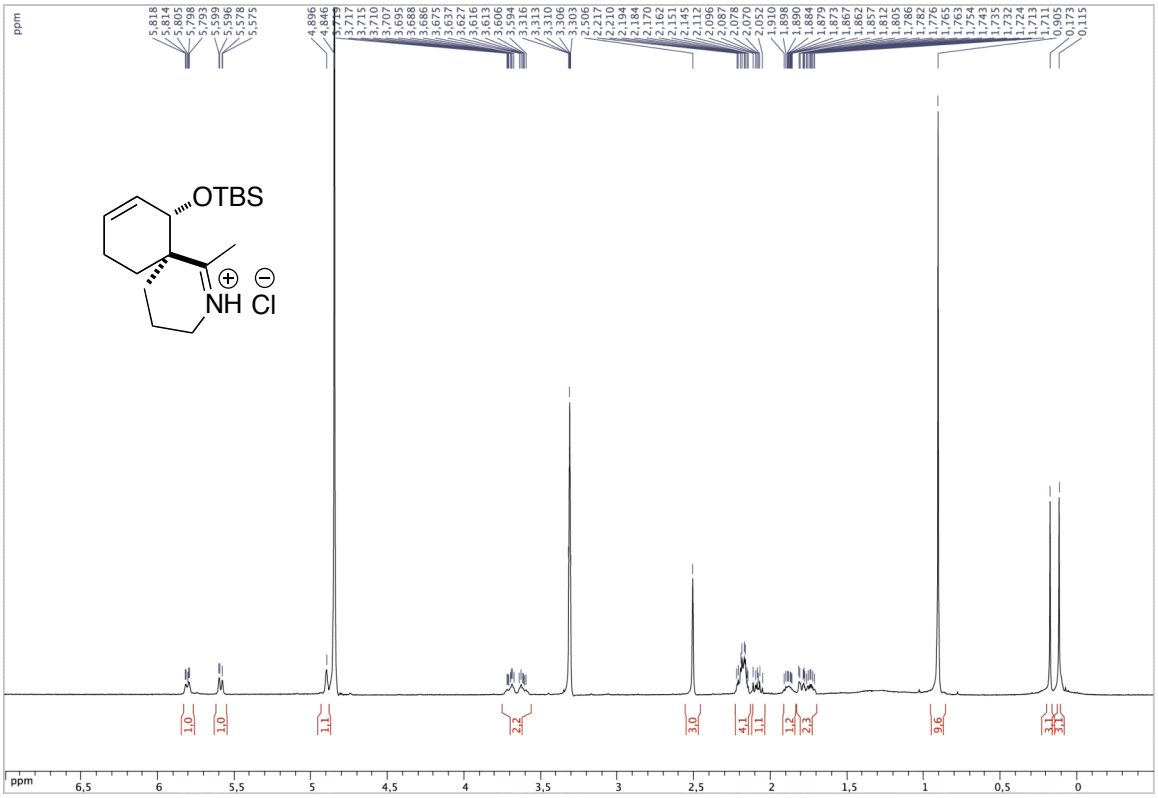
(+)-(6*S*,7*S*)-7-((*tert*-butyldimethylsilyl)oxy)-1-methyl-2-azaspiro[5.5]undeca-1,8-diene (**9**)

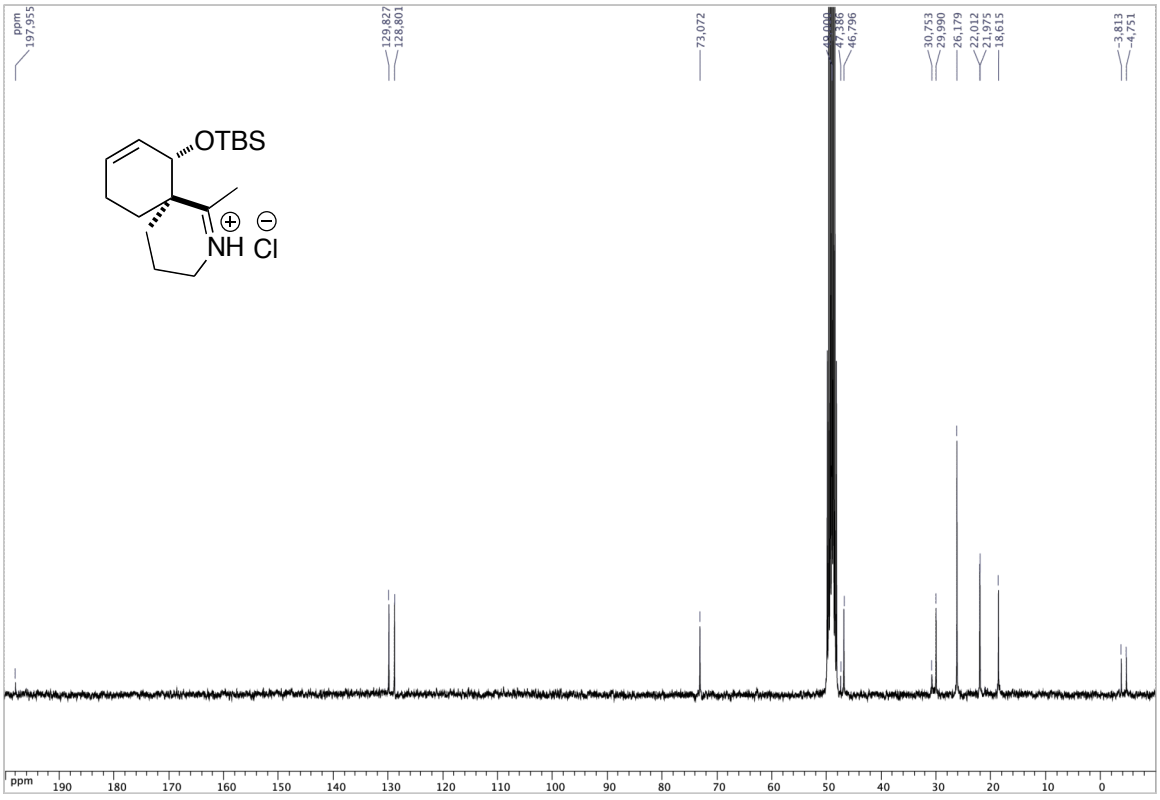




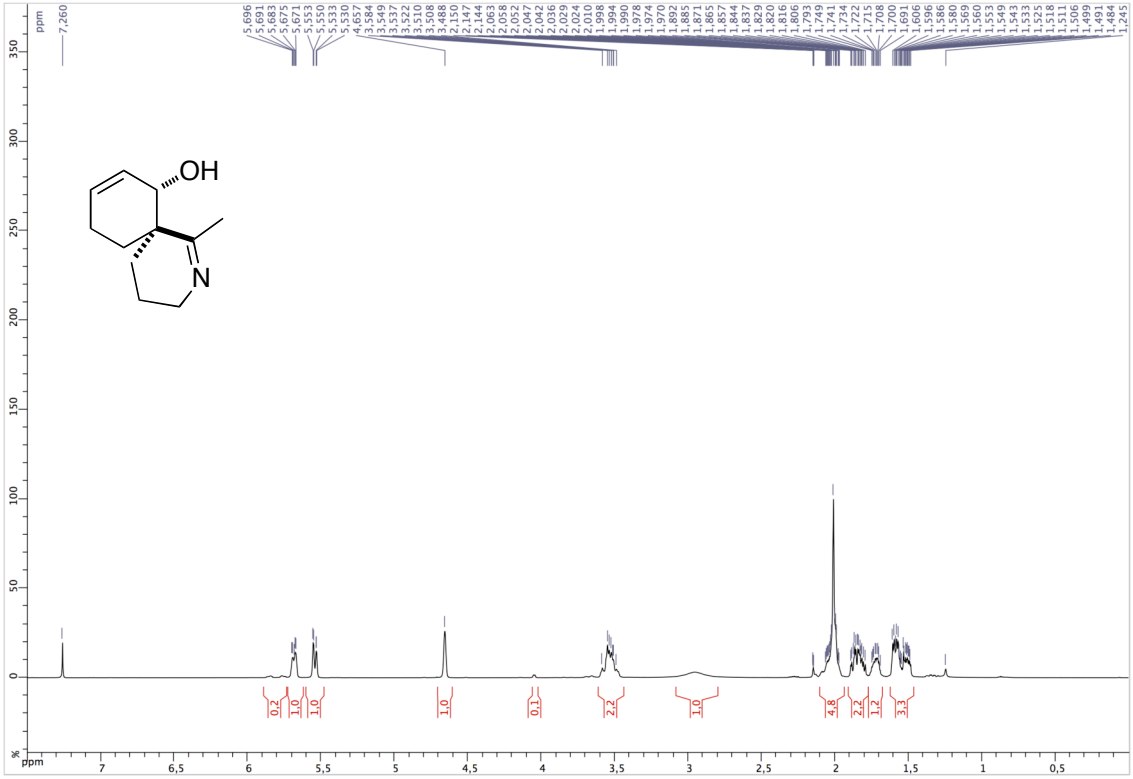
This journal is © The Royal Society of Chemistry 2011

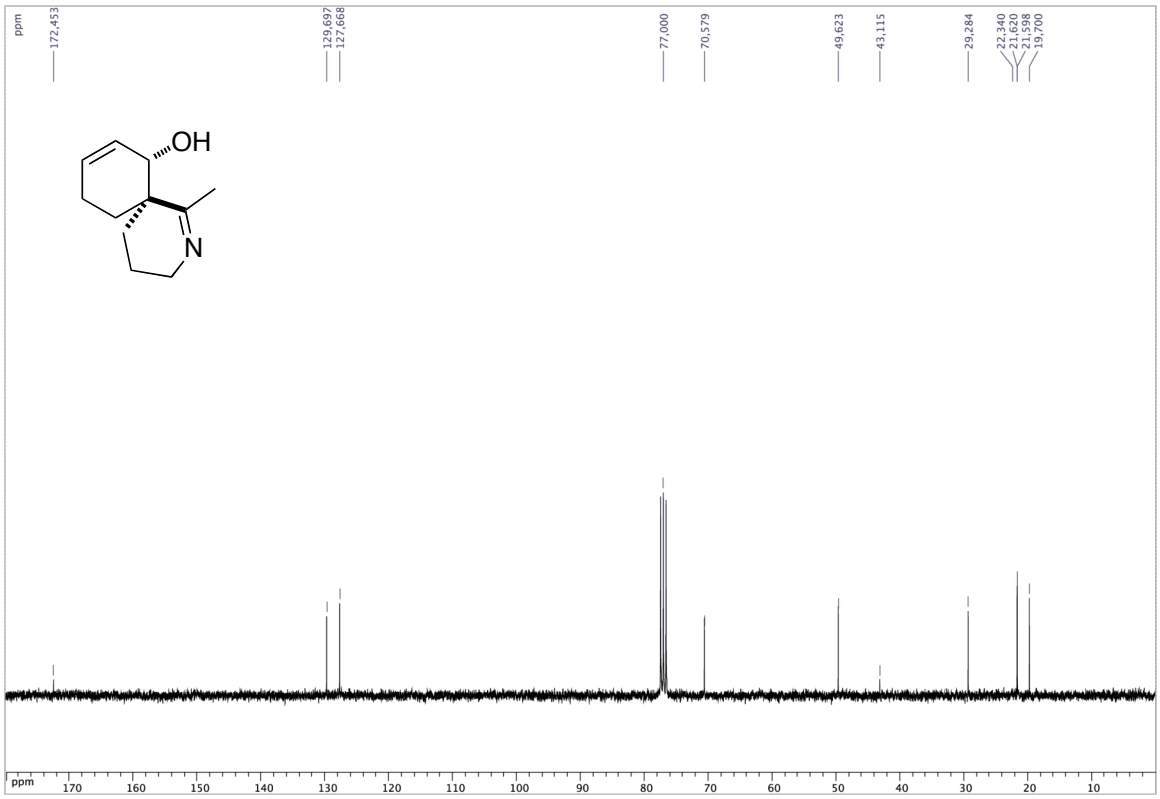
(+)-((6S,7S)-7-((tert-butyldimethylsilyl)oxy)-1-methyl-2-azaspiro[5.5]undeca-1,8-dien-2-ium chloride (**15**)



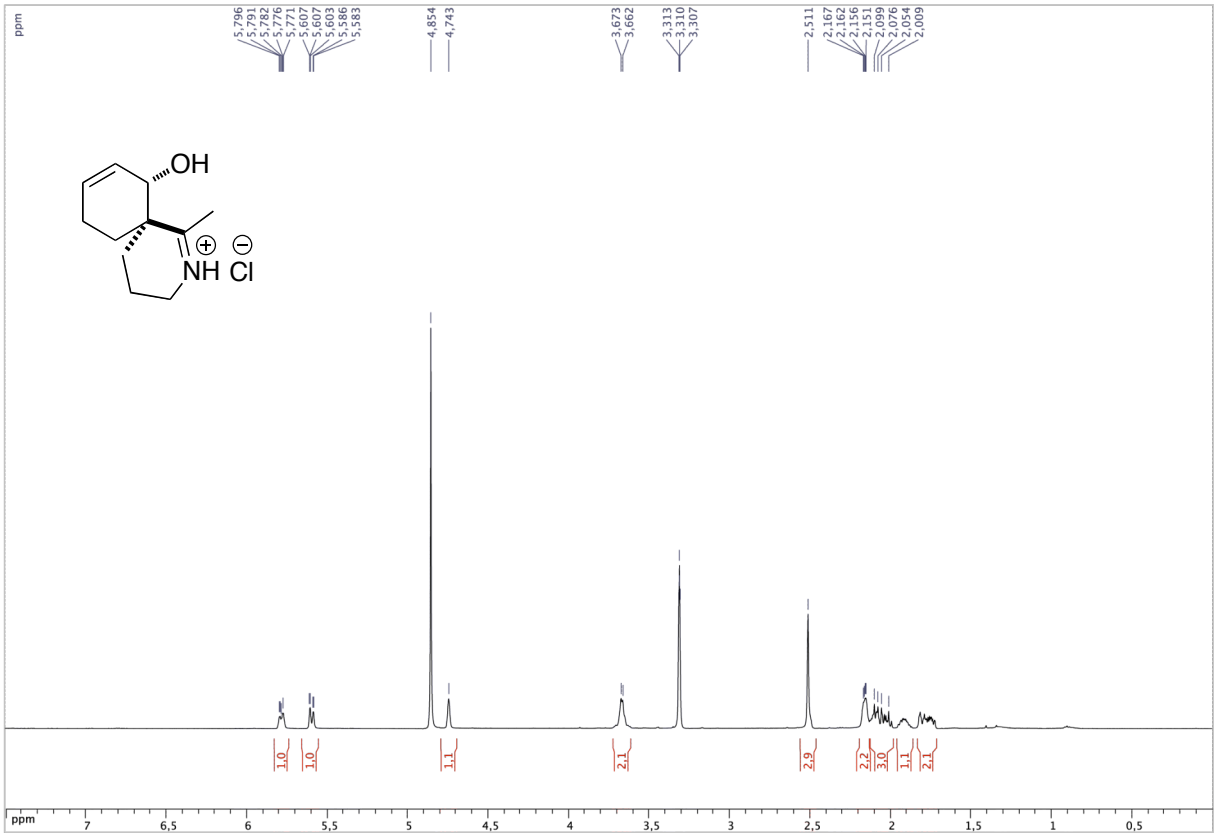


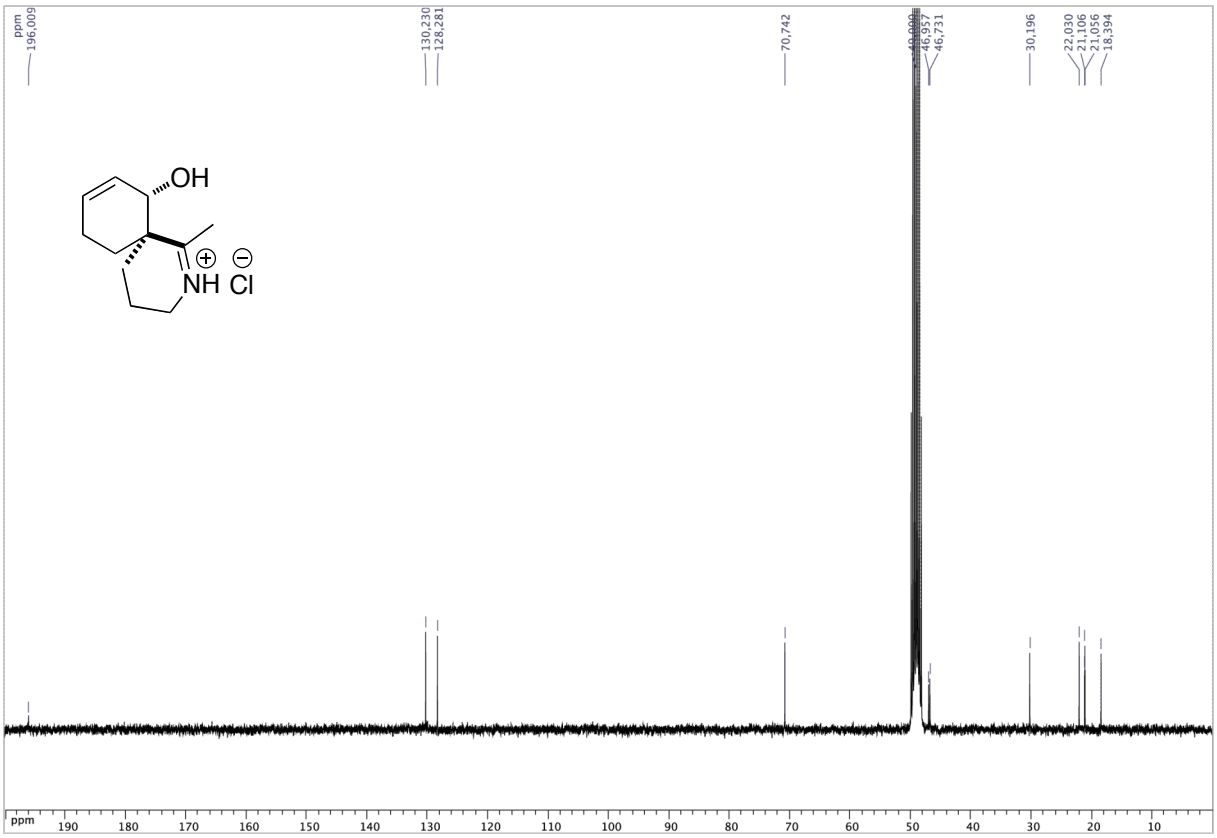
(+)-(6*S*,7*S*)-1-methyl-2-azaspiro[5.5]undeca-1,8-dien-7-ol (**11**)





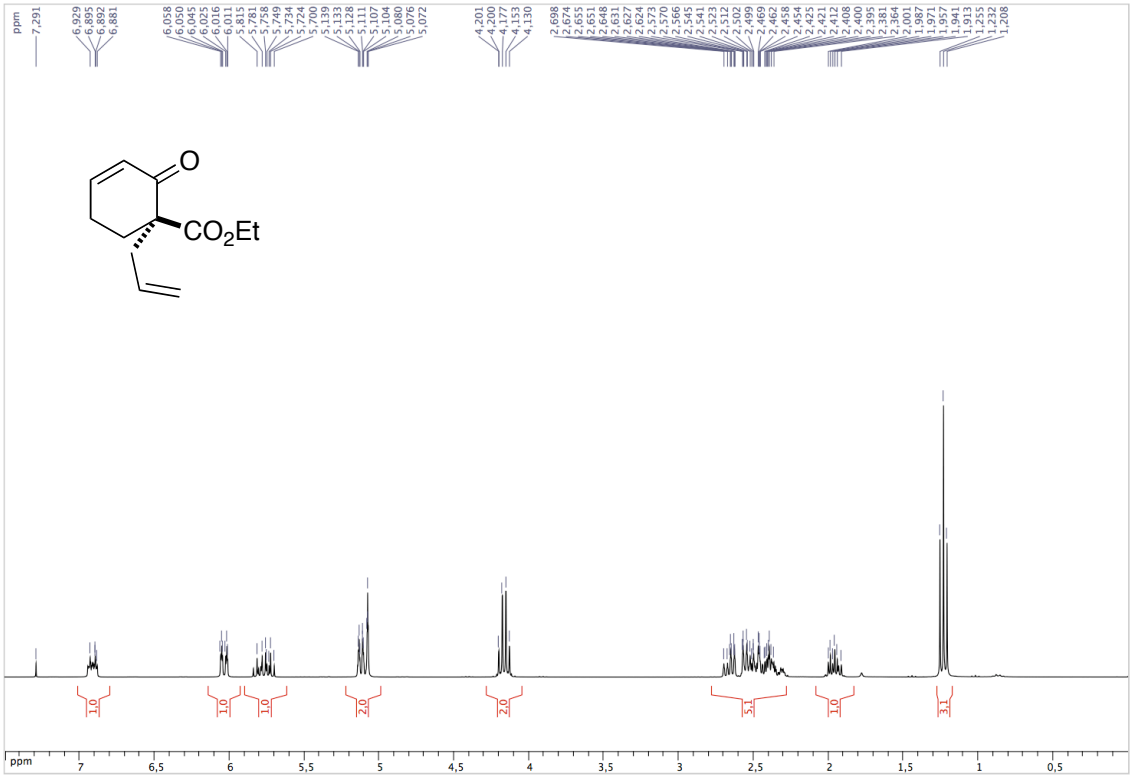
(-)-(6S,7S)-7-hydroxy-1-methyl-2-azaspiro[5.5]undeca-1,8-dien-2-ium chloride (**10**)

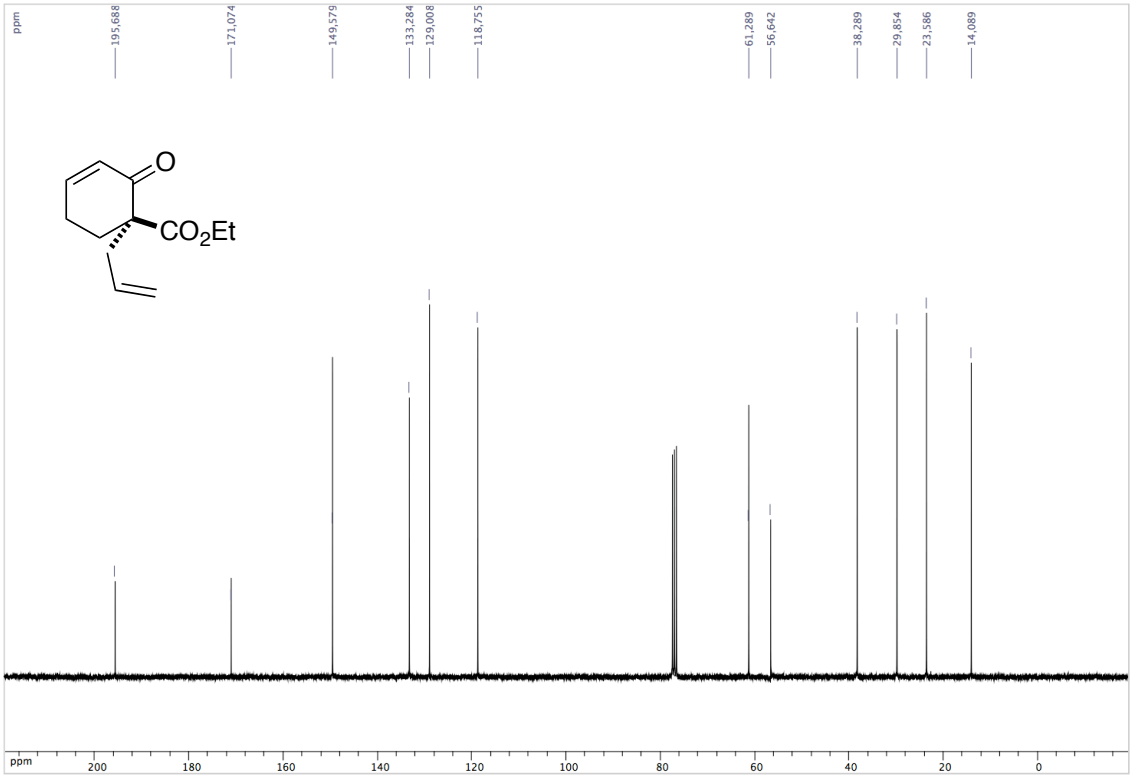




This journal is © The Royal Society of Chemistry 2011

(+)-(*R*)-ethyl 1-allyl-2-oxocyclohex-3-enecarboxylate (**12**)





(*R*)-ethyl 2-oxo-1-(3-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)allyl)cyclohex-3-enecarboxylate (**14**)