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

Supporting Information

One Pot Synthesis of Amino Acids Derived Chiral Disubstituted Morpholines and 1,4-Oxazepanes *via* Tandem Aziridine/Epoxide Ring Opening Sequences†

Krishnananda Samanta and Gautam Panda*

Medicinal and Process Chemistry Division, Central Drug Research Institute, Lucknow-226001, UP, India

E-mail : gautam.panda@gmail.com Tel : 91-522-2612411-18, Ext. 4385, 4603 Fax: 91-522-2623405

This journal is © The Royal Society of Chemistry 2011

This journal is © The Royal Society of Chemistry 2011

This journal is © The Royal Society of Chemistry 2011

Fig. S-55 : ^{1}H spectra of (3*S*,6*S*)-3-*iso*-Propyl-1,4-oxazepan-6-ol **15.**

Fig. S-56: ^{13}C spectra of (3*S*,6*S*)-3-*iso*-Propyl-1,4-oxazepan-6-ol **15.**

Fig. S-57: ^{1}H spectra of (3*S*,5*S*)-3-((tert-butyldimethylsilyloxy)methyl)-5-isopropyl-4-tosylmorpholine **16.**

This journal is © The Royal Society of Chemistry 2011

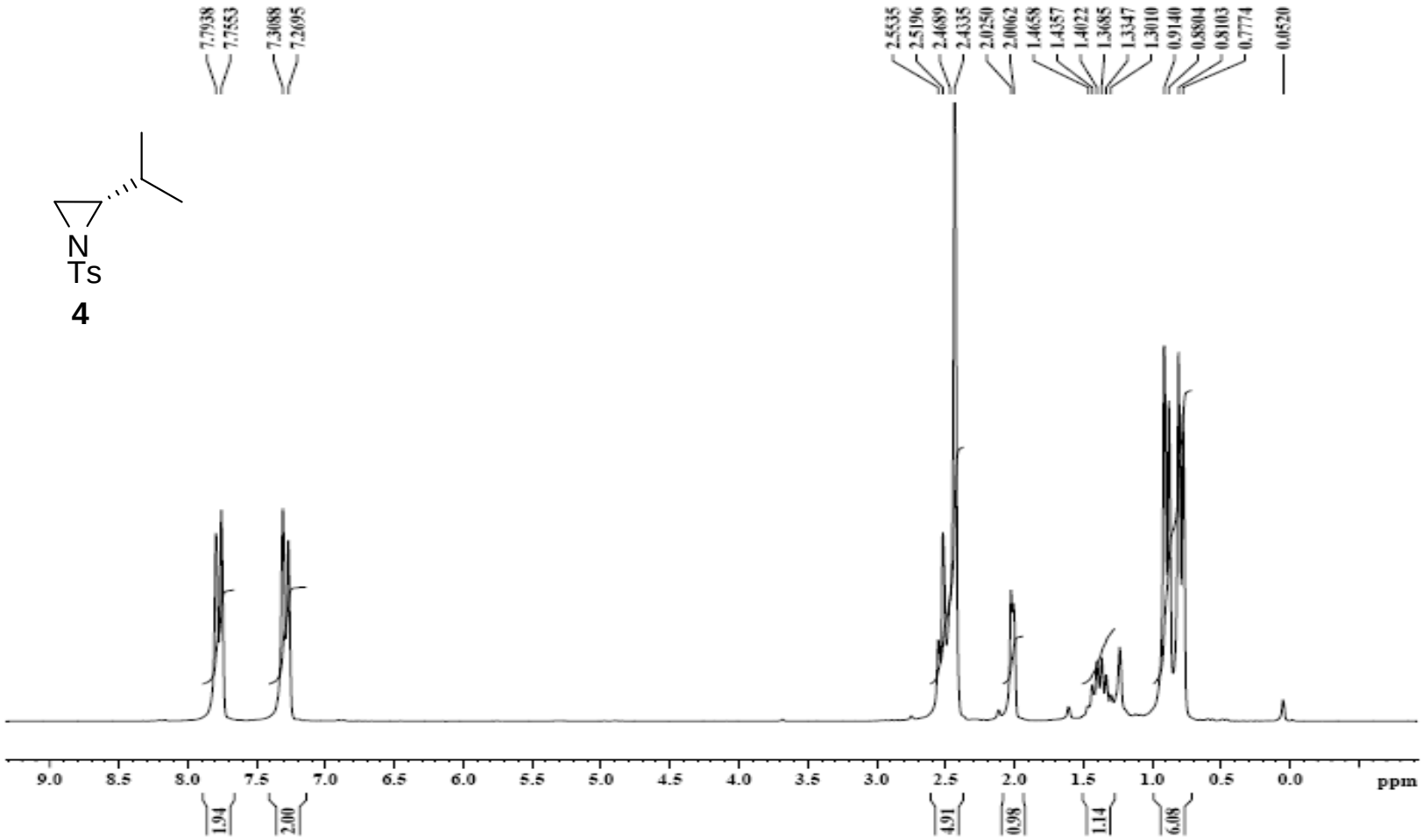


Figure S-1: ^{1}H spectrum (200 MHz, $CDCl_3$) of **4.**

This journal is © The Royal Society of Chemistry 2011

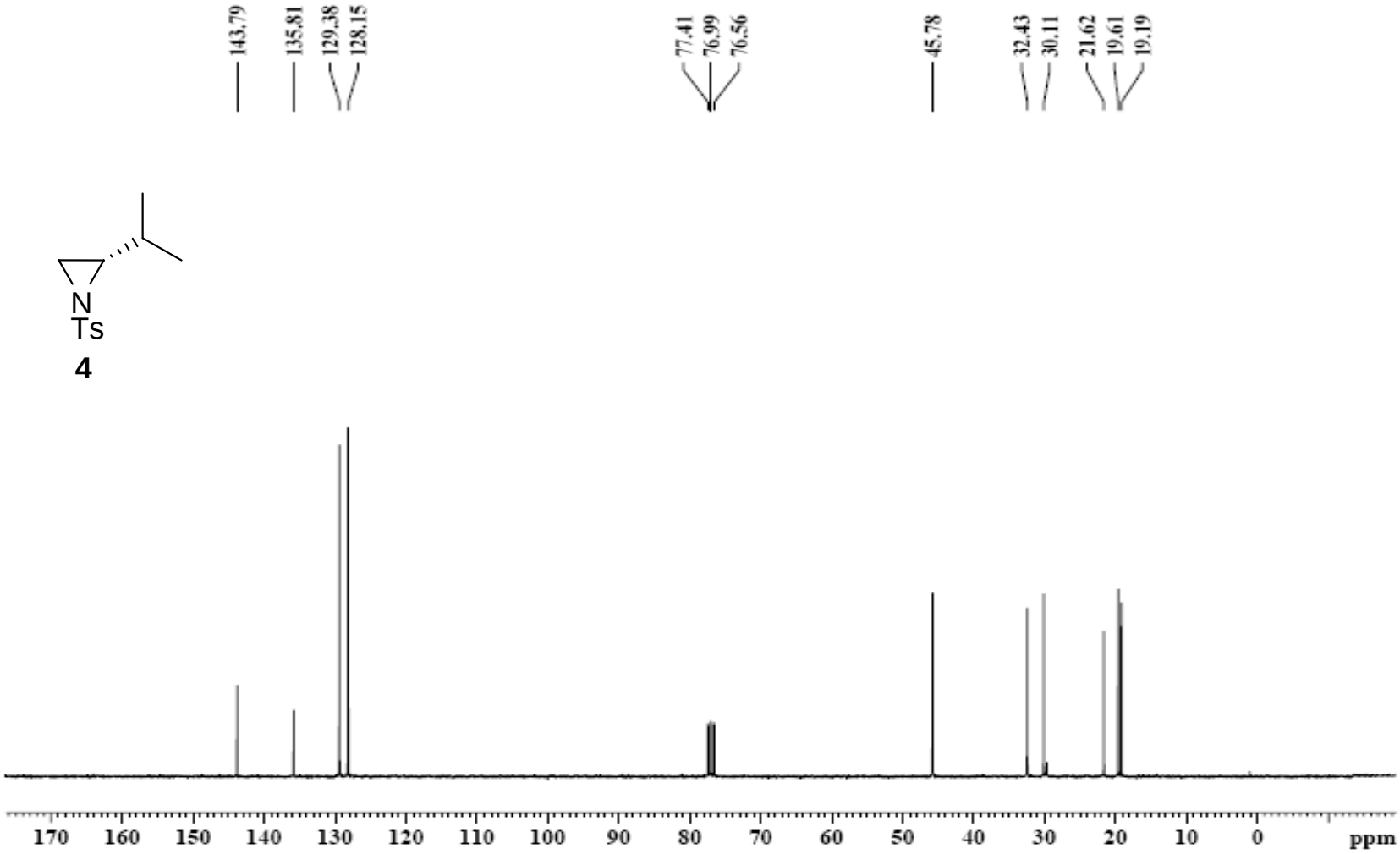


Figure S-2: ^{13}C spectrum (75 MHz, $CDCl_3$) of **4.**

This journal is © The Royal Society of Chemistry 2011

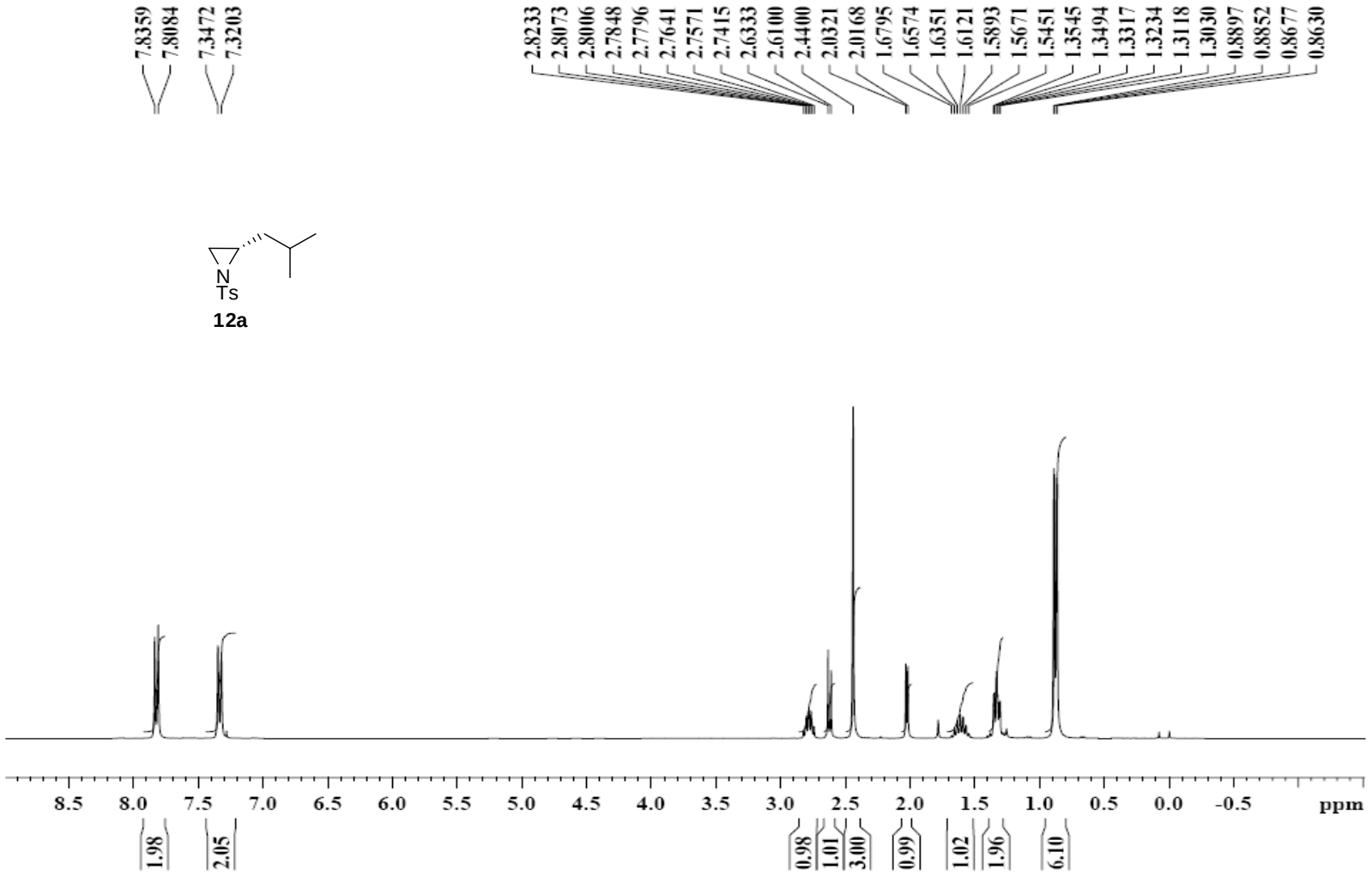
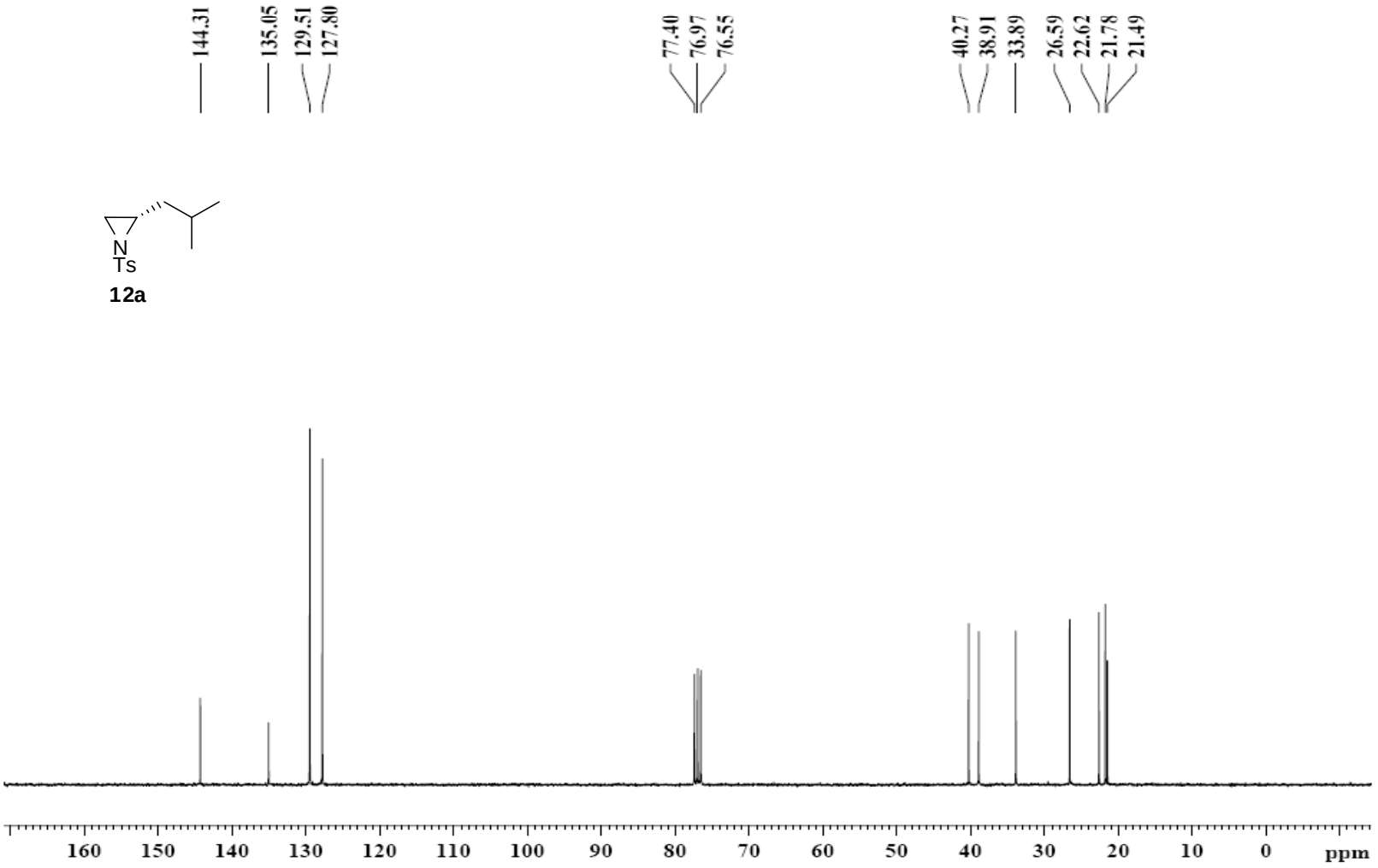


Figure S-3: ^{1}H spectrum (300 MHz, $CDCl_3$) of 1**2a.**

This journal is © The Royal Society of Chemistry 2011



12a

Figure S-4:^{13}C spectrum (75 MHz, $CDCl_3$) of **12a.**

This journal is © The Royal Society of Chemistry 2011

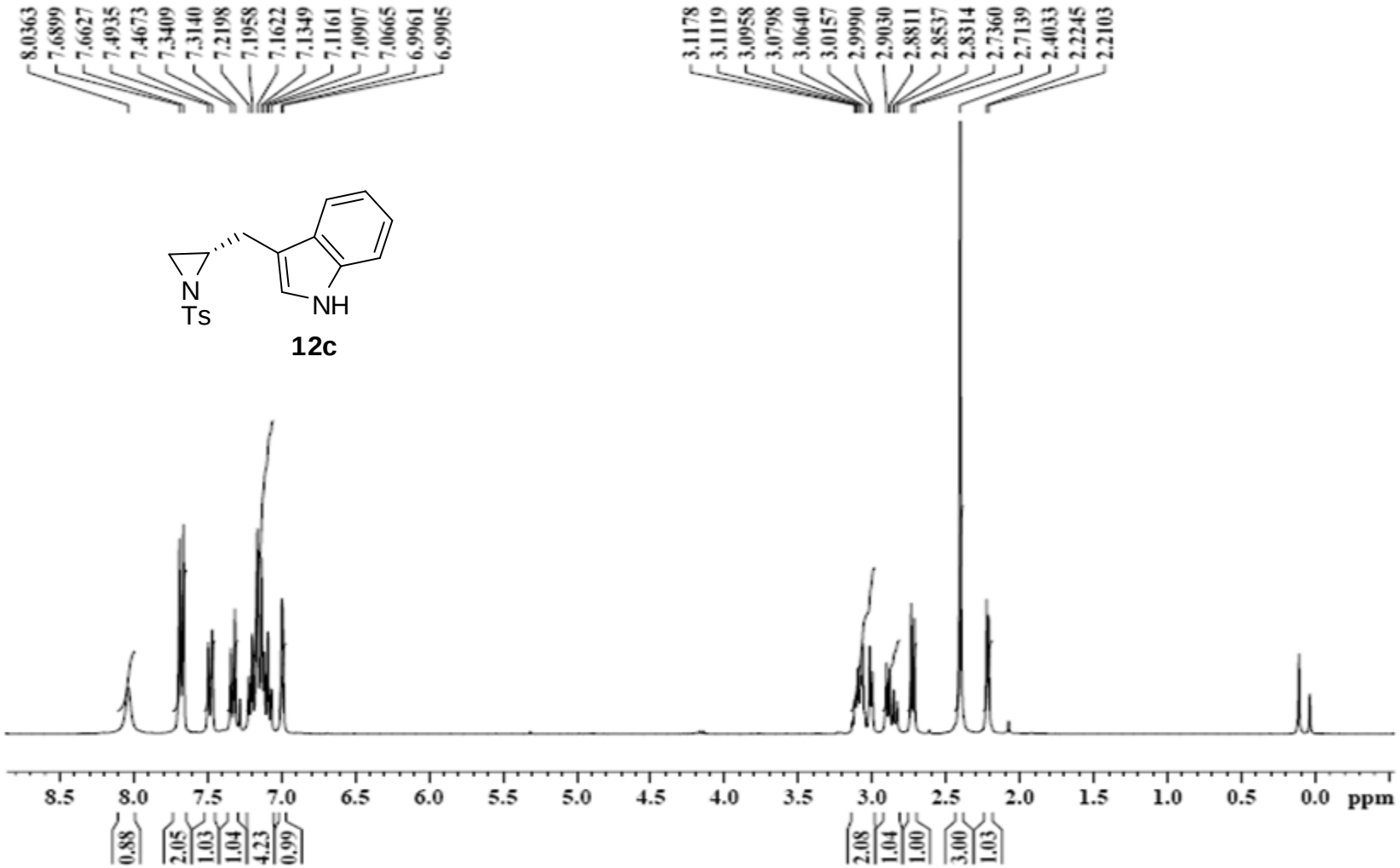


Figure S-5: ^{1}H spectrum (300 MHz, $CDCl_3$) of **12c.**

This journal is © The Royal Society of Chemistry 2011

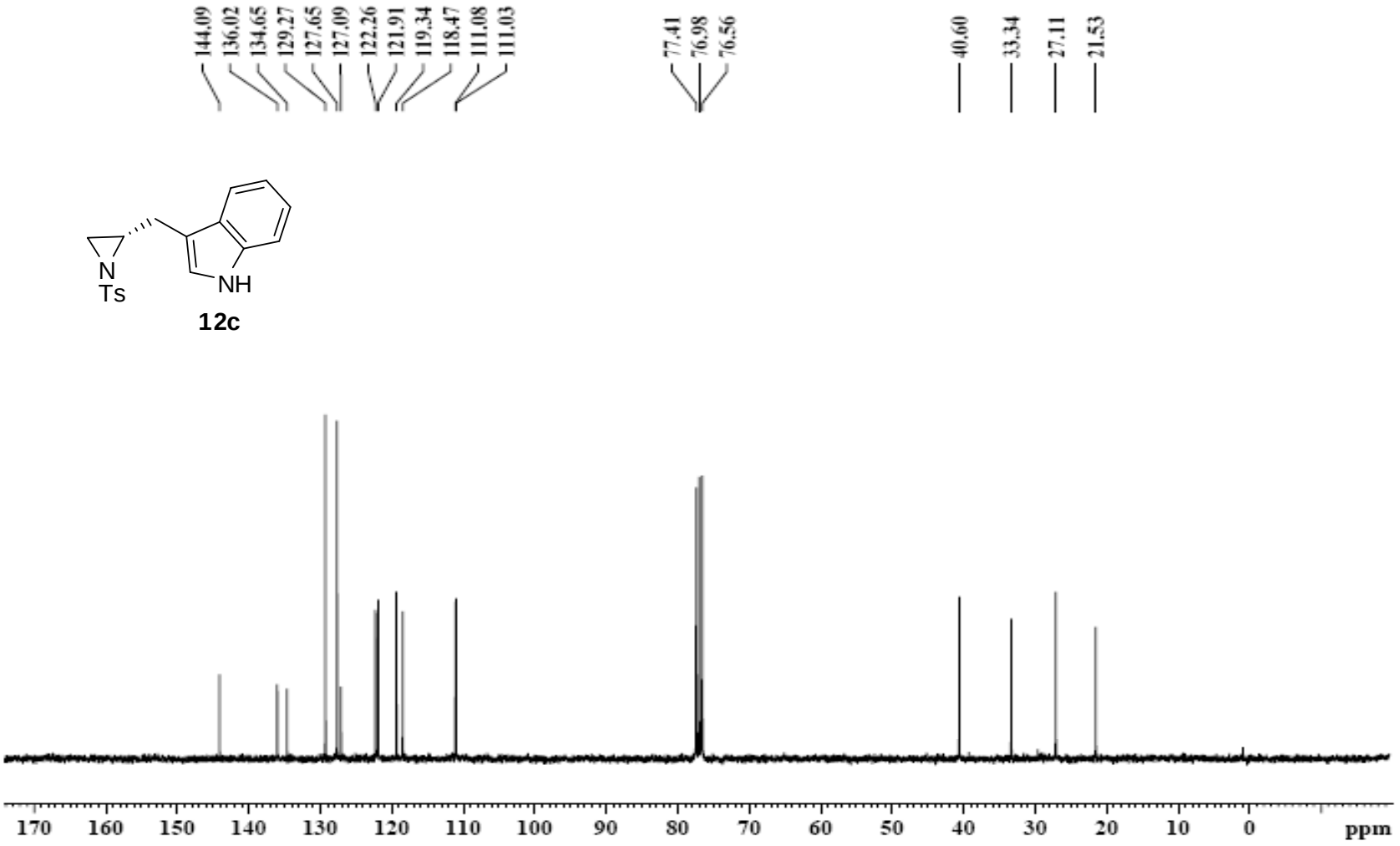


Figure S-6: ^{13}C spectrum (75MHz, $CDCl_3$) **12c.**

This journal is © The Royal Society of Chemistry 2011

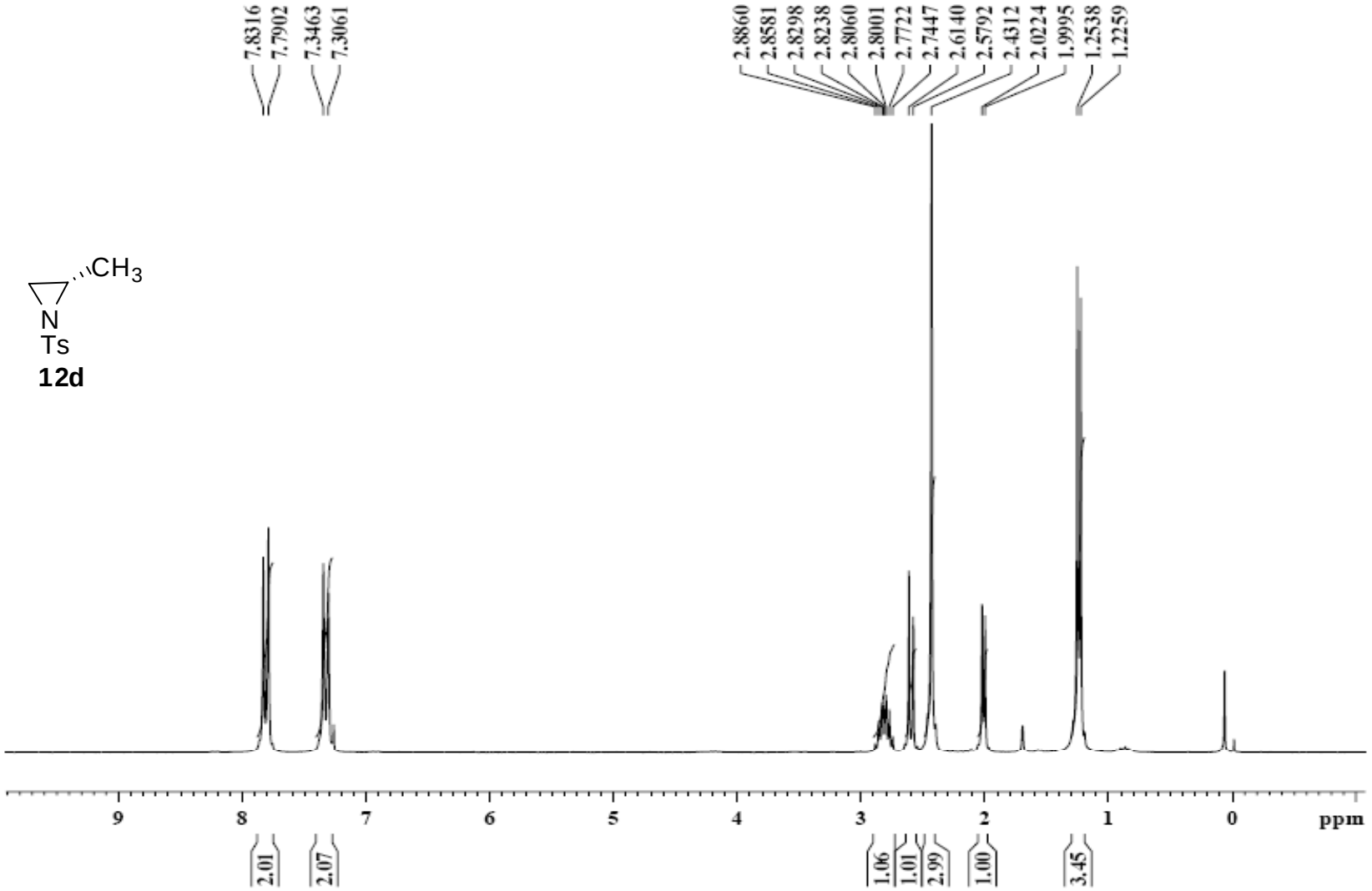


Figure S-7: ^{1}H spectrum (300 MHz, $CDCl_3$) of **12d.**

This journal is © The Royal Society of Chemistry 2011

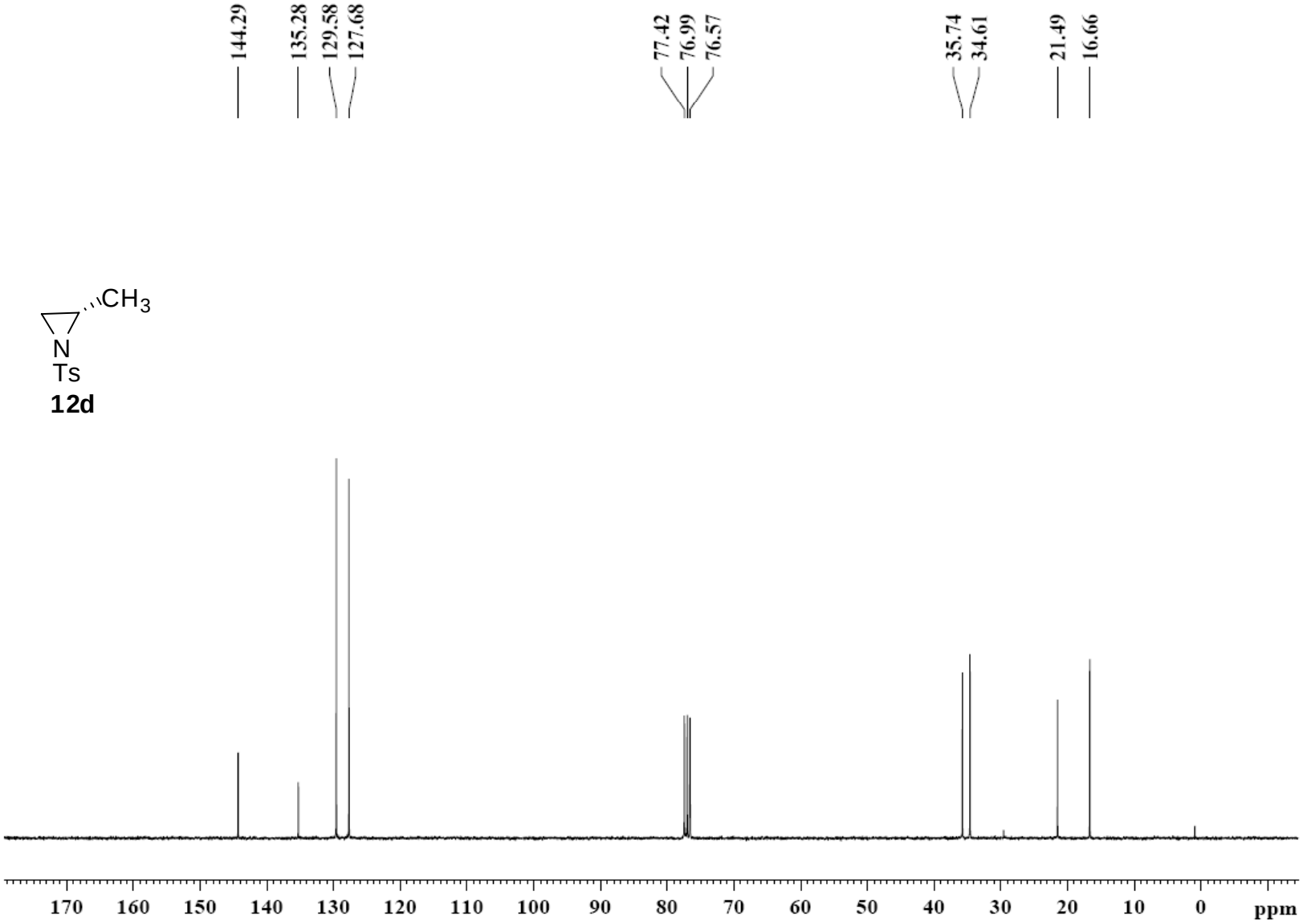


Figure S-8: ^{13}C spectrum (75MHz, $CDCl_3$) **12d.**

This journal is © The Royal Society of Chemistry 2011

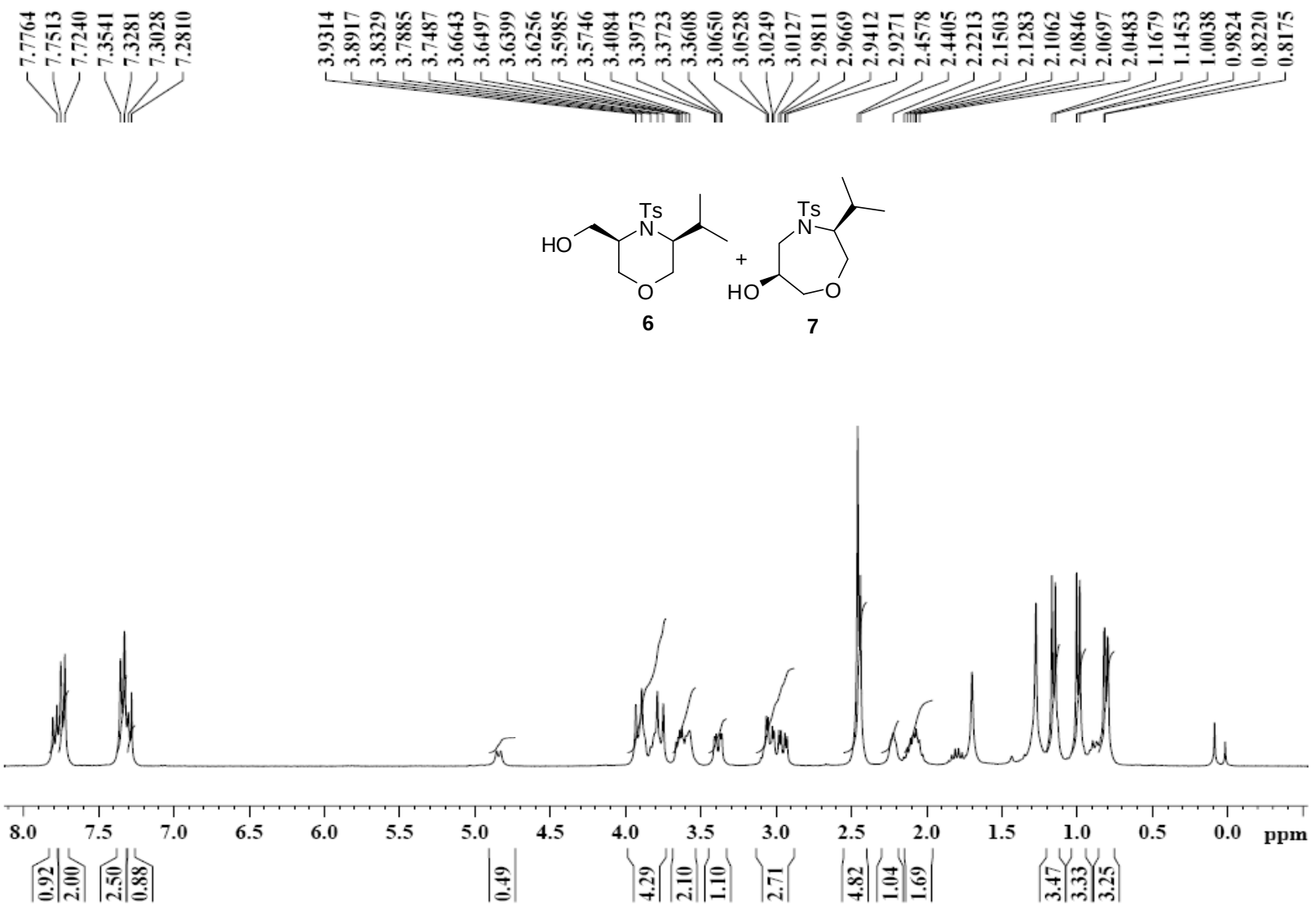


Figure S-9: ^{1}H spectrum (300 MHz, $CDCl_3$) of inseparable **6 + 7** (2.1:1).

This journal is © The Royal Society of Chemistry 2011

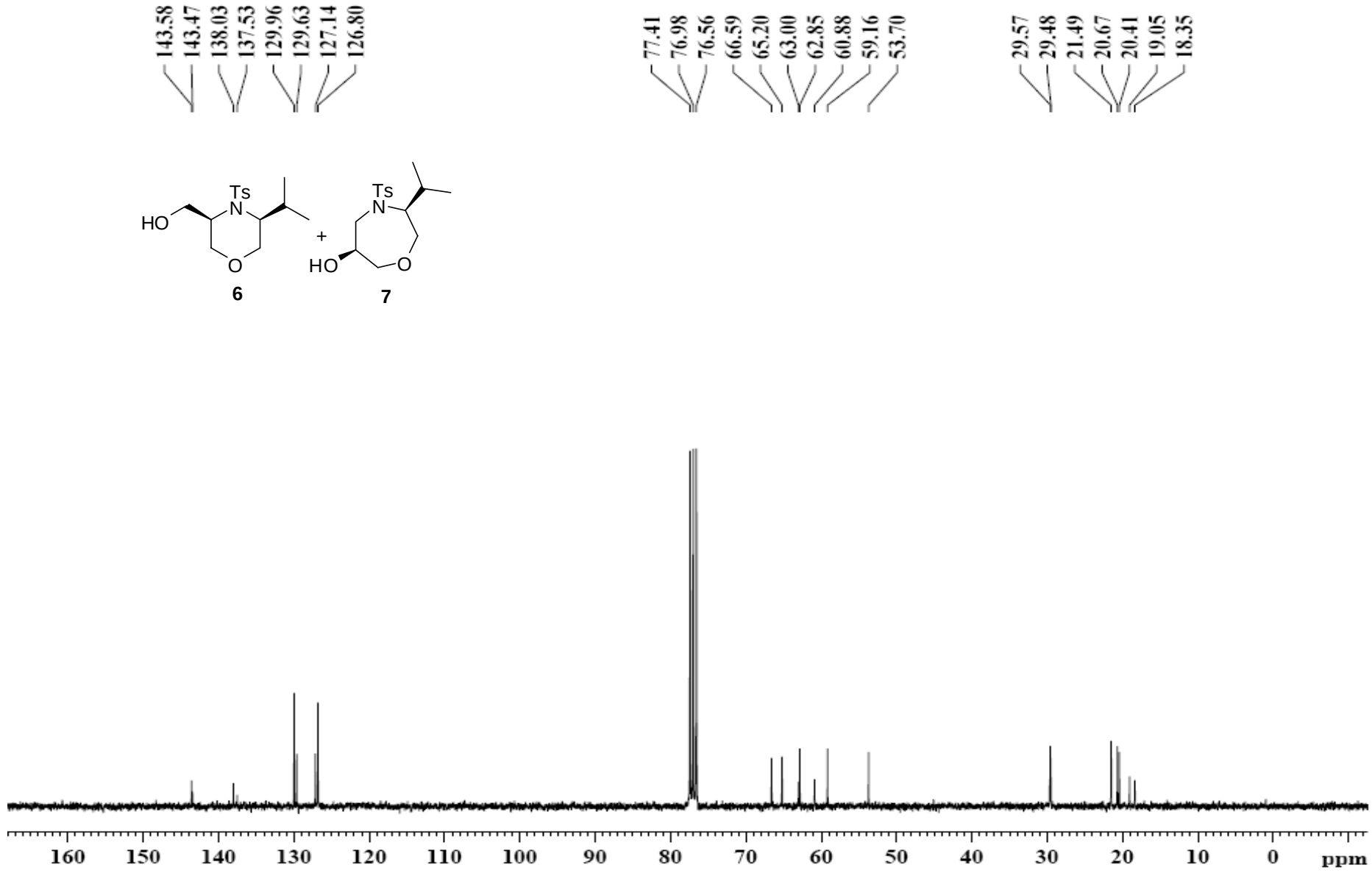


Figure S-10: ^{13}C spectrum (75MHz, $CDCl_3$) of mixture compounds.

This journal is © The Royal Society of Chemistry 2011

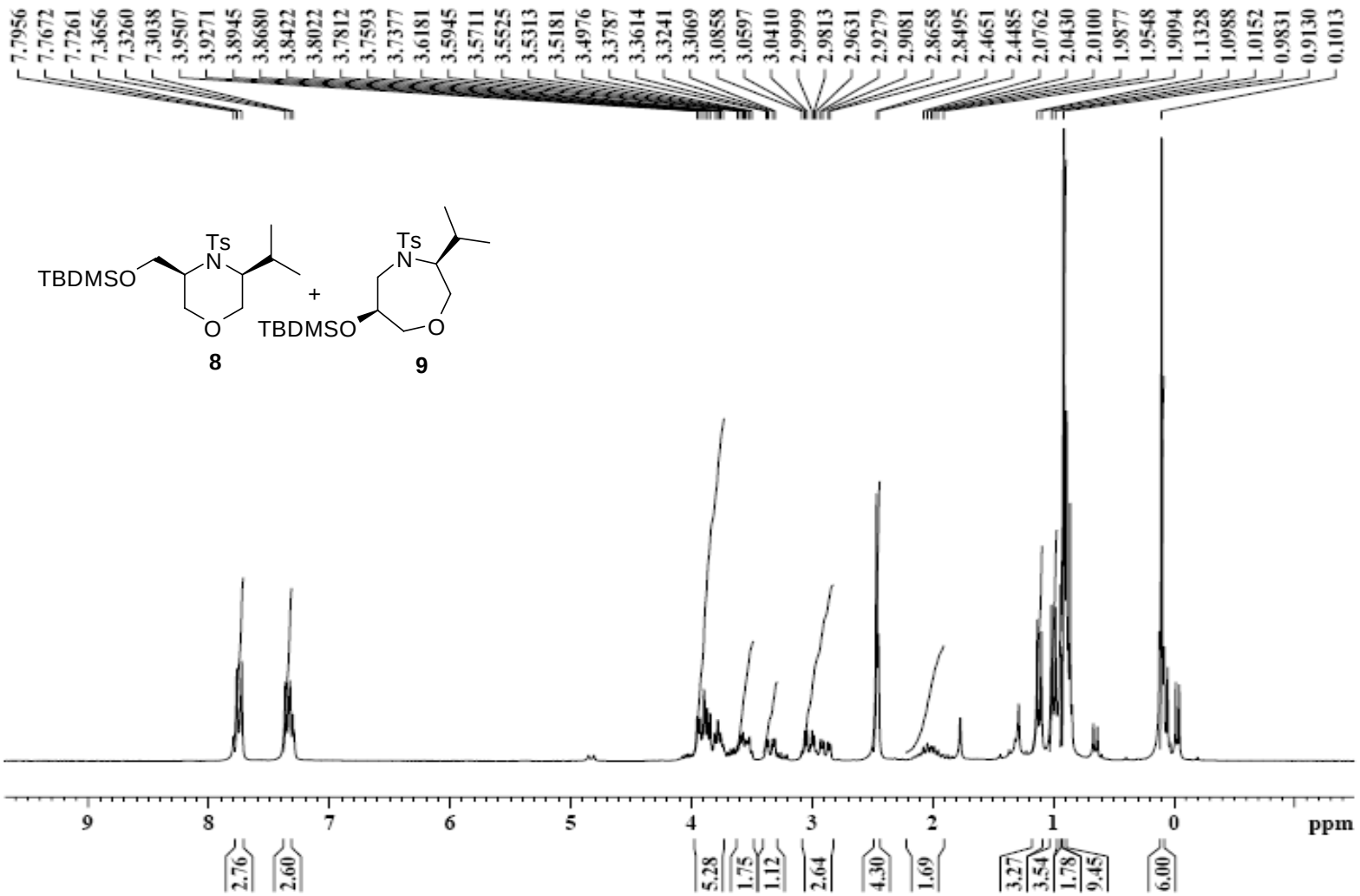


Figure S-11: ^{1}H spectrum (300 MHz, $CDCl_3$) of **8 + 9** (3.8:1). Reaction is performed at rt.

This journal is © The Royal Society of Chemistry 2011

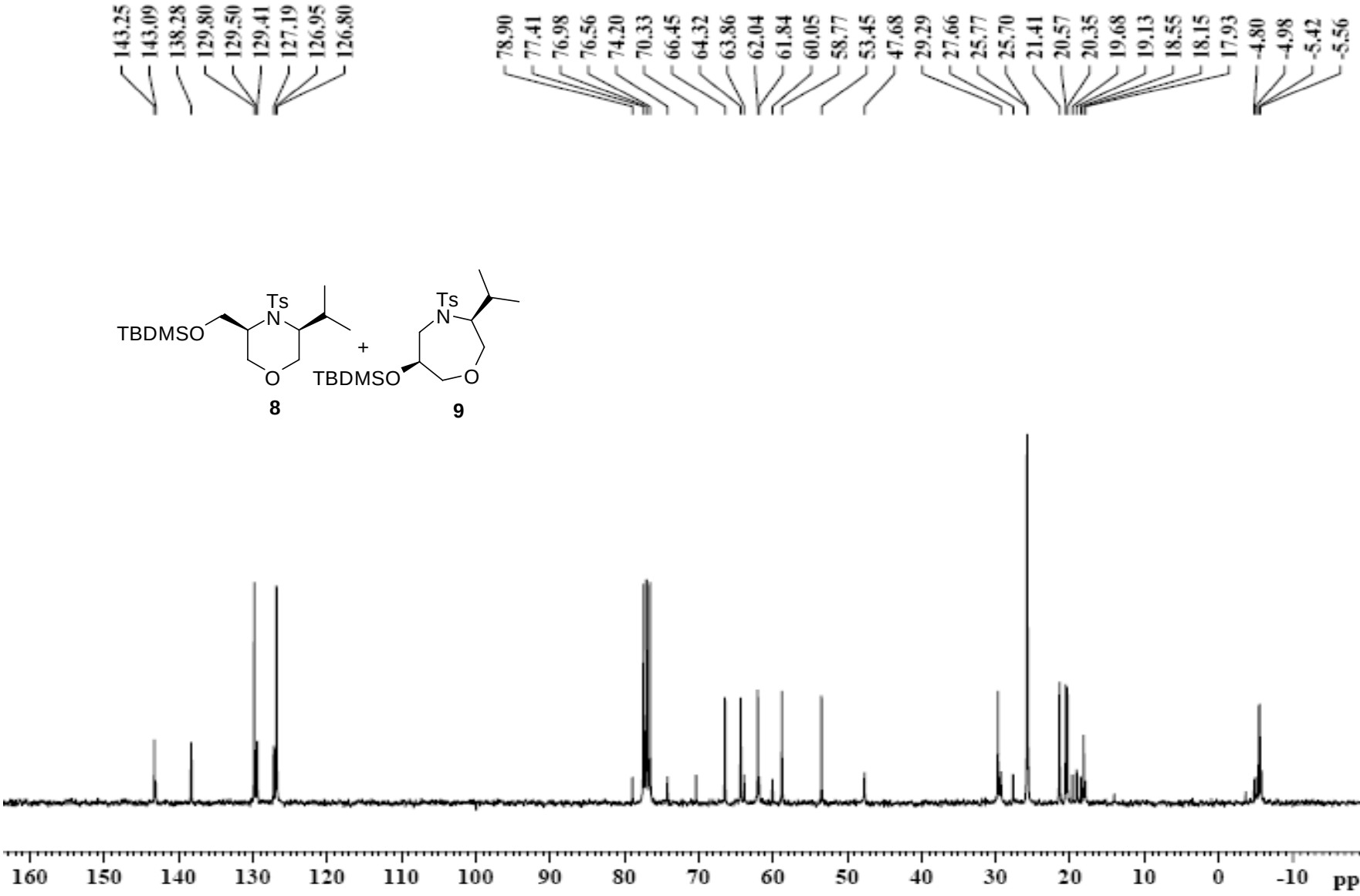


Figure S-12: ^{13}C spectrum (75 MHz, $CDCl_3$)of **8 & 9.**

This journal is © The Royal Society of Chemistry 2011

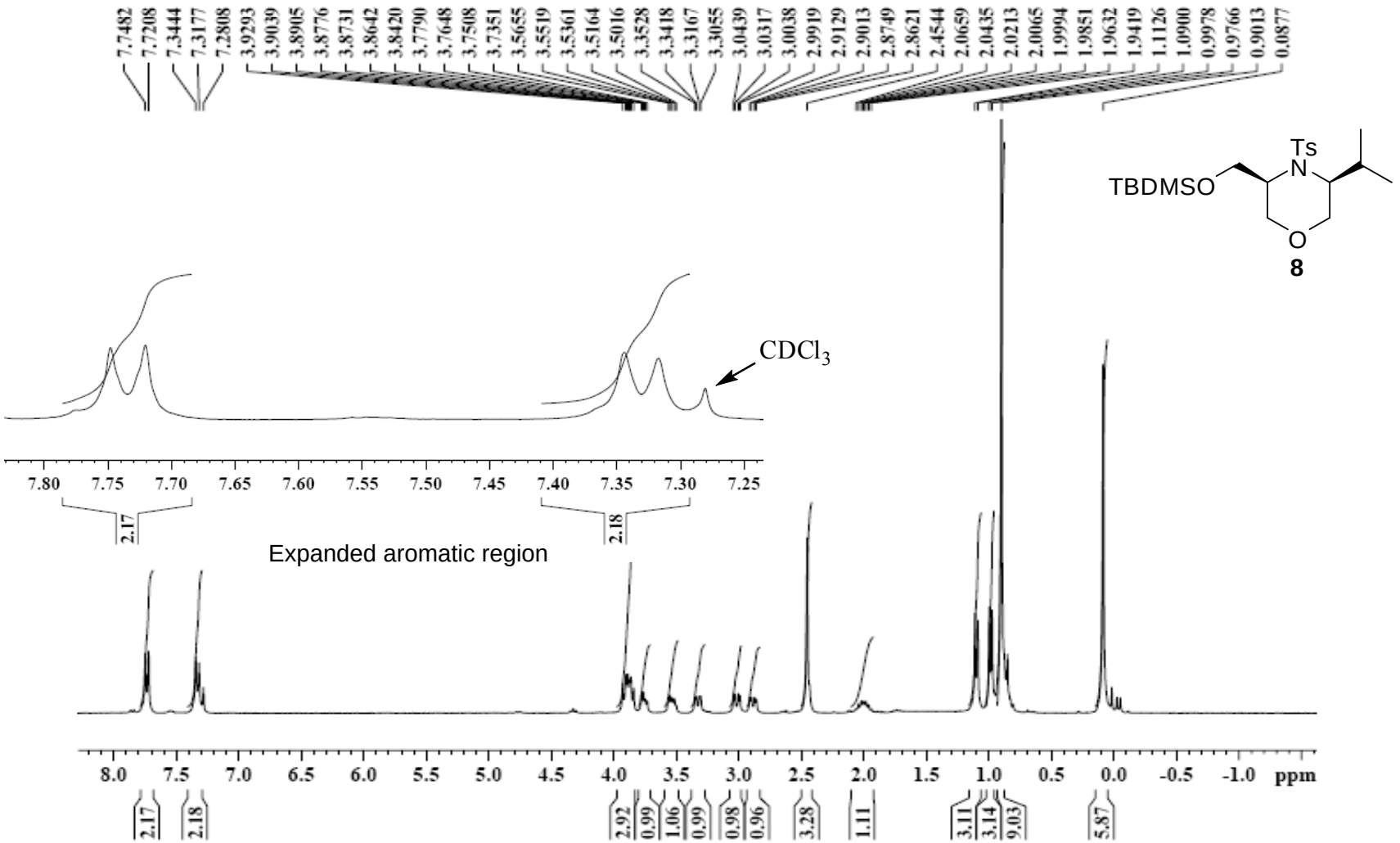


Figure S-13: Pure ^{1}H spectrum (300 MHz, $CDCl_3$) of **8.** When reaction is carried out at 0 ^{o}C**.**

This journal is © The Royal Society of Chemistry 2011

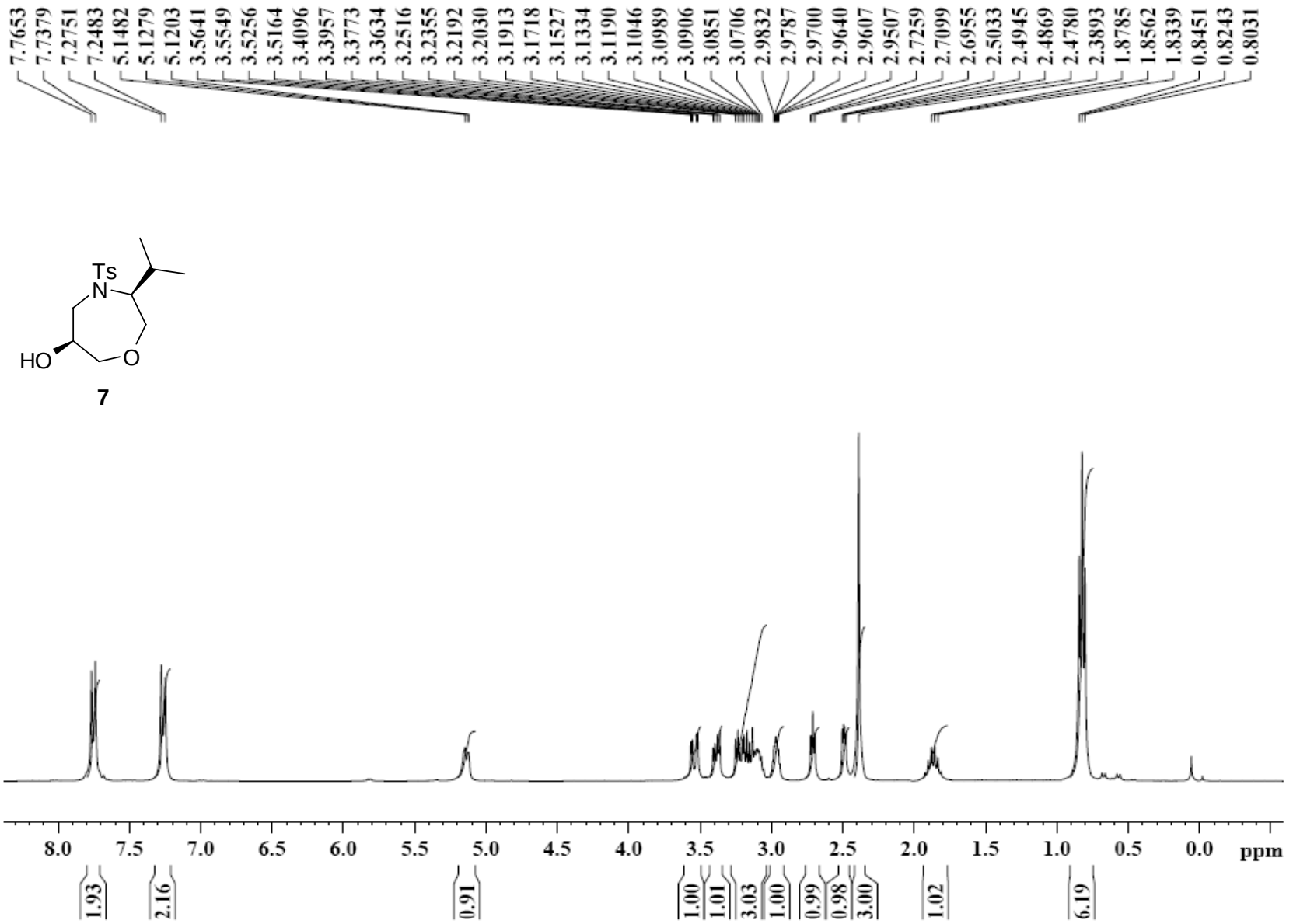


Figure S-14: ^{1}H spectrum (300 MHz, $CDCl_3$) of **7**.

This journal is © The Royal Society of Chemistry 2011

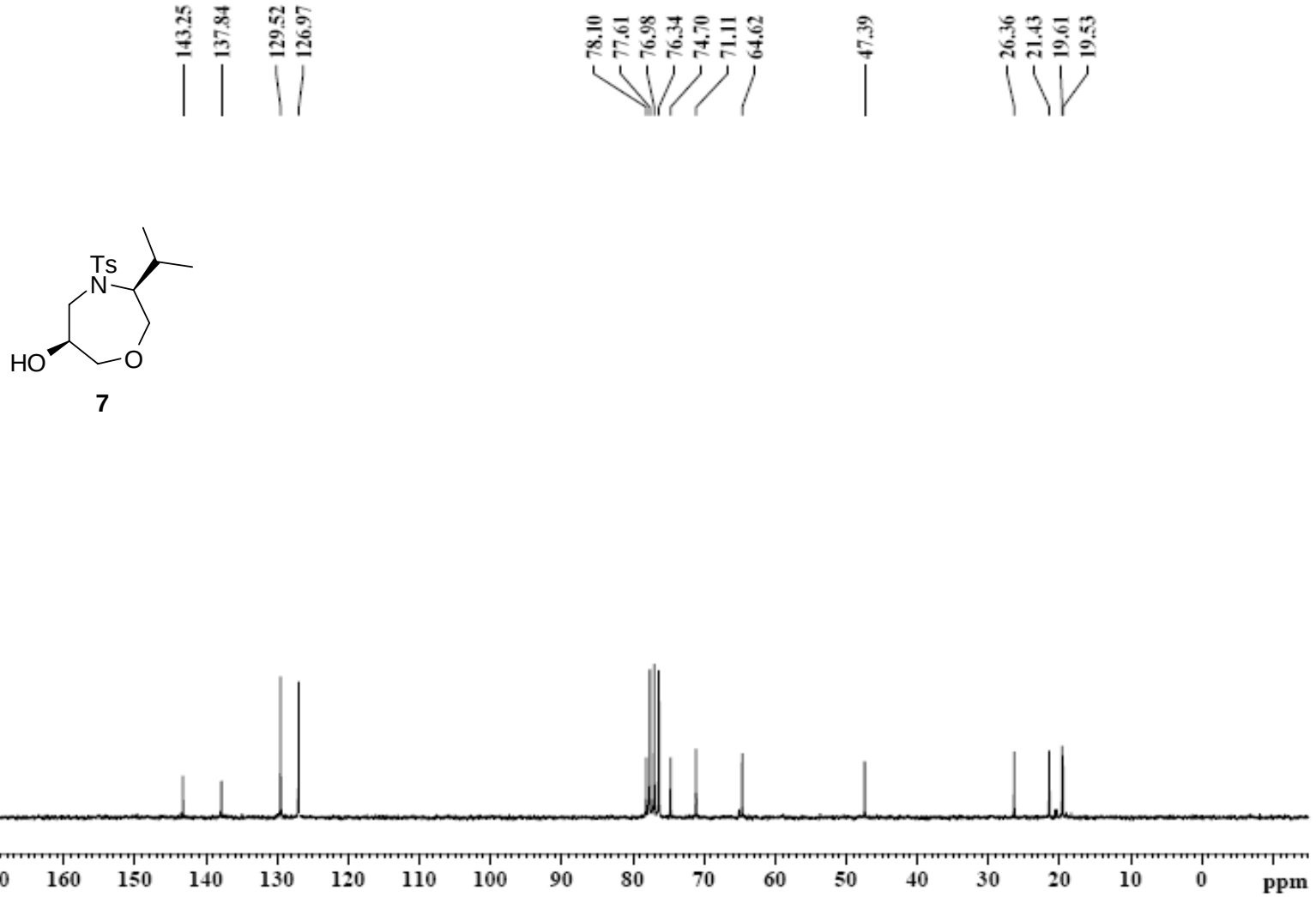
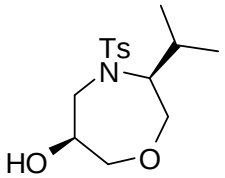


Figure S-15:^{13}C spectrum (50 MHz, $CDCl_3$) of **7.**

This journal is © The Royal Society of Chemistry 2011



7

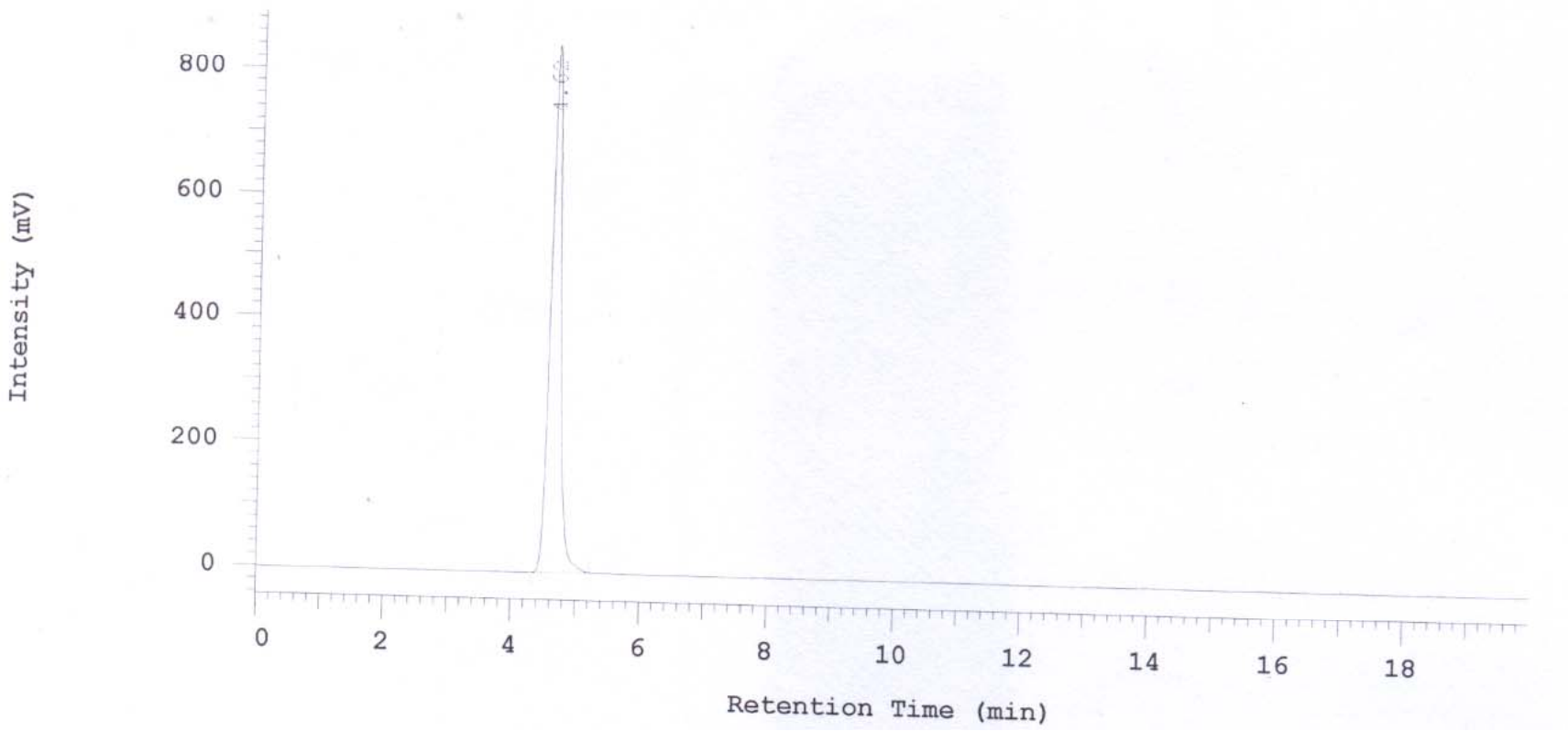


Figure S-16: HPLC spectrum of **7.**

This journal is © The Royal Society of Chemistry 2011

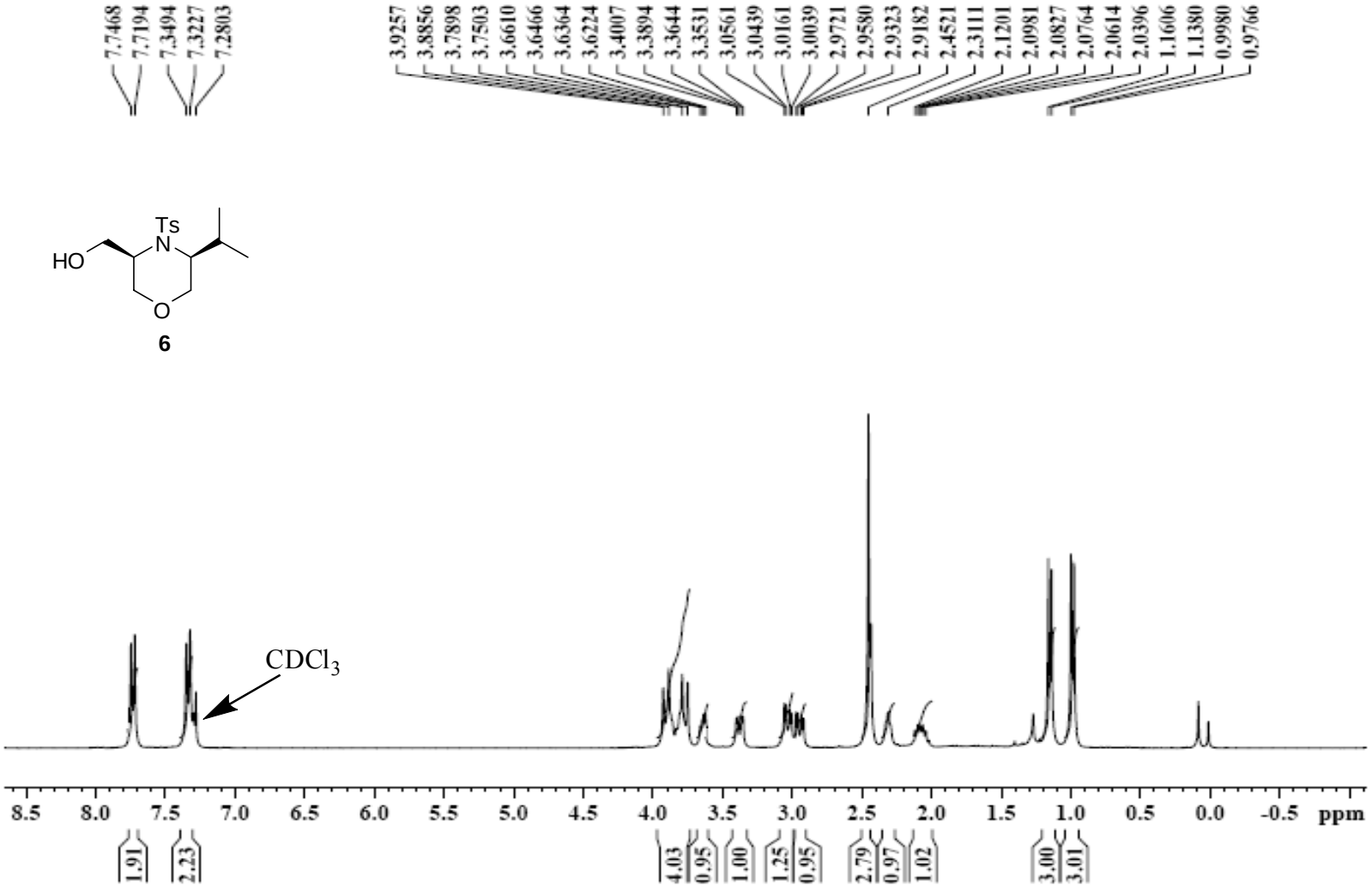


Figure S-17: ^{1}H spectrum (300 MHz, $CDCl_3$) of **6.**

This journal is © The Royal Society of Chemistry 2011

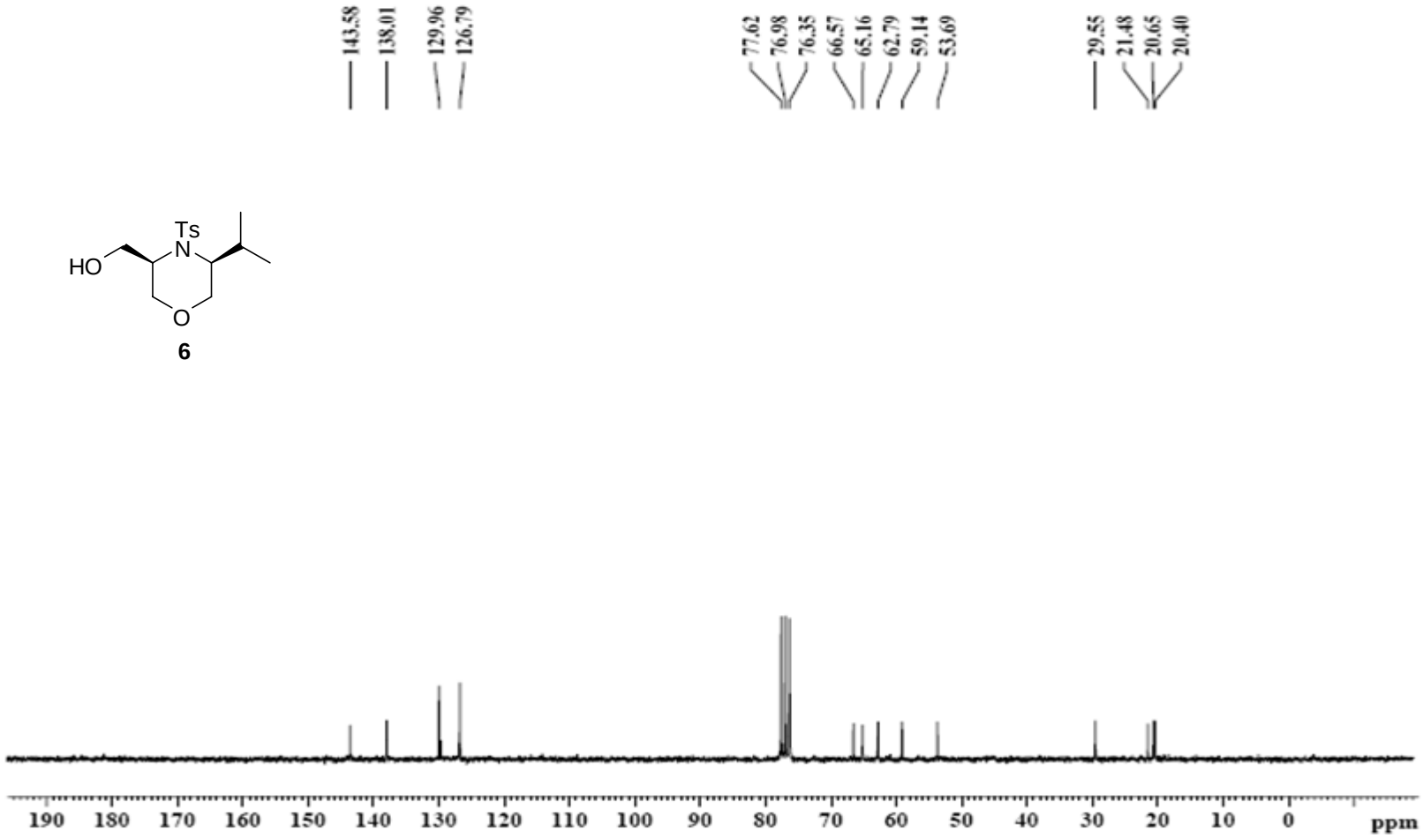


Figure S-18:^{13}C spectrum (50 MHz, $CDCl_3$) of **6.**

This journal is © The Royal Society of Chemistry 2011

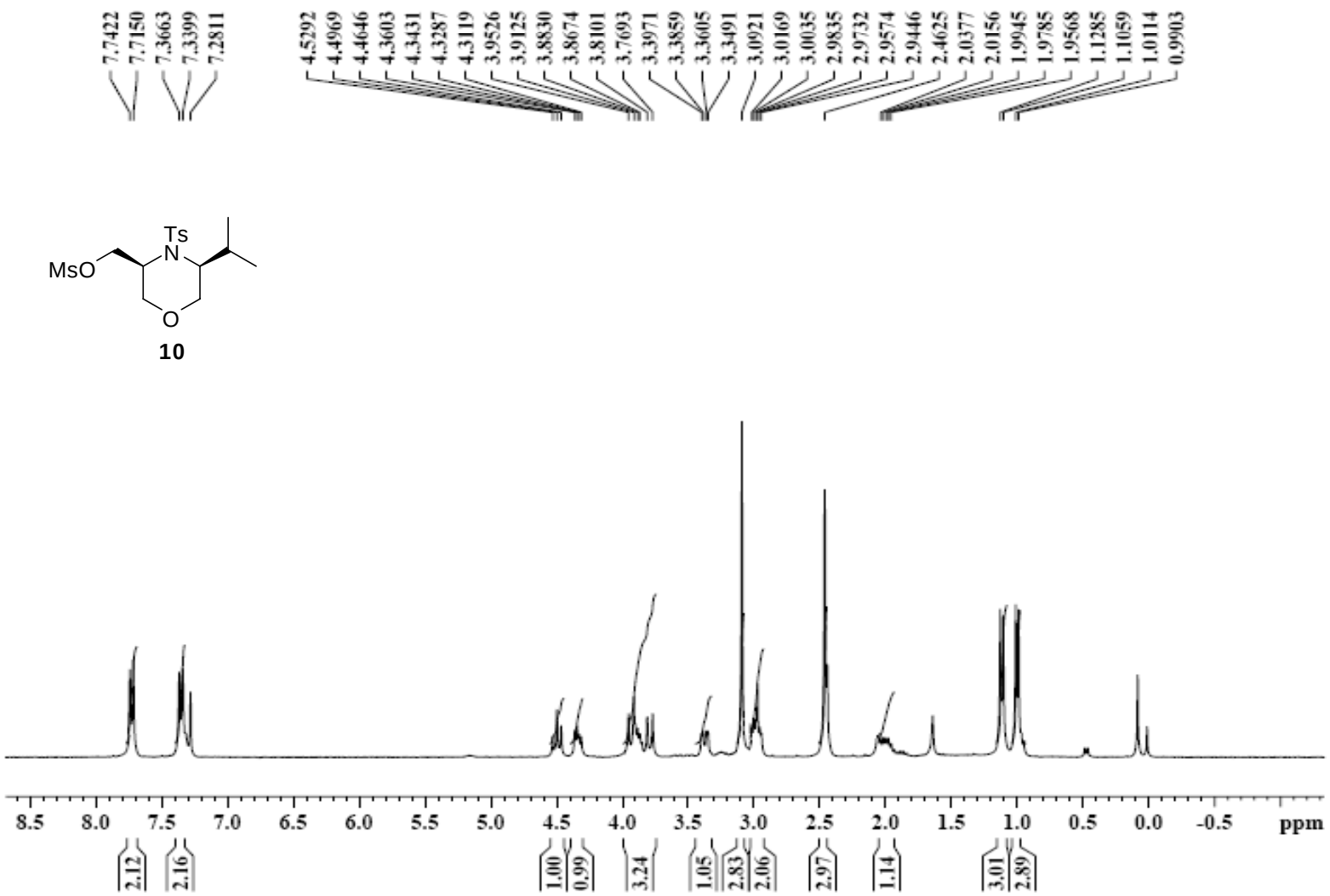


Figure S-19: ^{1}H spectrum (300 MHz, $CDCl_3$) of **10.**

This journal is © The Royal Society of Chemistry 2011

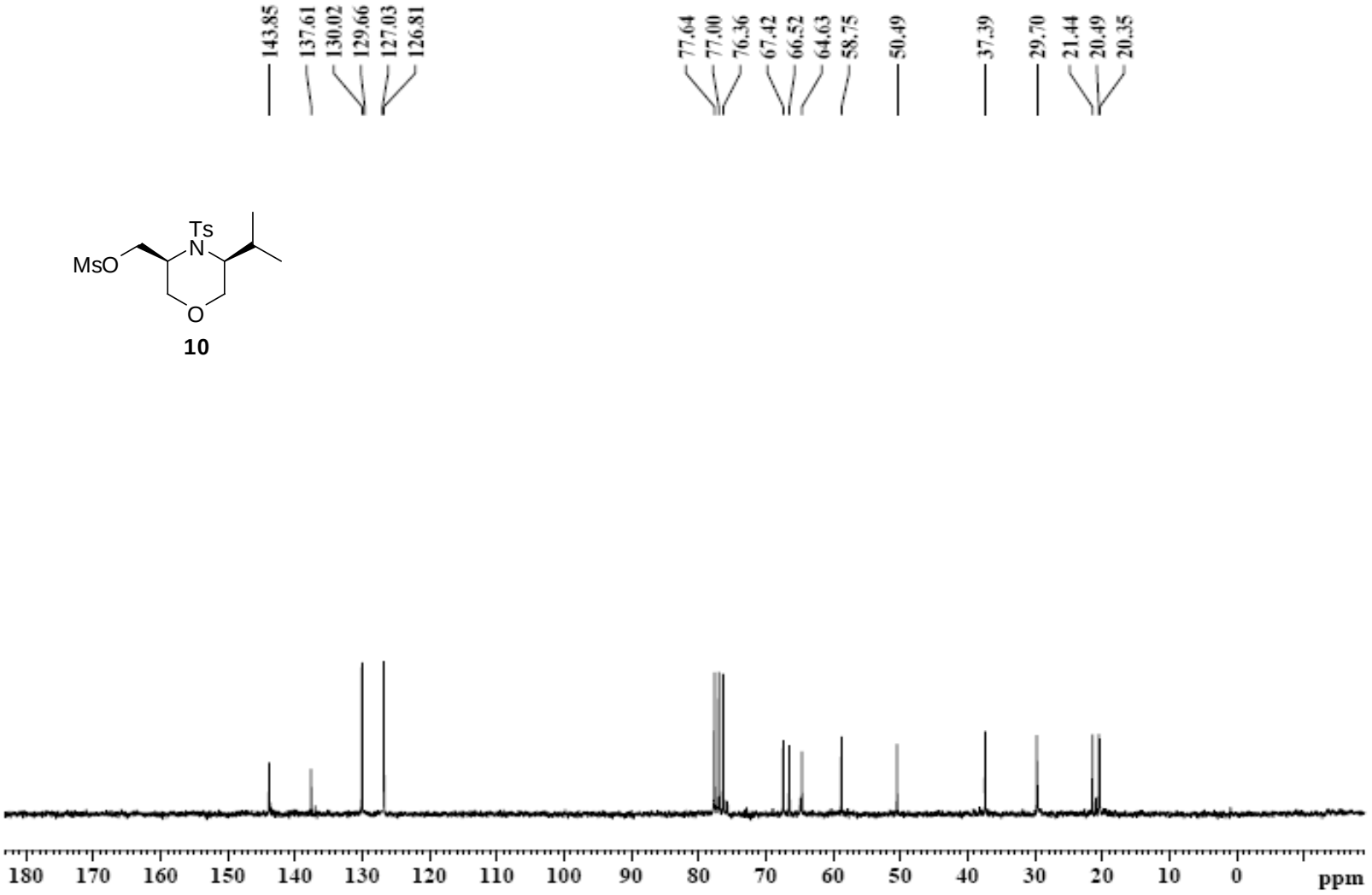
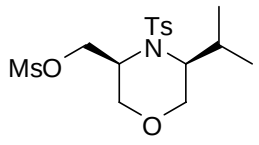


Figure S-20: ^{1}H spectrum (50 MHz, $CDCl_3$) of **10.**

This journal is © The Royal Society of Chemistry 2011



10

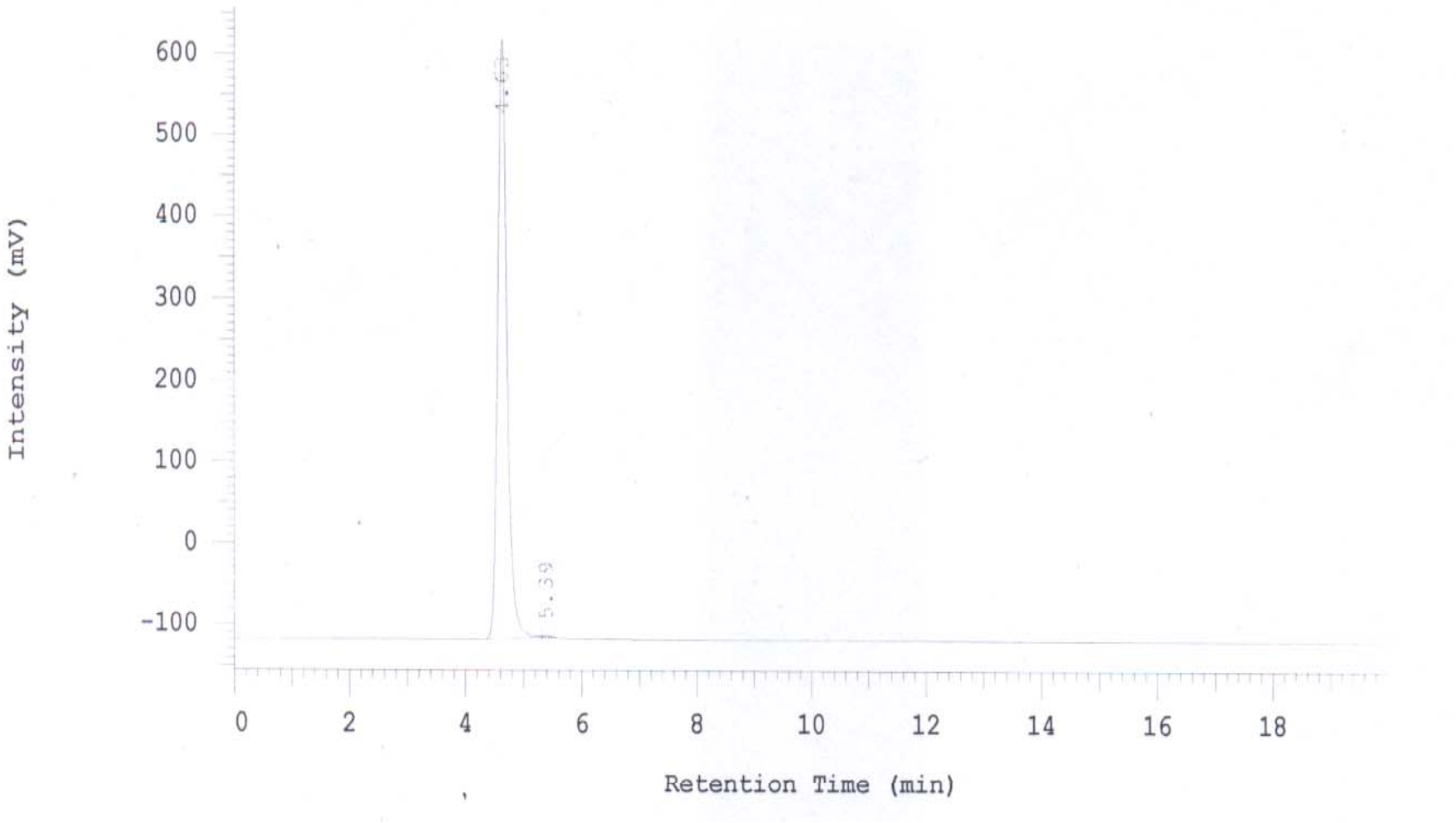
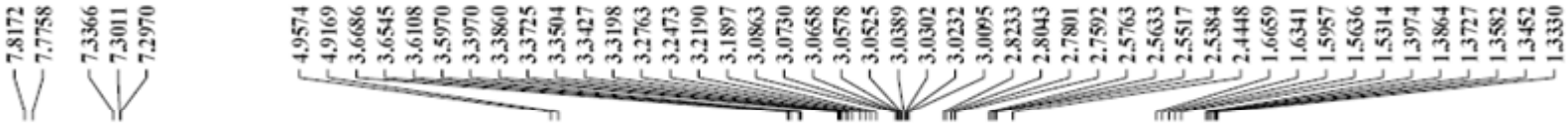
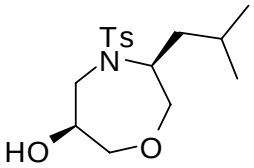


Figure S-21: HPLC spectrum of **10**

This journal is © The Royal Society of Chemistry 2011





14a

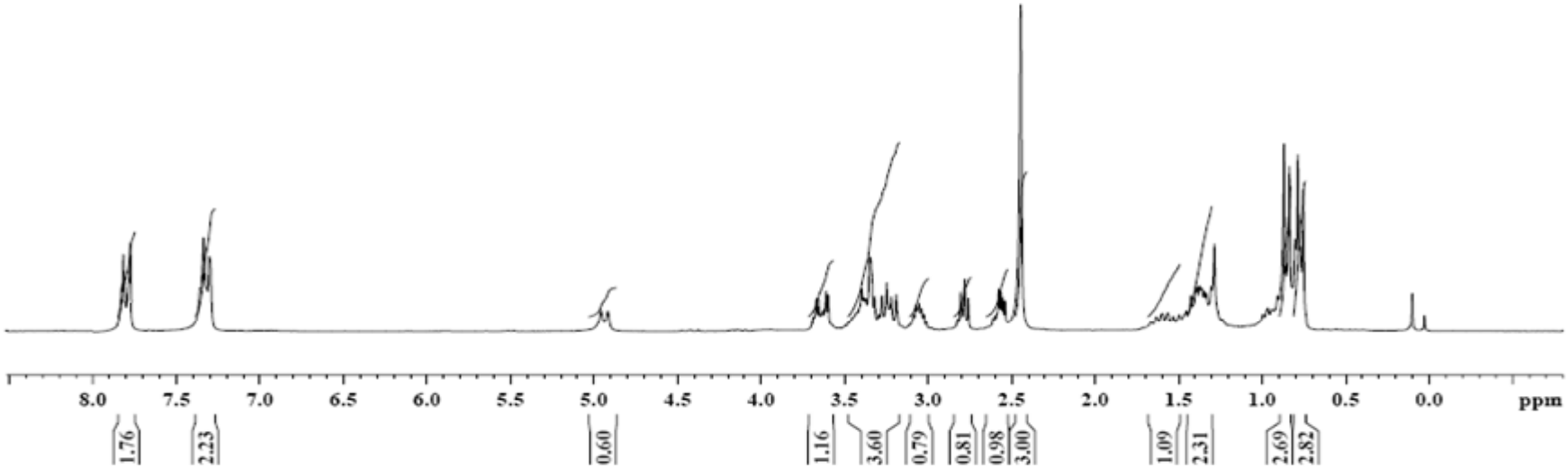
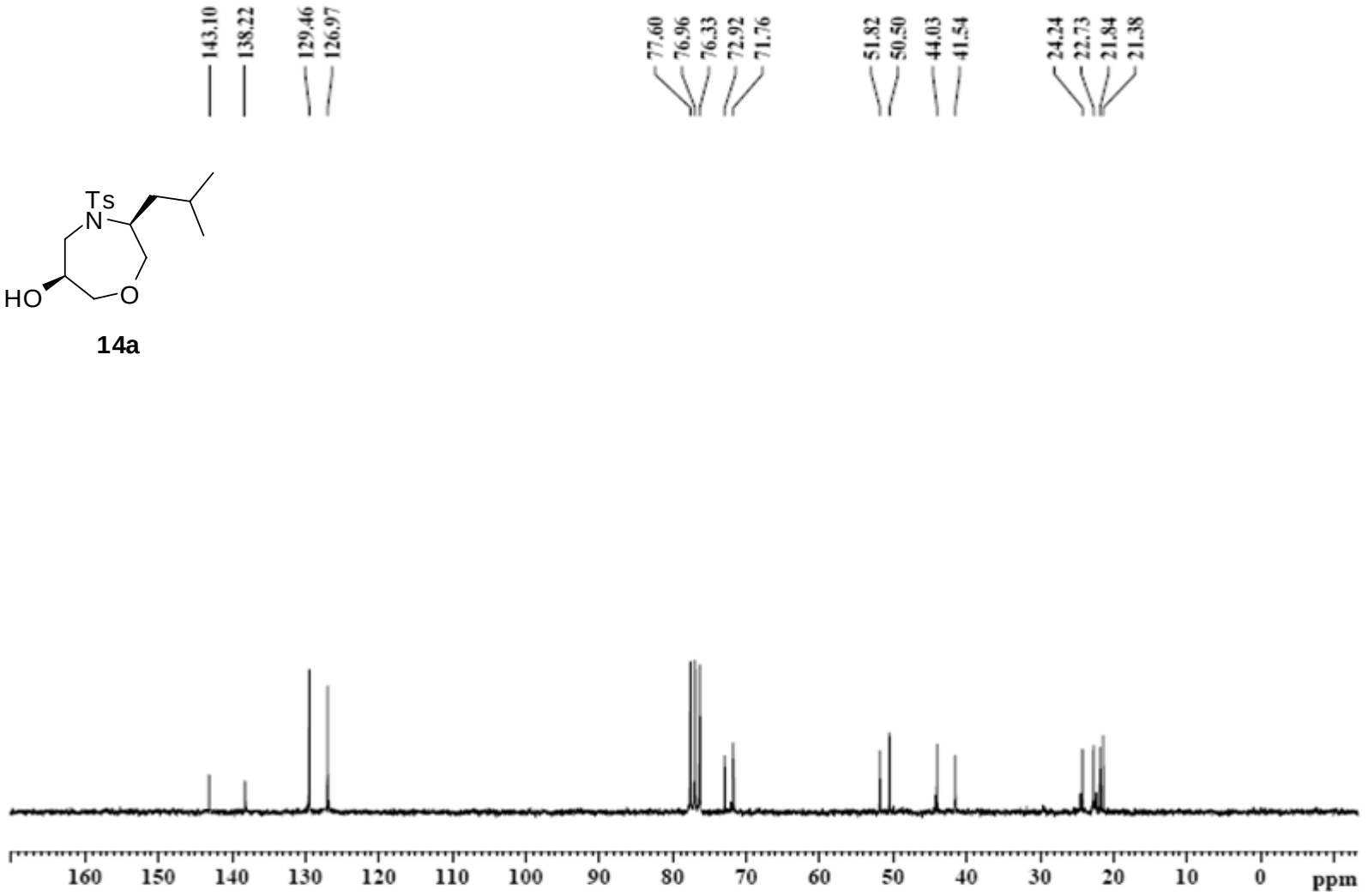


Figure S-22: ^{1}H spectrum (200 MHz, $CDCl_3$) **14a.**

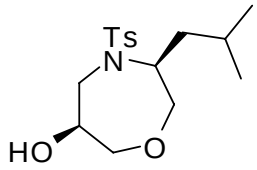
This journal is © The Royal Society of Chemistry 2011



14a

Figure S-23: ^{13}C spectrum (50 MHz, $CDCl_3$) **14a.**

This journal is © The Royal Society of Chemistry 2011



14a

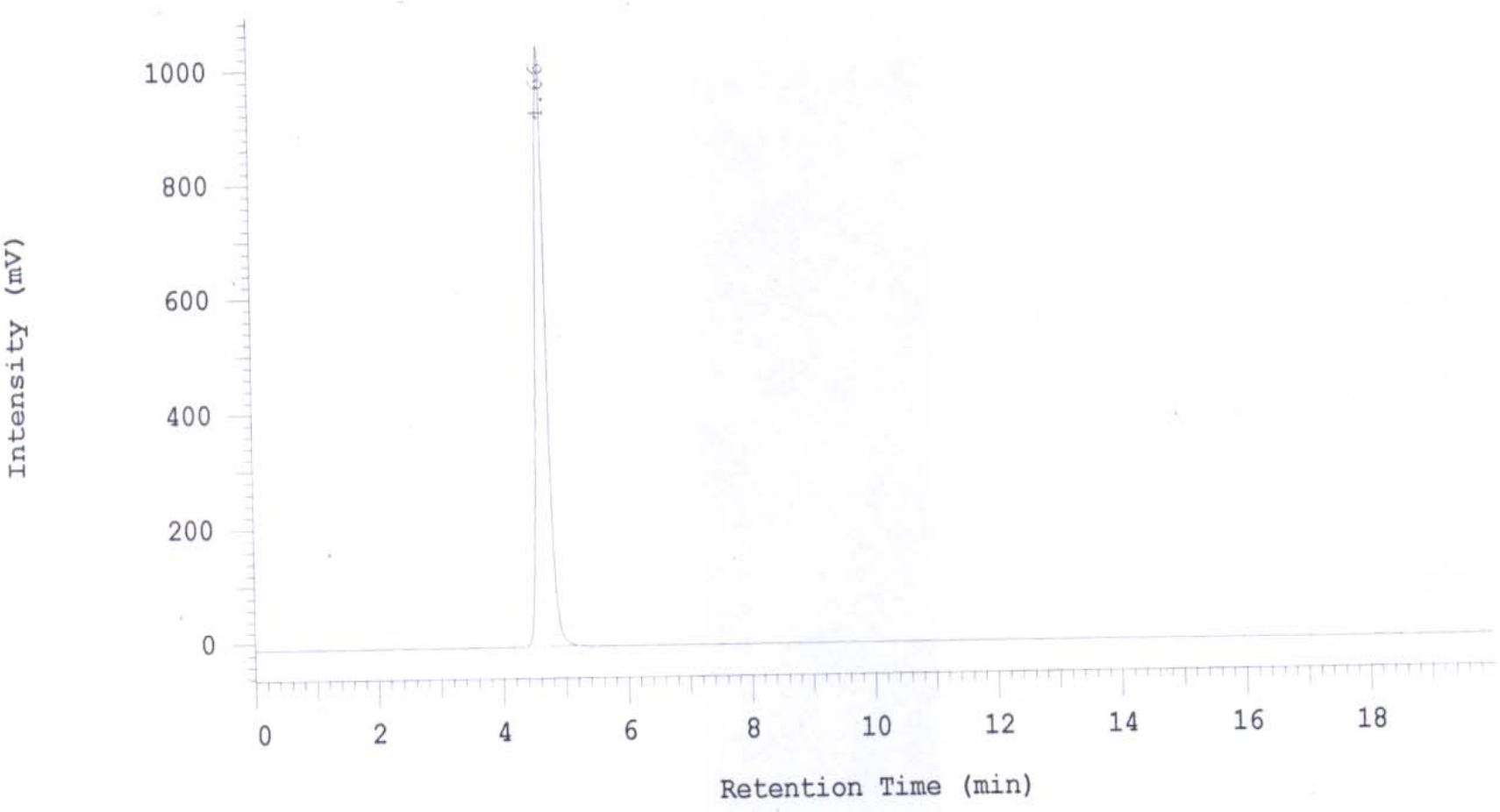


Figure S-24: HPLC spectrum of **14a.**

This journal is © The Royal Society of Chemistry 2011

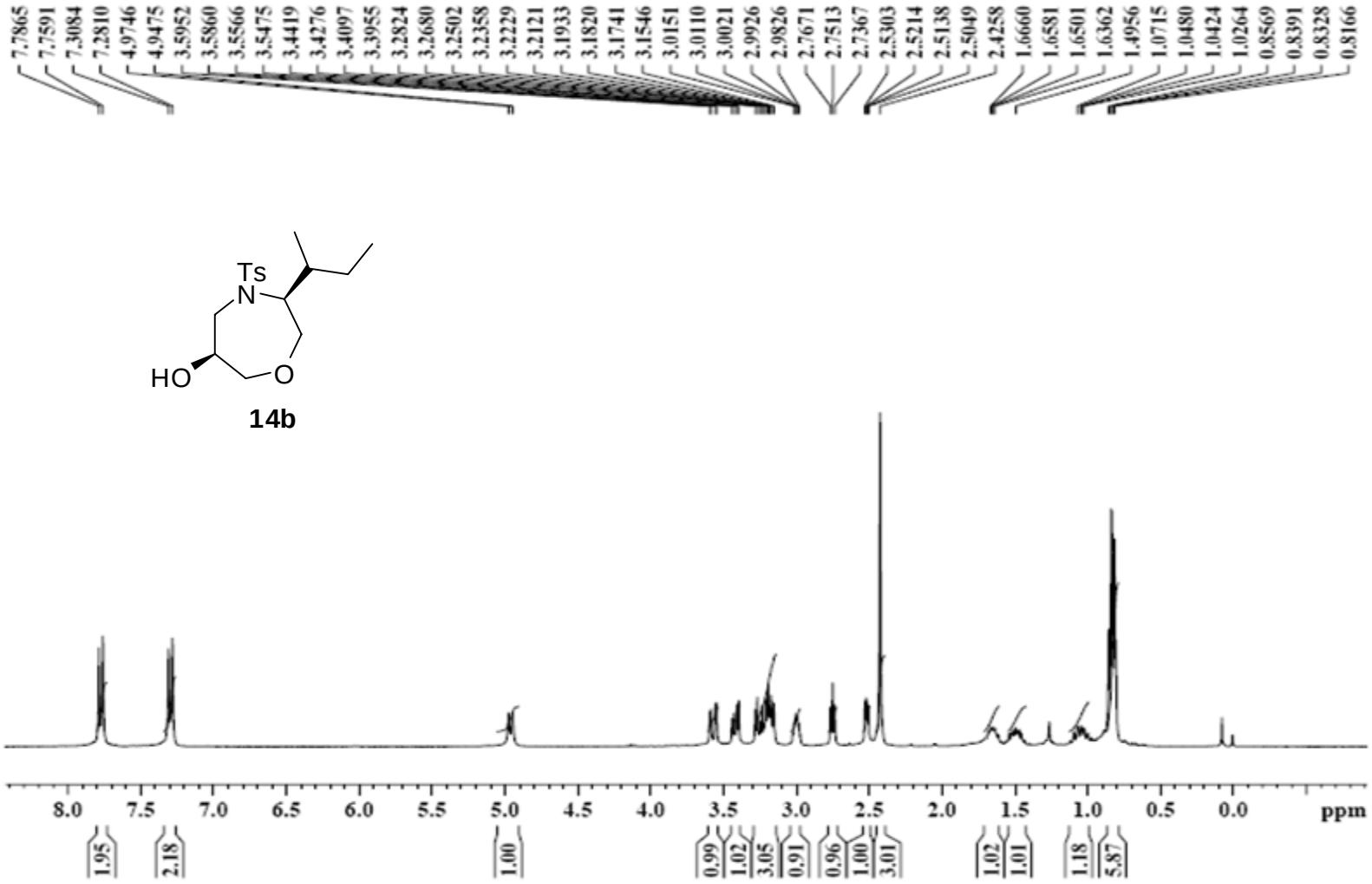


Figure S-25: ^{1}H spectrum (300 MHz, $CDCl_3$) **14b.**

This journal is © The Royal Society of Chemistry 2011

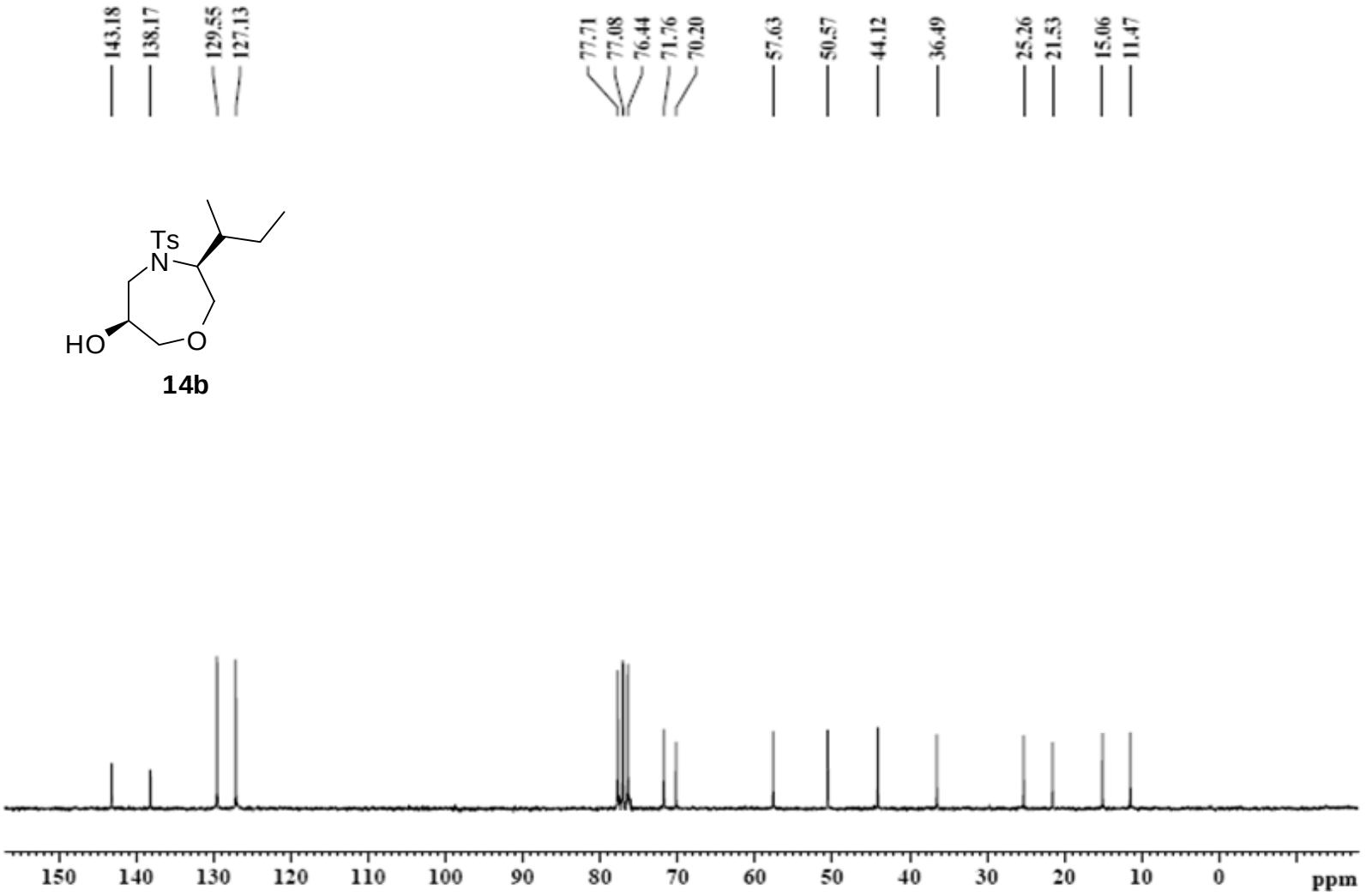
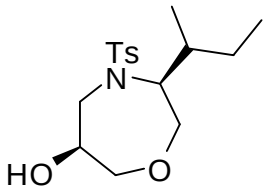


Figure S-26: ^{13}C spectrum (75 MHz, $CDCl_3$) **14b.**

This journal is © The Royal Society of Chemistry 2011



14b

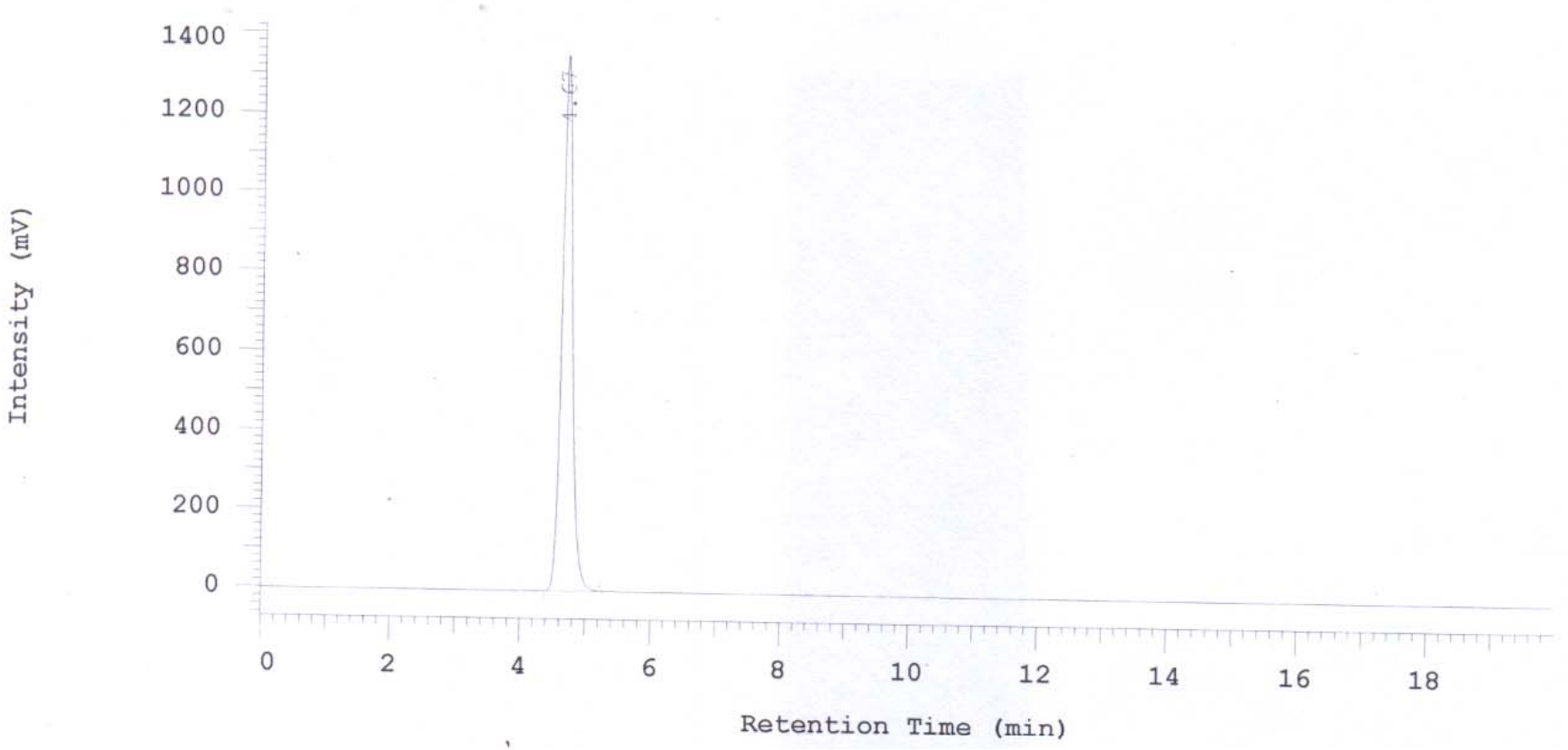


Figure S-27: HPLC spectrum of **14b.**

This journal is © The Royal Society of Chemistry 2011

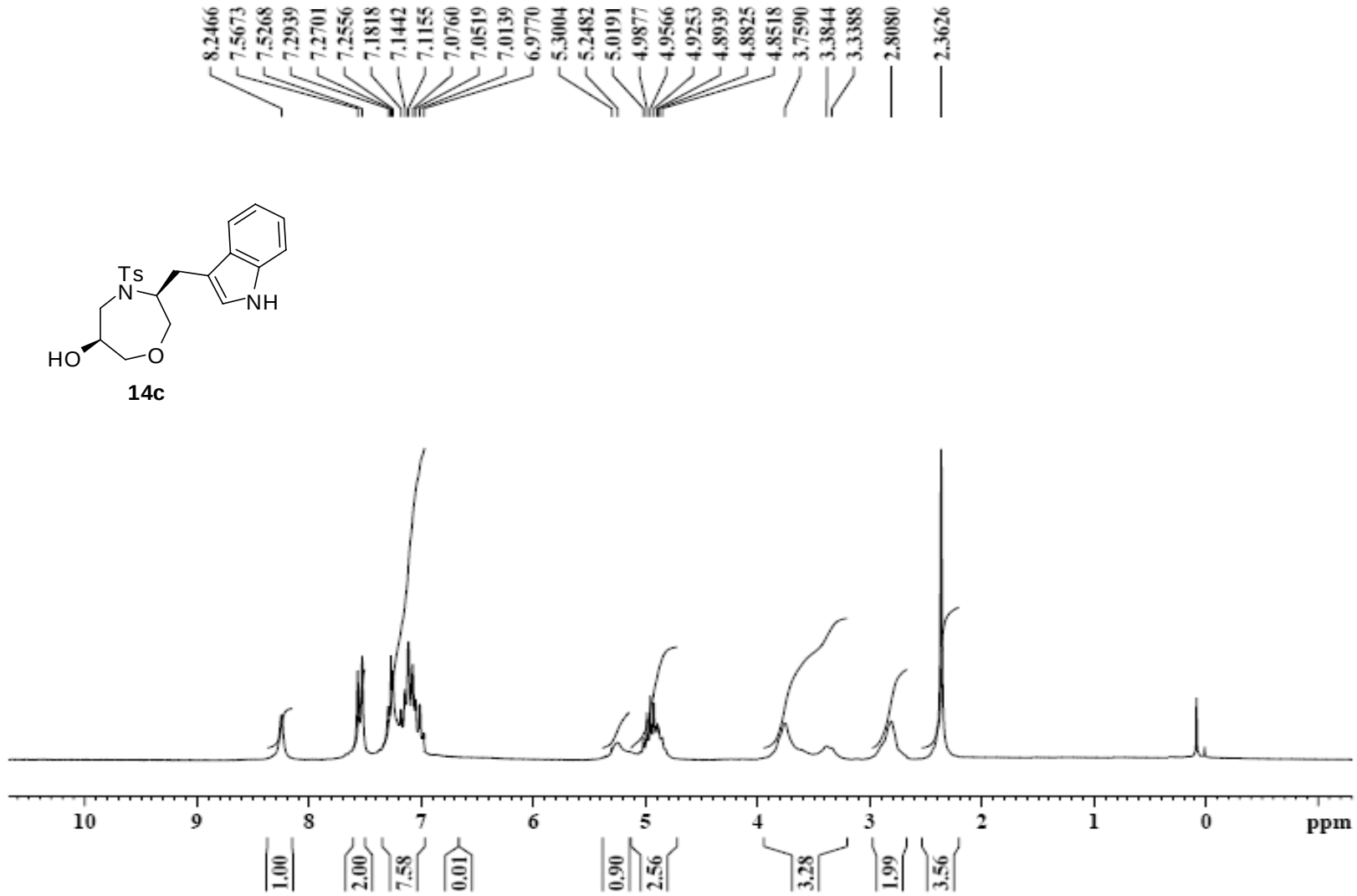
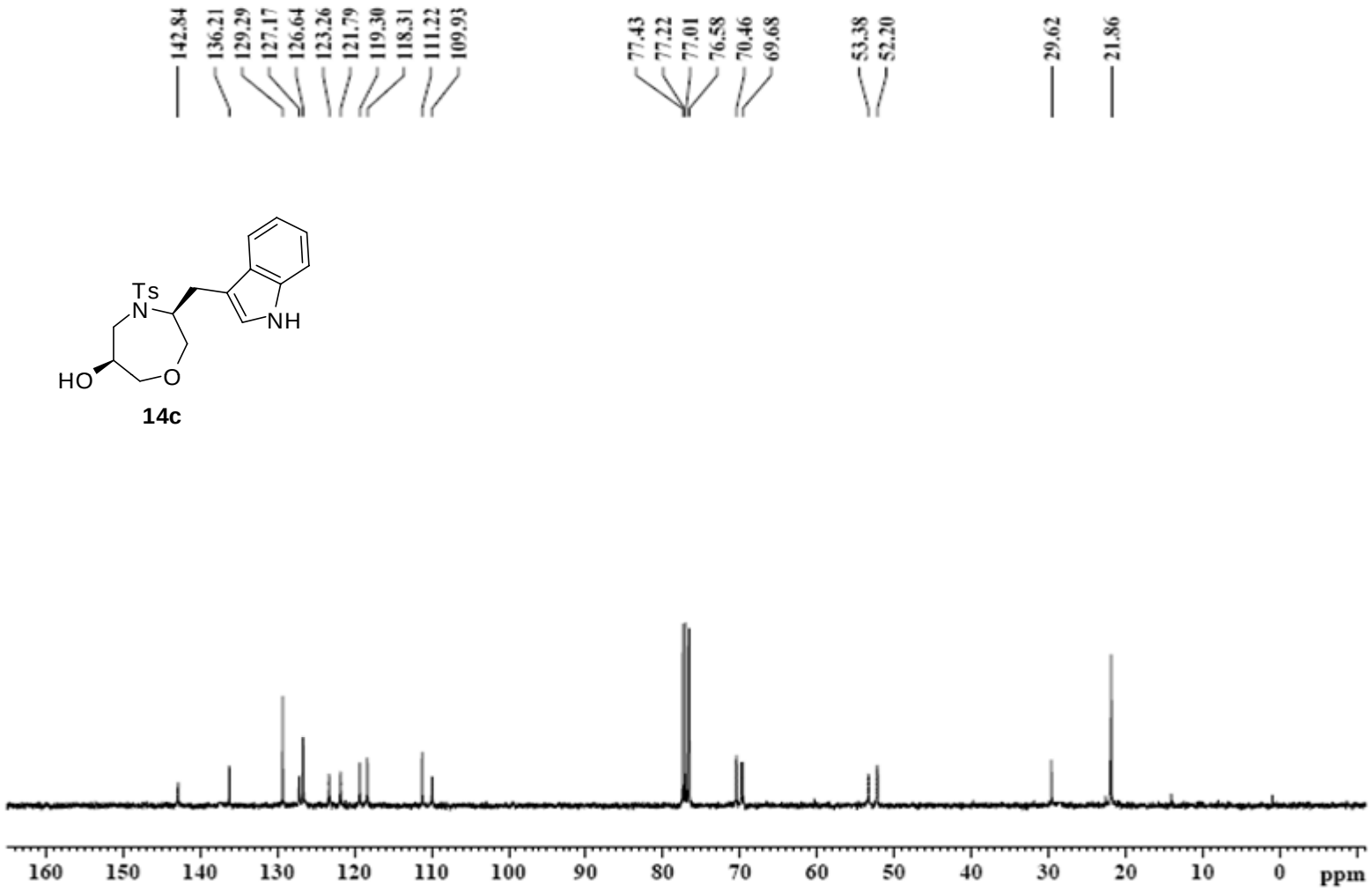


Figure S-28: ^{1}H spectrum (200 MHz, $CDCl_3$) **14c.**

This journal is © The Royal Society of Chemistry 2011



14c

Figure S-29: ^{13}C spectrum (75 MHz, $CDCl_3$) **14c.**

This journal is © The Royal Society of Chemistry 2011

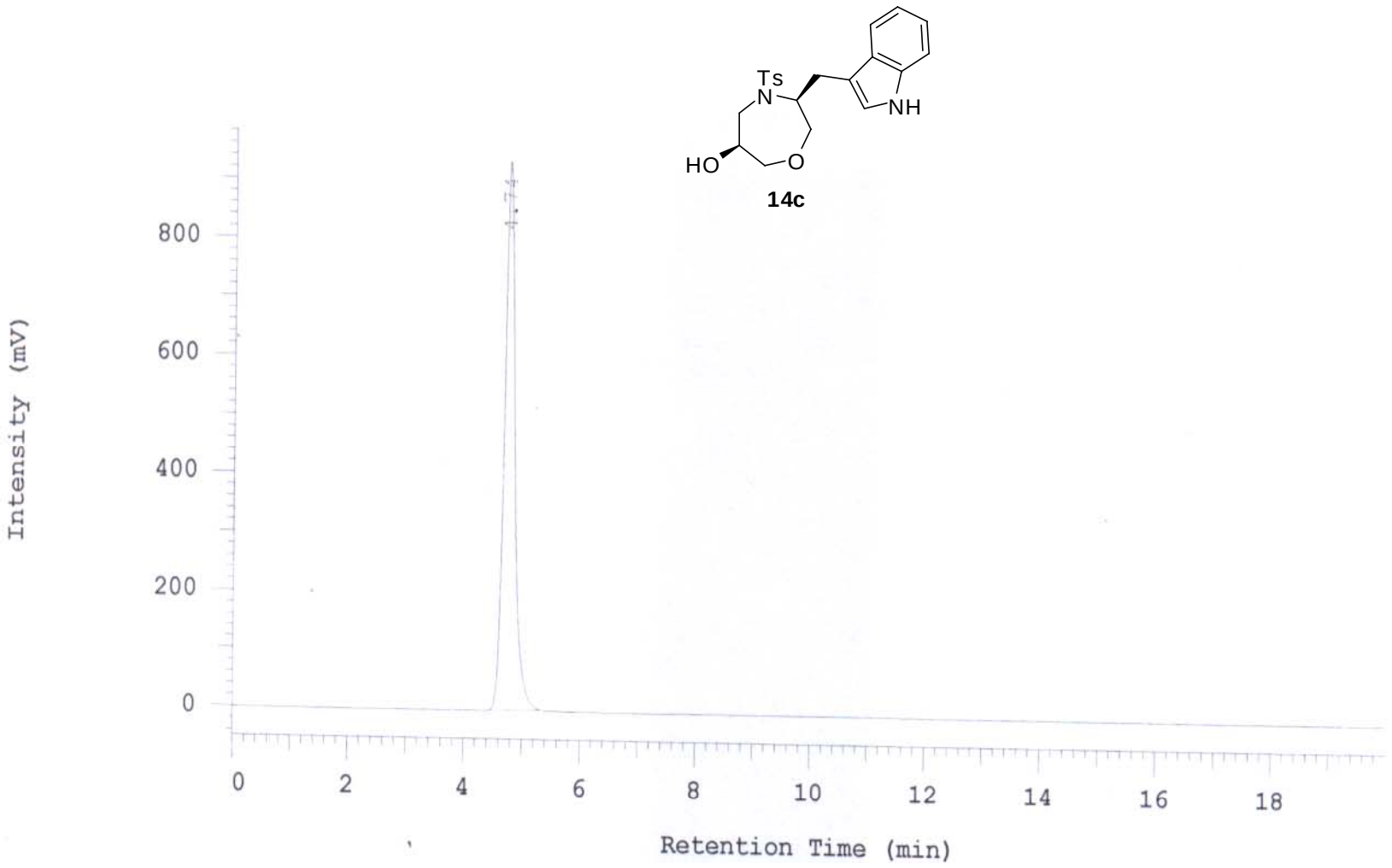


Figure S-30: HPLC spectrum of **14c.**

This journal is © The Royal Society of Chemistry 2011

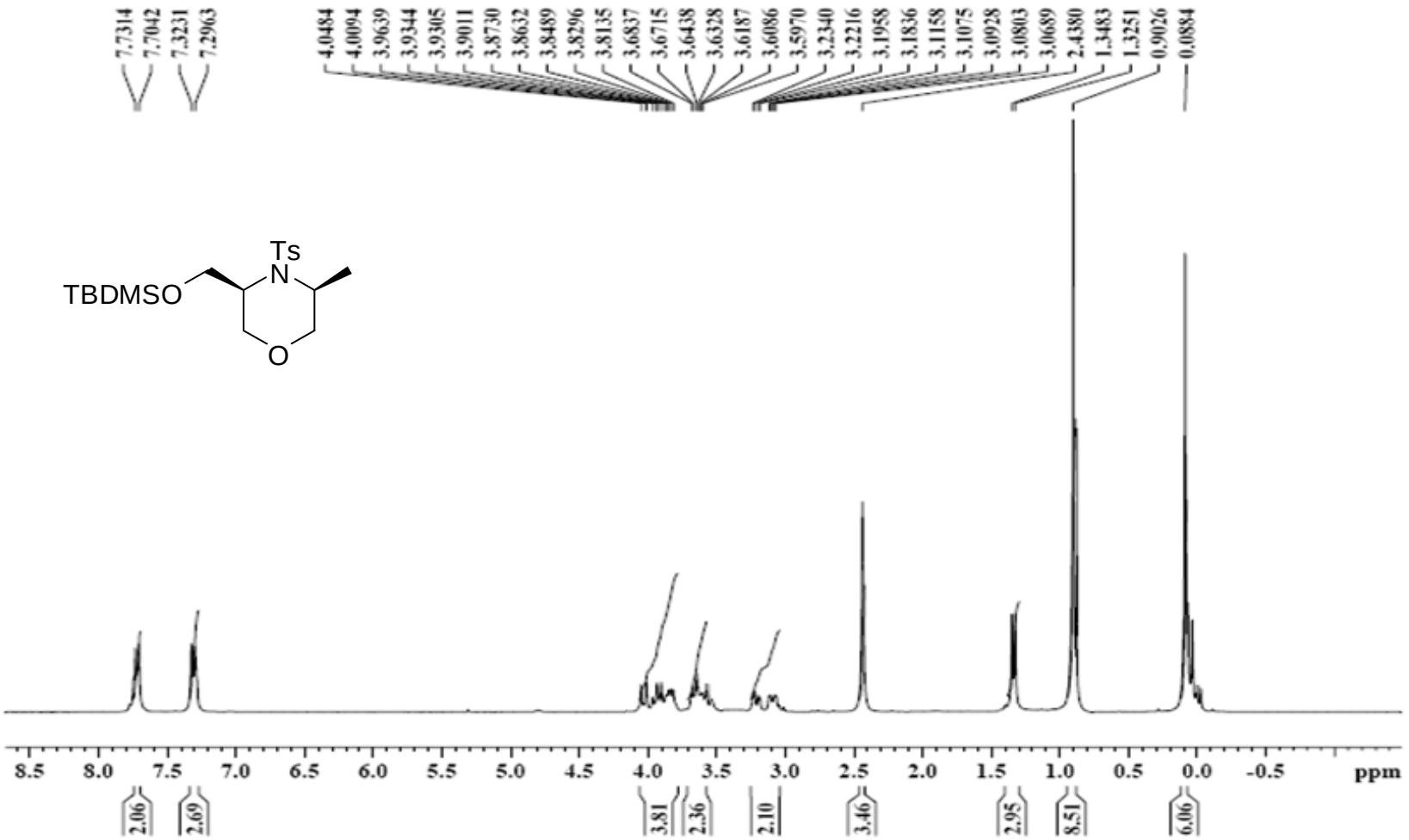


Figure S-31: ^{1}H spectrum (300 MHz, $CDCl_3$) of (3*S*,5*S*)-3-((tert-butyldimethyl silyloxy) methyl)-5-methyl-4-tosylmorpholine .

This journal is © The Royal Society of Chemistry 2011

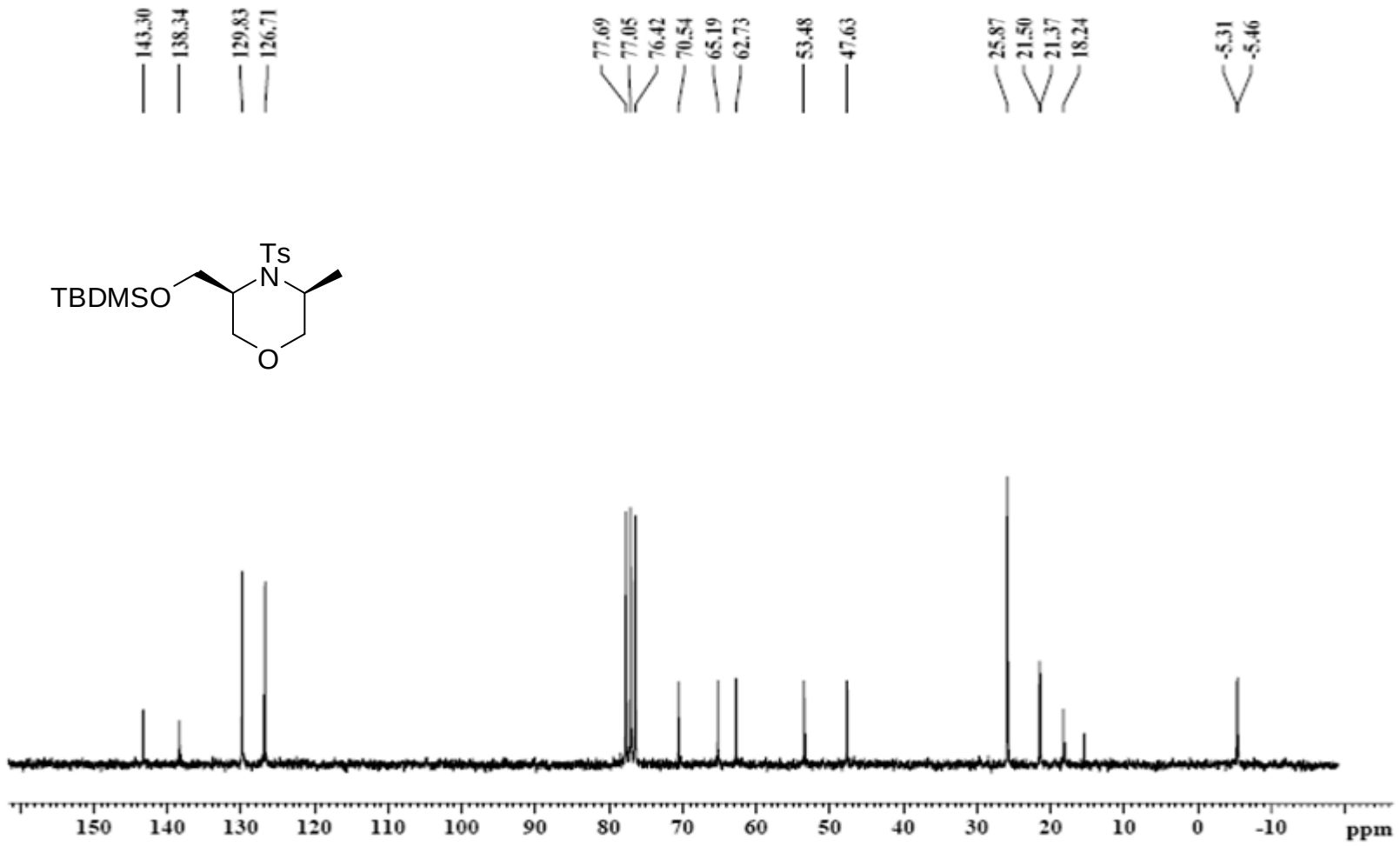


Figure S-32: ^{13}C spectrum (50 MHz, $CDCl_3$) of (3*S*,5*S*)-3-((tert-butyldimethyl silyloxy) methyl)-5-methyl-4-tosylmorpholine.

This journal is © The Royal Society of Chemistry 2011

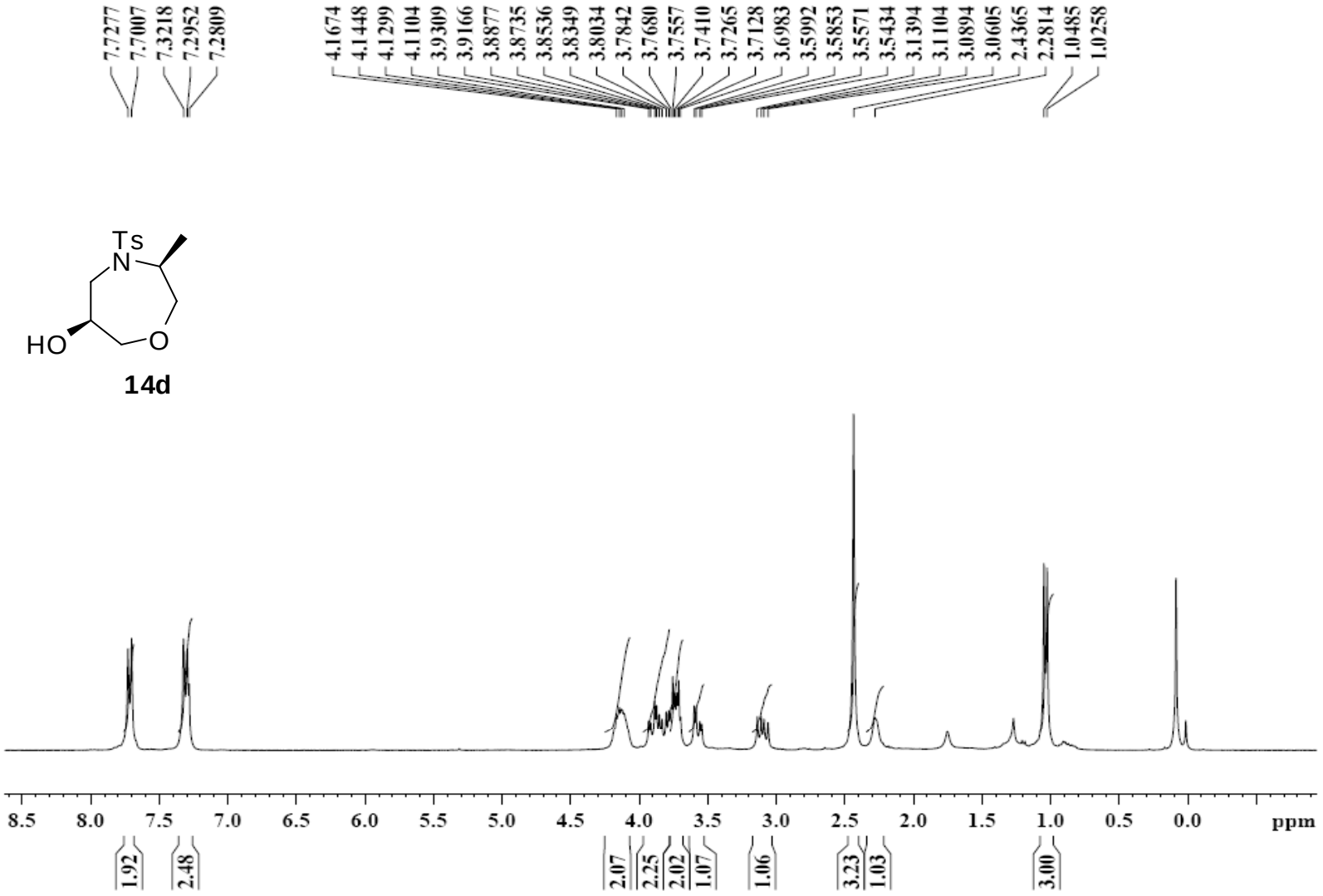
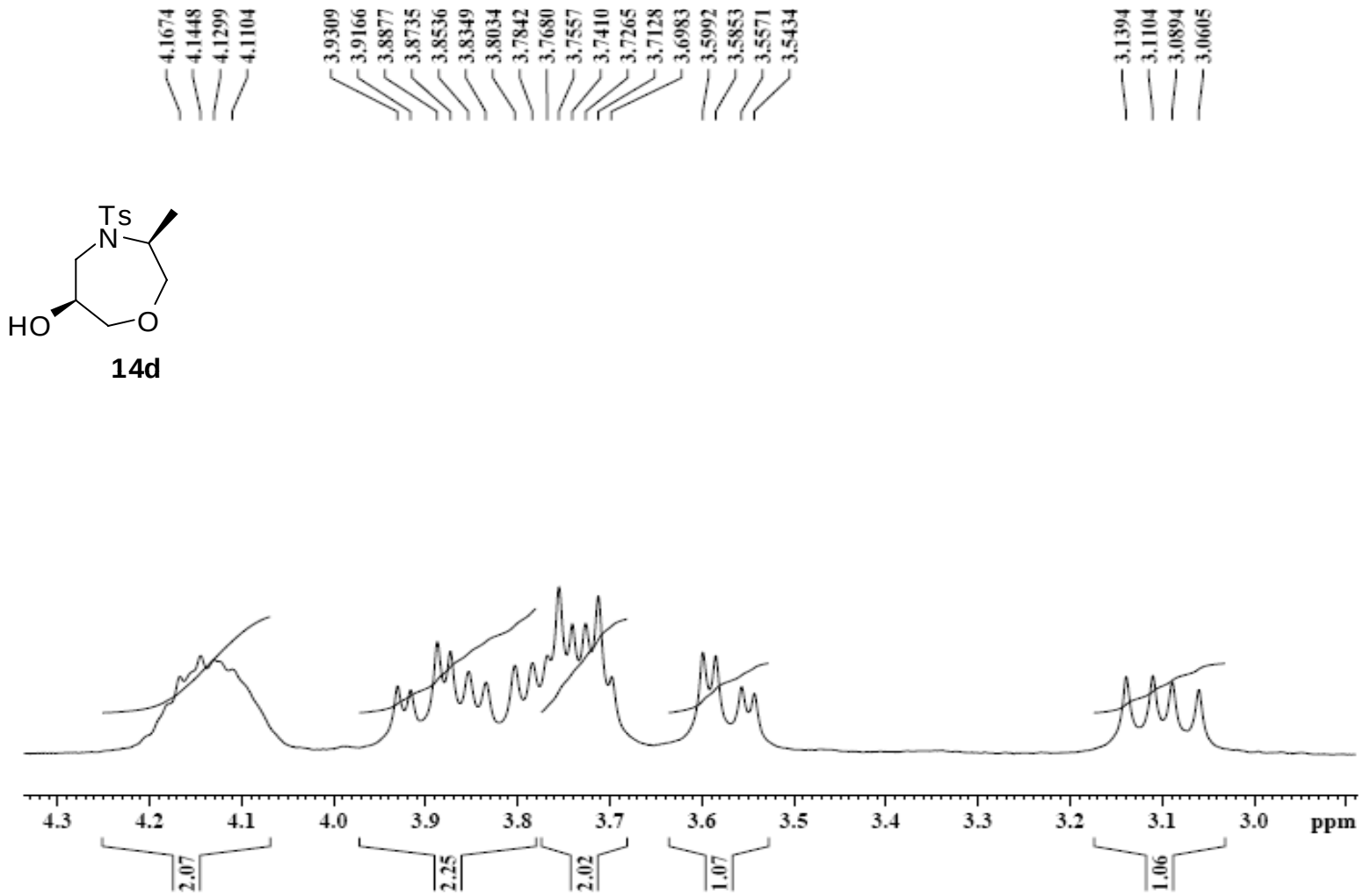


Figure S-33: ^{1}H spectrum (300 MHz, $CDCl_3$) **14d.**

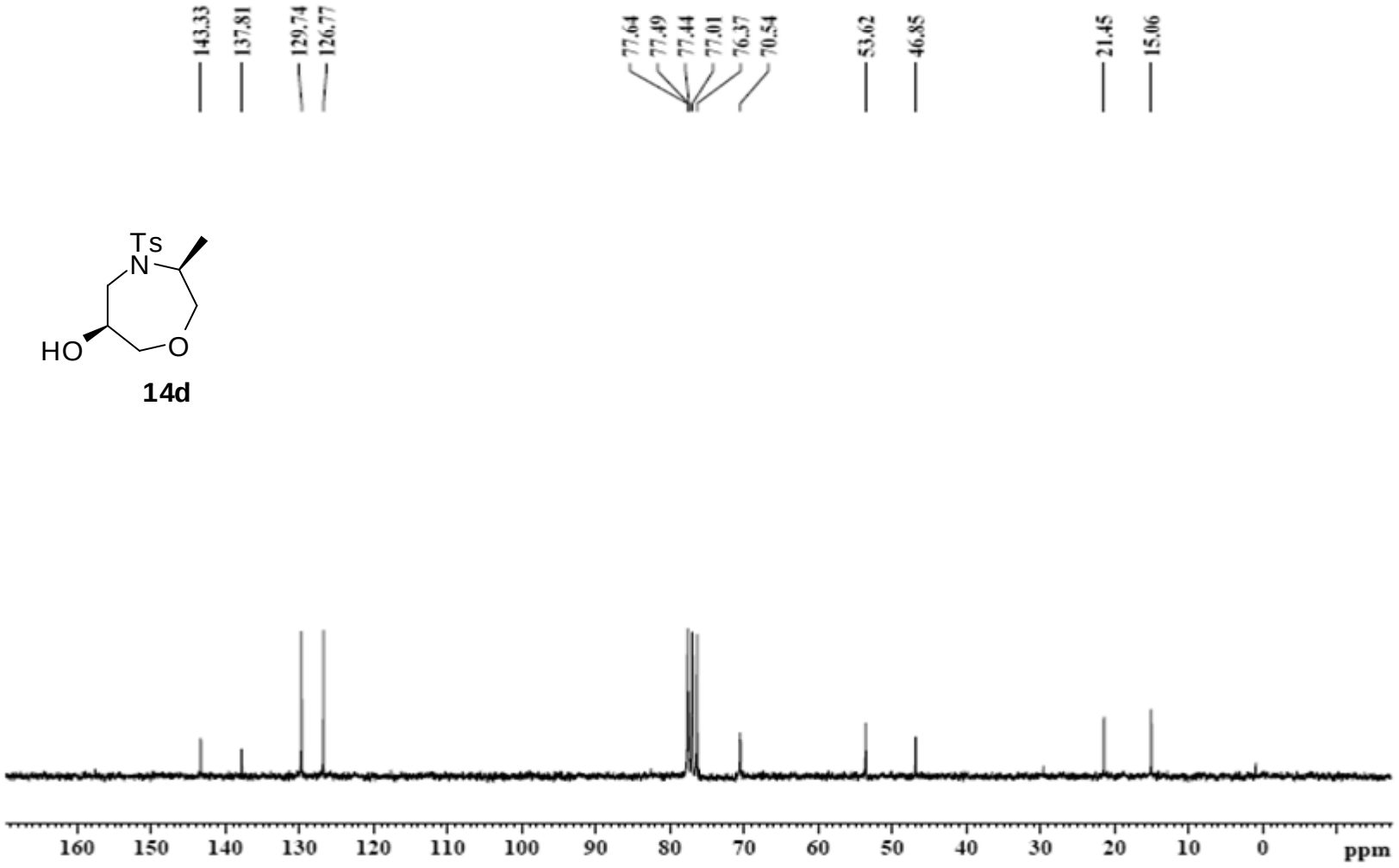
This journal is © The Royal Society of Chemistry 2011



14d

Figure S-34: Expanded aliphatic region of **14d.**

This journal is © The Royal Society of Chemistry 2011



14d

Figure S-35: ^{13}C spectrum (50 MHz, $CDCl_3$) **14d.**

This journal is © The Royal Society of Chemistry 2011

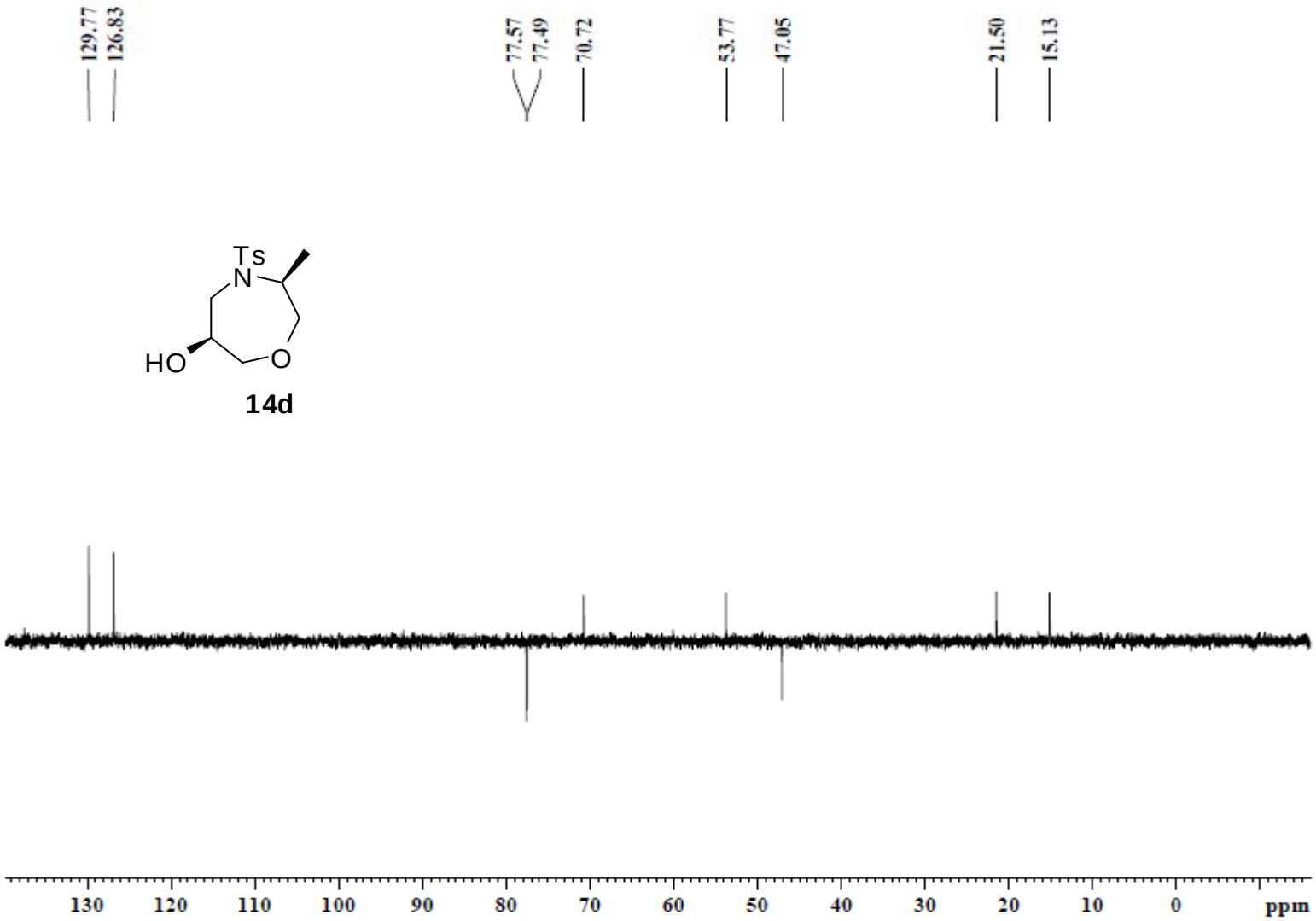


Figure S-36: DEPT spectrum (75 MHz, $CDCl_3$) of **14d.**

This journal is © The Royal Society of Chemistry 2011

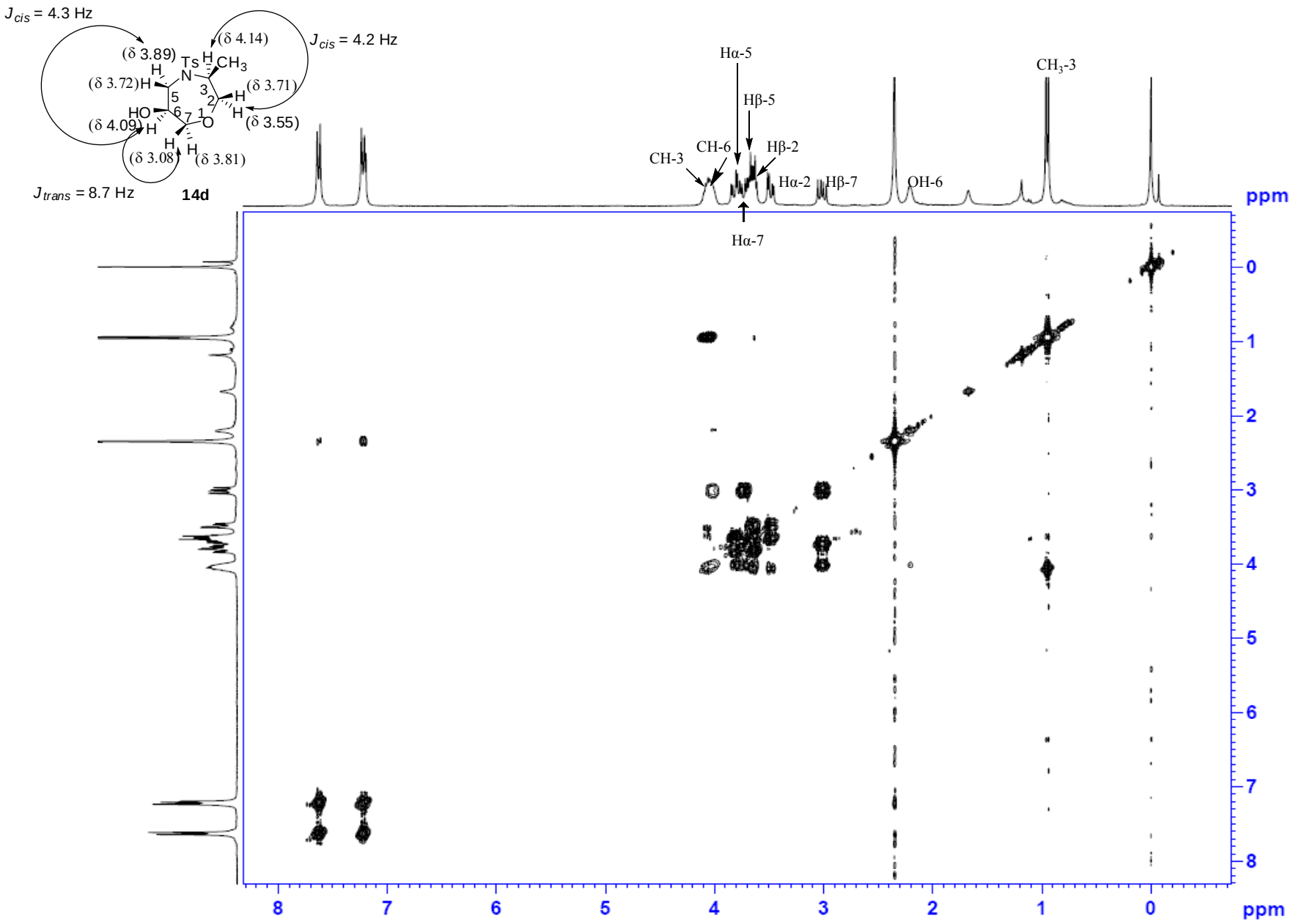


Figure S-37: COSY spectrum of **14d** (300 MHz, $CDCl_3$).

This journal is © The Royal Society of Chemistry 2011

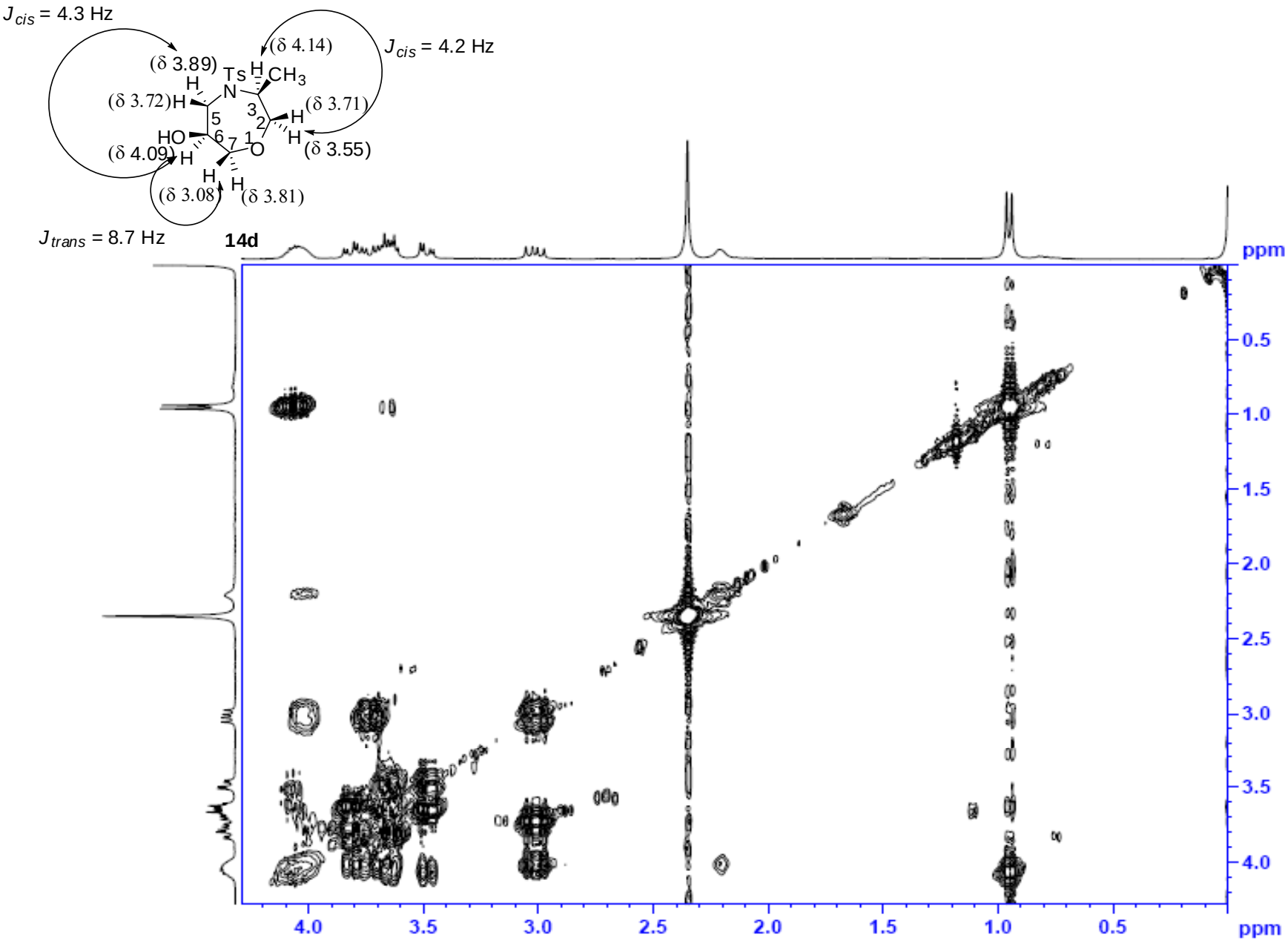


Figure S-38: Expanded COSY spectrum of **14d.**

This journal is © The Royal Society of Chemistry 2011

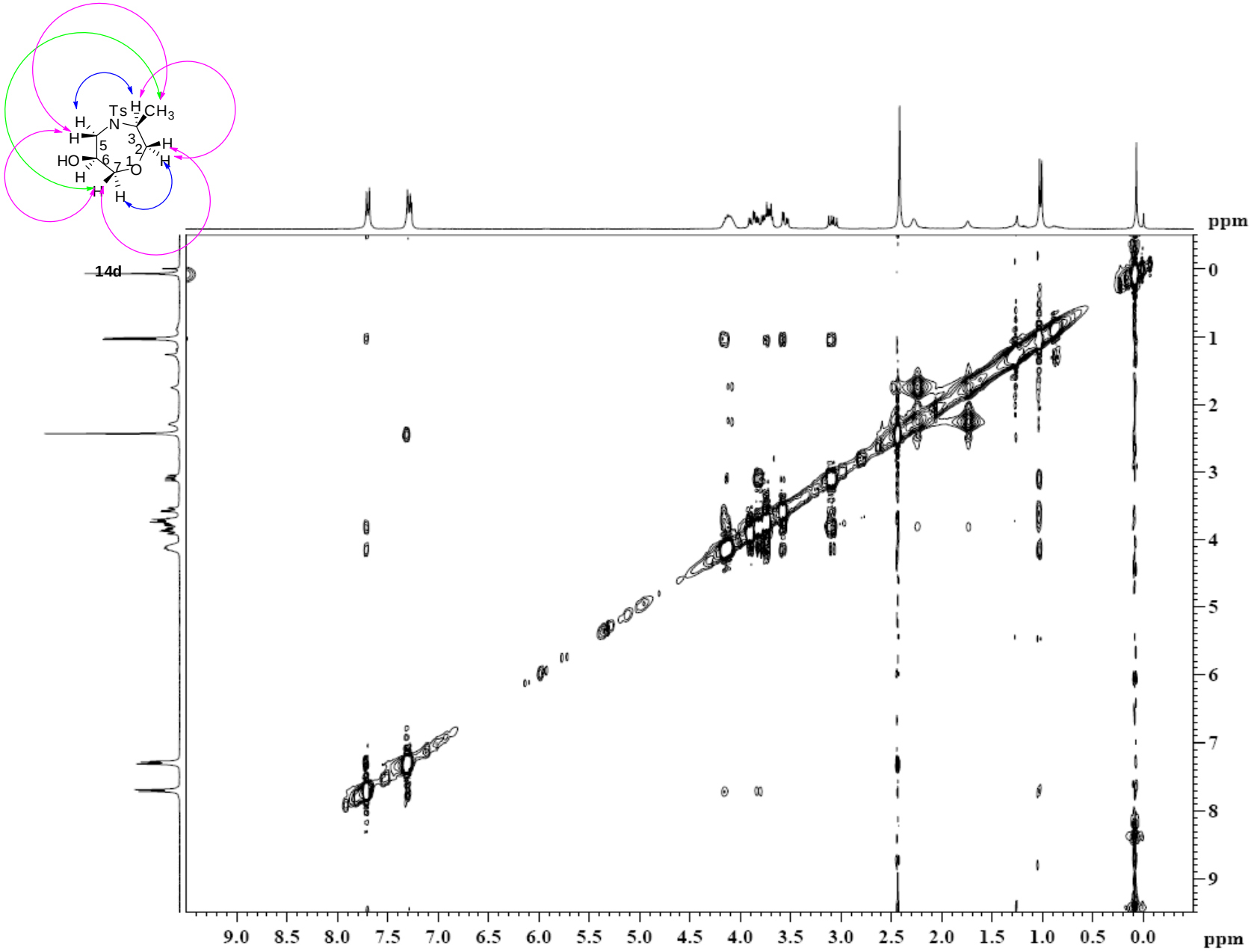


Figure S-39: NOESY spectrum (400 MHz, $CDCl_3$) of **14d.**

This journal is © The Royal Society of Chemistry 2011

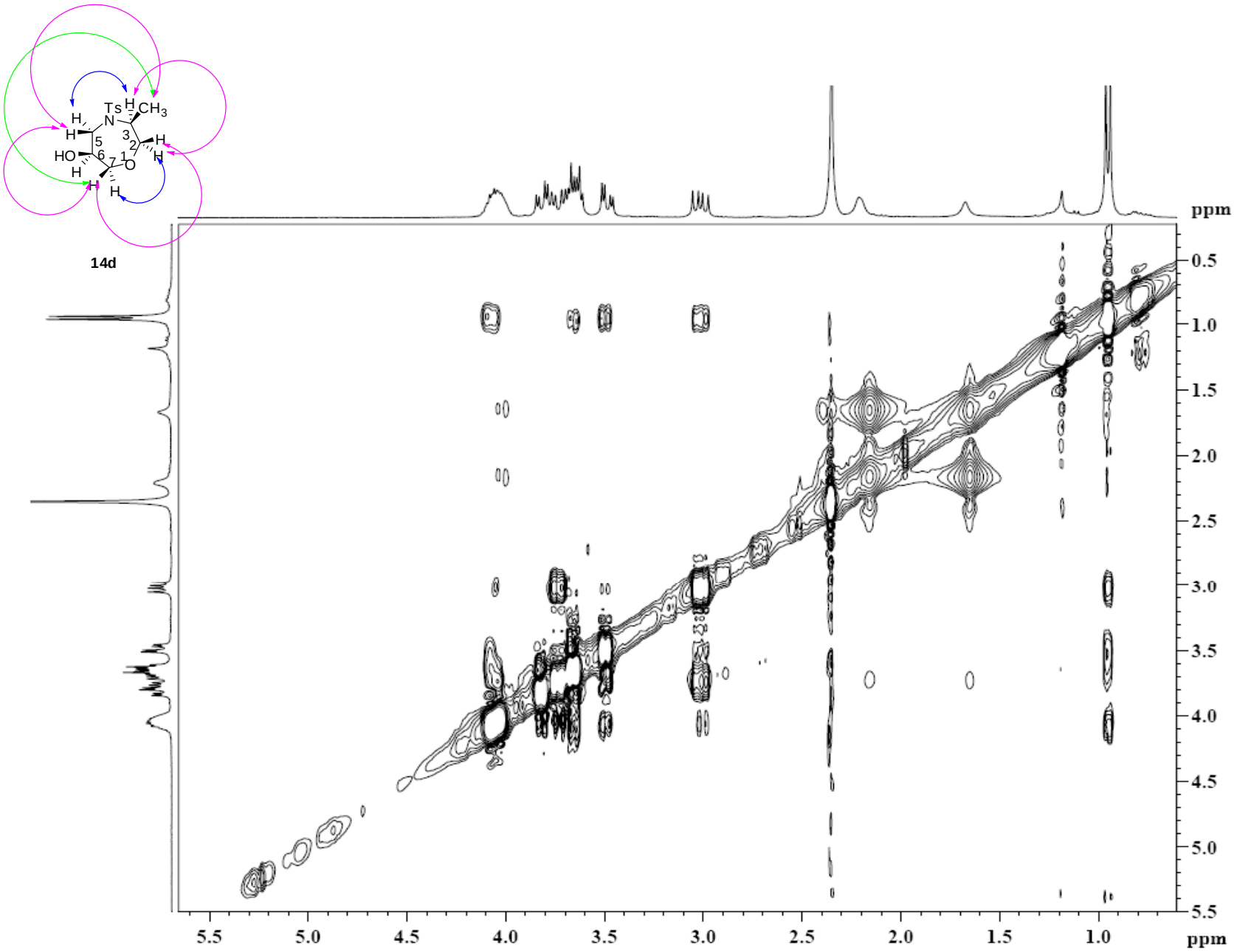
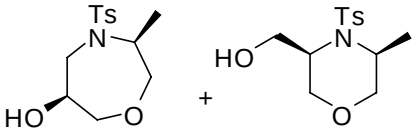


Figure S-40: Expanded NOESY spectrum of **14d.**

This journal is © The Royal Society of Chemistry 2011



14d **13a**

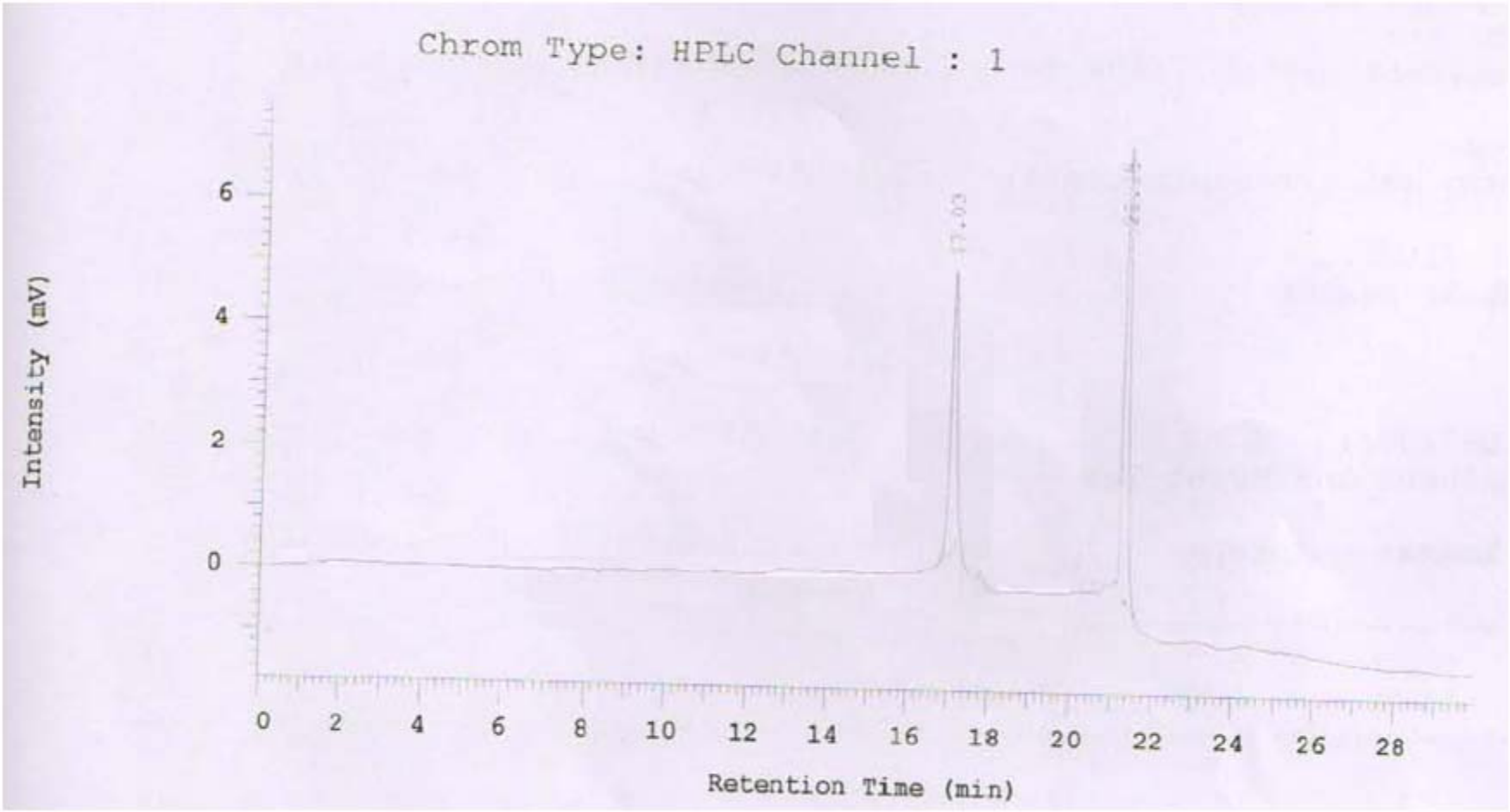
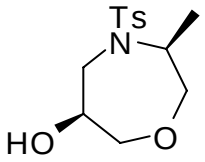


Figure S-41: HPLC spectrum for mixture of **14d + 13a.**

This journal is © The Royal Society of Chemistry 2011



14d

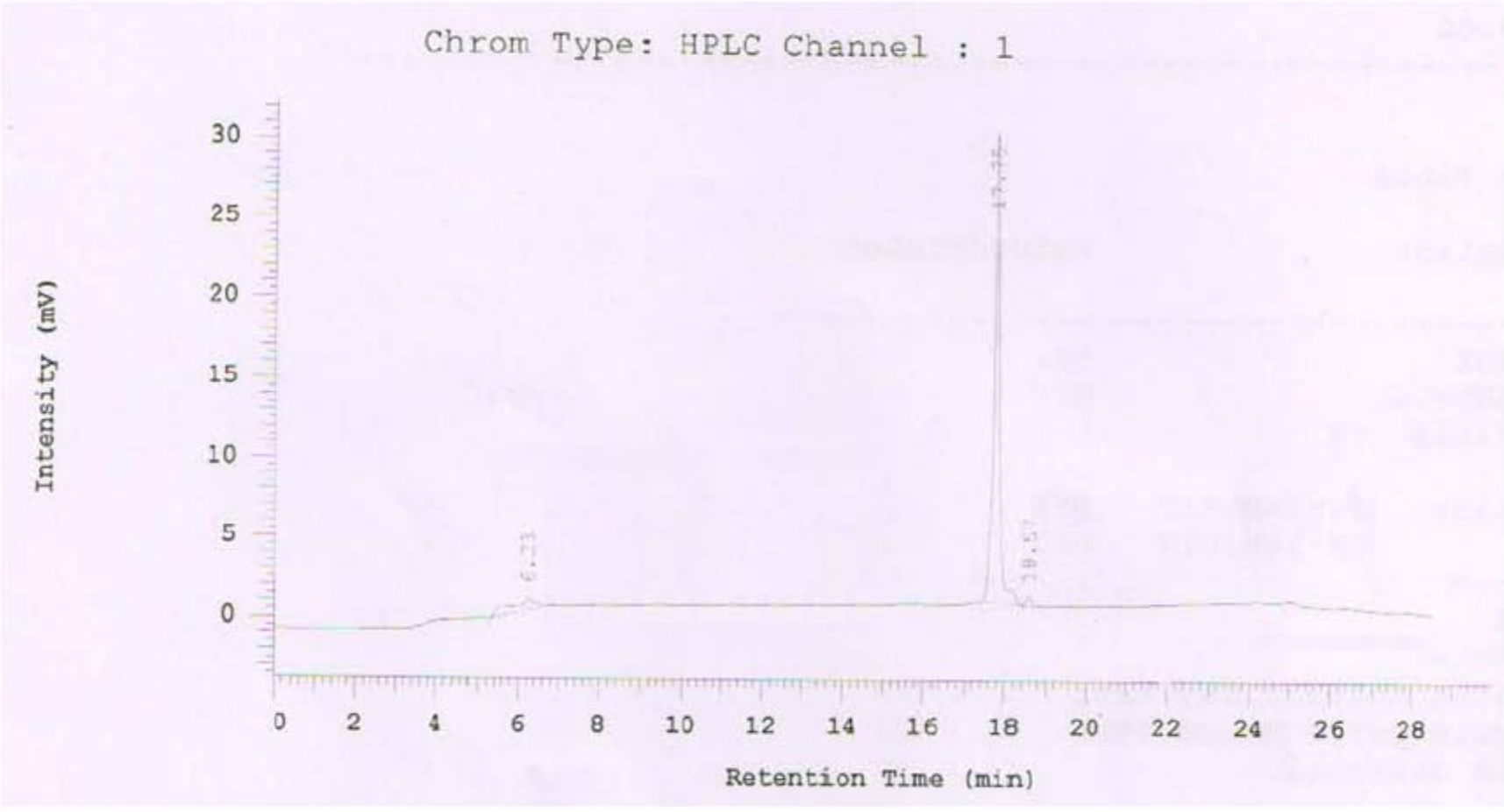


Figure S-42: HPLC spectrum of pure **14d.**

This journal is © The Royal Society of Chemistry 2011

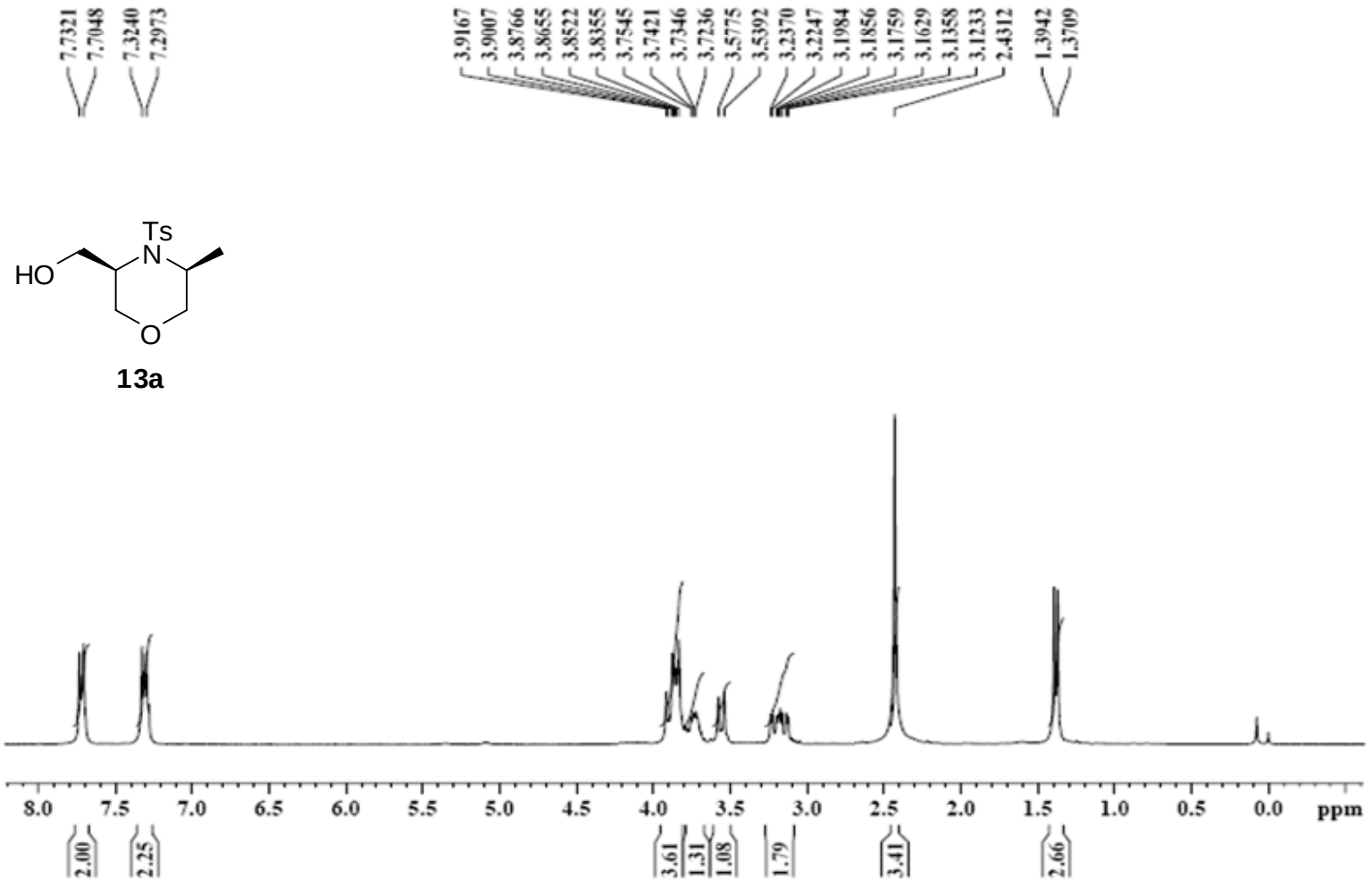
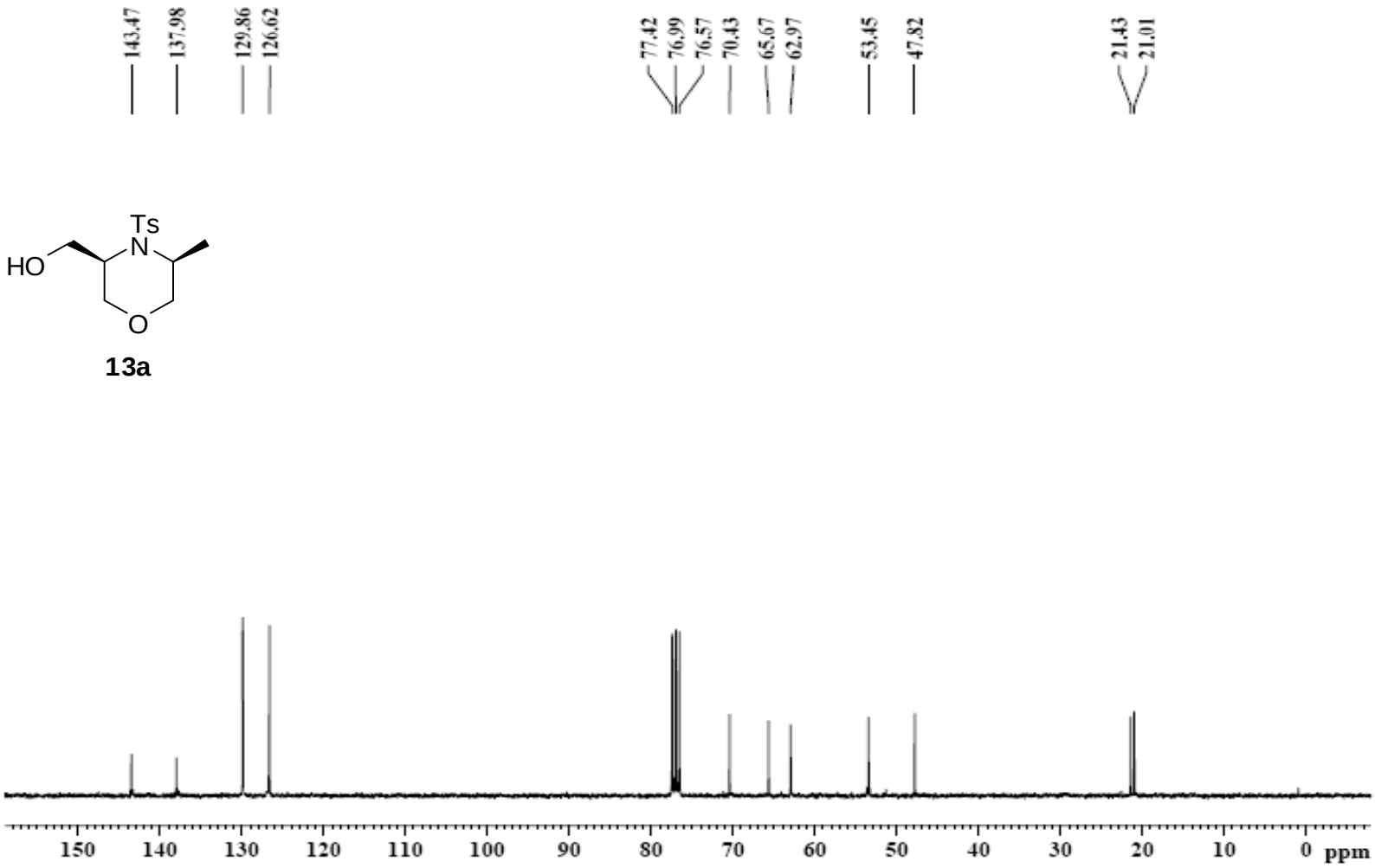


Figure S-43: ^{1}H spectrum (300 MHz, $CDCl_3$) **13a.**

This journal is © The Royal Society of Chemistry 2011



13a

Figure S-44: ^{13}C spectrum (50 MHz, $CDCl_3$) **13a.**

This journal is © The Royal Society of Chemistry 2011

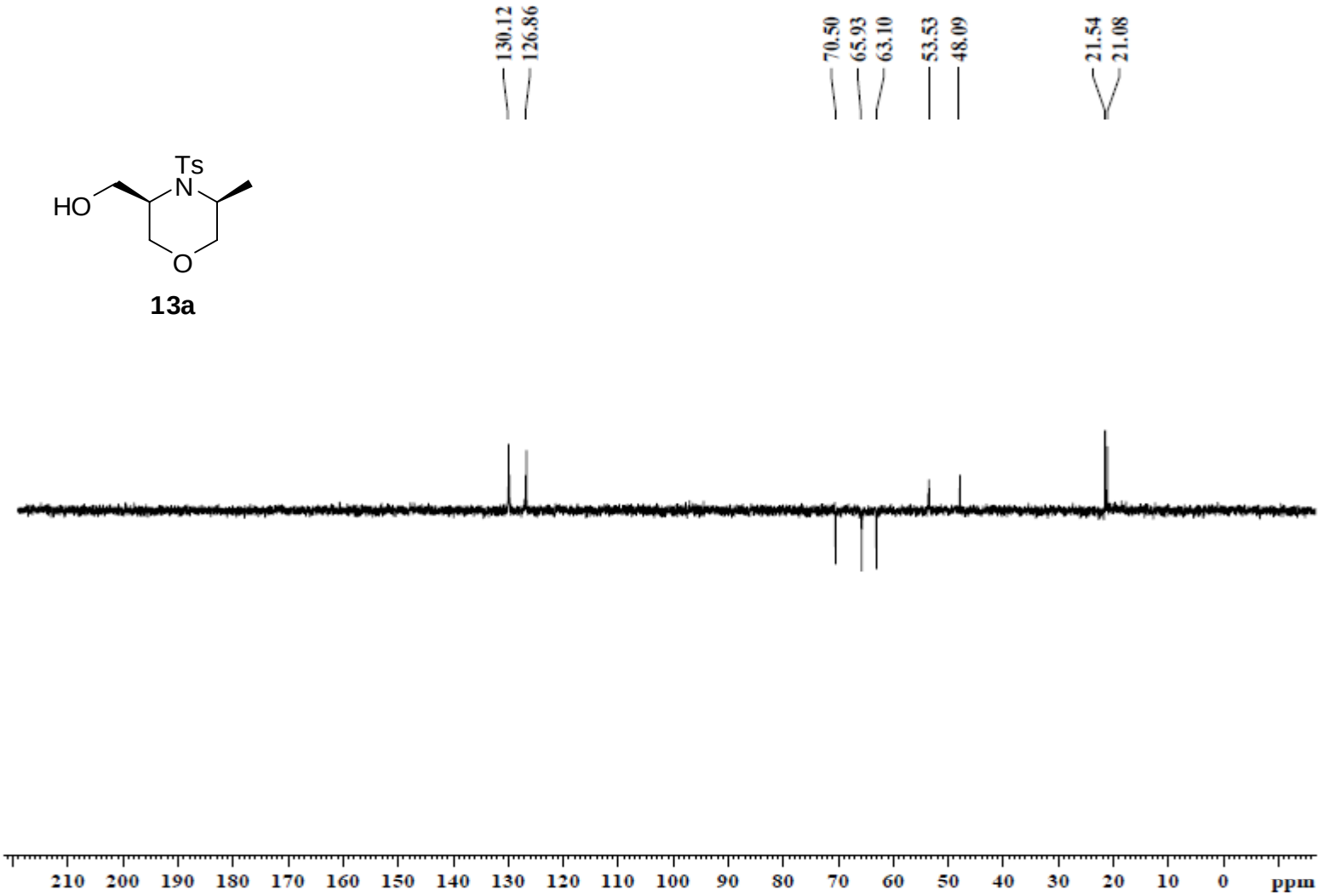


Figure S-45: DEPT spectrum (50 MHz, $CDCl_3$) of **13a.**

This journal is © The Royal Society of Chemistry 2011

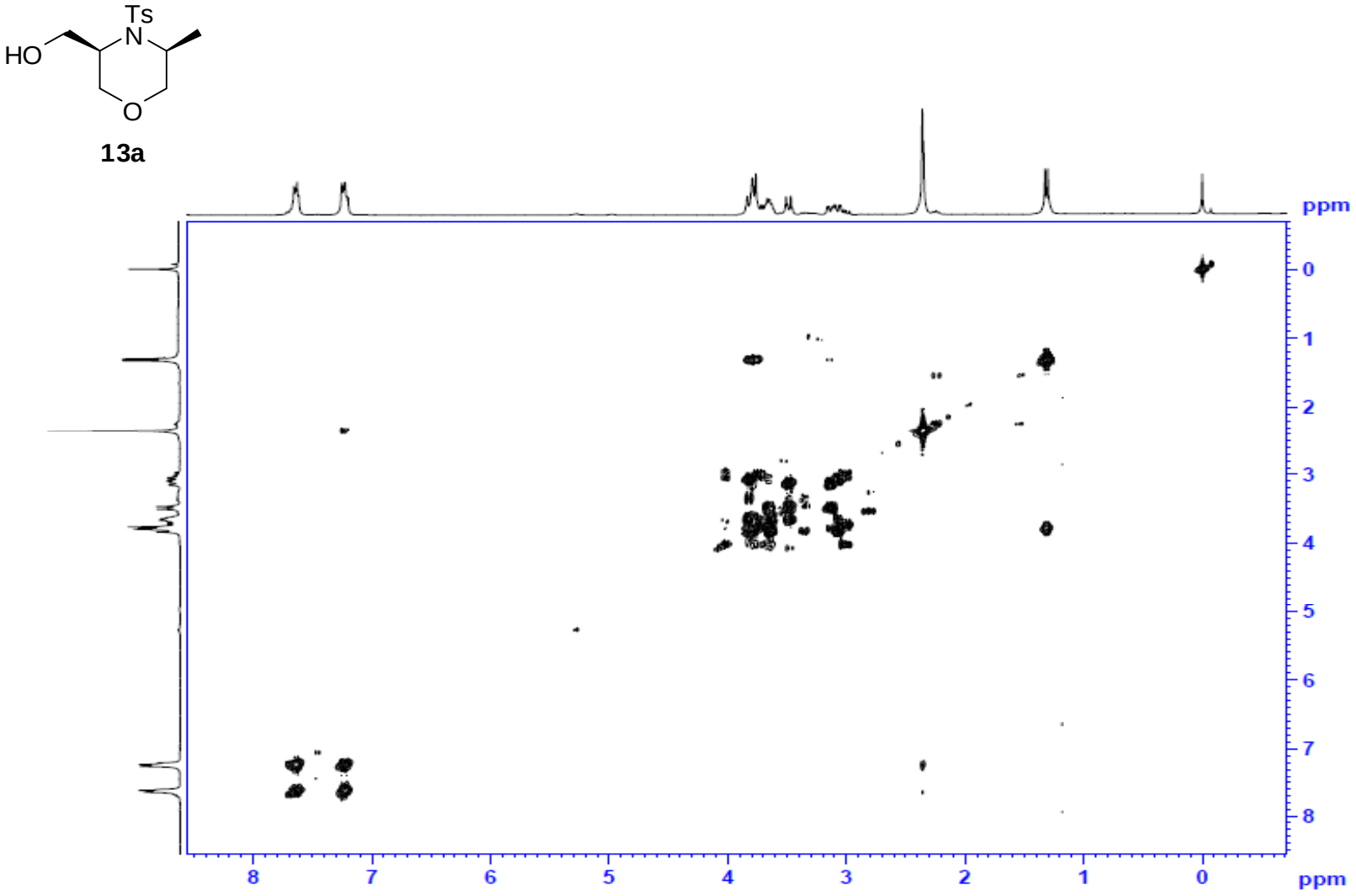
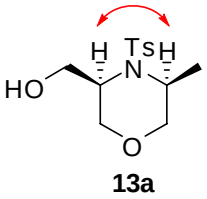


Figure S-46: COSY spectrum of **13a** (300 MHz, $CDCl_3$).

This journal is © The Royal Society of Chemistry 2011



13a

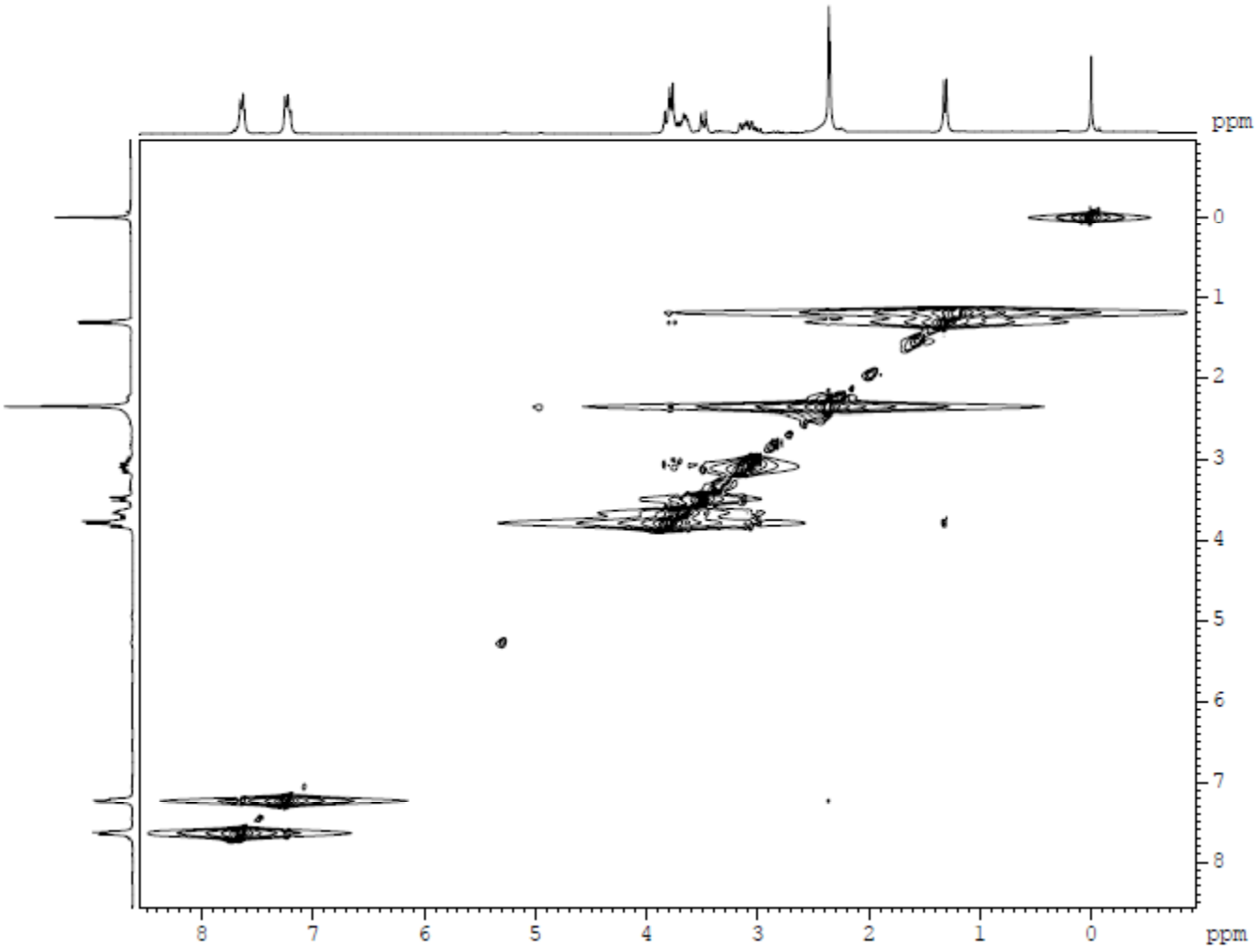
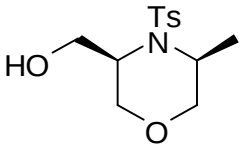


Figure S-47: NOESY spectrum of **13a** (300 MHz, $CDCl_3$).

This journal is © The Royal Society of Chemistry 2011



13a

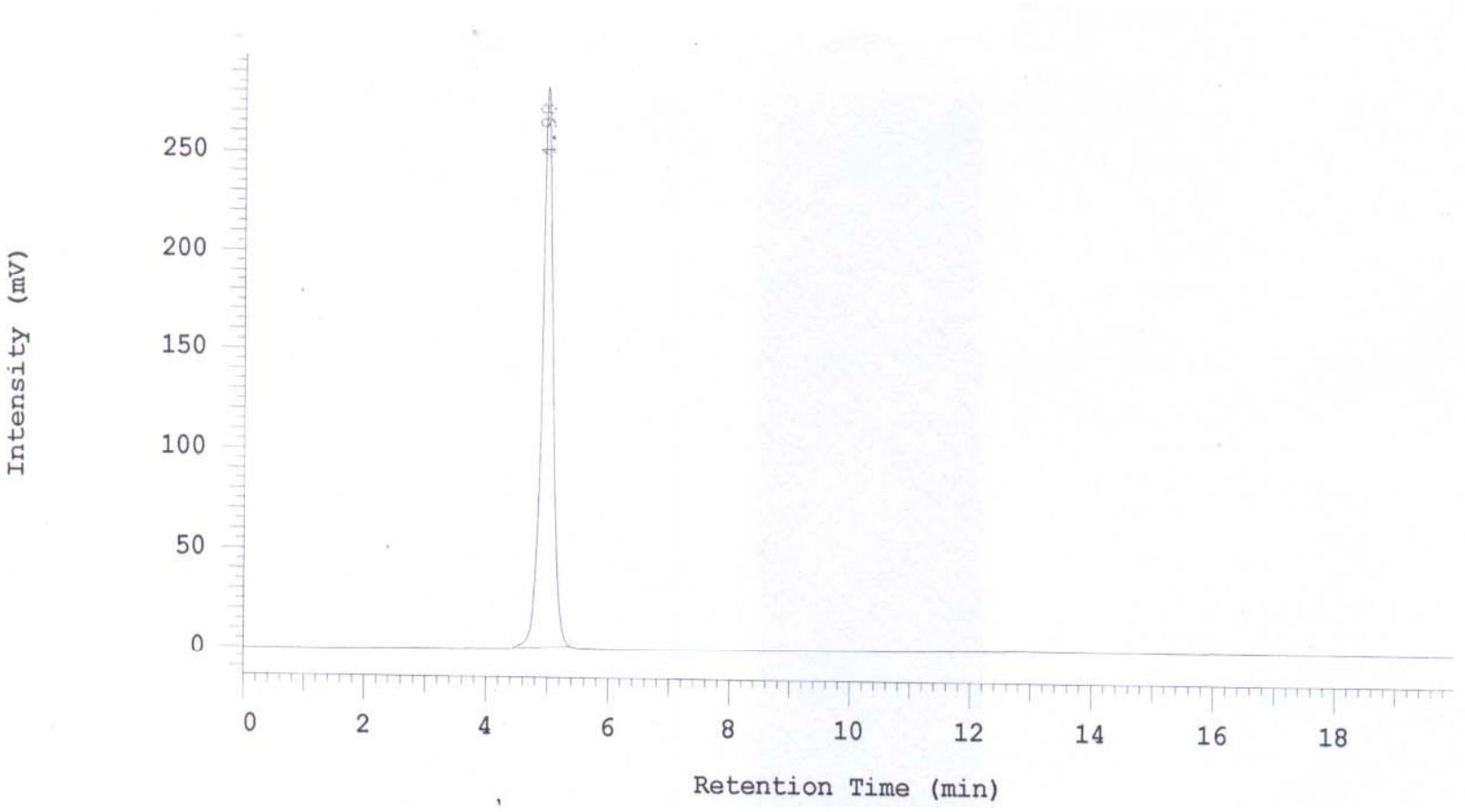
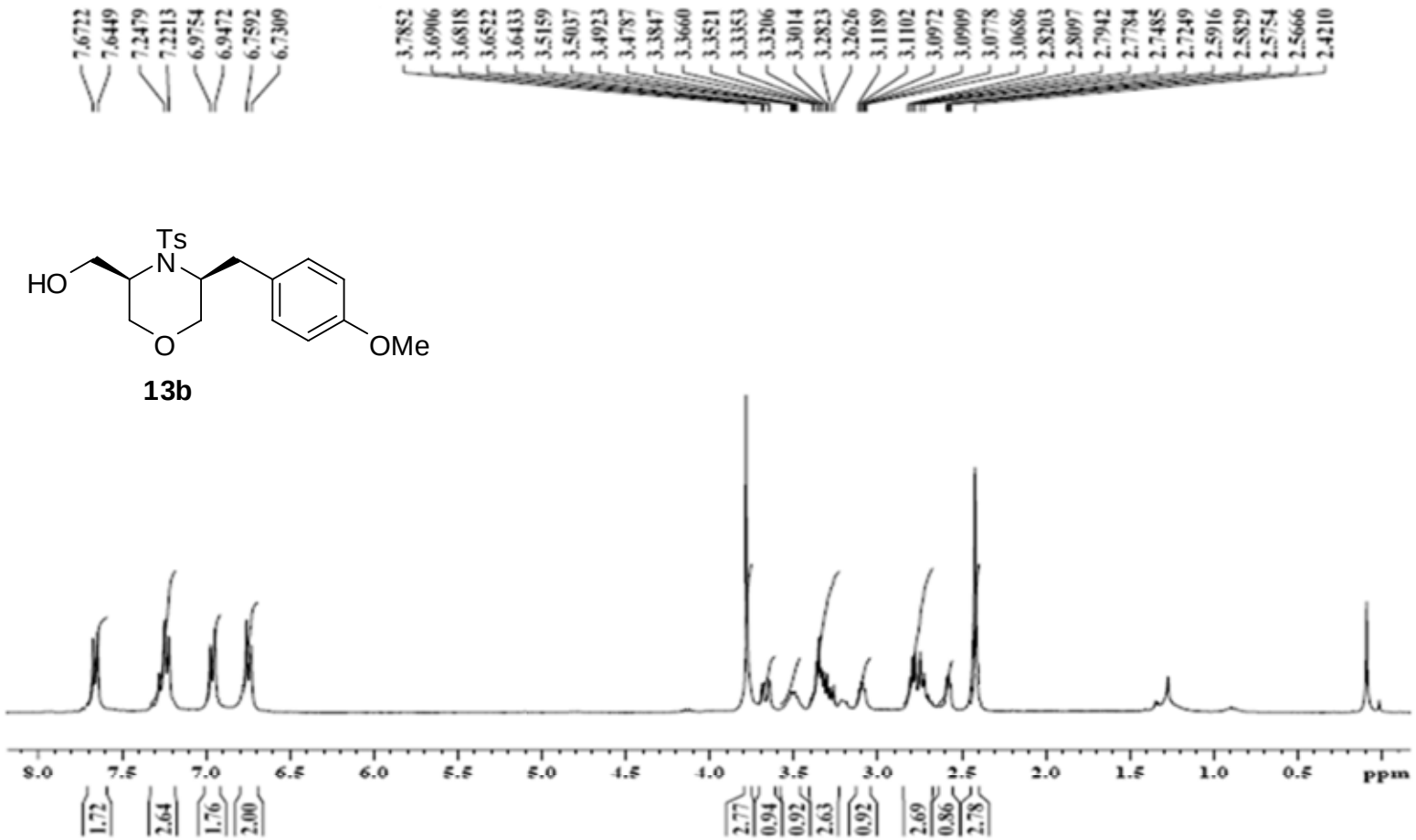


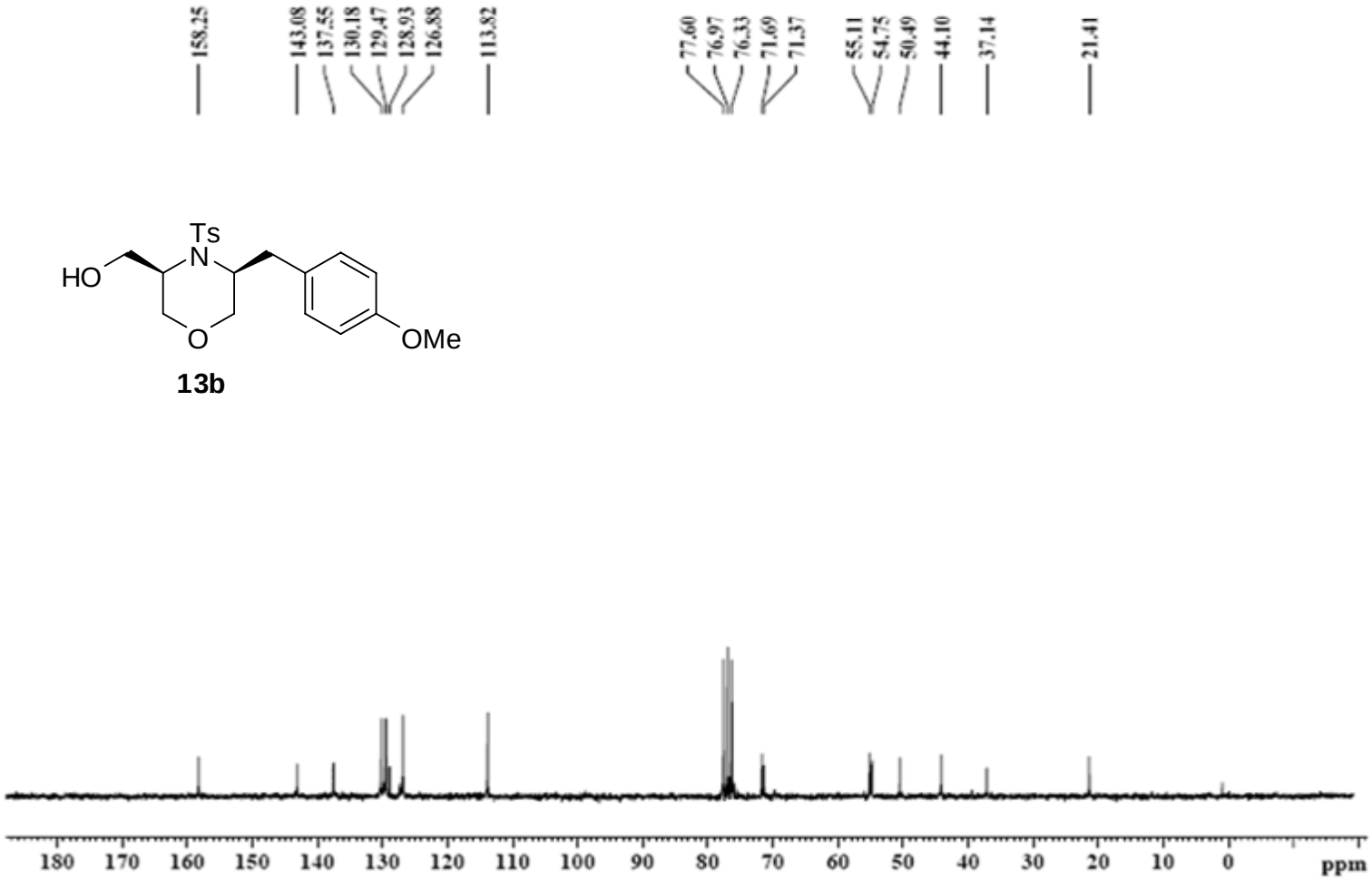
Figure S-48: HPLC spectrum of **13a.**

This journal is © The Royal Society of Chemistry 2011



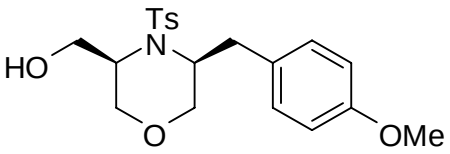
FigureS-49: ^{1}H spectrum (300 MHz, $CDCl_3$) of **13b.**

This journal is © The Royal Society of Chemistry 2011



FigureS-50: ^{13}C spectrum (50 MHz, $CDCl_3$) **13b.**

This journal is © The Royal Society of Chemistry 2011



13b

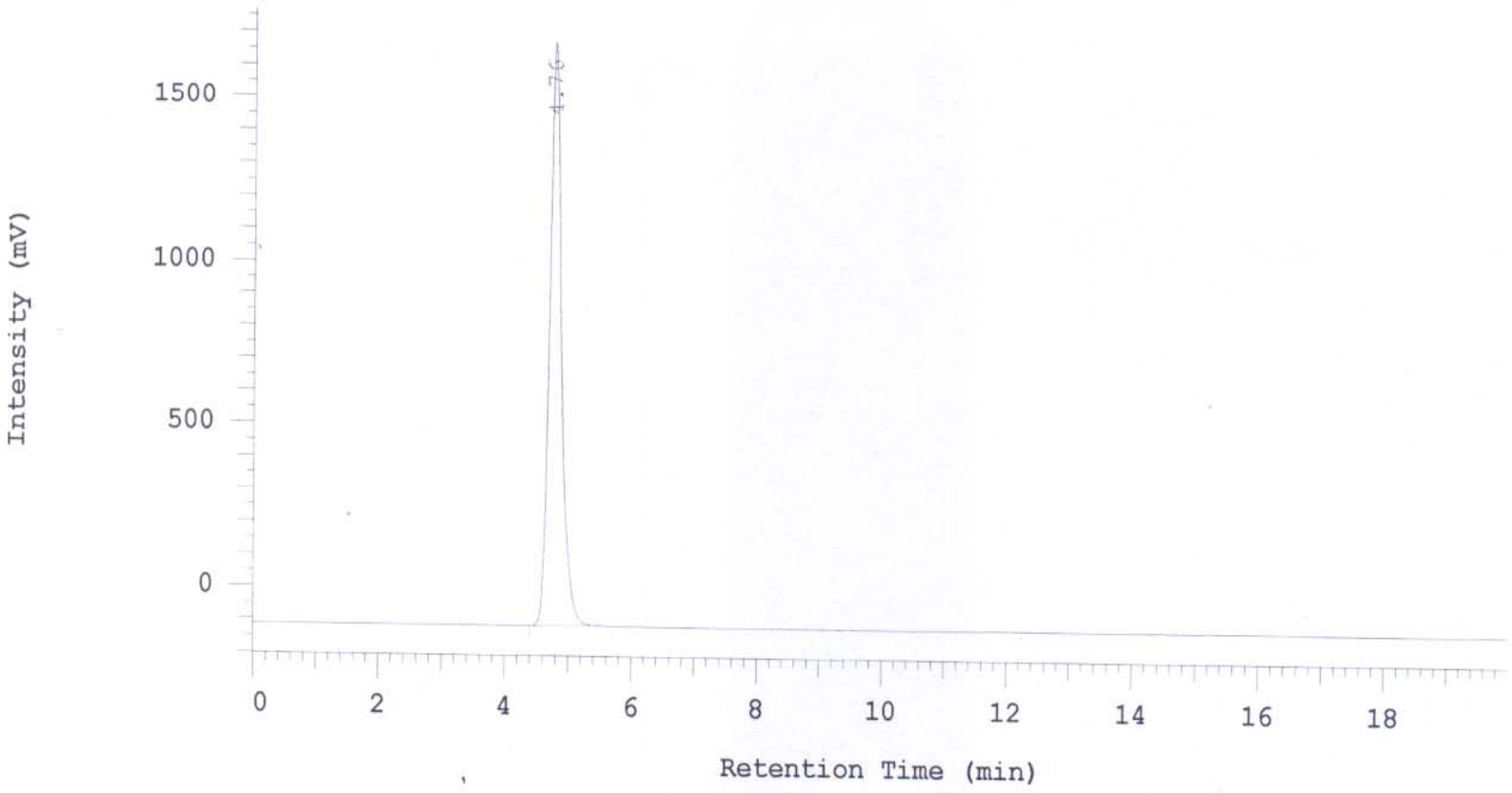


Figure S-51: HPLC Spectrum of **13b**

This journal is © The Royal Society of Chemistry 2011

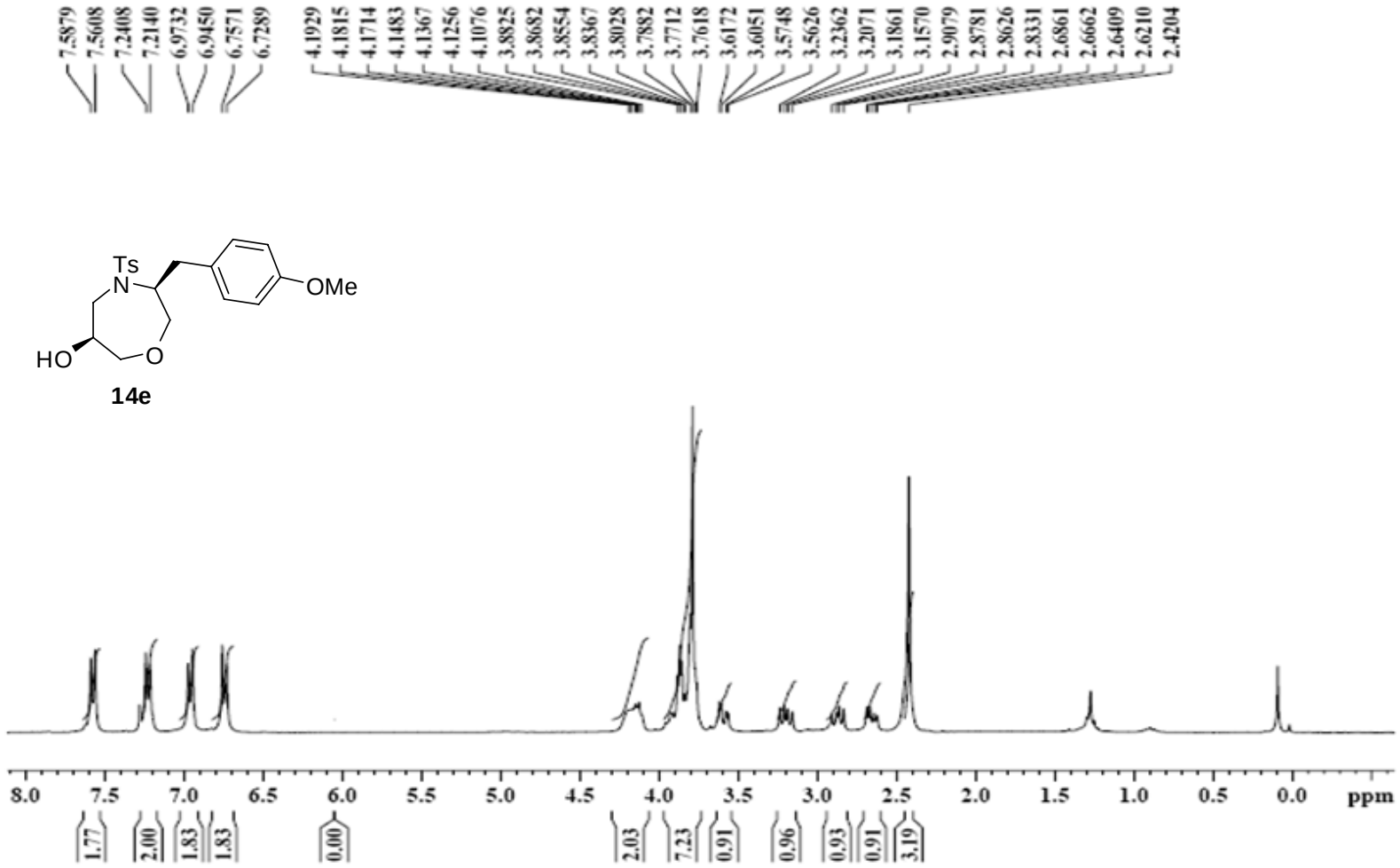


Figure S-52: ^{1}H spectrum (300 MHz, $CDCl_3$) of **14e.**

This journal is © The Royal Society of Chemistry 2011

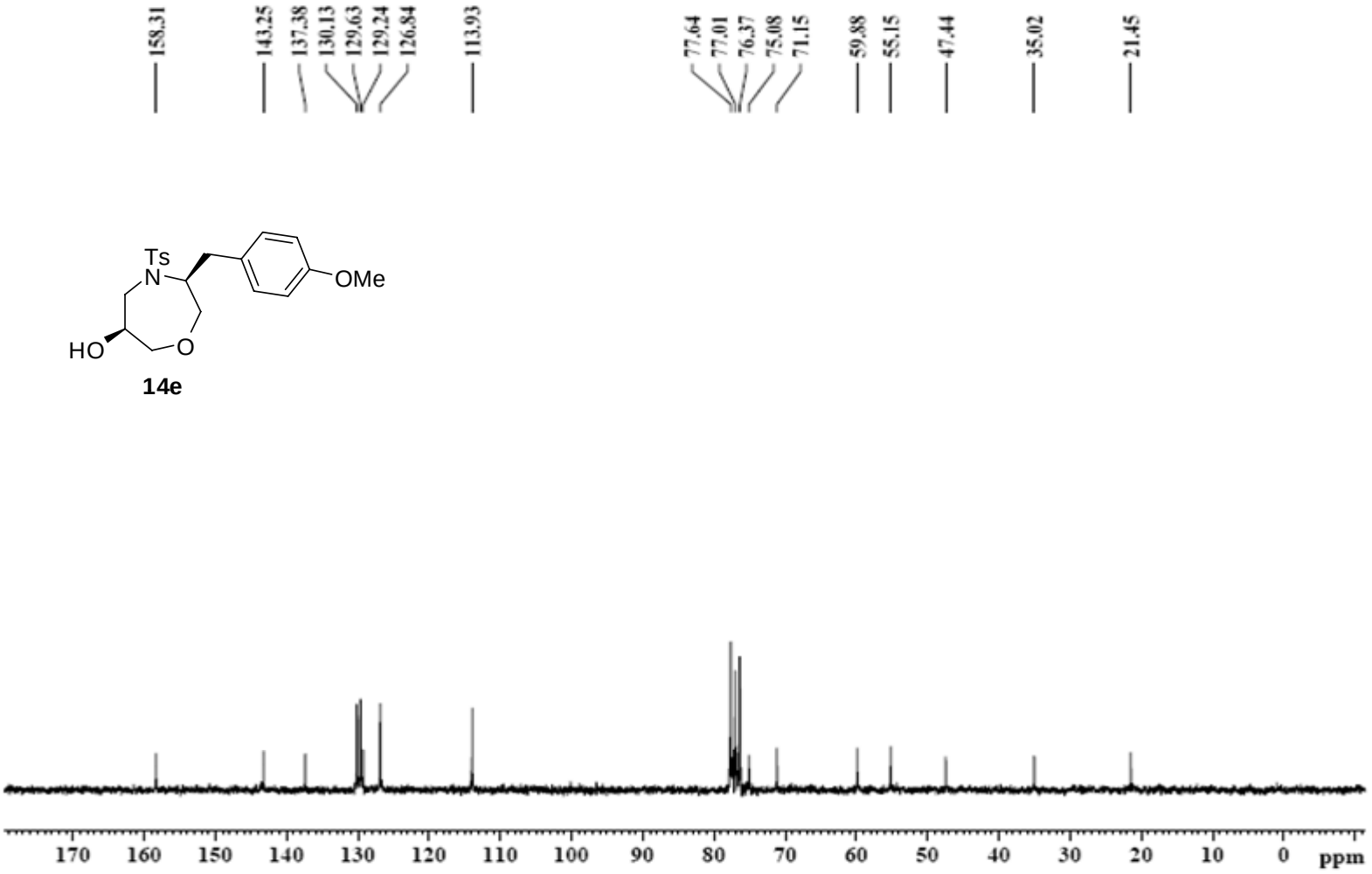
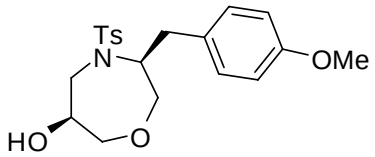


Figure S-53: ^{13}C spectrum (50 MHz, $CDCl_3$) **14e.**

This journal is © The Royal Society of Chemistry 2011



14e

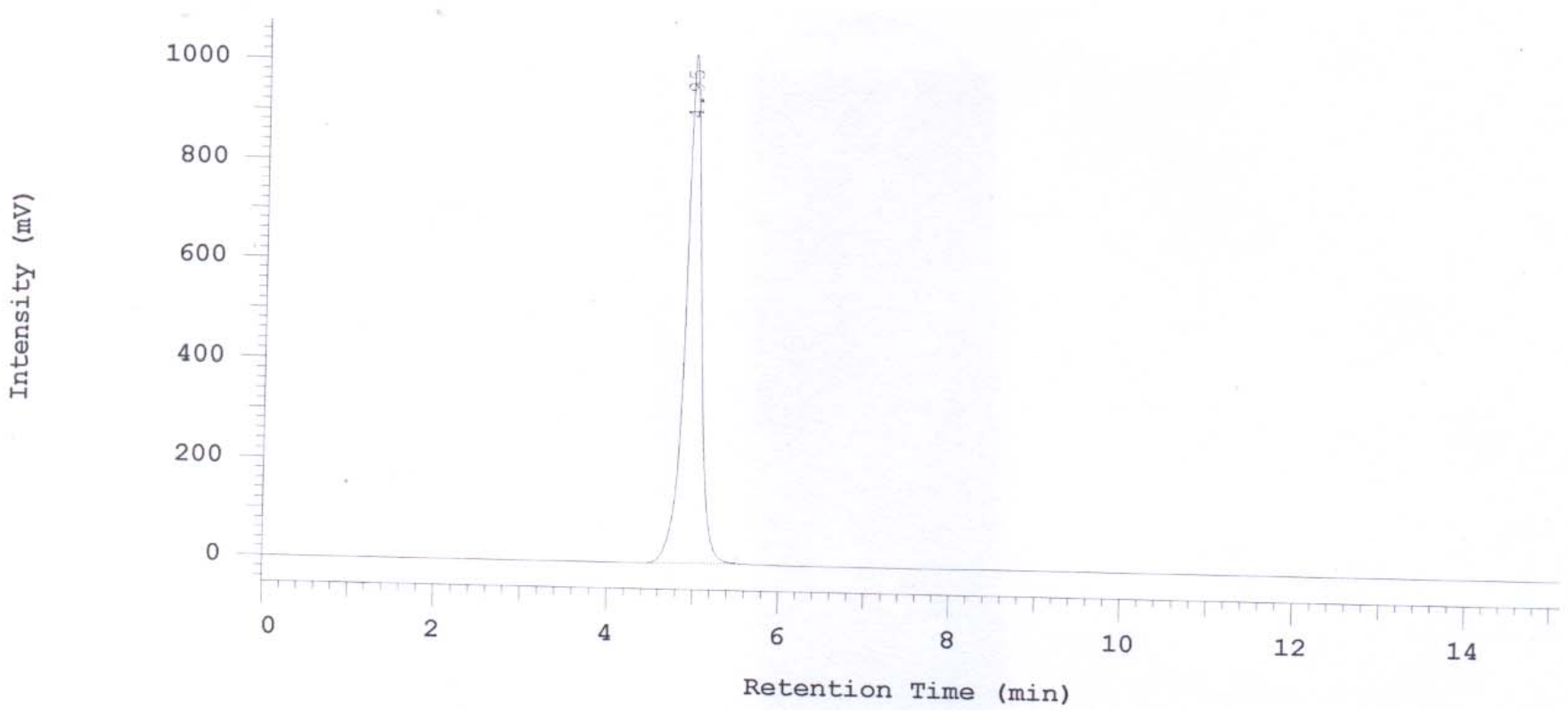


Figure S-54: HPLC spectrum of **14e.**

This journal is © The Royal Society of Chemistry 2011

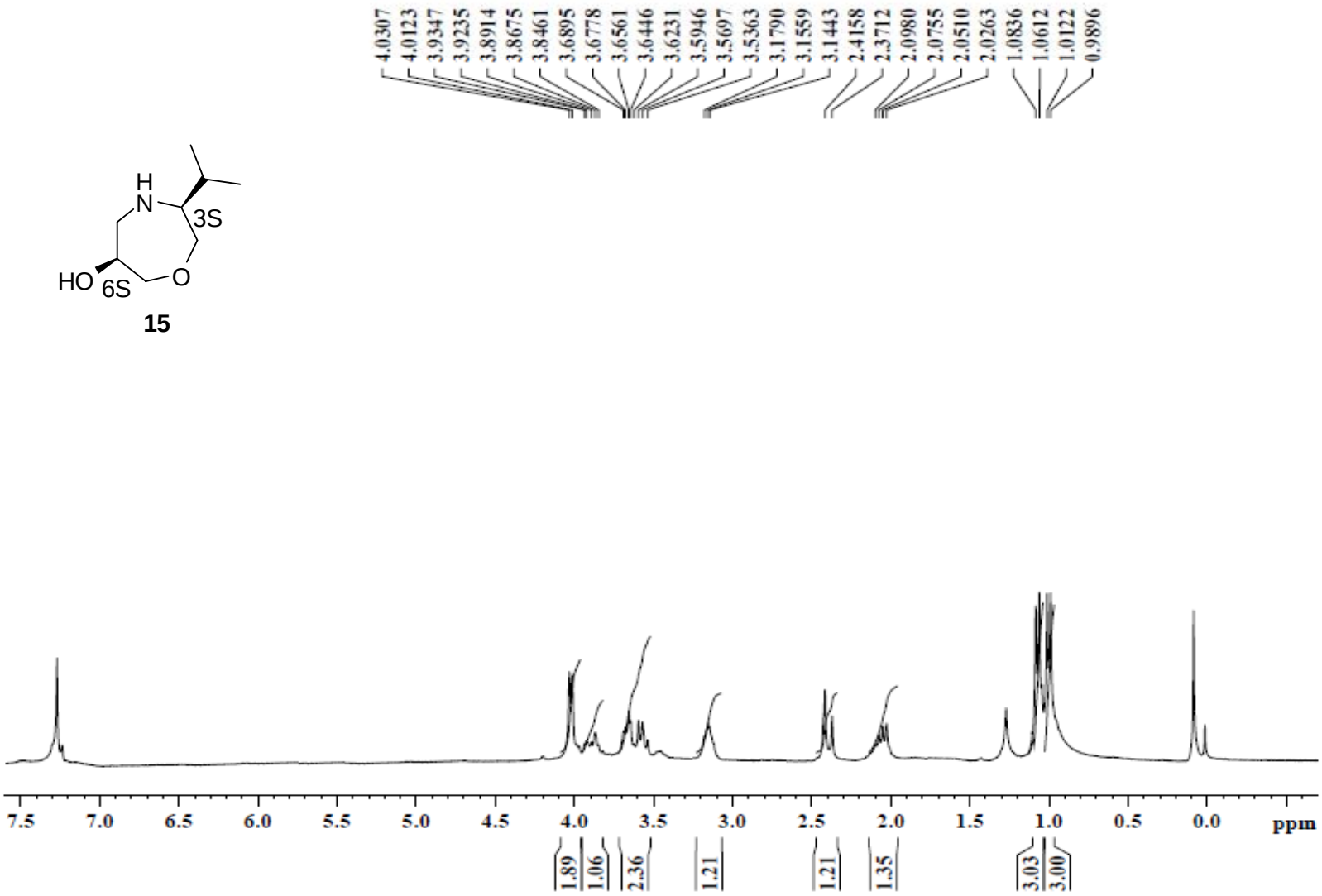
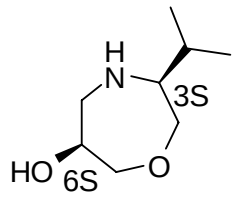


Figure S-55: ^{1}H spectrum (300 MHz, $CDCl_3$) of **15.**

This journal is © The Royal Society of Chemistry 2011



15

Figure S-56: ^{13}C spectrum (75 MHz, $CDCl_3$) **15.**

This journal is © The Royal Society of Chemistry 2011

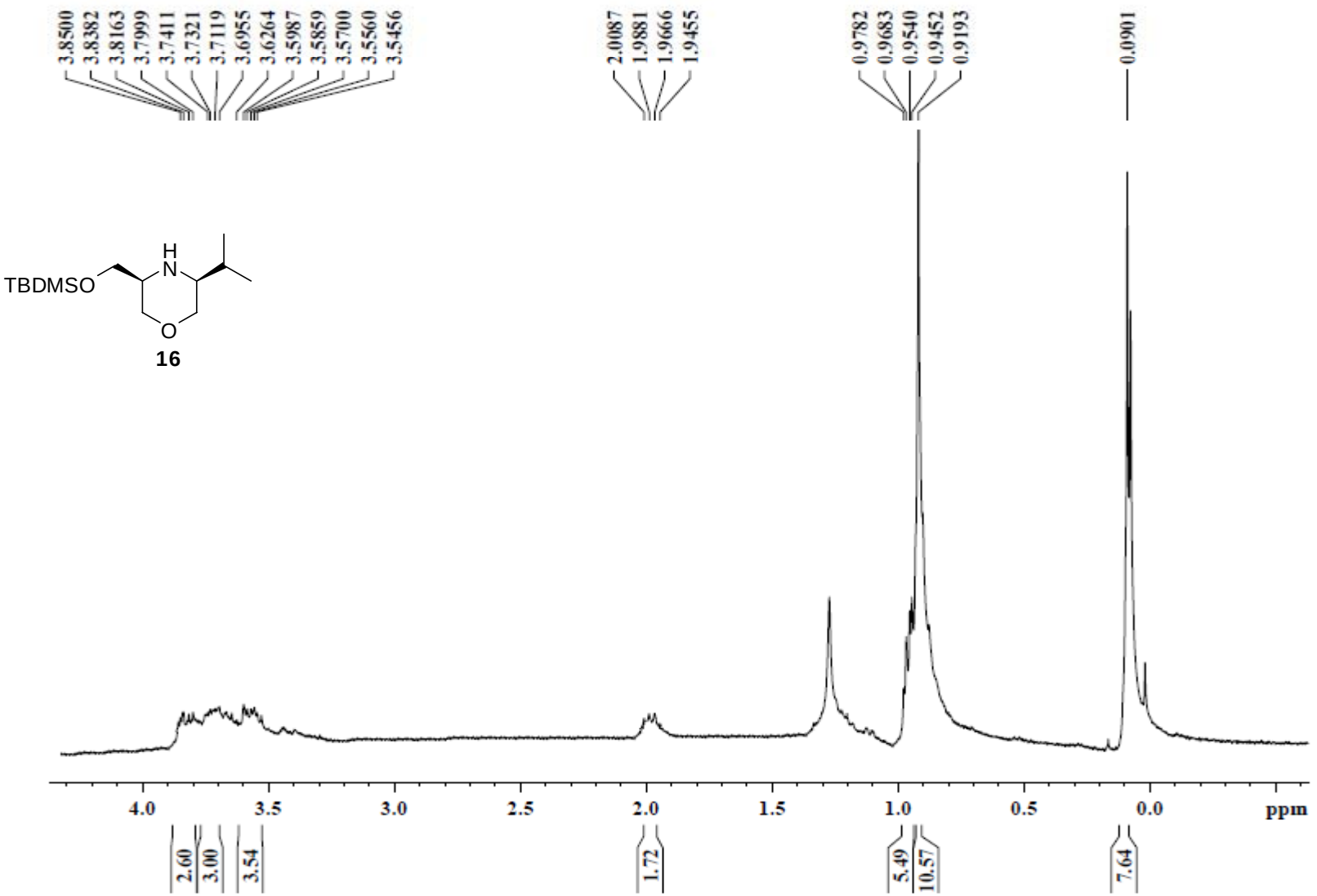


Figure S-57: ^{1}H spectrum (75 MHz, $CDCl_3$) **16.**