

Temperature- and Reagent-Controlled Complementary *Syn*- and *Anti*-Selective Enolboration-aldolization of Substituted Phenylacetates

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Hammond, LA 70402

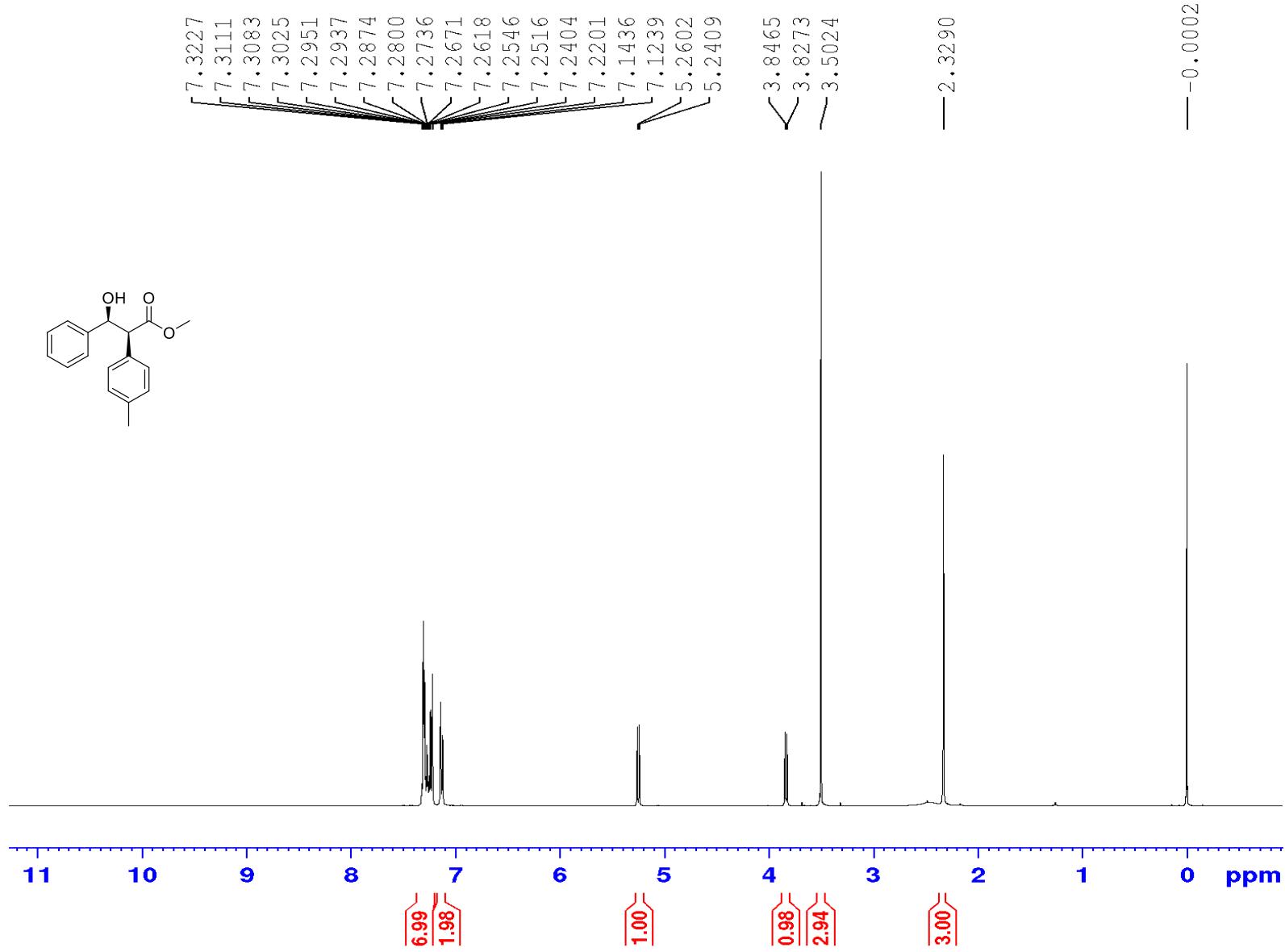
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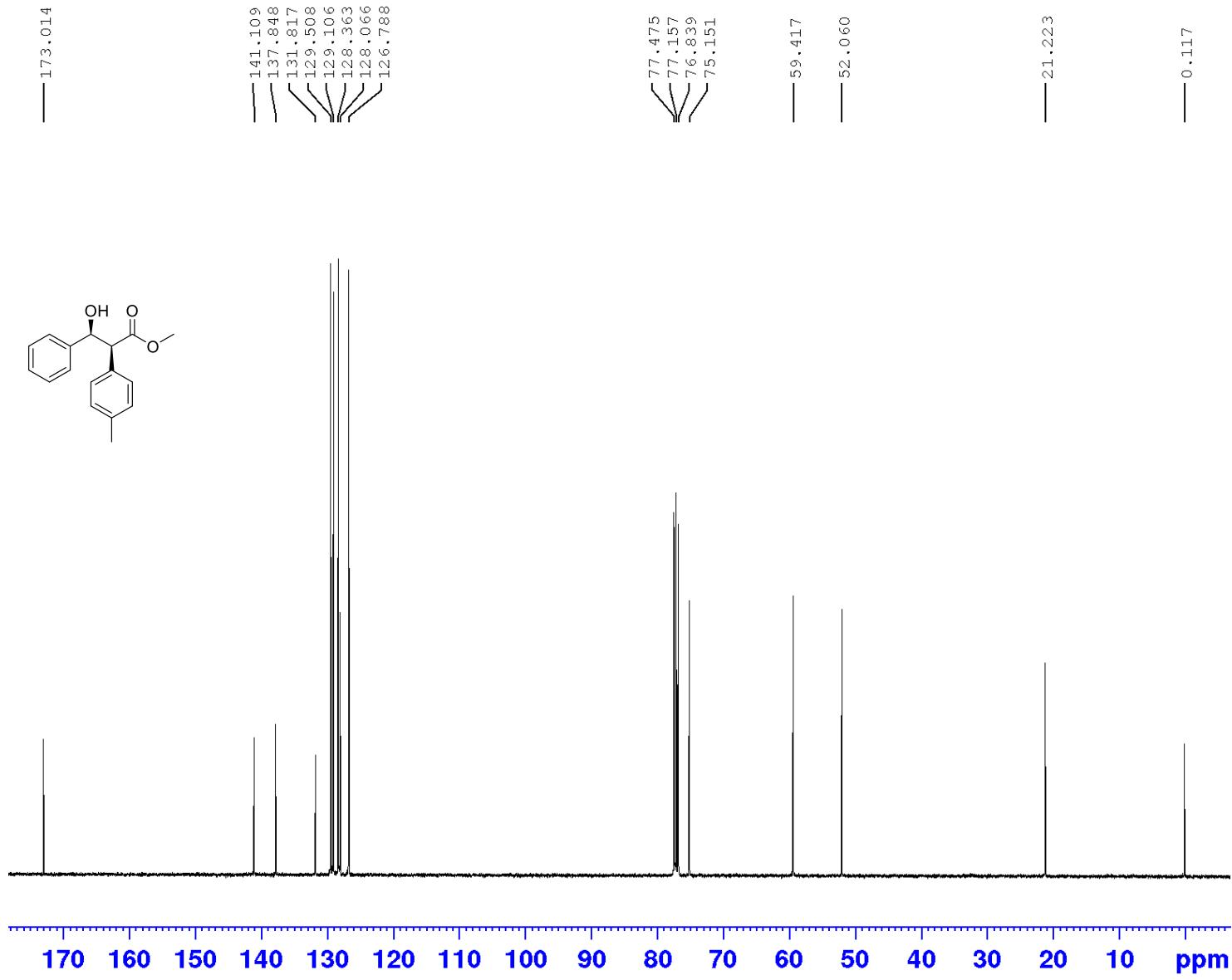
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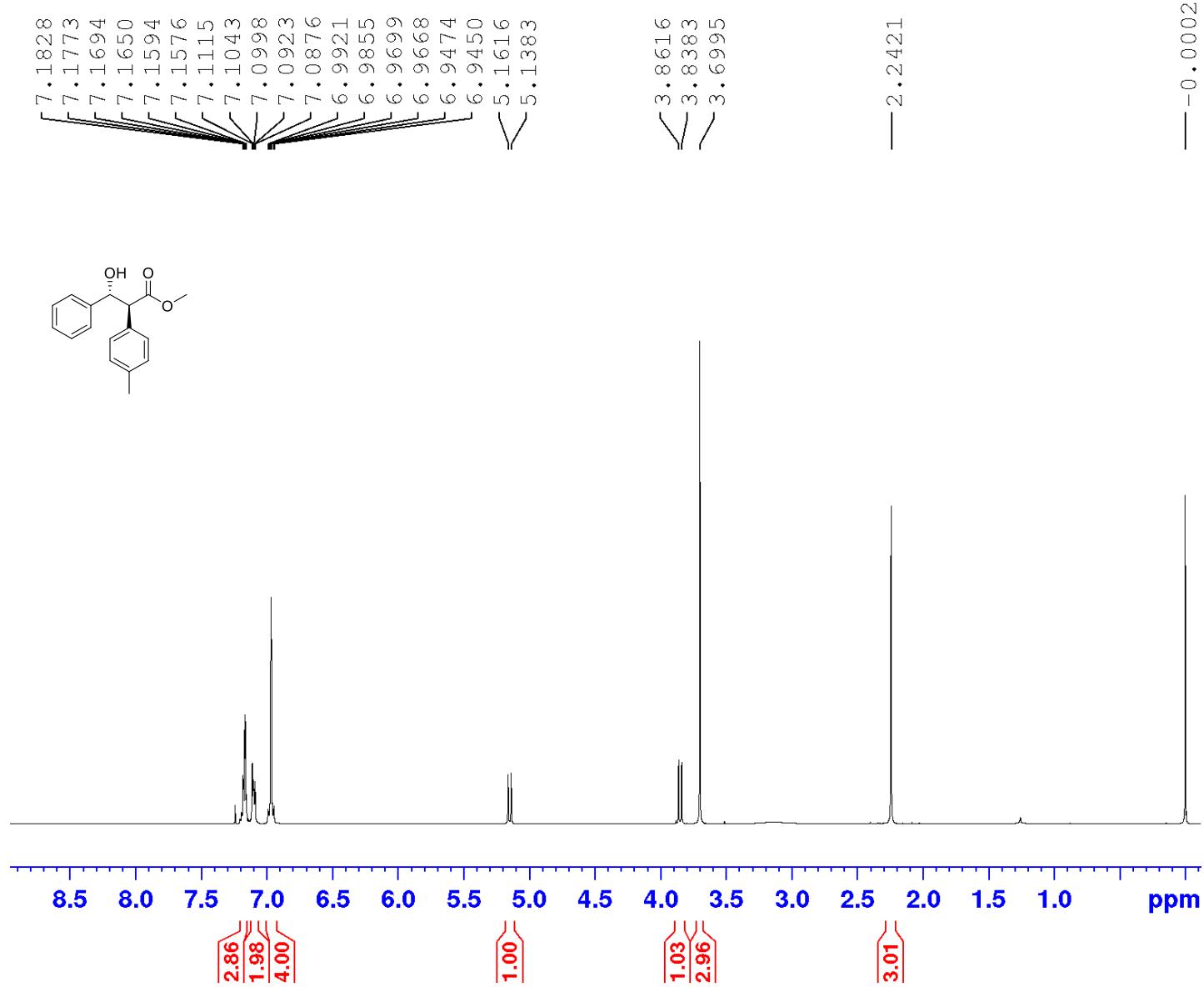
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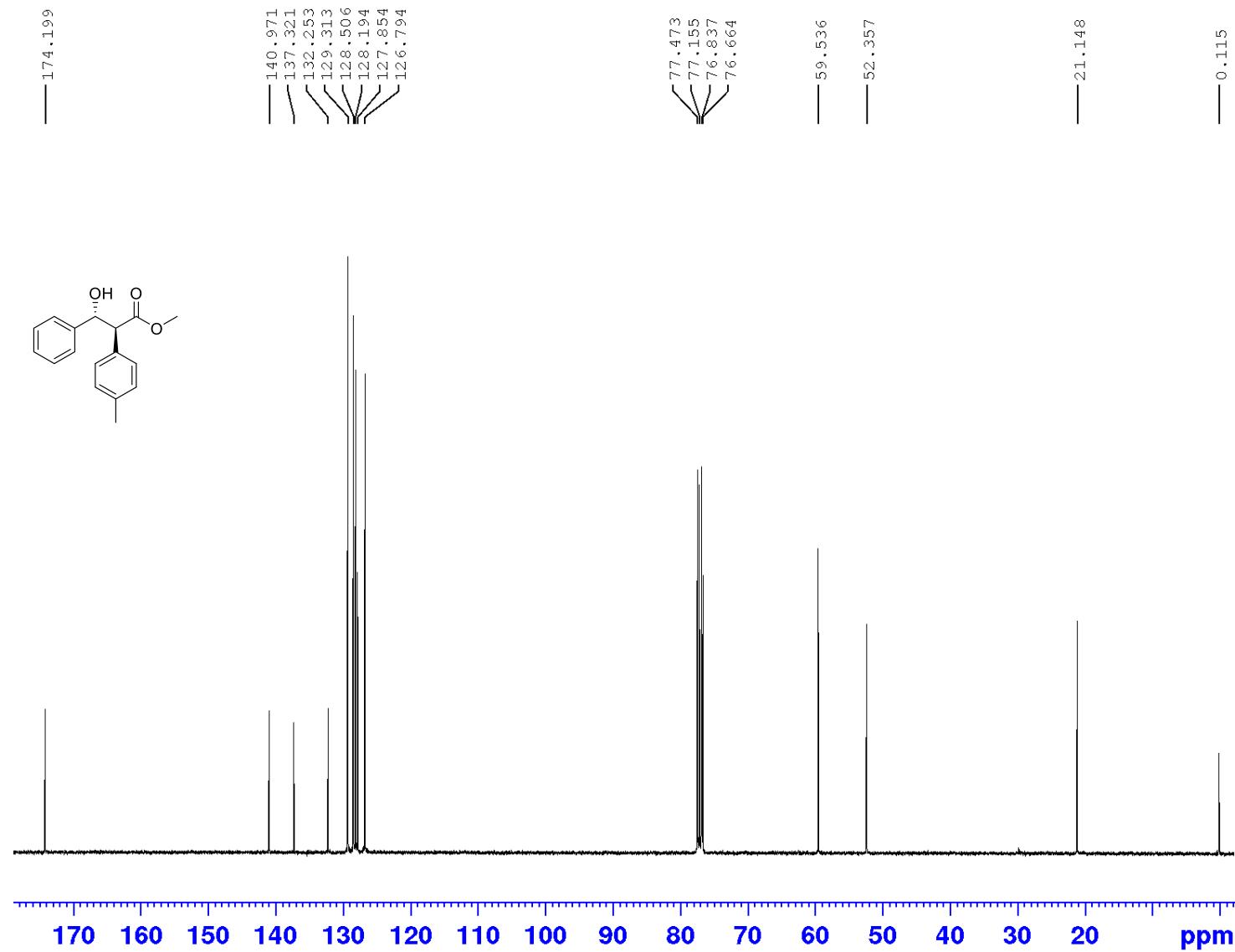
^1H NMR (400 MHz, CDCl_3) Spectrum of *syn*-methyl 3-hydroxy-3-phenyl-2-*p*-tolylpropanoate (**7a**)



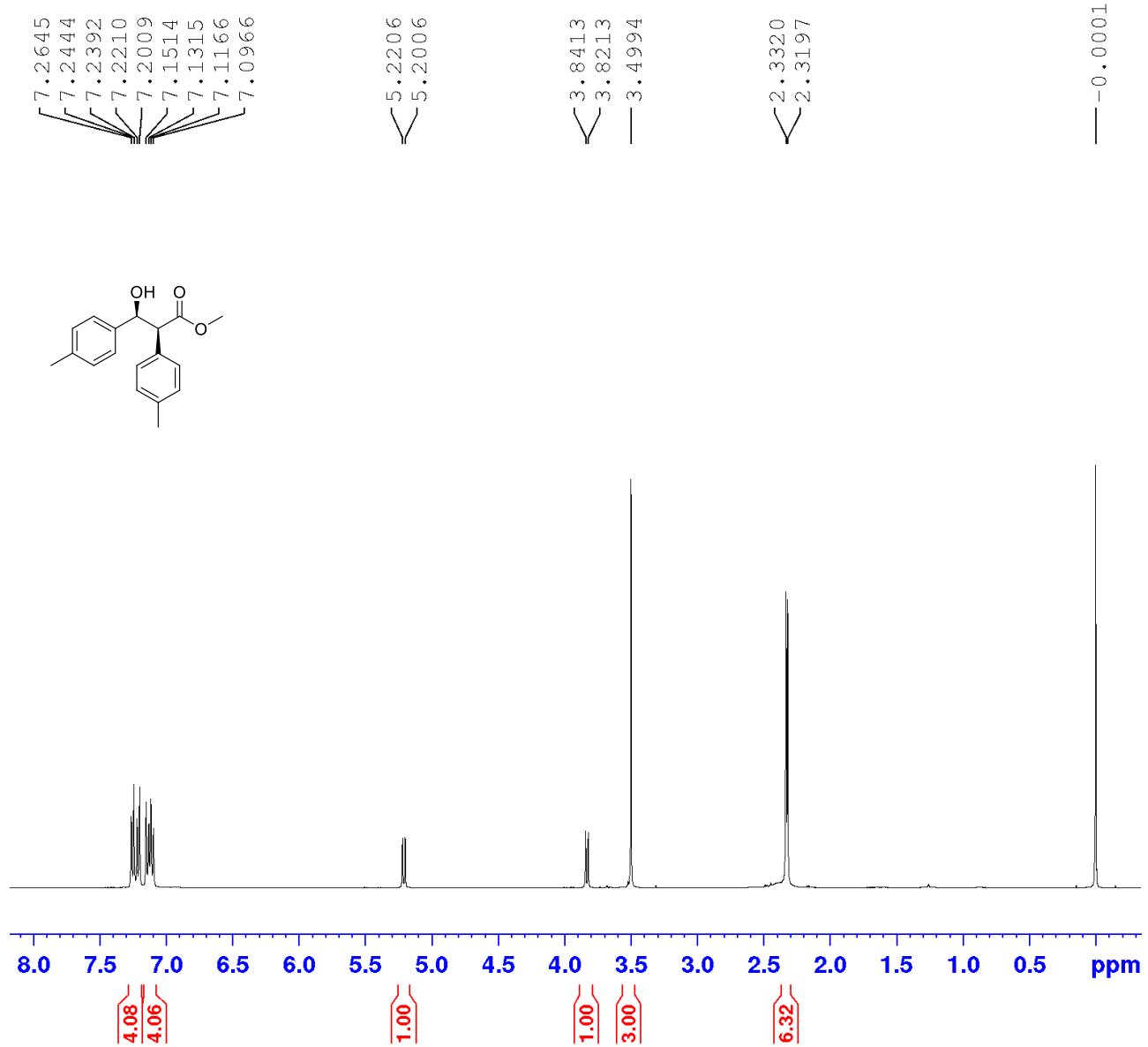
¹³C{¹H} NMR (100 MHz, CDCl₃) Spectrum of *syn*-methyl 3-hydroxy-3-phenyl-2-*p*-tolylpropanoate (**7a**)



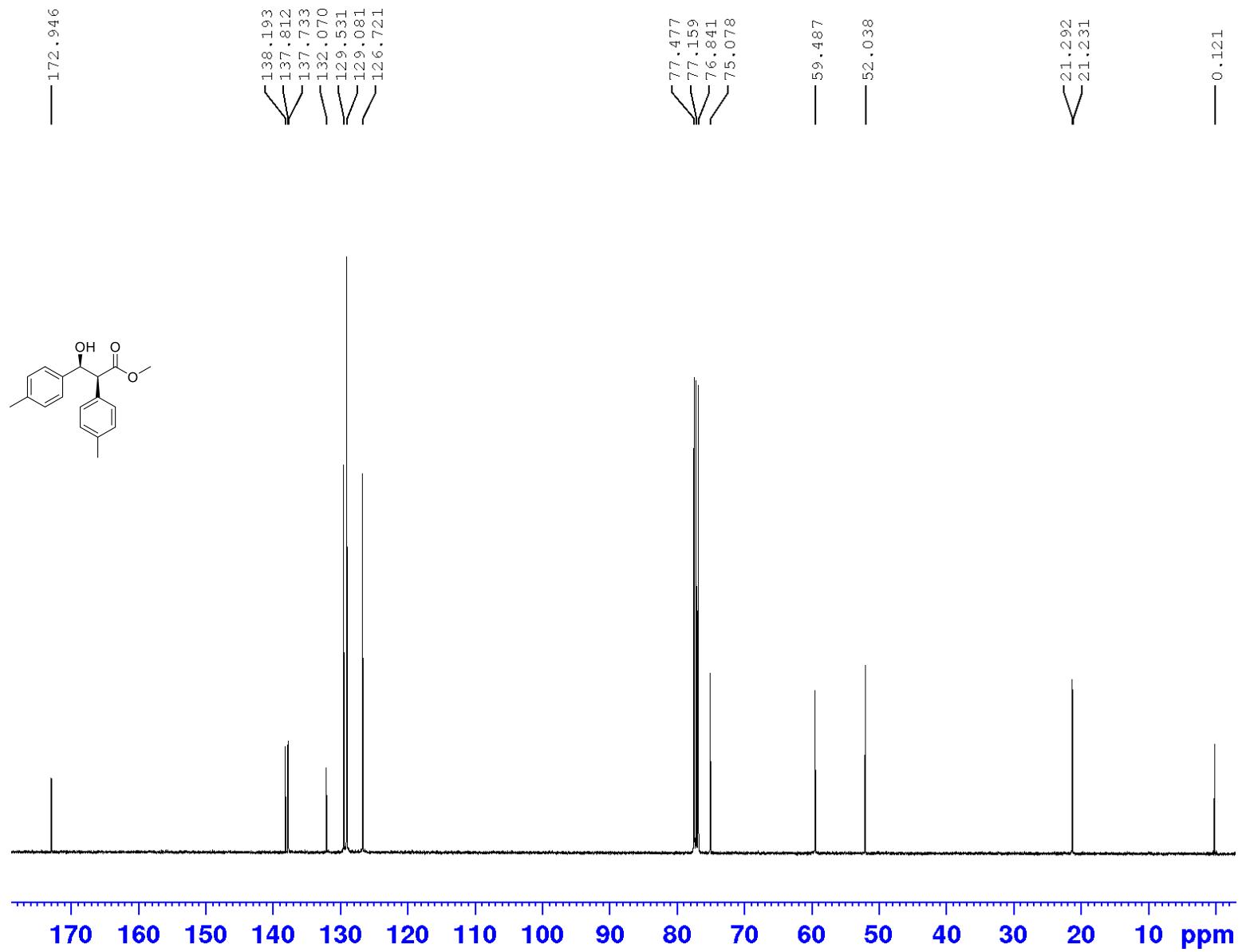
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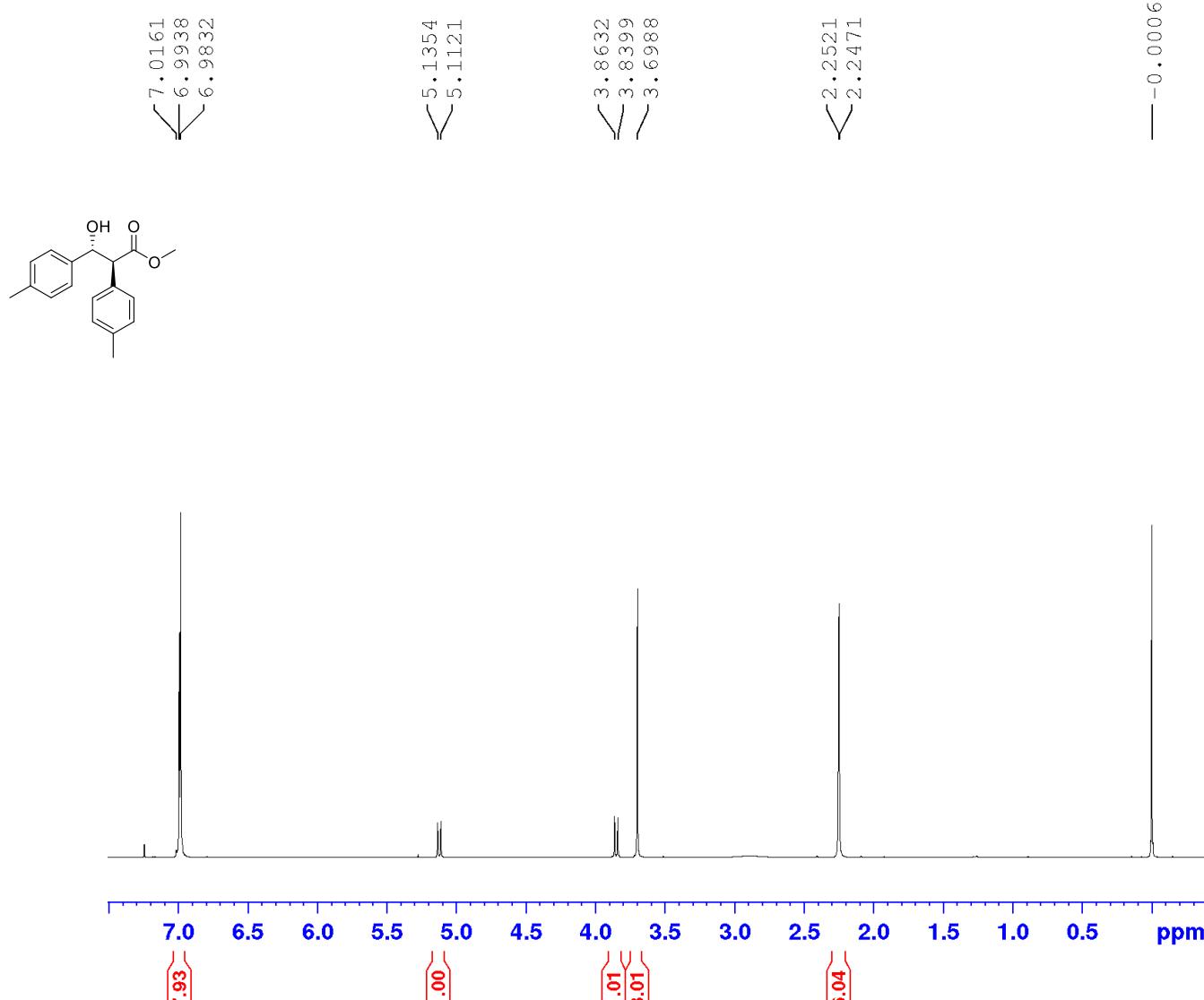
$^{13}\text{C}\{\text{H}\}$ NMR (100 MHz, CDCl_3) Spectrum of *anti*-methyl 3-hydroxy-3-phenyl-2-*p*-tolylpropanoate (**7a**)



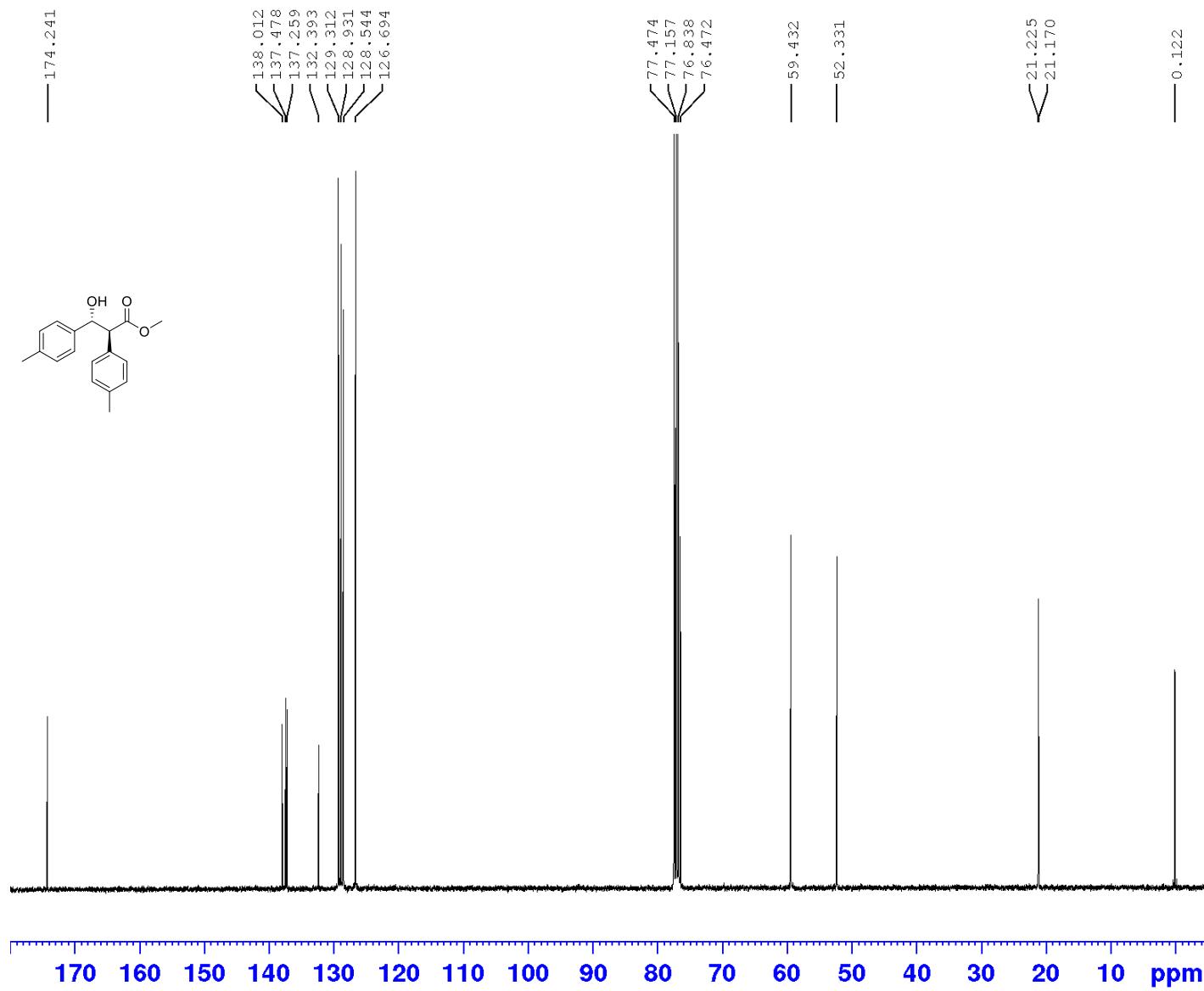
¹H NMR (400 MHz, CDCl₃) Spectrum of *syn*-methyl 3-hydroxy-2,3-diphenylpropanoate (**7b**)



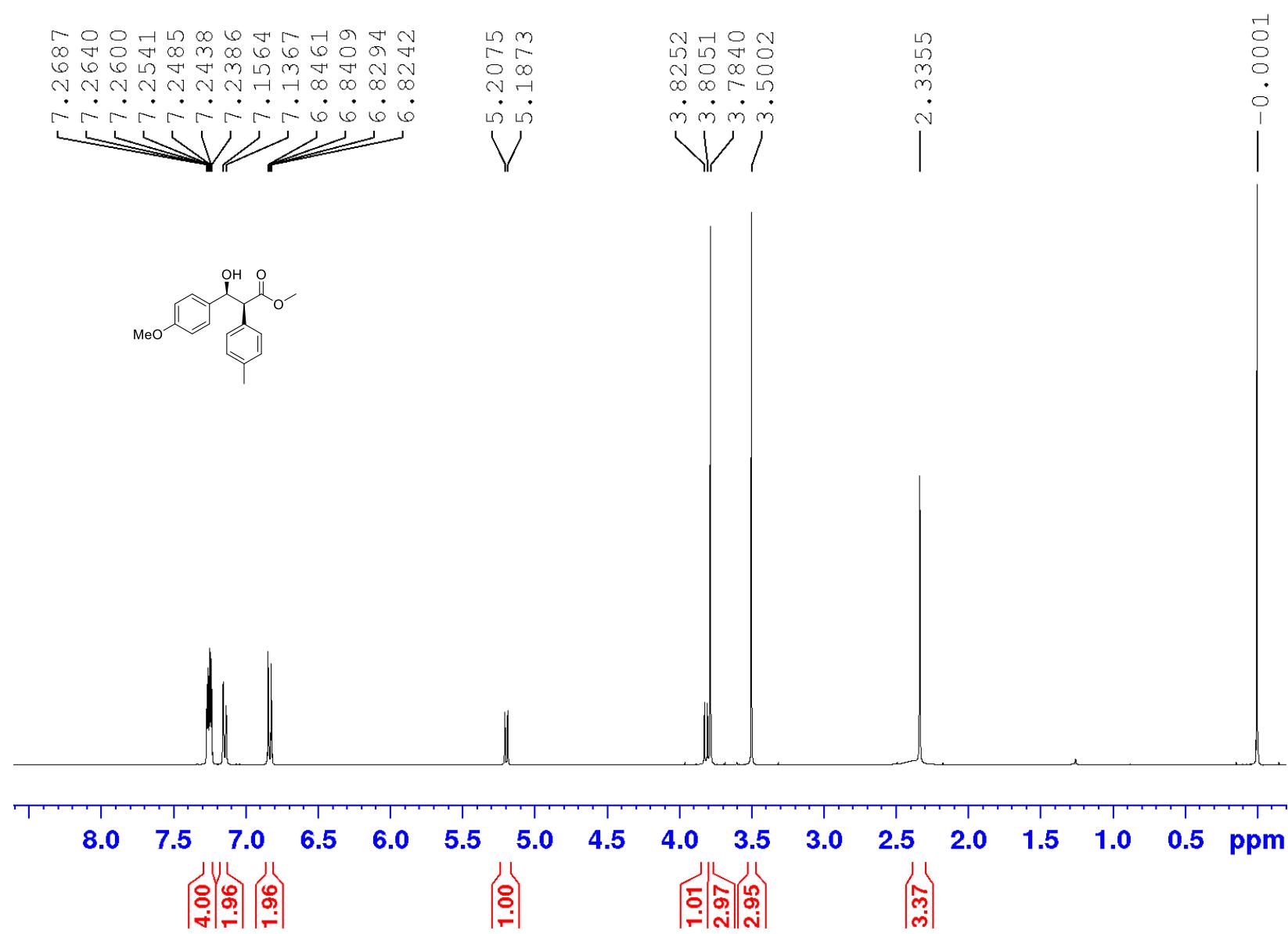
¹³C{¹H} NMR (100 MHz, CDCl₃) Spectrum of *syn*-methyl 3-hydroxy-2,3-diphenylpropanoate (**7b**)



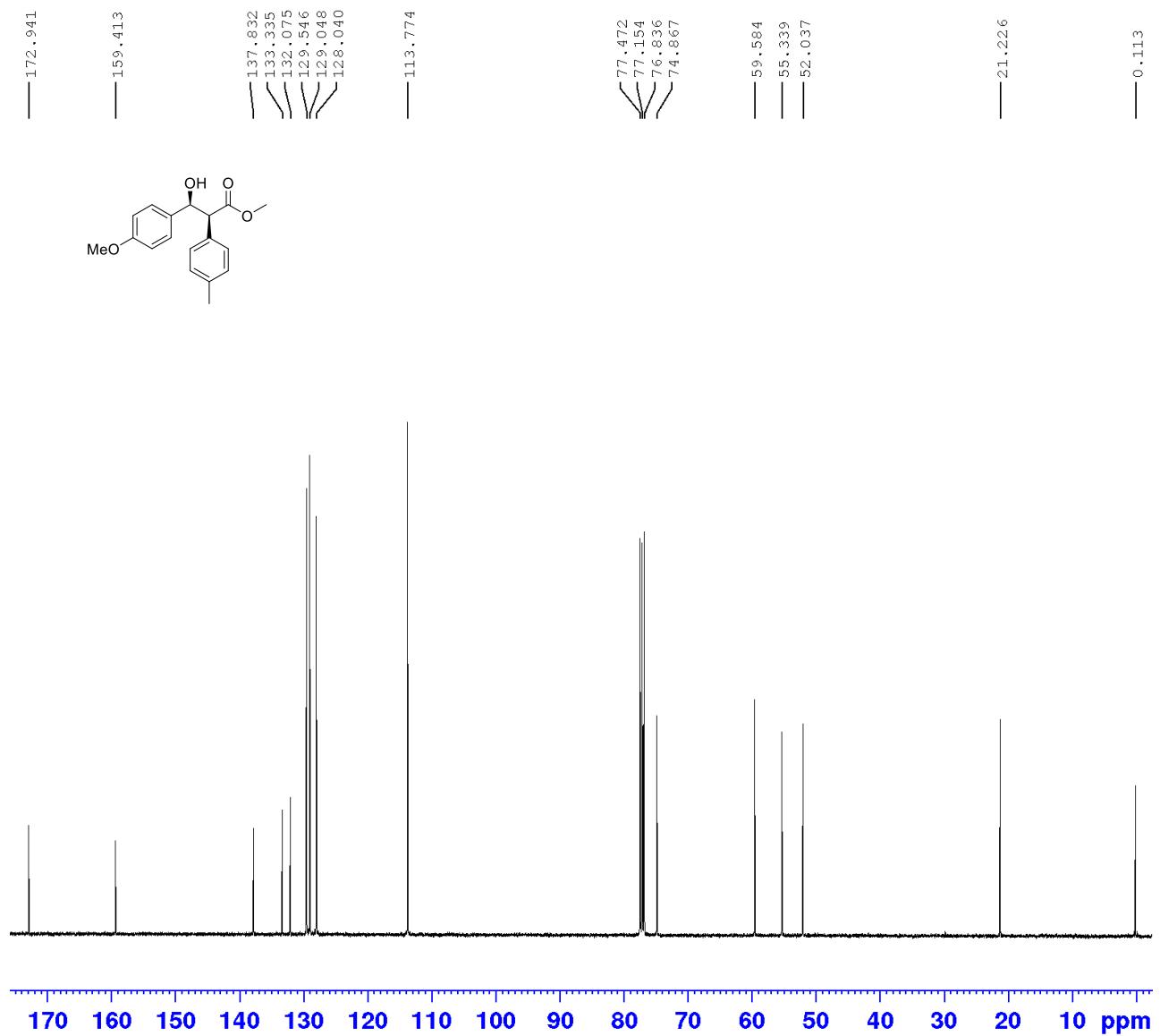
¹H NMR (400 MHz, CDCl₃) Spectrum of *anti*-methyl 3-hydroxy-2,3-diphenylpropanoate (**7b**)



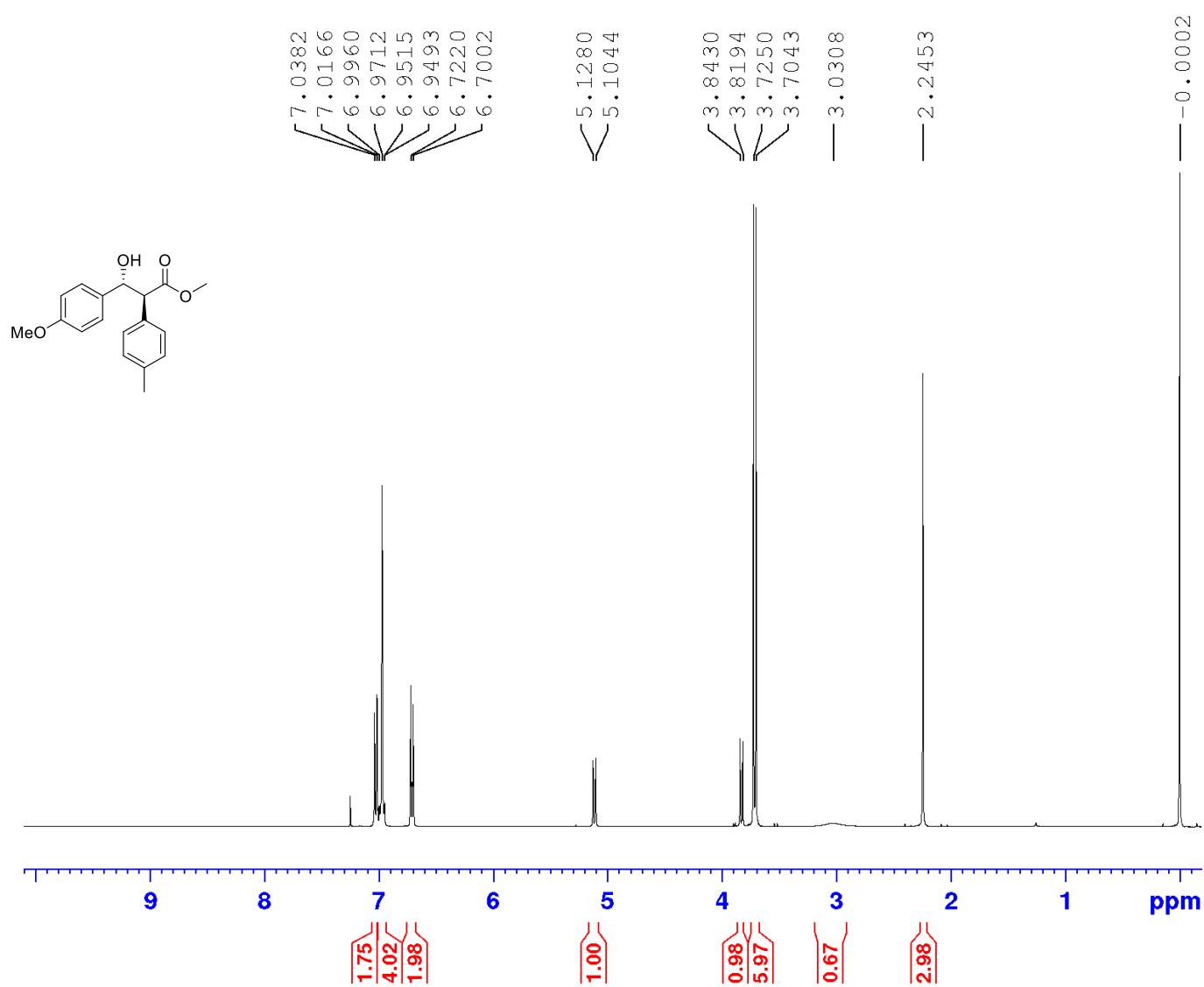
$^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl₃) Spectrum of *anti*-methyl 3-hydroxy-2,3-diphenylpropanoate (**7b**)



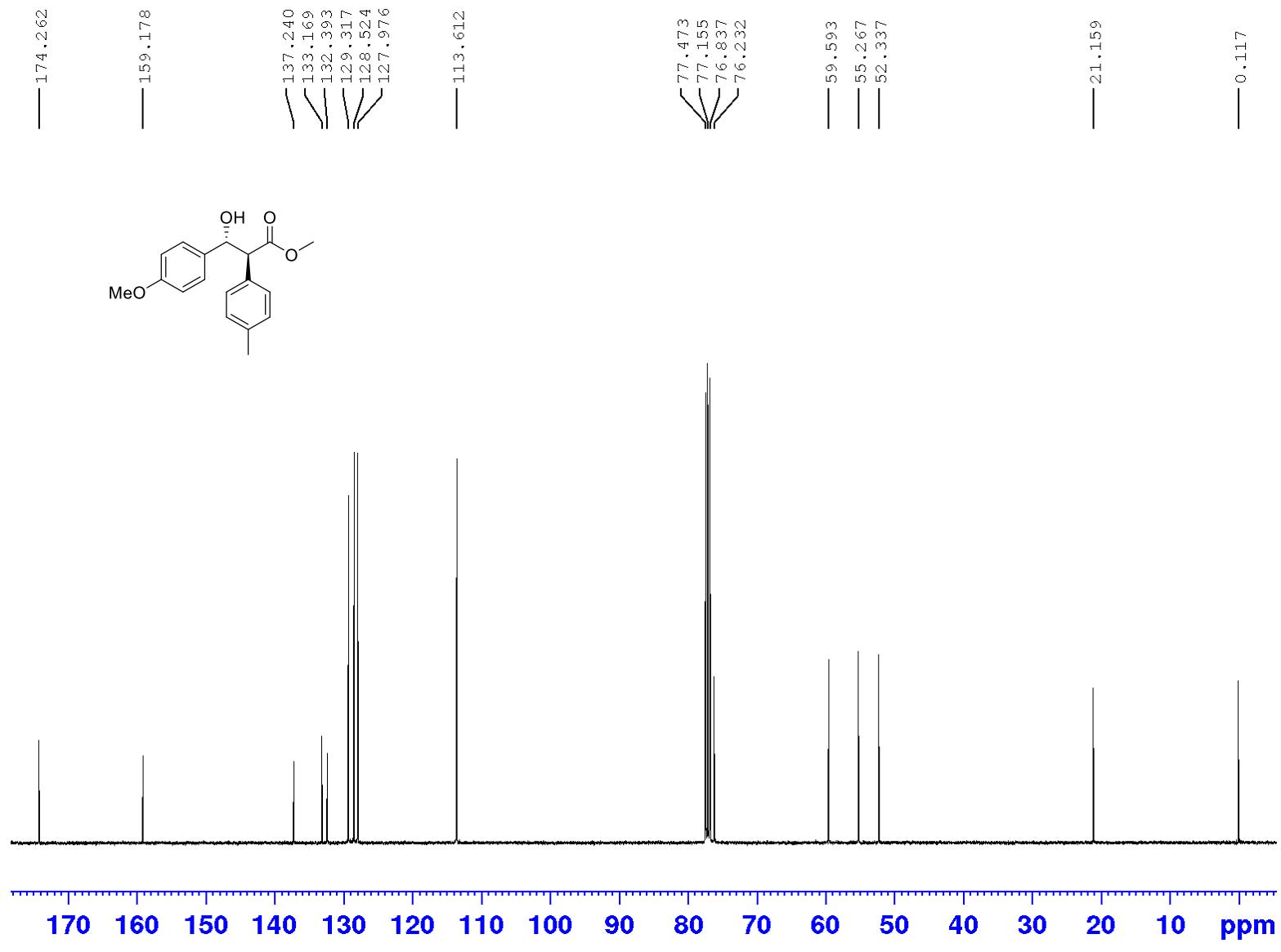
^1H NMR (400 MHz, CDCl_3) Spectrum of *syn*-methyl 3-hydroxy-3-(4-methoxyphenyl)-2-*p*-tolylpropanoate (**7c**)



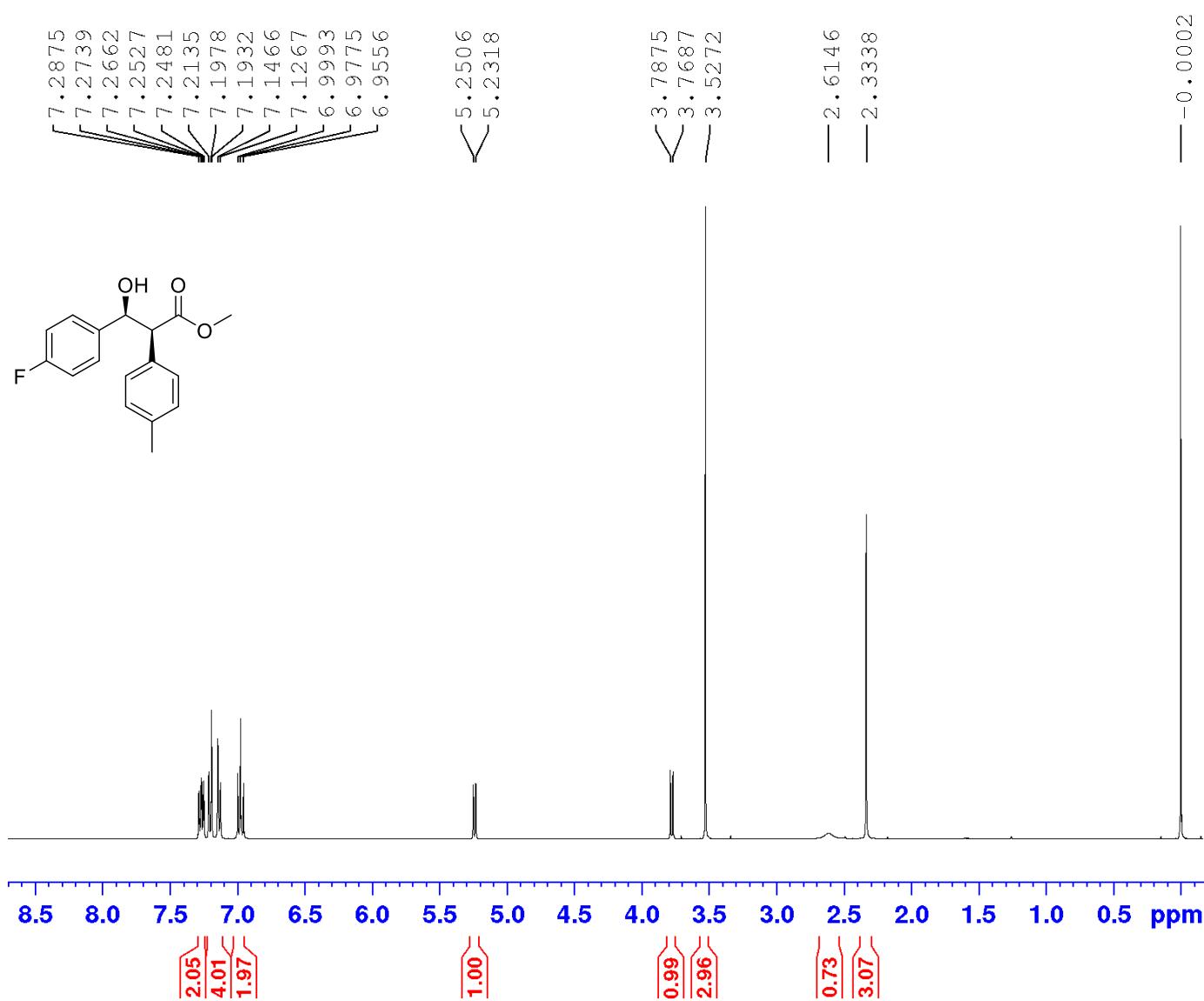
$^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3) Spectrum of *syn*-methyl 3-hydroxy-3-(4-methoxyphenyl)-2-*p*-tolylpropanoate (**7c**)



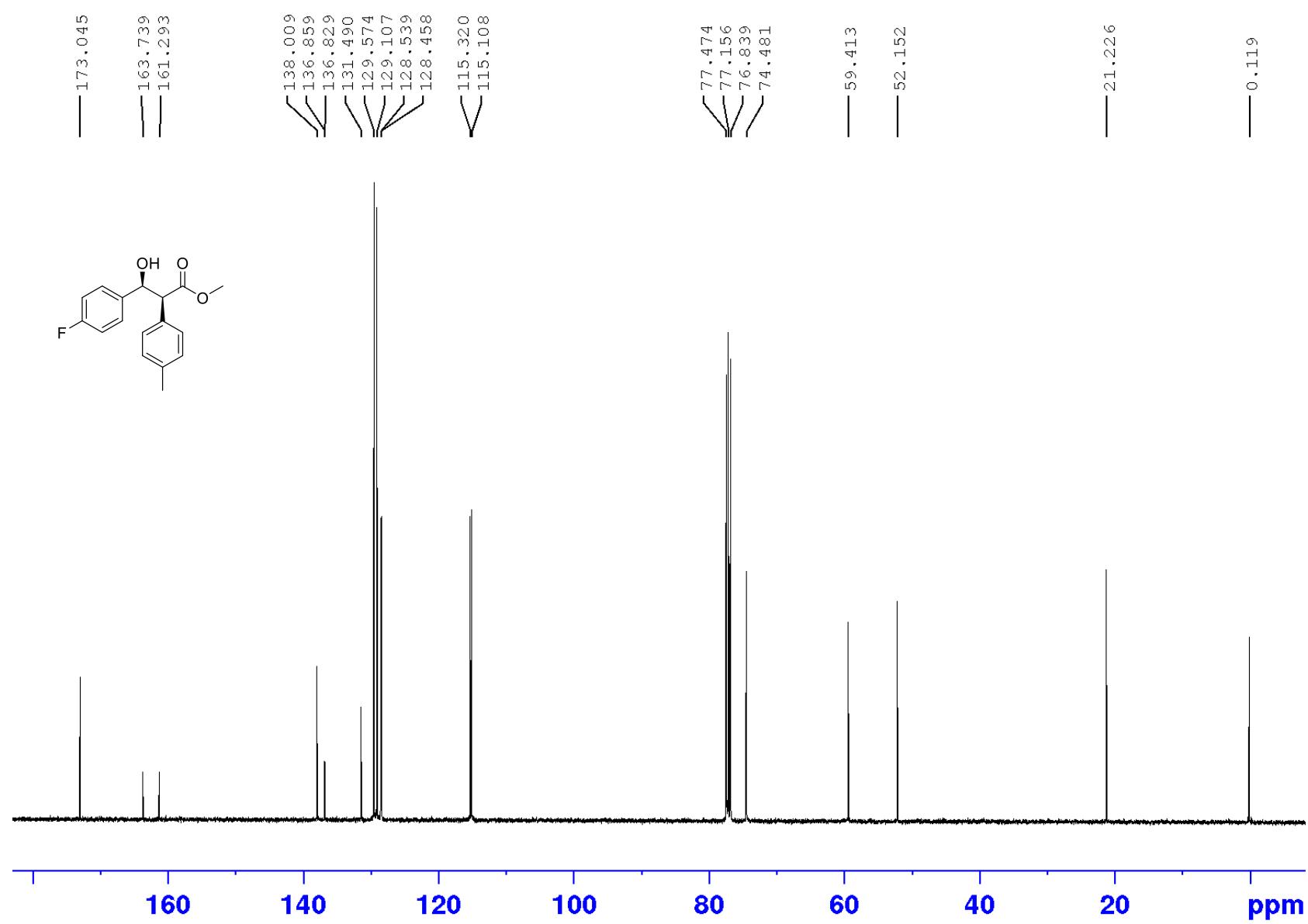
¹H NMR (400 MHz, CDCl₃) Spectrum of *anti*-methyl 3-hydroxy-3-(4-methoxyphenyl)-2-*p*-tolylpropanoate (**7c**)



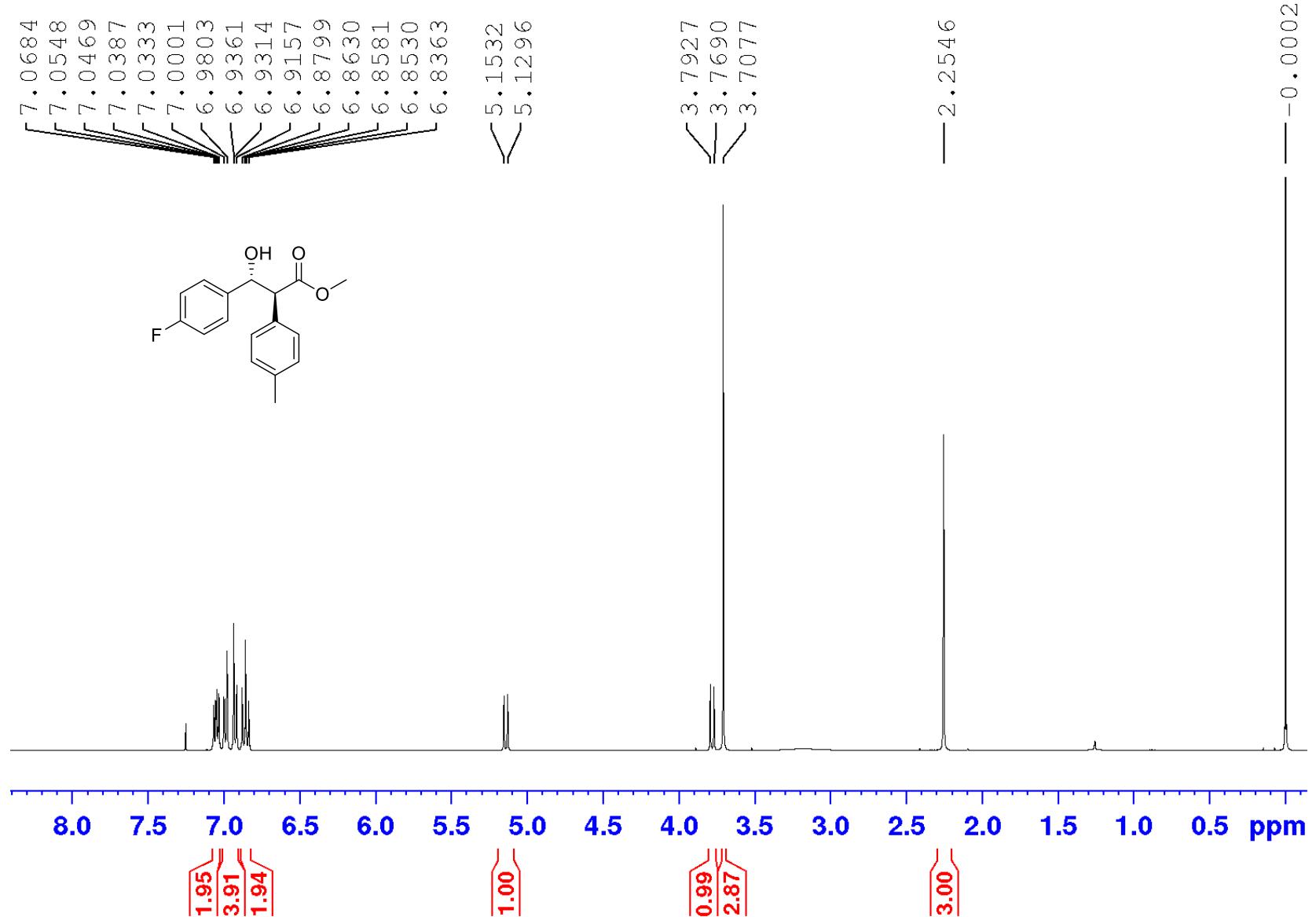
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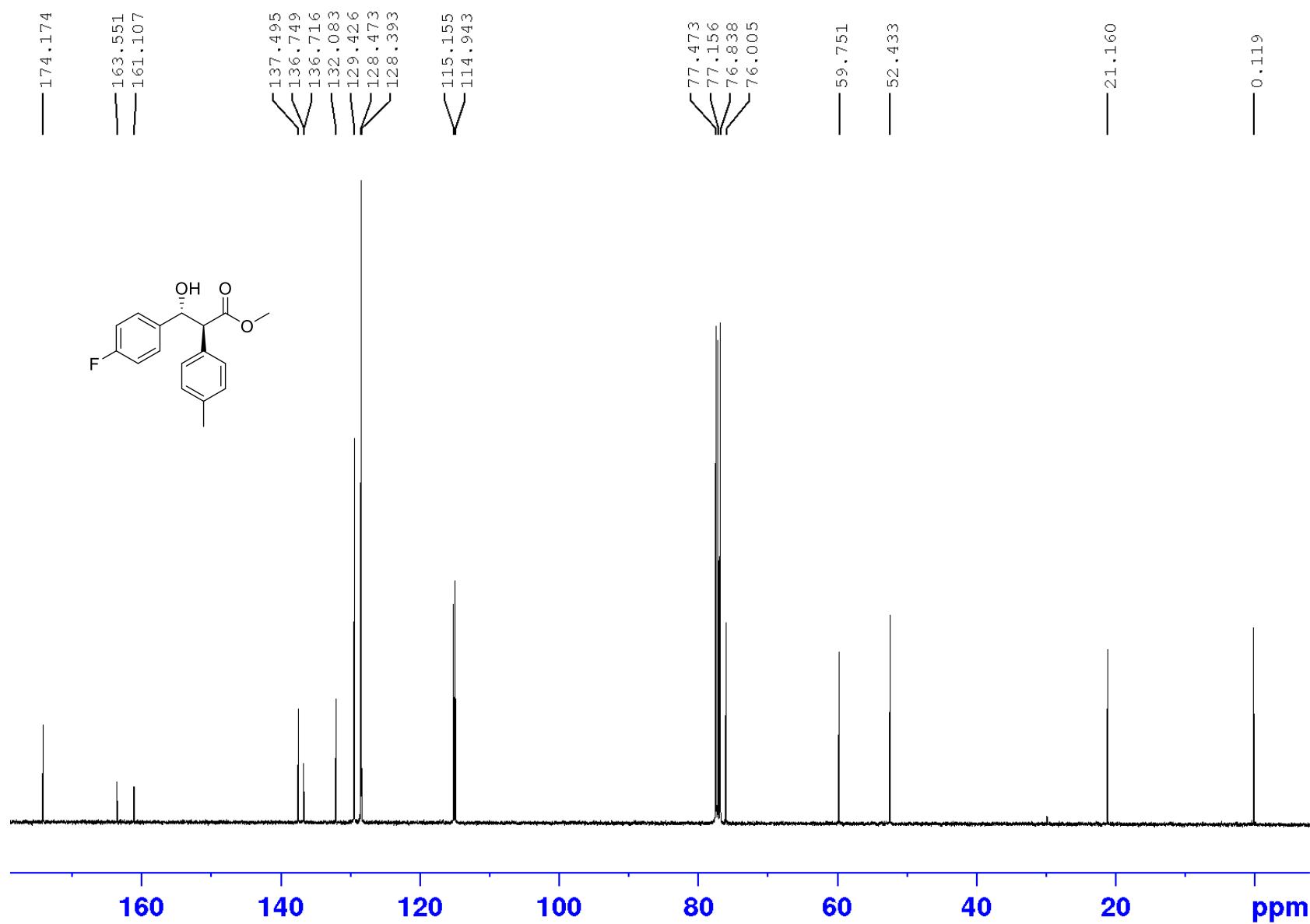
¹H NMR (400 MHz, CDCl₃) Spectrum of *syn*-methyl 3-(4-fluorophenyl)-3-hydroxy-2-*p*-tolylpropanoate (**7d**)



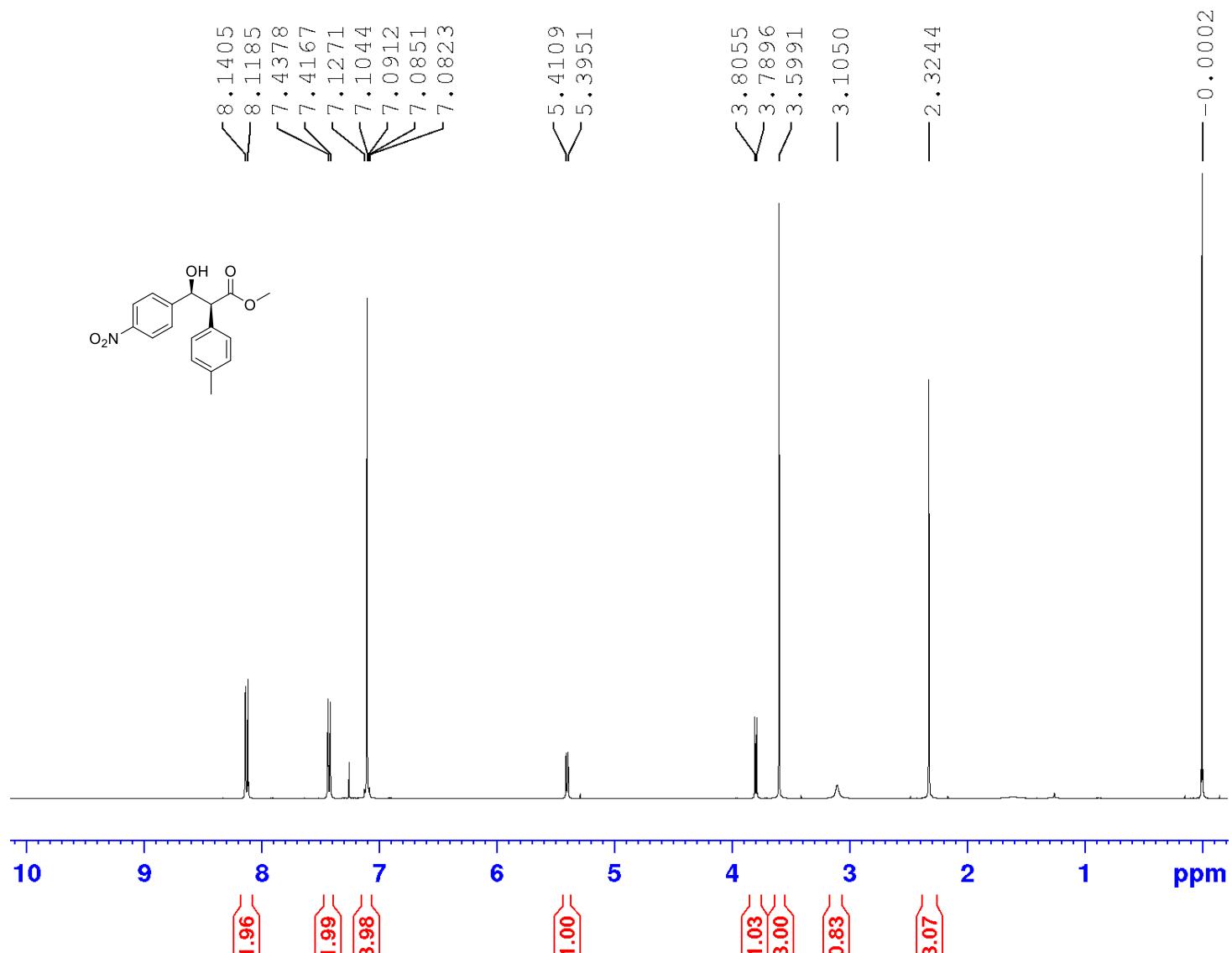
$^{13}\text{C}\{\text{H}\}$ NMR (100 MHz, CDCl_3) Spectrum of *syn*-methyl 3-(4-fluorophenyl)-3-hydroxy-2-*p*-tolylpropanoate (**7d**)

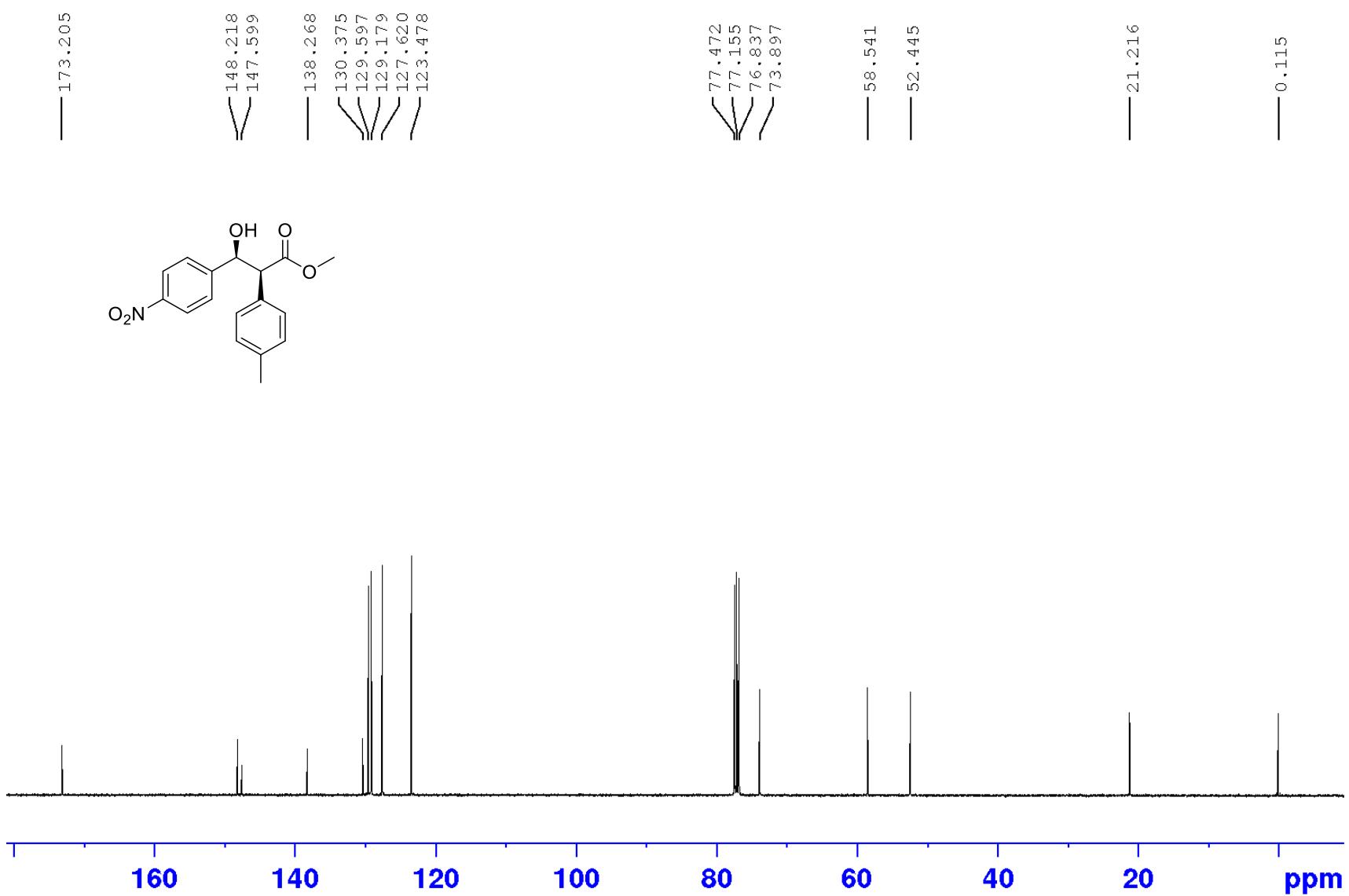


¹H NMR (400 MHz, CDCl₃) spectrum of *anti*-methyl 3-(4-fluorophenyl)-3-hydroxy-2-*p*-tolylpropanoate (**7d**)

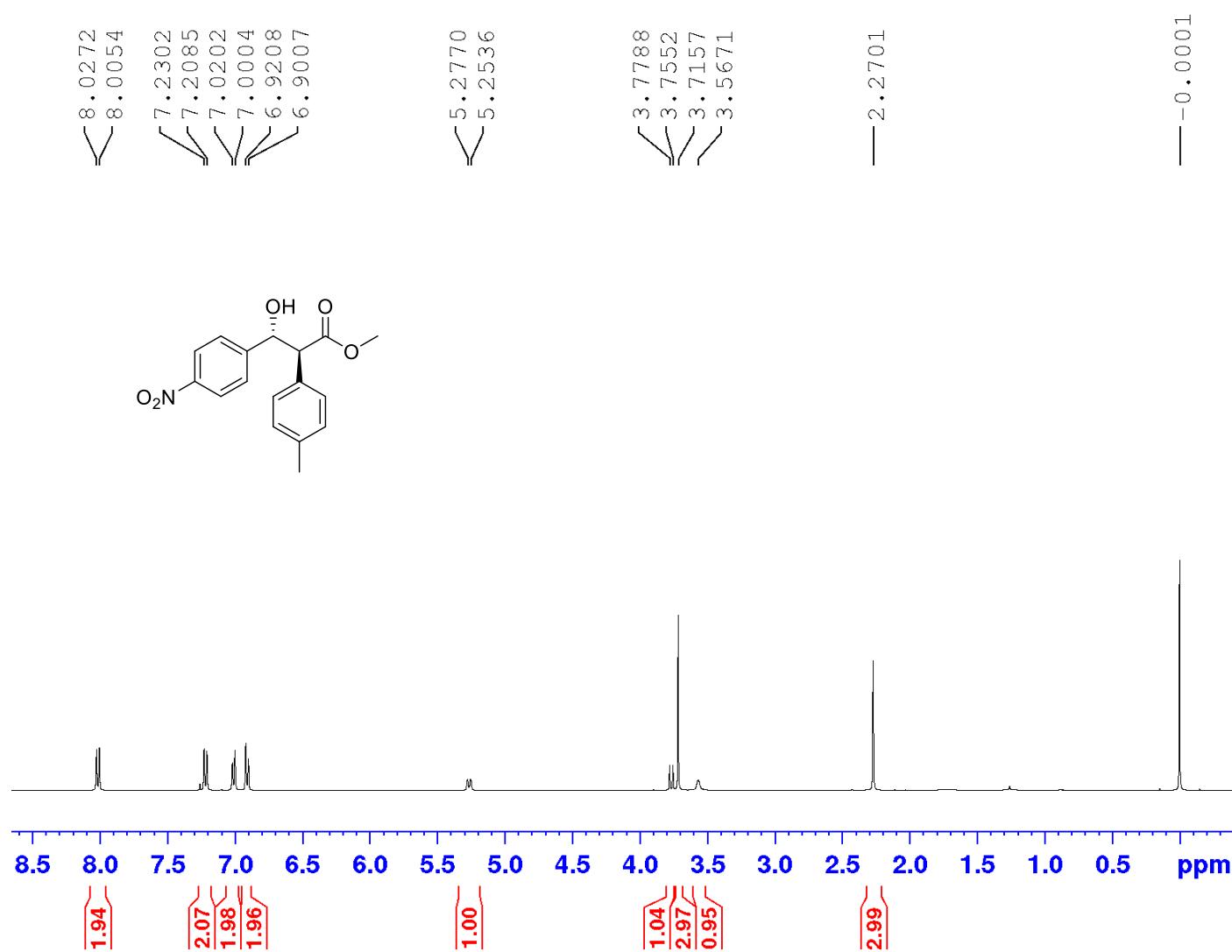


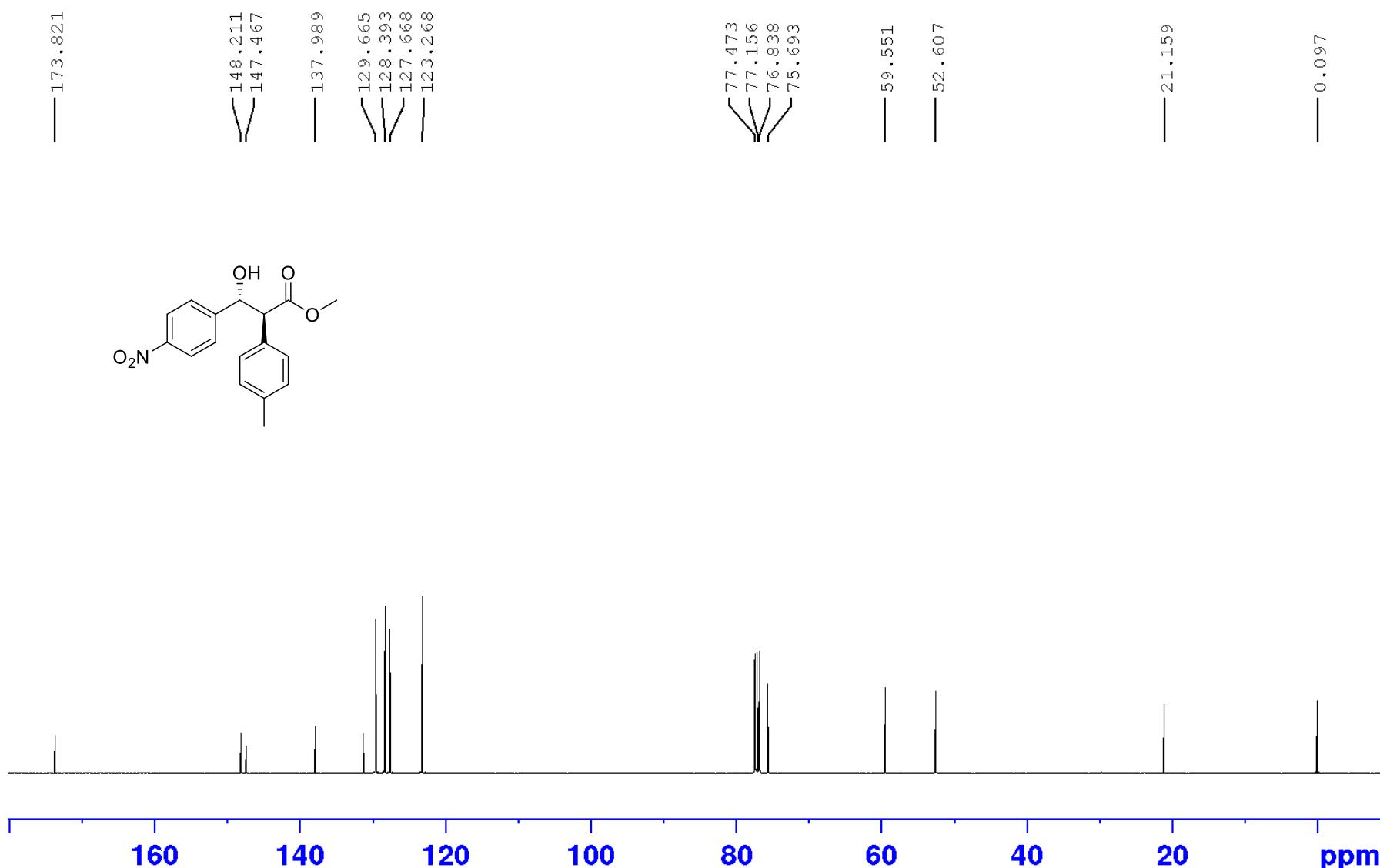
$^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3) Spectrum of *anti*-methyl 3-(4-fluorophenyl)-3-hydroxy-2-*p*-tolylpropanoate (**7d**)

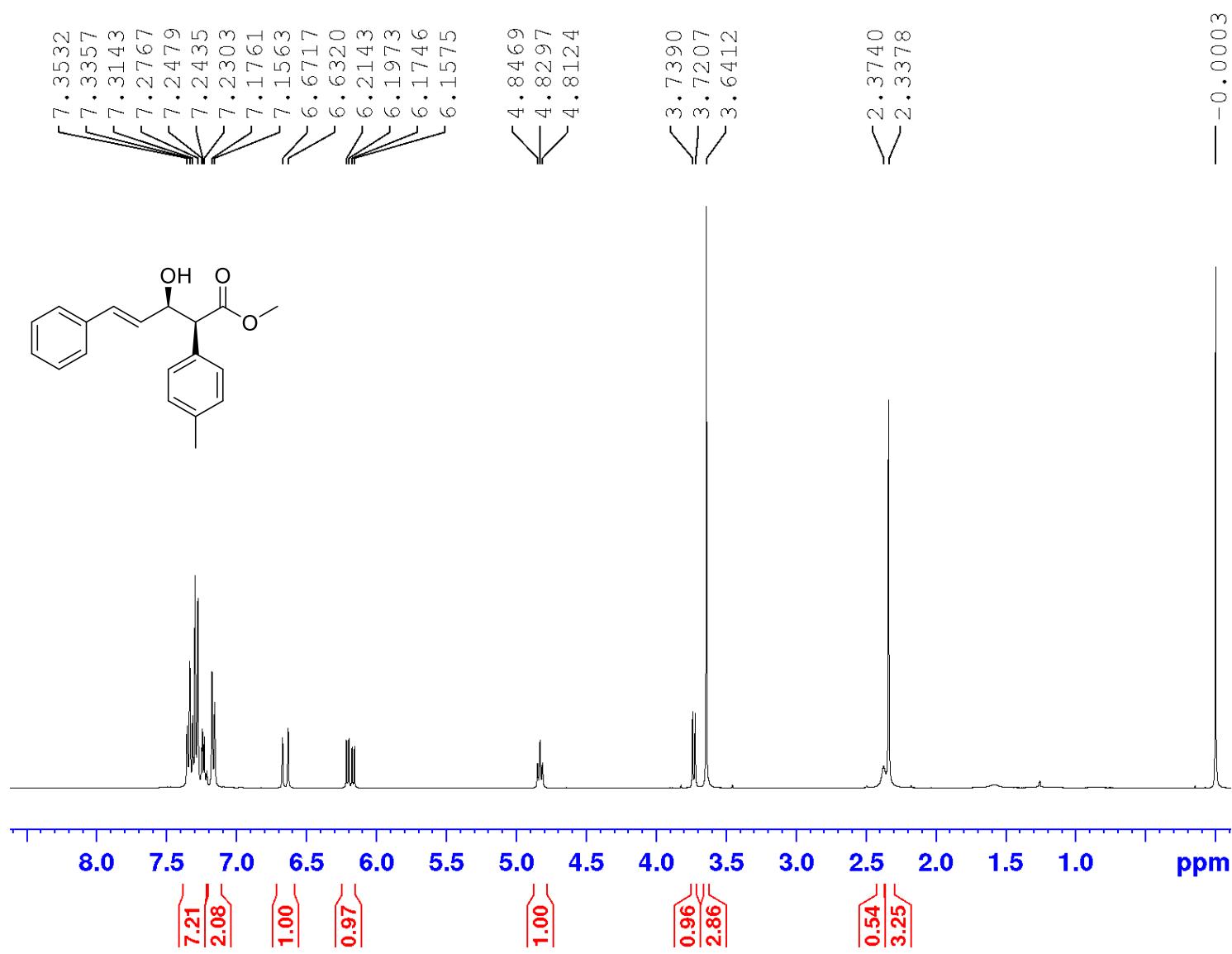




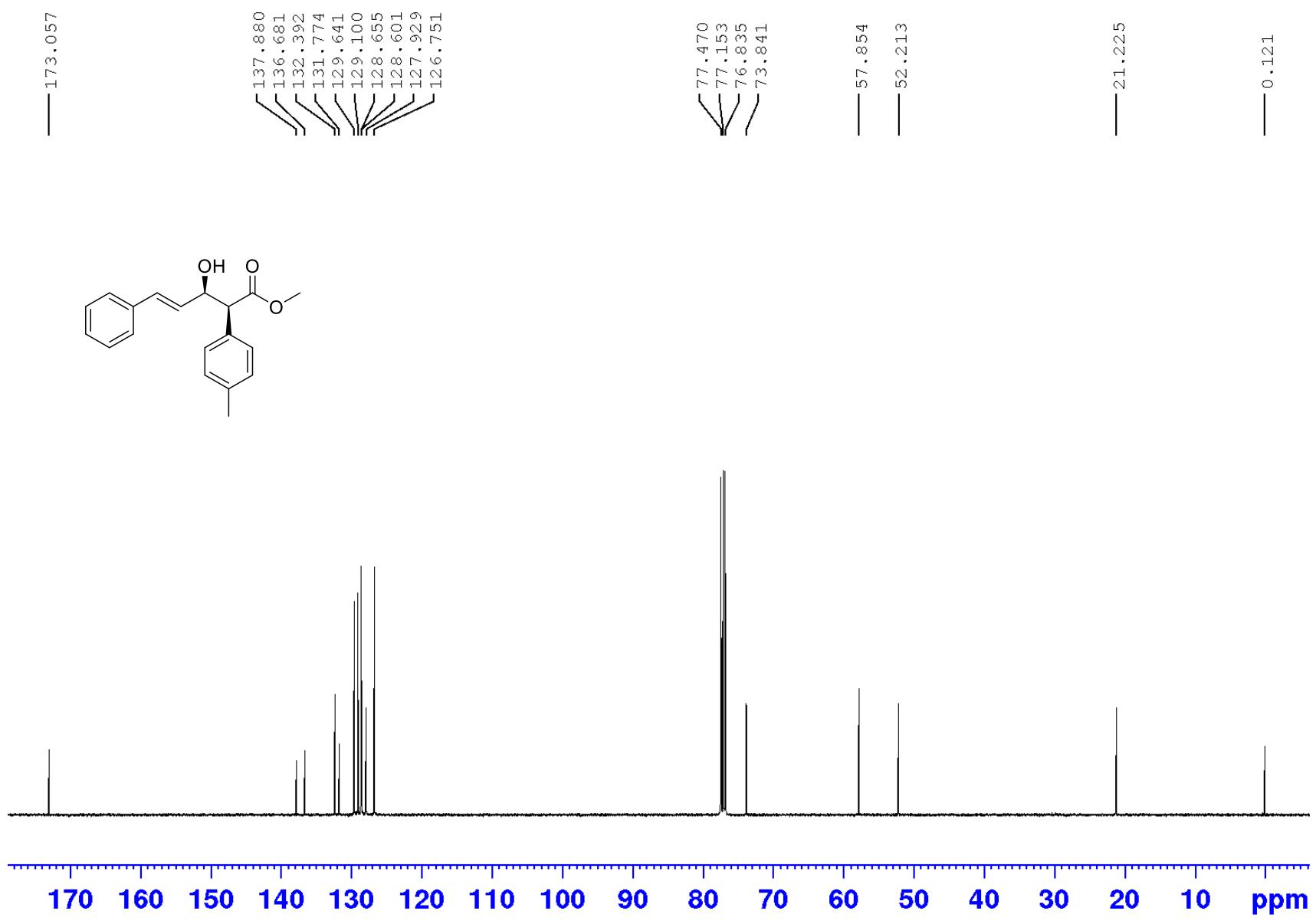
$^{13}\text{C}\{\text{H}\}$ NMR (100 MHz, CDCl_3) Spectrum of *syn*-methyl 3-hydroxy-3-(4-nitrophenyl)-2-*p*-tolylpropanoate (**7e**)



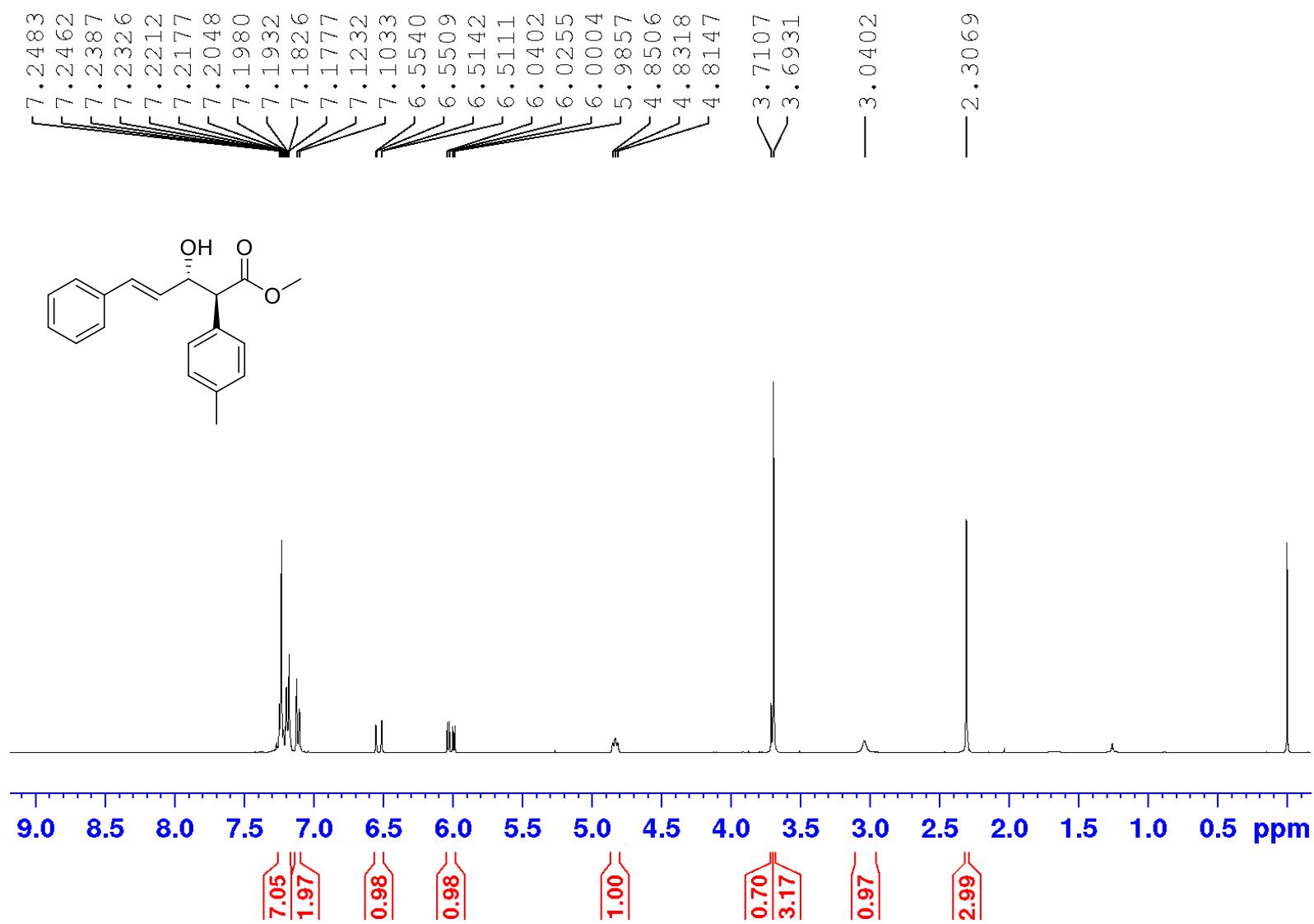


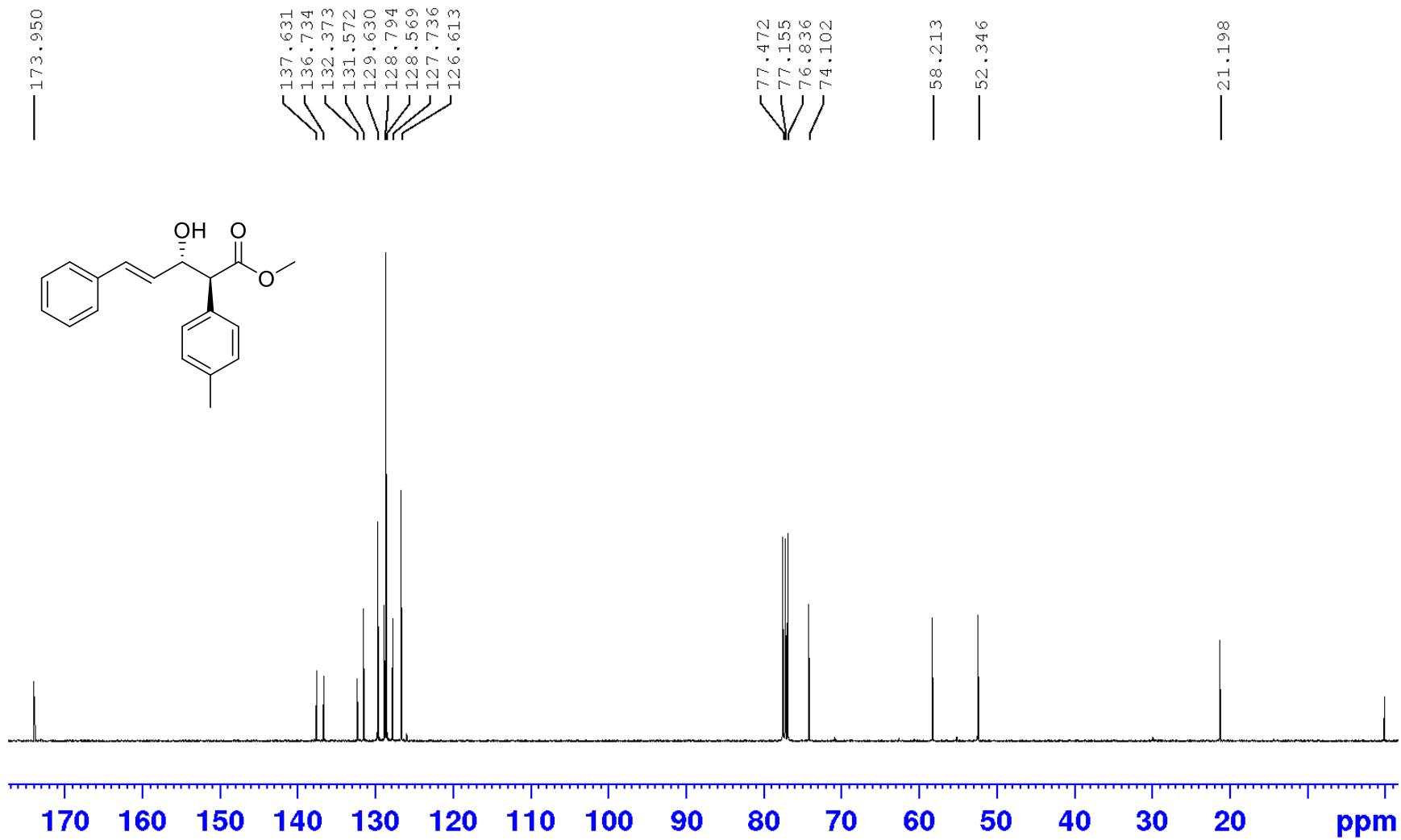


^1H NMR (400 MHz, CDCl_3) Spectrum of *syn*-(*E*)-methyl 3-hydroxy-5-phenyl-2-*p*-tolylpent-4-enoate (**7f**)

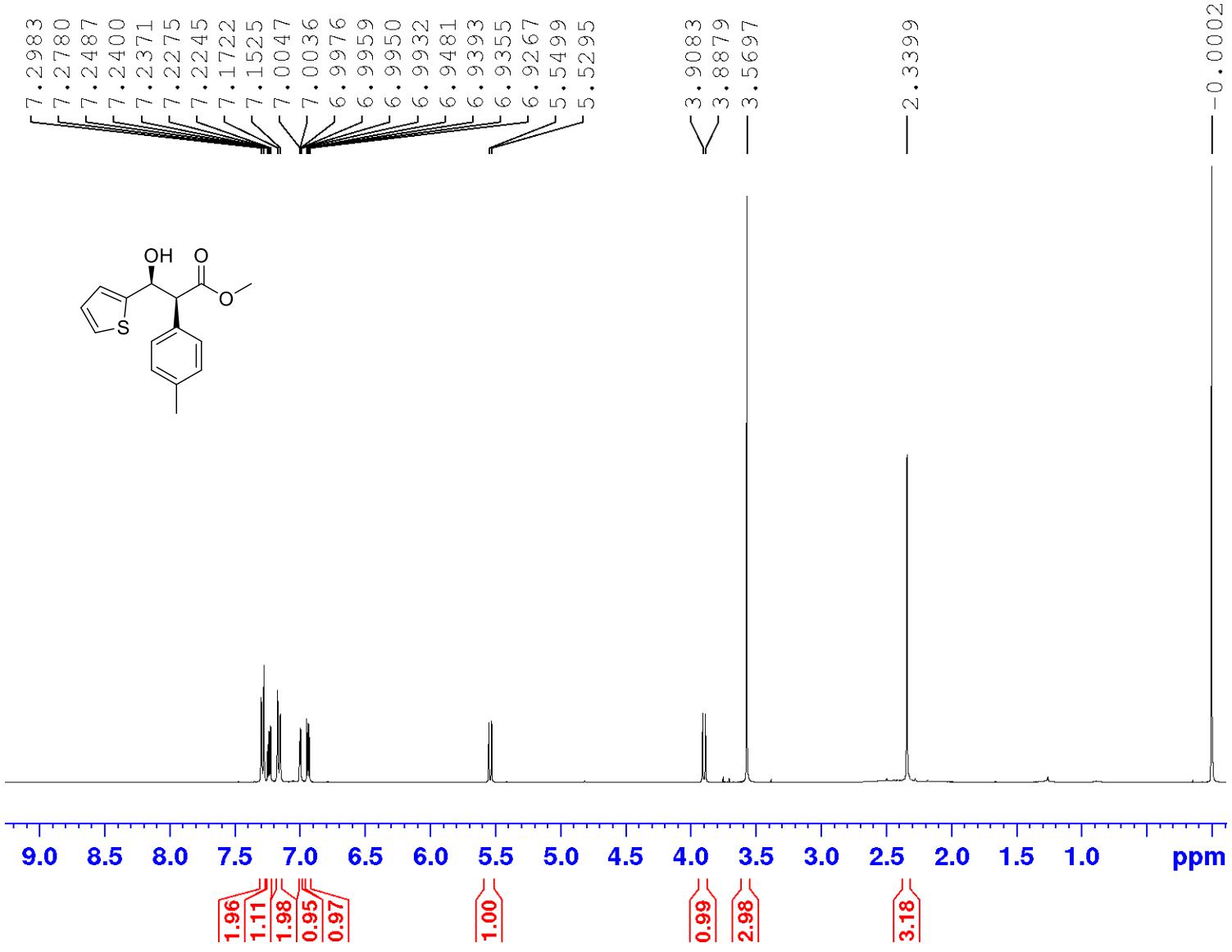


$^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3) Spectrum of *syn*-(*E*)-methyl 3-hydroxy-5-phenyl-2-*p*-tolylpent-4-enoate (**7f**)

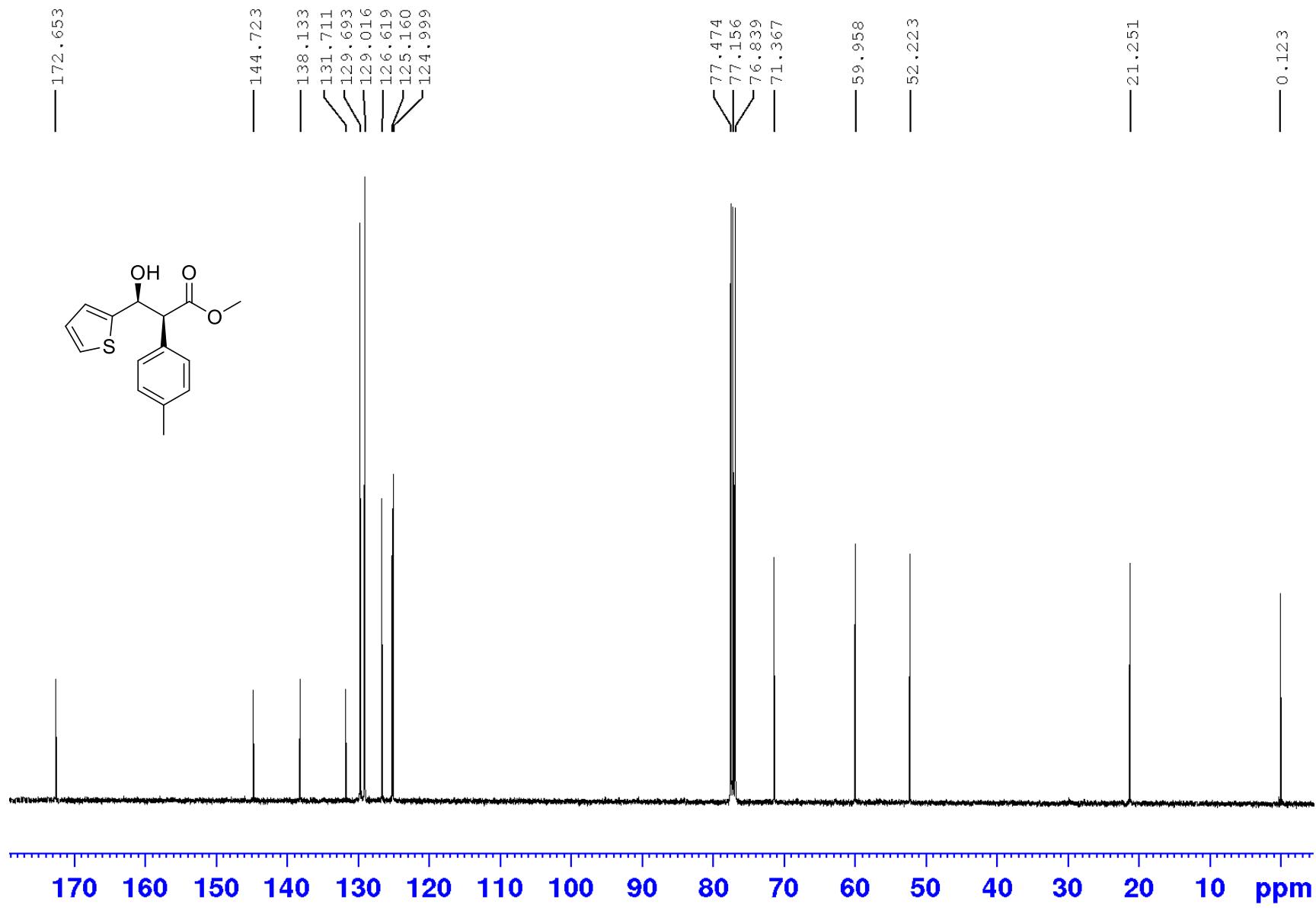


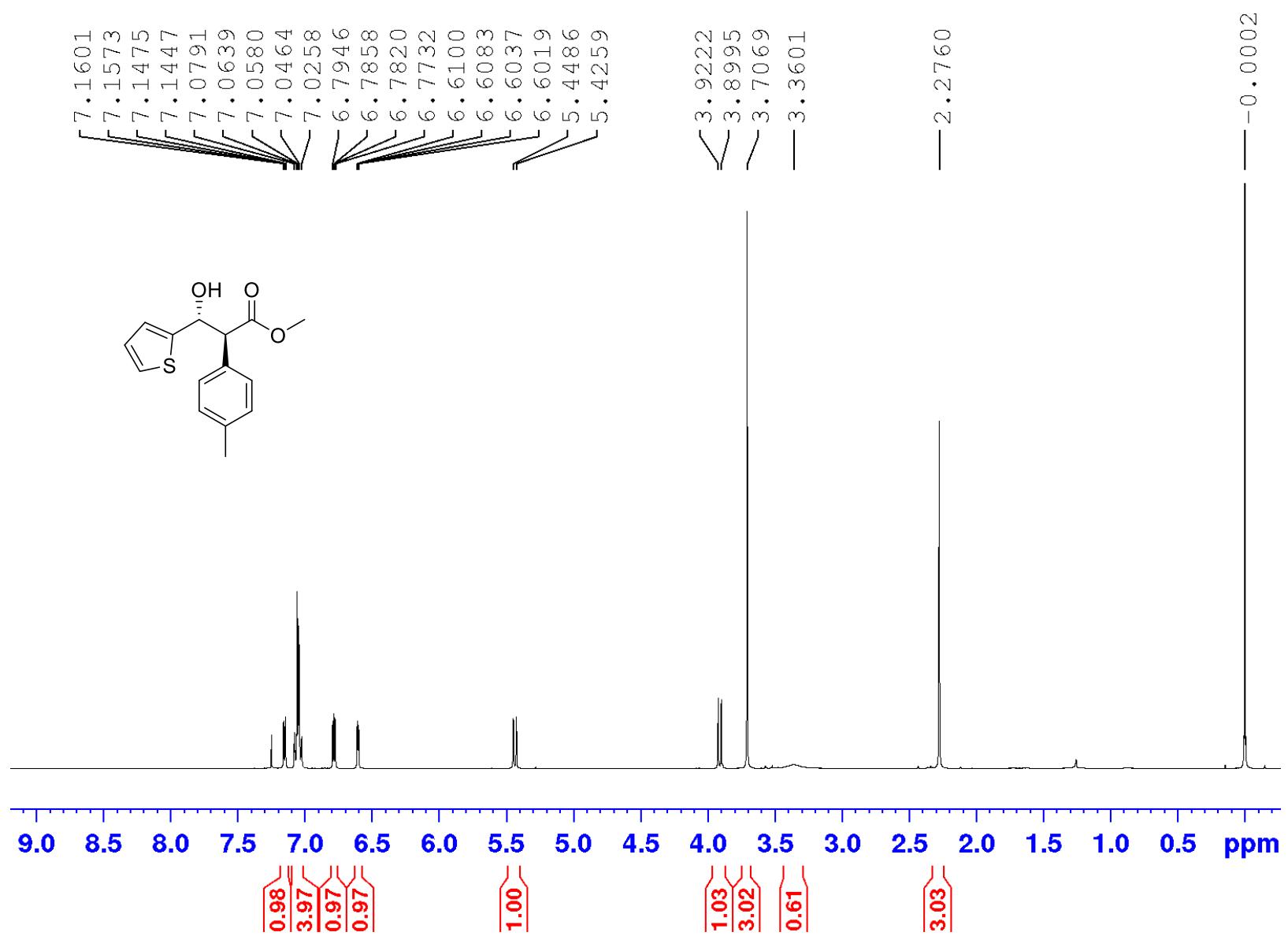


$^{13}\text{C}\{\text{H}\}$ NMR (100 MHz, CDCl_3) Spectrum of *anti*-(*E*)-methyl 3-hydroxy-5-phenyl-2-*p*-tolylpent-4-enoate (**7f**)

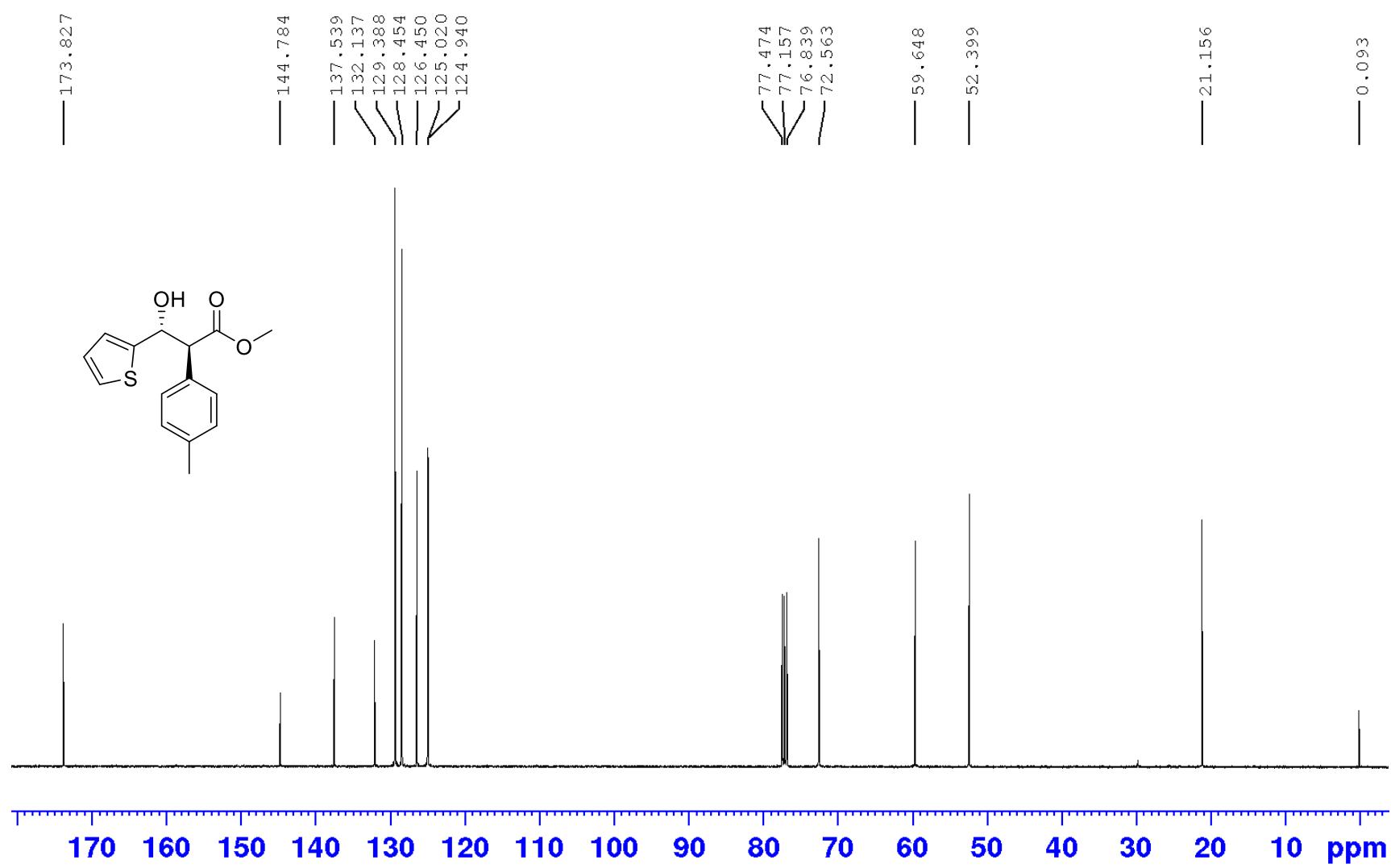


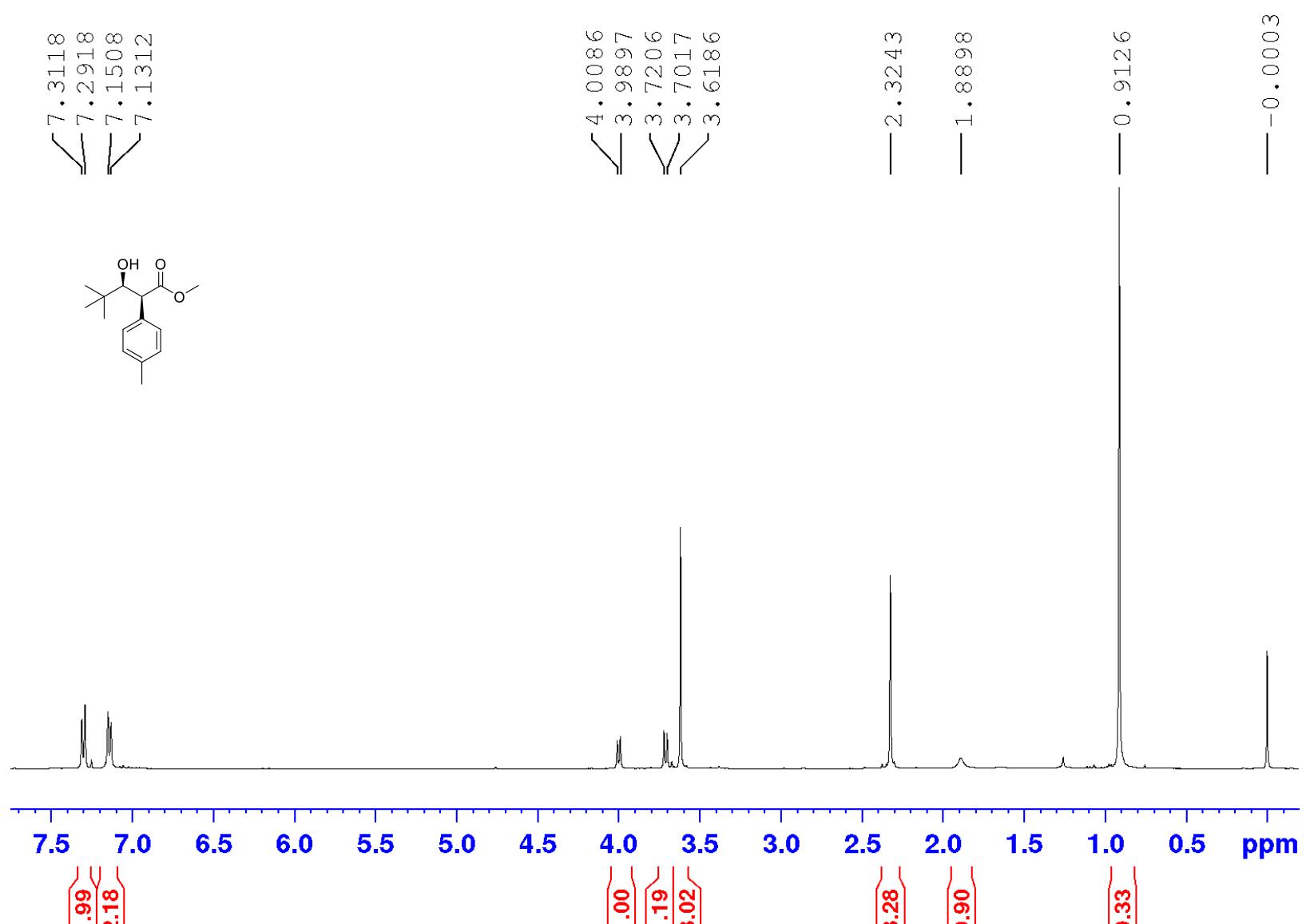
¹H NMR (400 MHz, CDCl₃) Spectrum of *syn*-methyl 3-hydroxy-3-(thiophen-2-yl)-2-*p*-tolylpropanoate (**7g**)

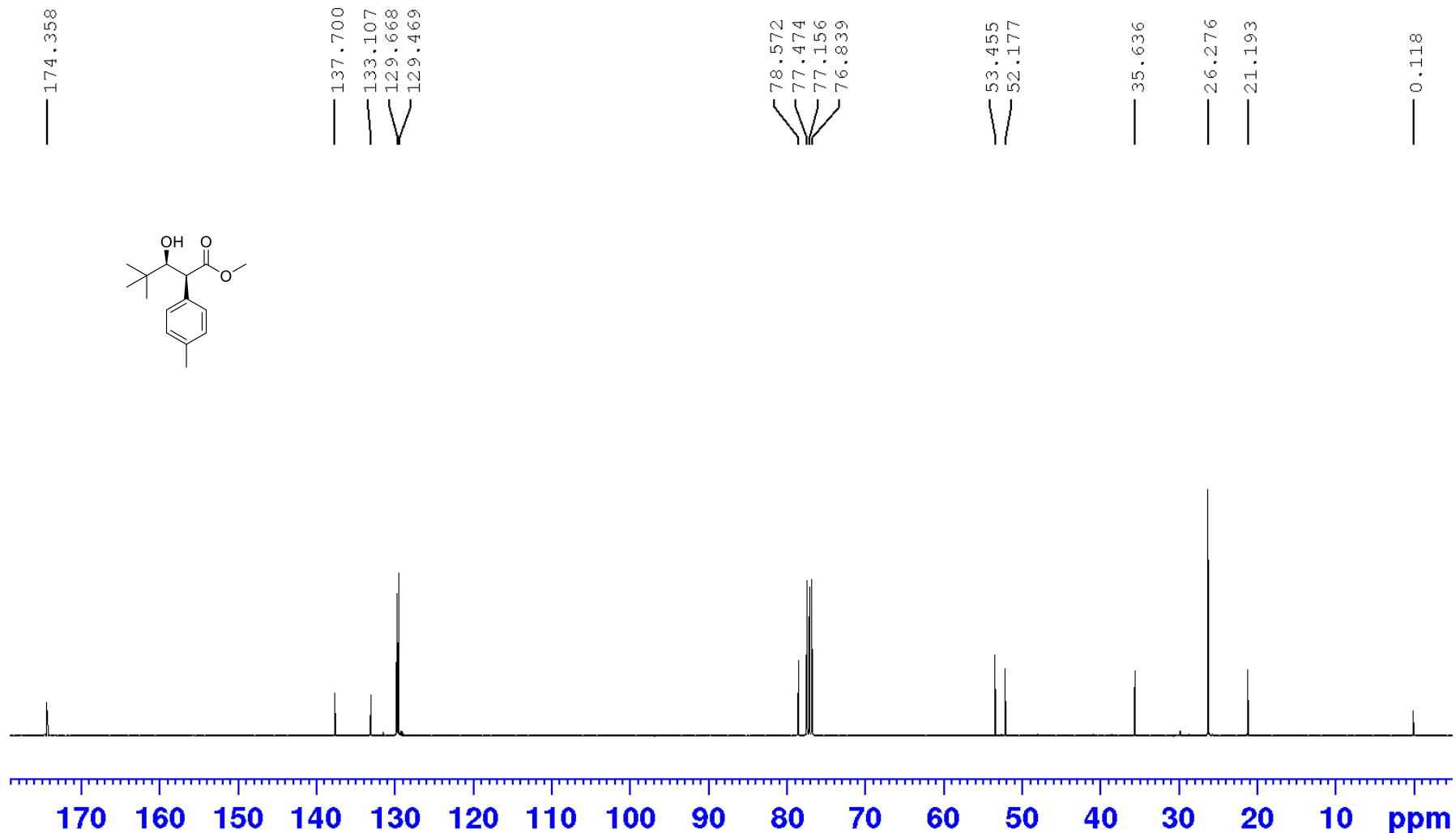




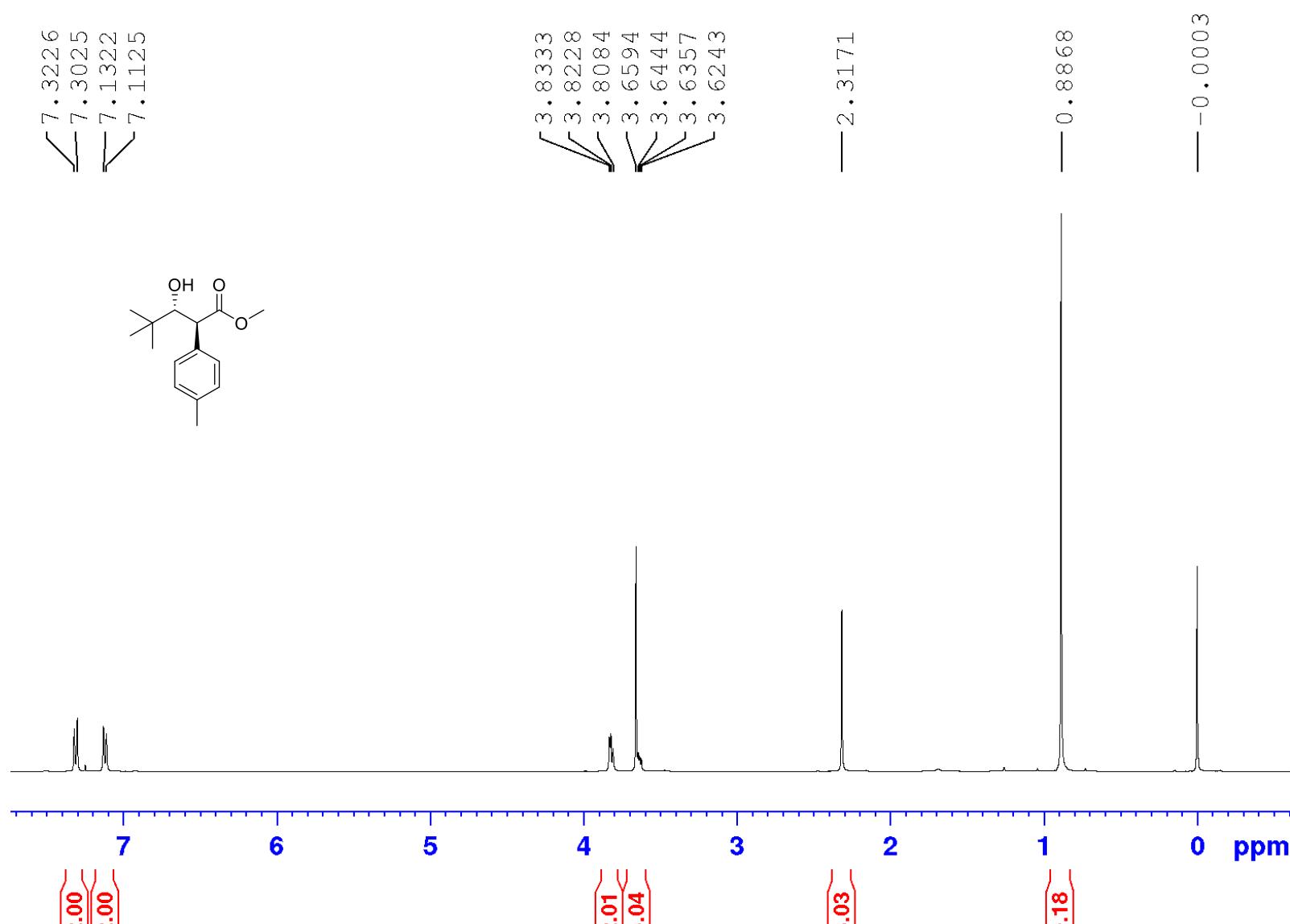
¹H NMR (400 MHz, CDCl₃) Spectrum of *anti*-methyl 3-hydroxy-3-(thiophen-2-yl)-2-*p*-tolylpropanoate (**7g**)



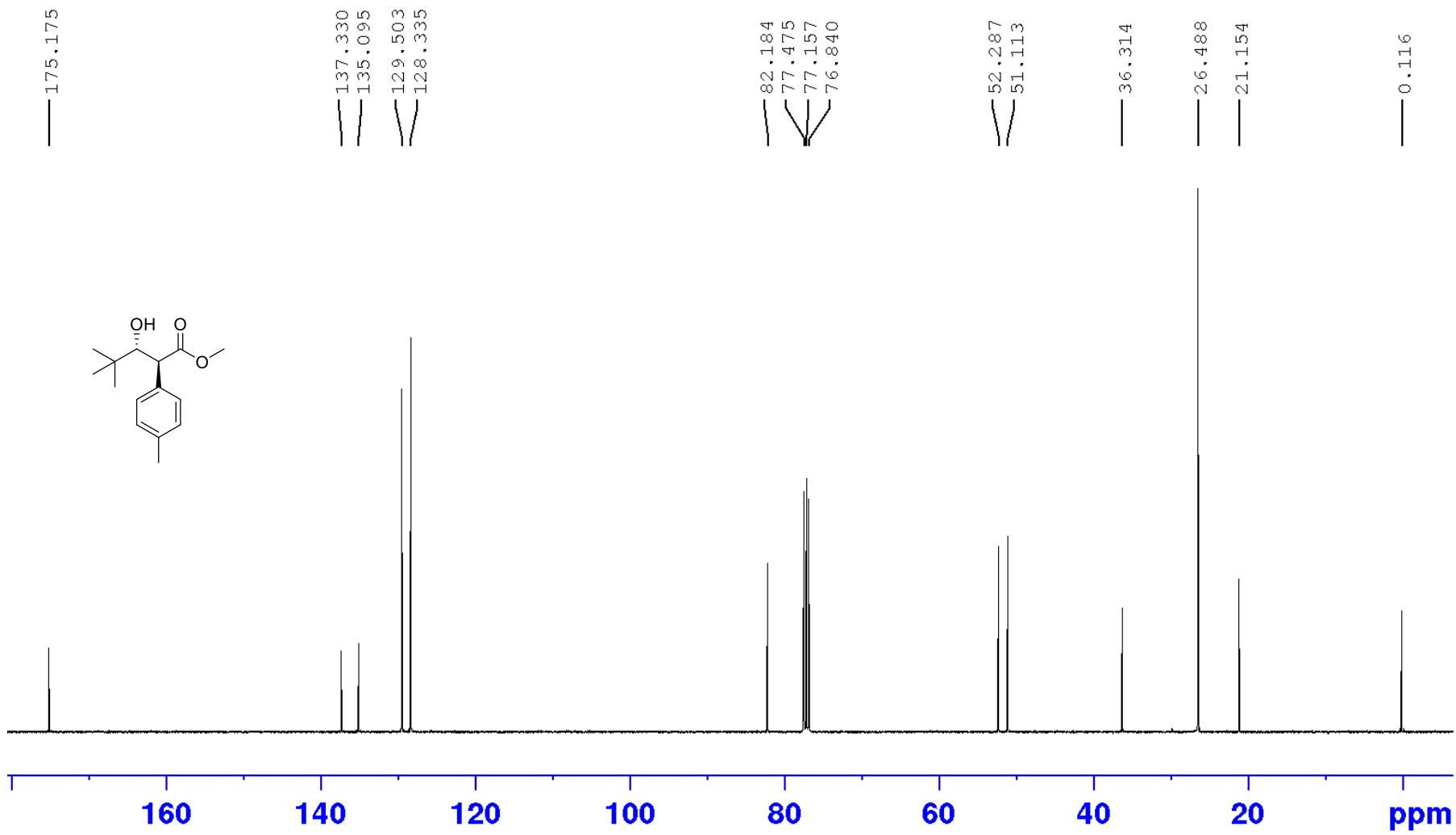




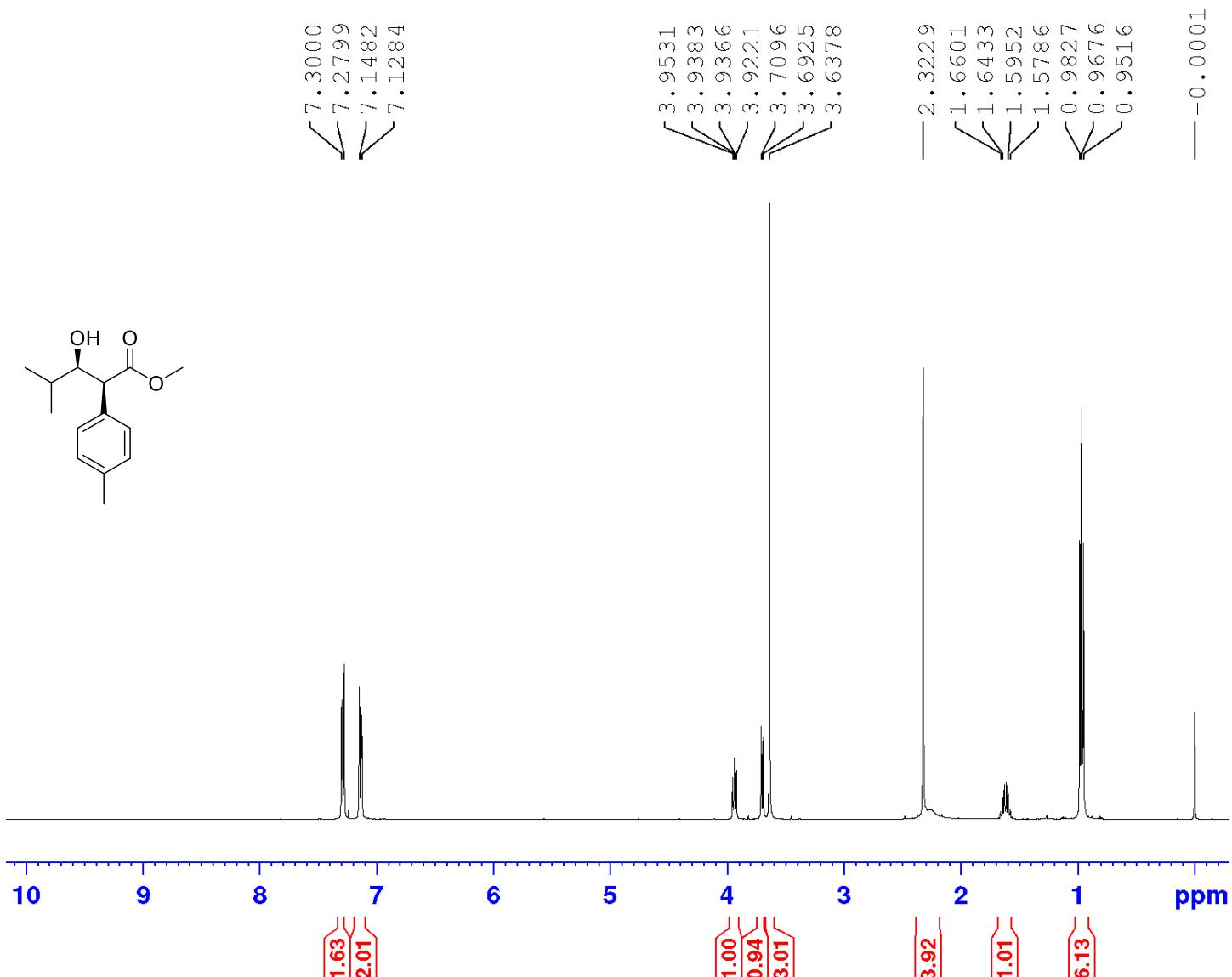
$^{13}\text{C}\{\text{H}\}$ NMR (100 MHz, CDCl_3) Spectrum of *syn*-methyl 3-hydroxy-4,4-dimethyl-2-*p*-tolylpentanoate (**7h**)



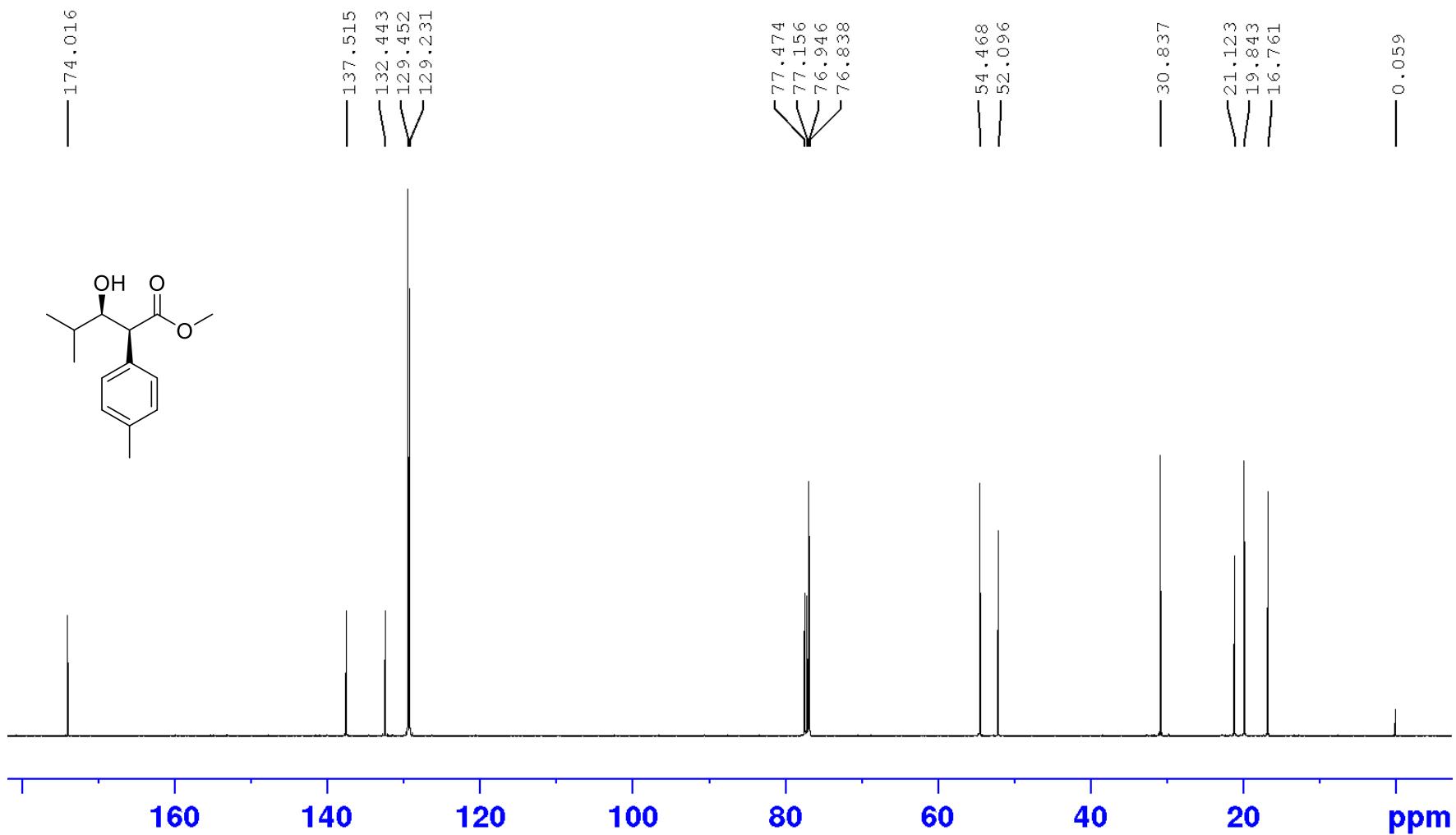
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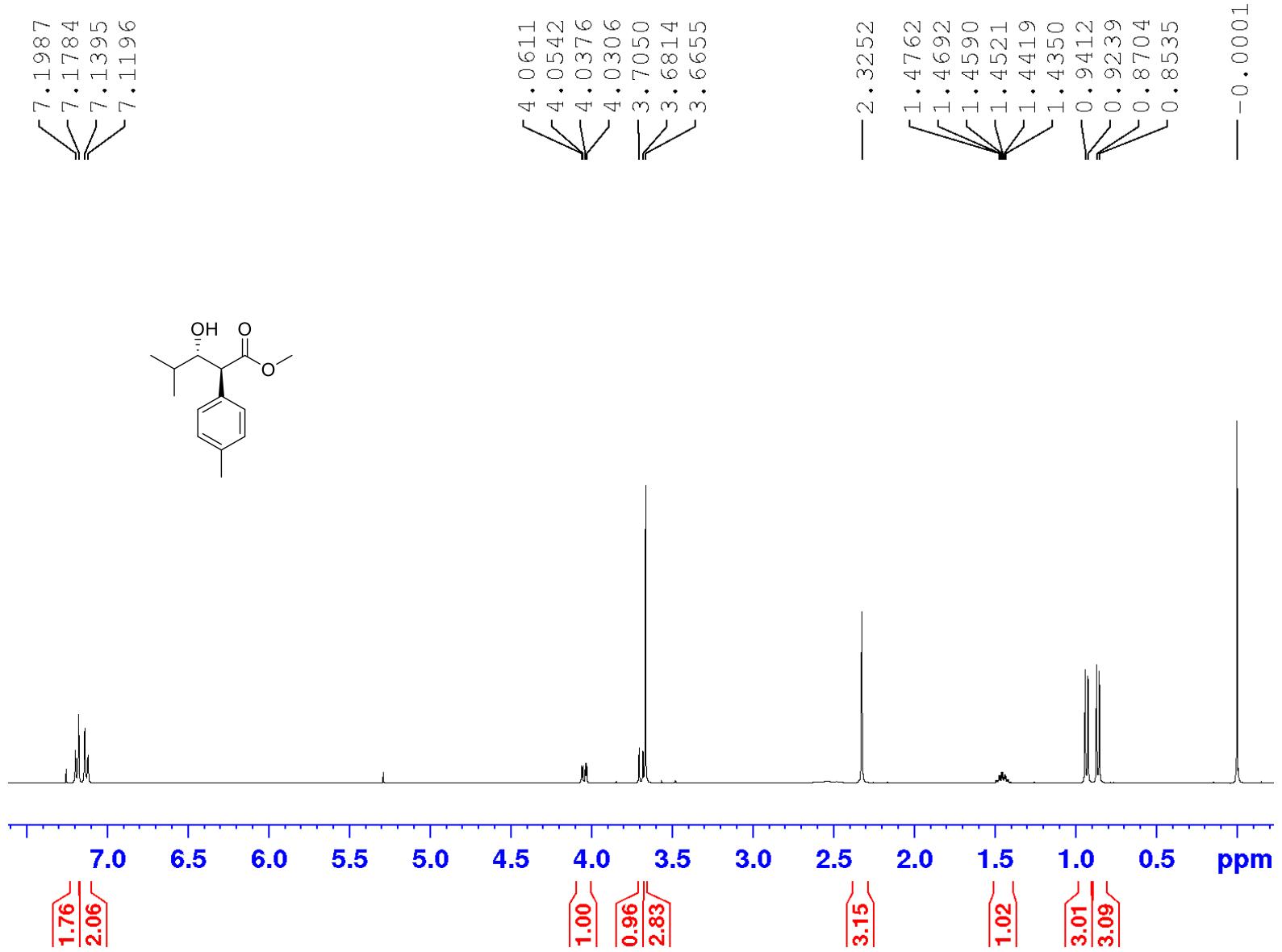
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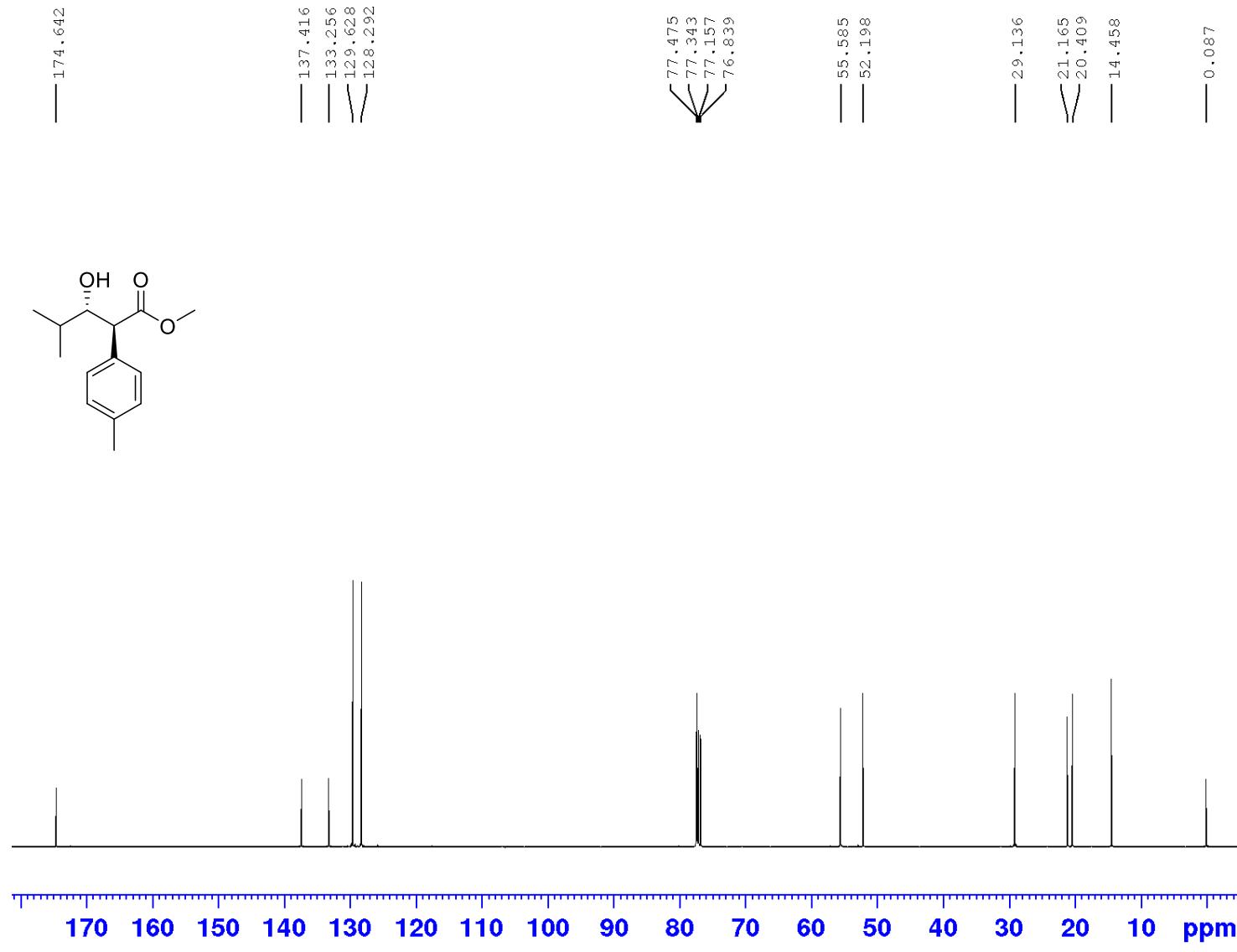
¹H NMR (400 MHz, CDCl₃) Spectrum of *syn*-methyl 3-hydroxy-4-methyl-2-*p*-tolylpentanoate (**7i**)



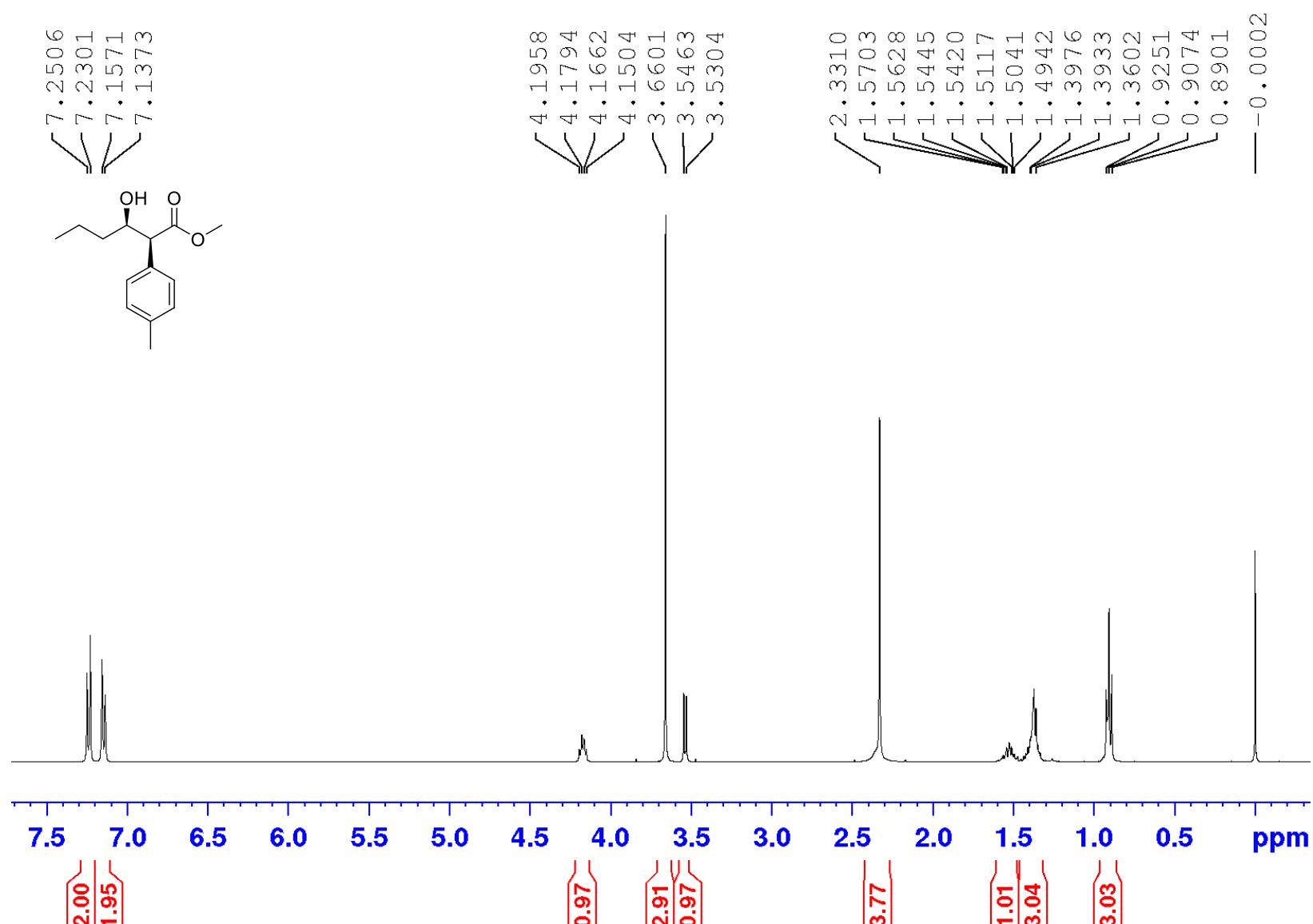
$^{13}\text{C}\{\text{H}\}$ NMR (100 MHz, CDCl_3) Spectrum of *syn*-methyl 3-hydroxy-4-methyl-2-*p*-tolylpentanoate (**7i**)



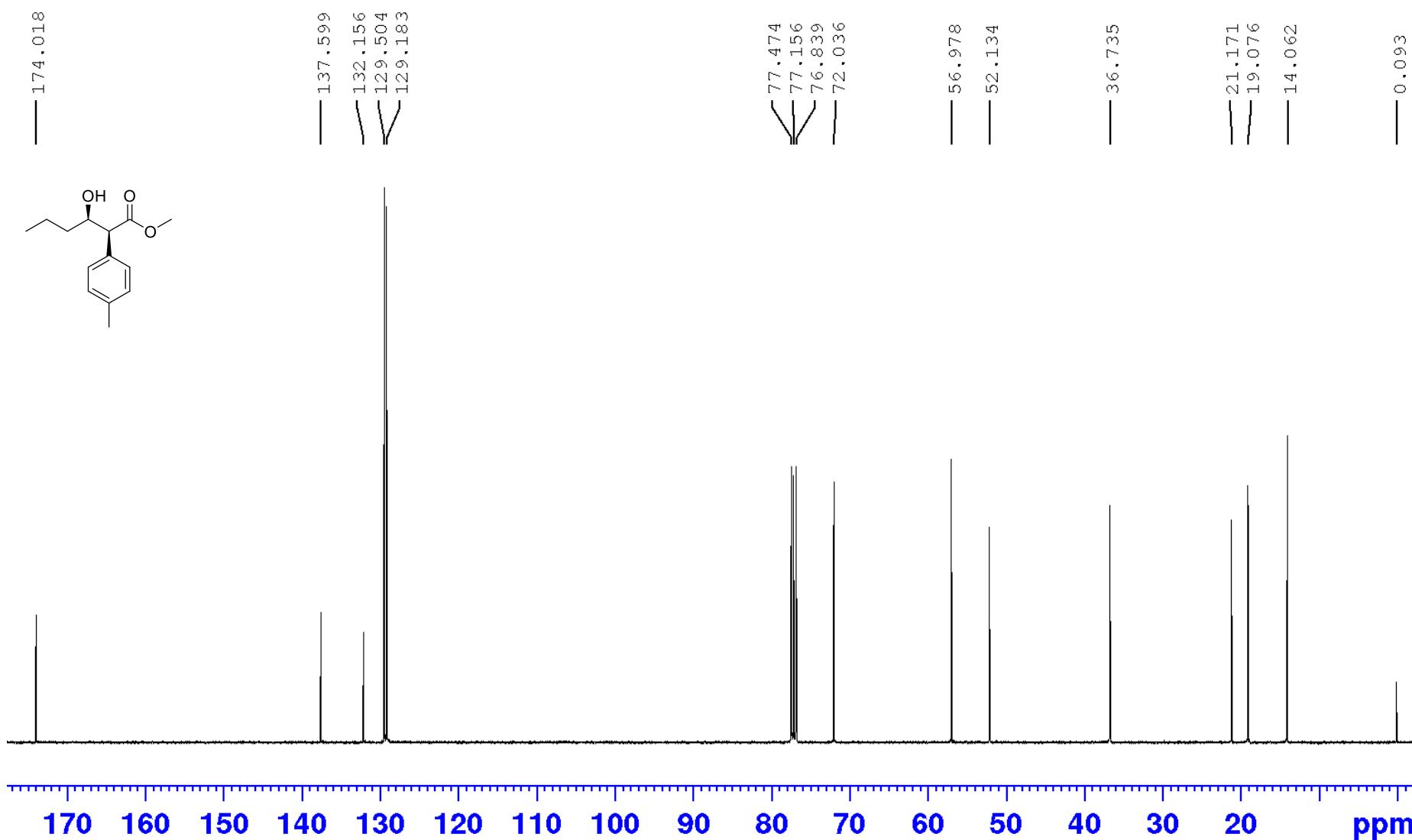
¹H NMR (400 MHz, CDCl₃) Spectrum of *anti*-methyl 3-hydroxy-4-methyl-2-*p*-tolylpentanoate (**7i**)



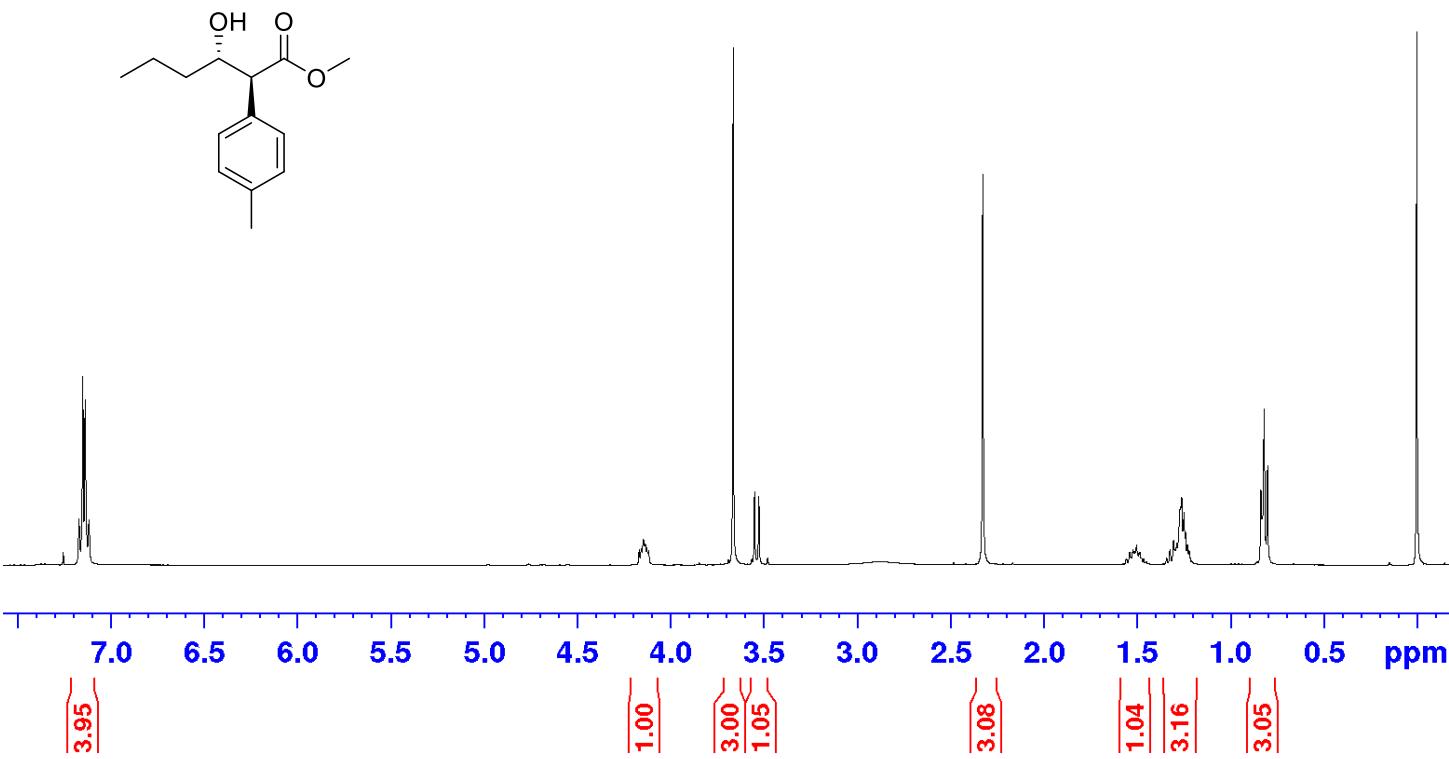
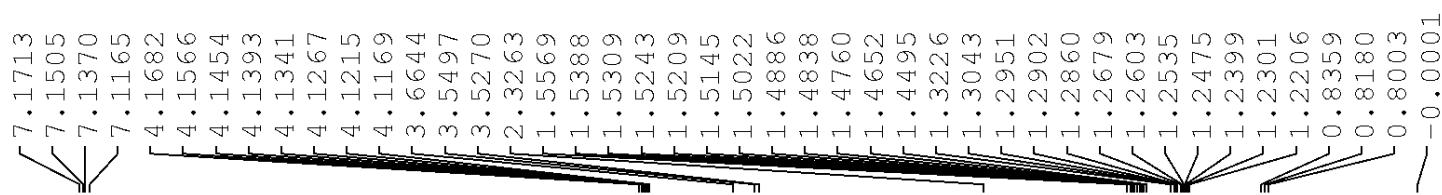
¹³C{¹H} NMR (100 MHz, CDCl₃) Spectrum of *anti*-methyl 3-hydroxy-4-methyl-2-*p*-tolylpentanoate (**7i**)



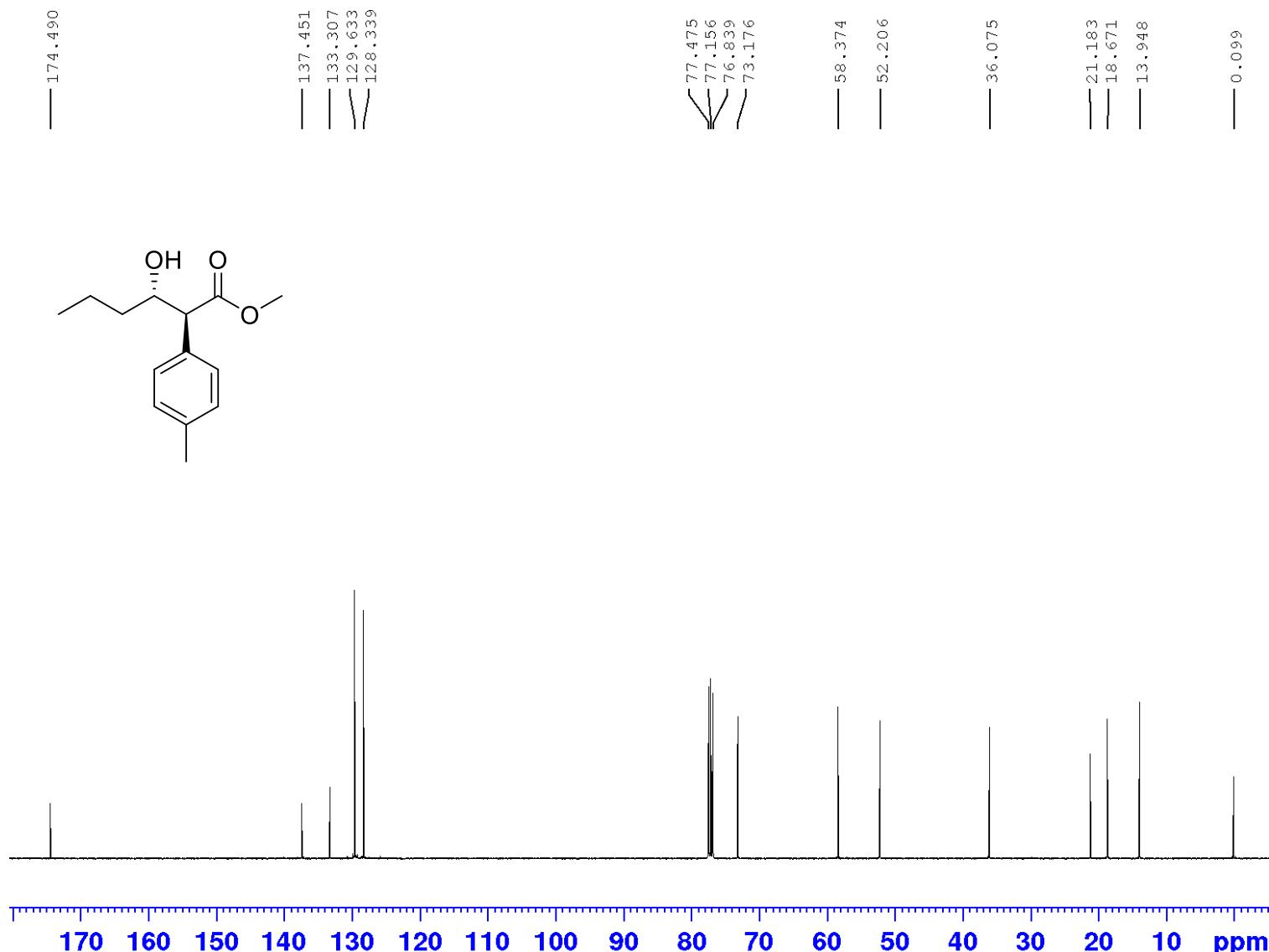
^1H NMR (400 MHz, CDCl_3) Spectrum of *syn*-methyl 3-hydroxy-2-*p*-tolylhexanoate (**7j**)



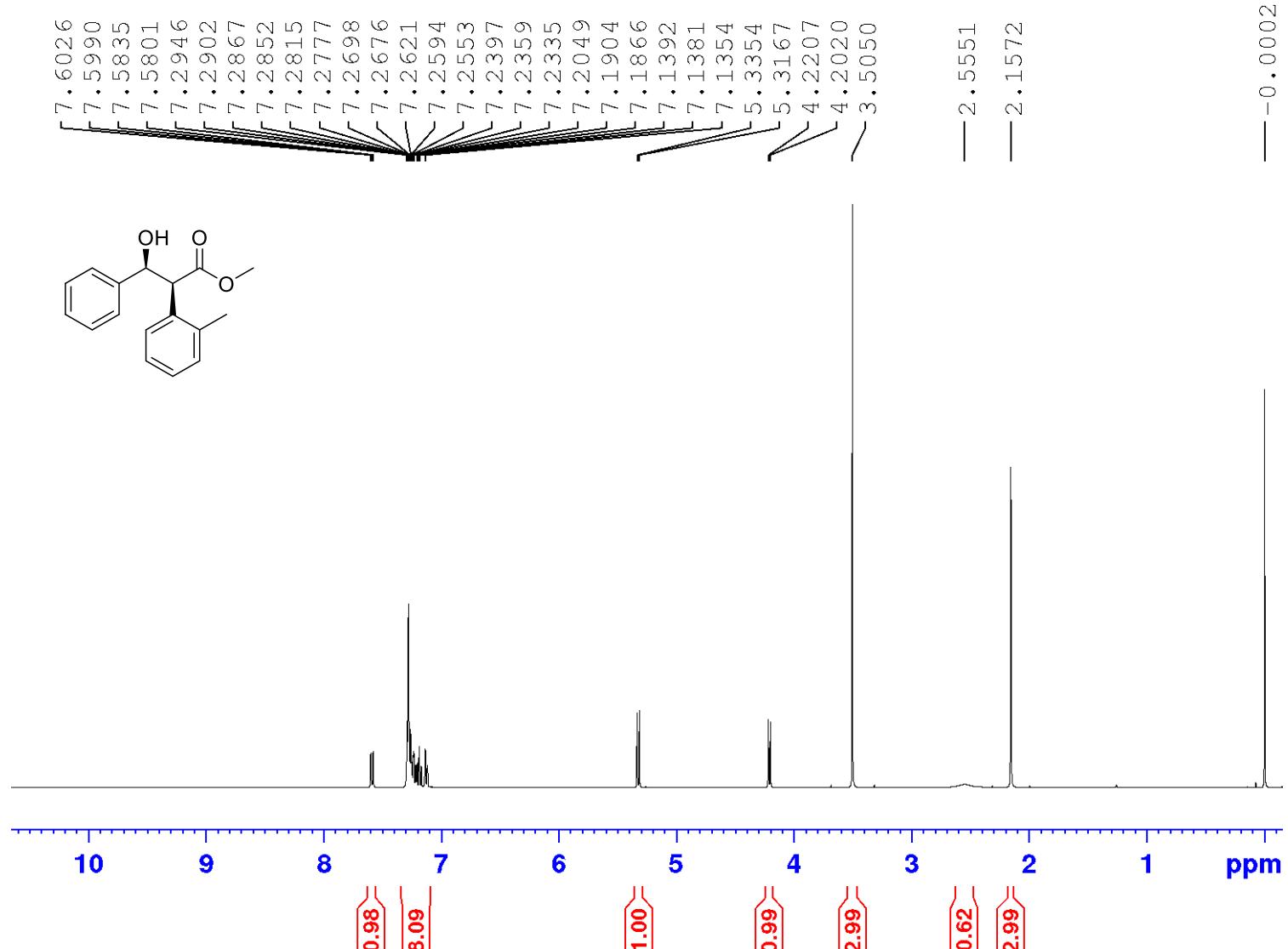
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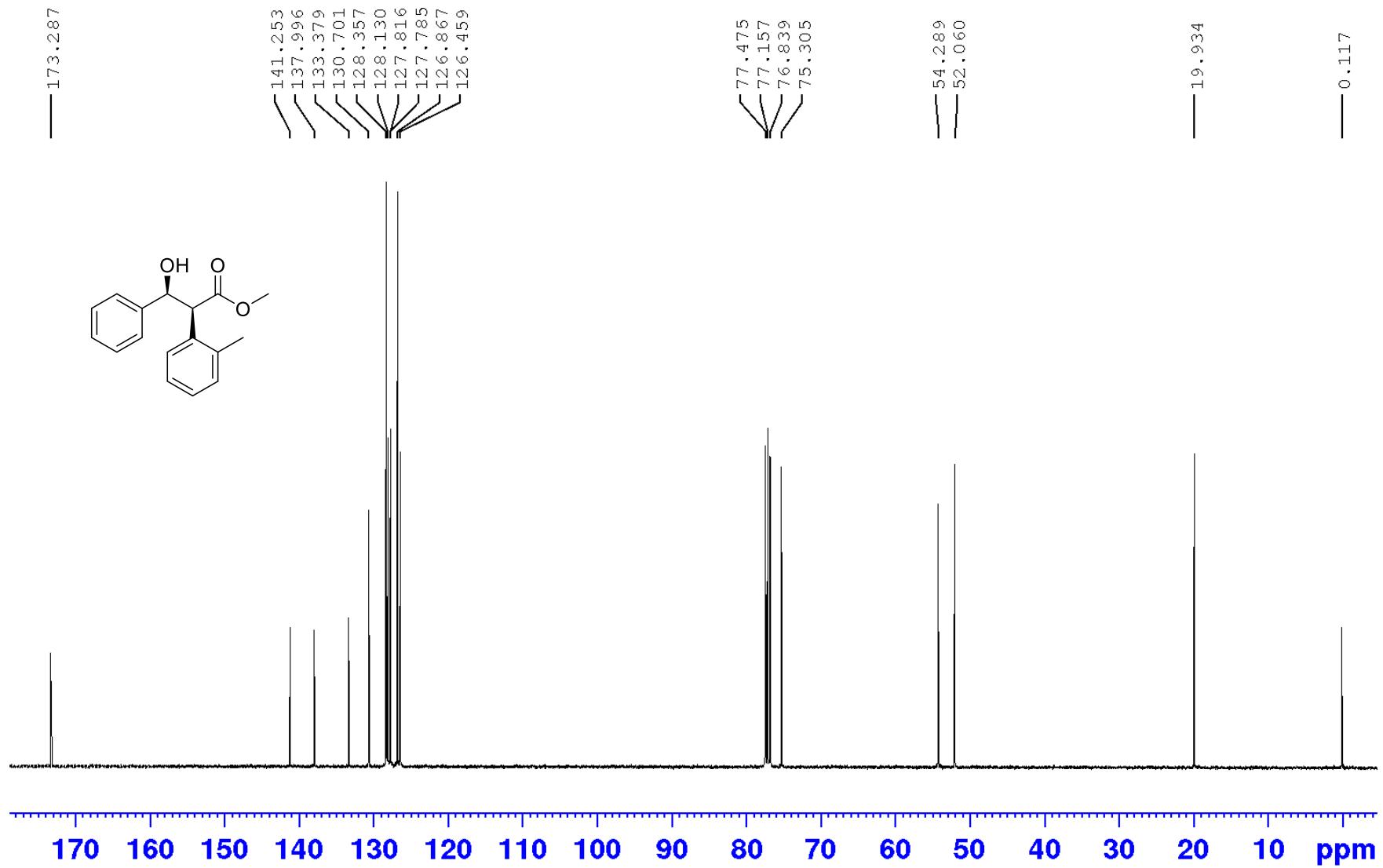
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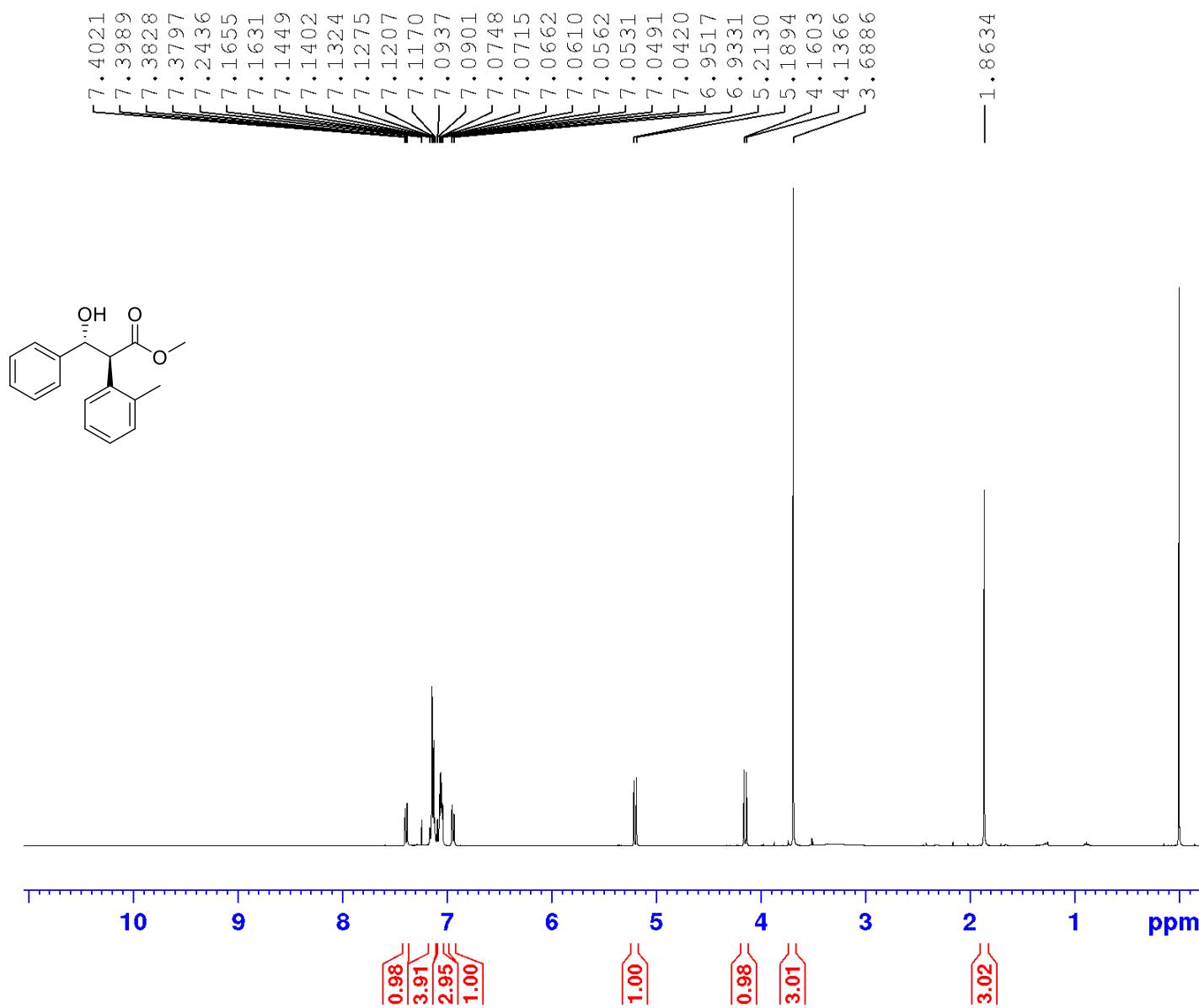


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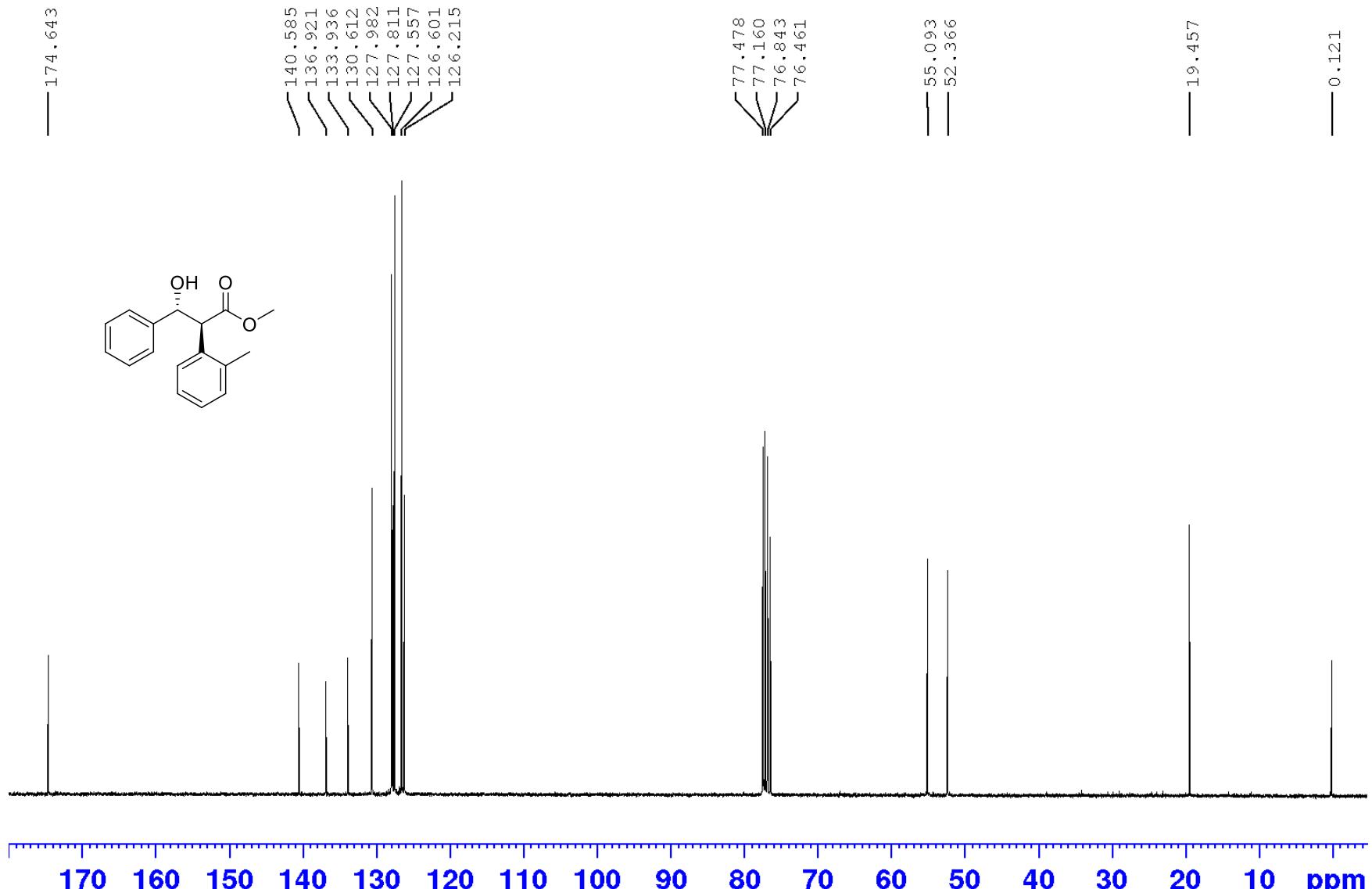


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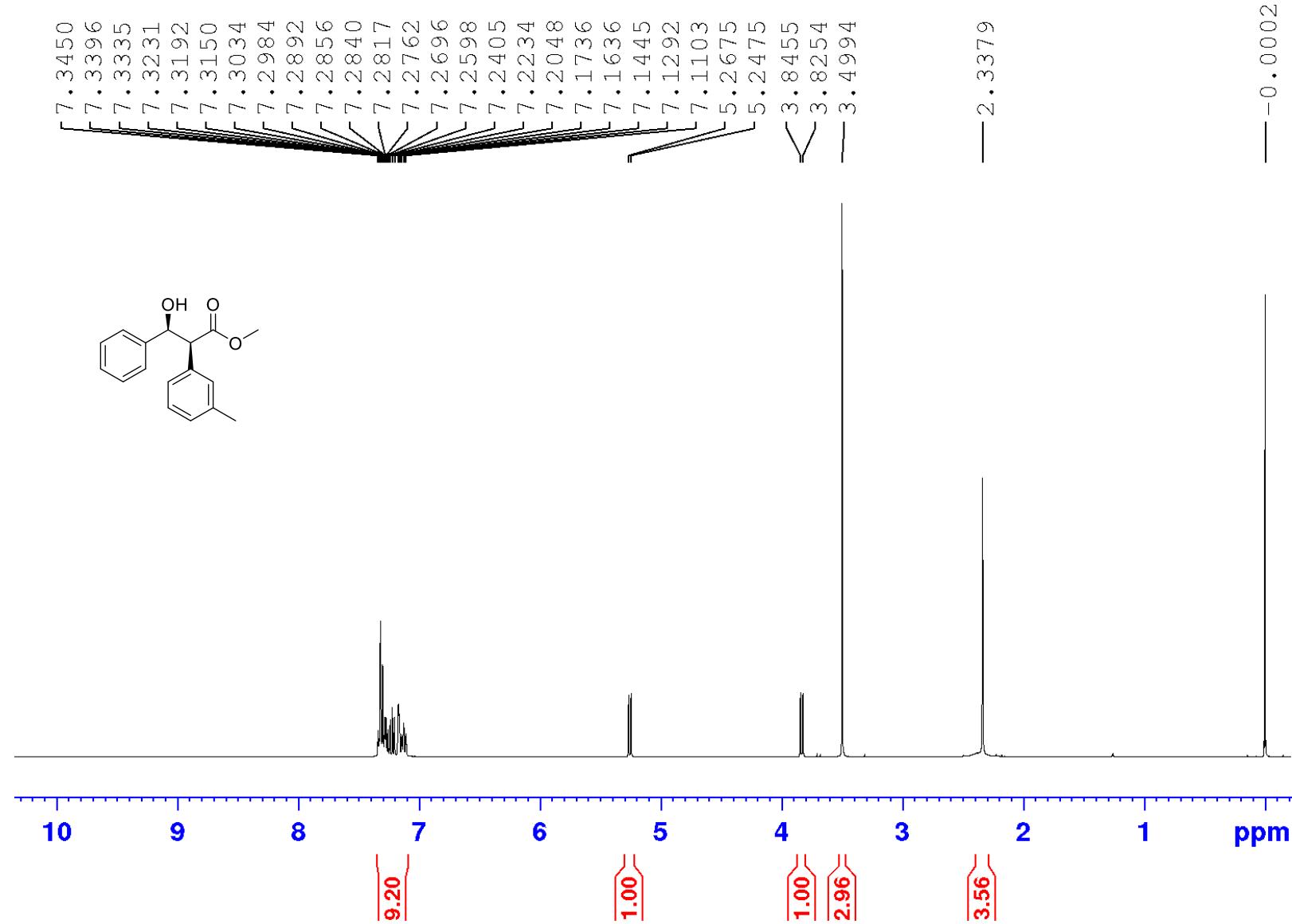




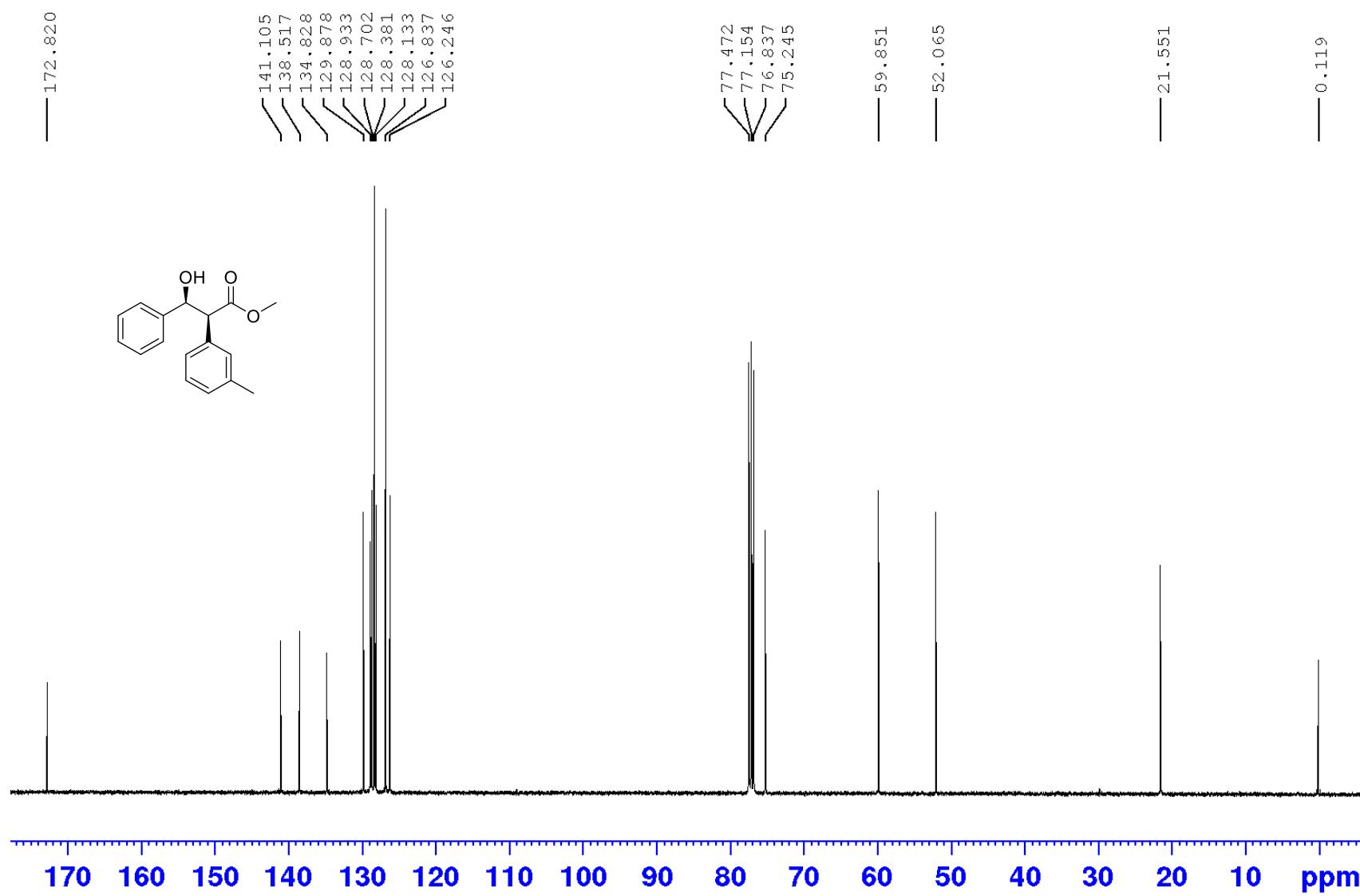
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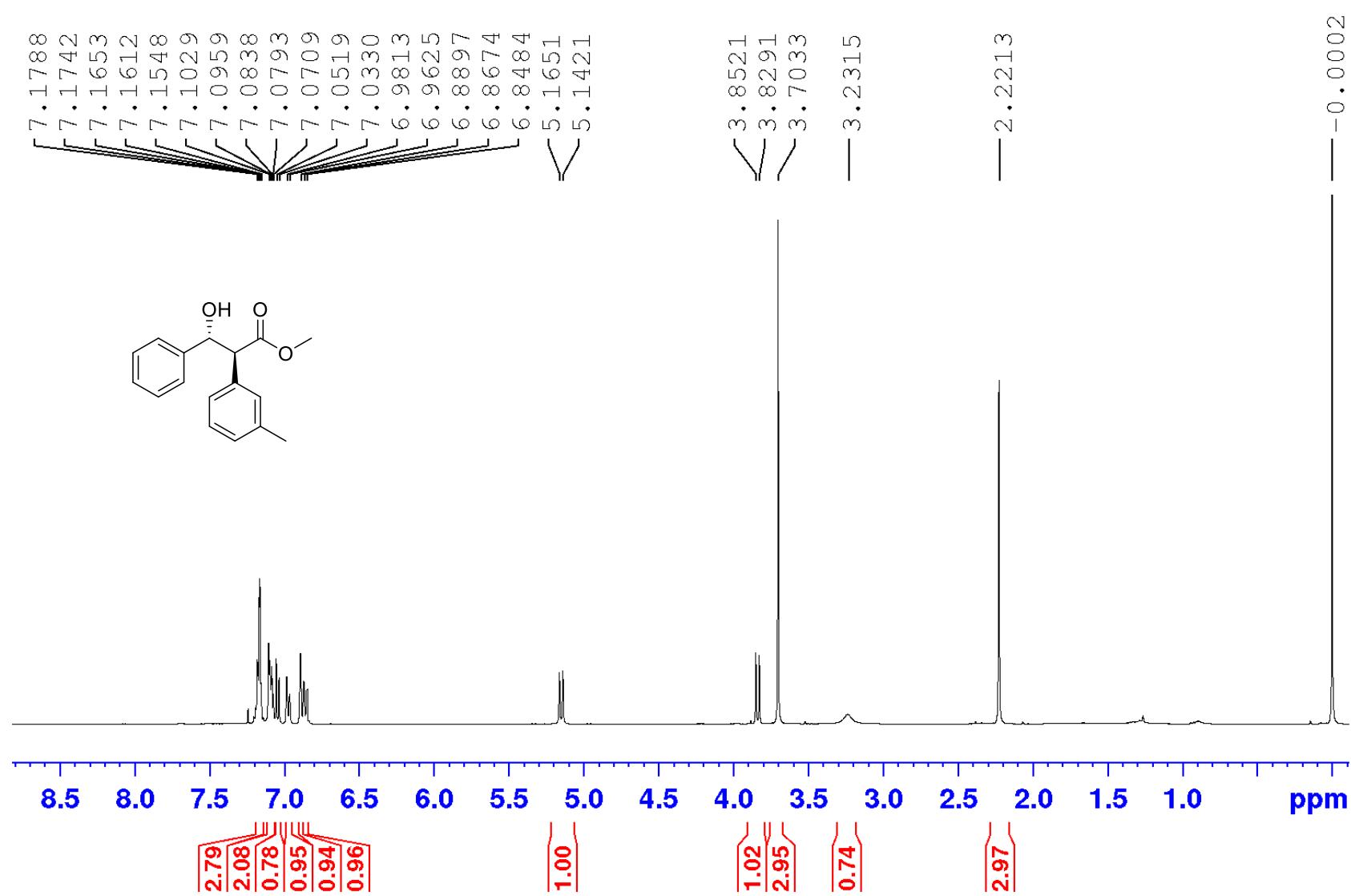


$^{13}\text{C}\{\text{H}\}$ NMR (100 MHz, CDCl_3) Spectrum of *anti*-methyl 3-hydroxy-3-phenyl-2-*o*-tolylpropanoate (**10a**)

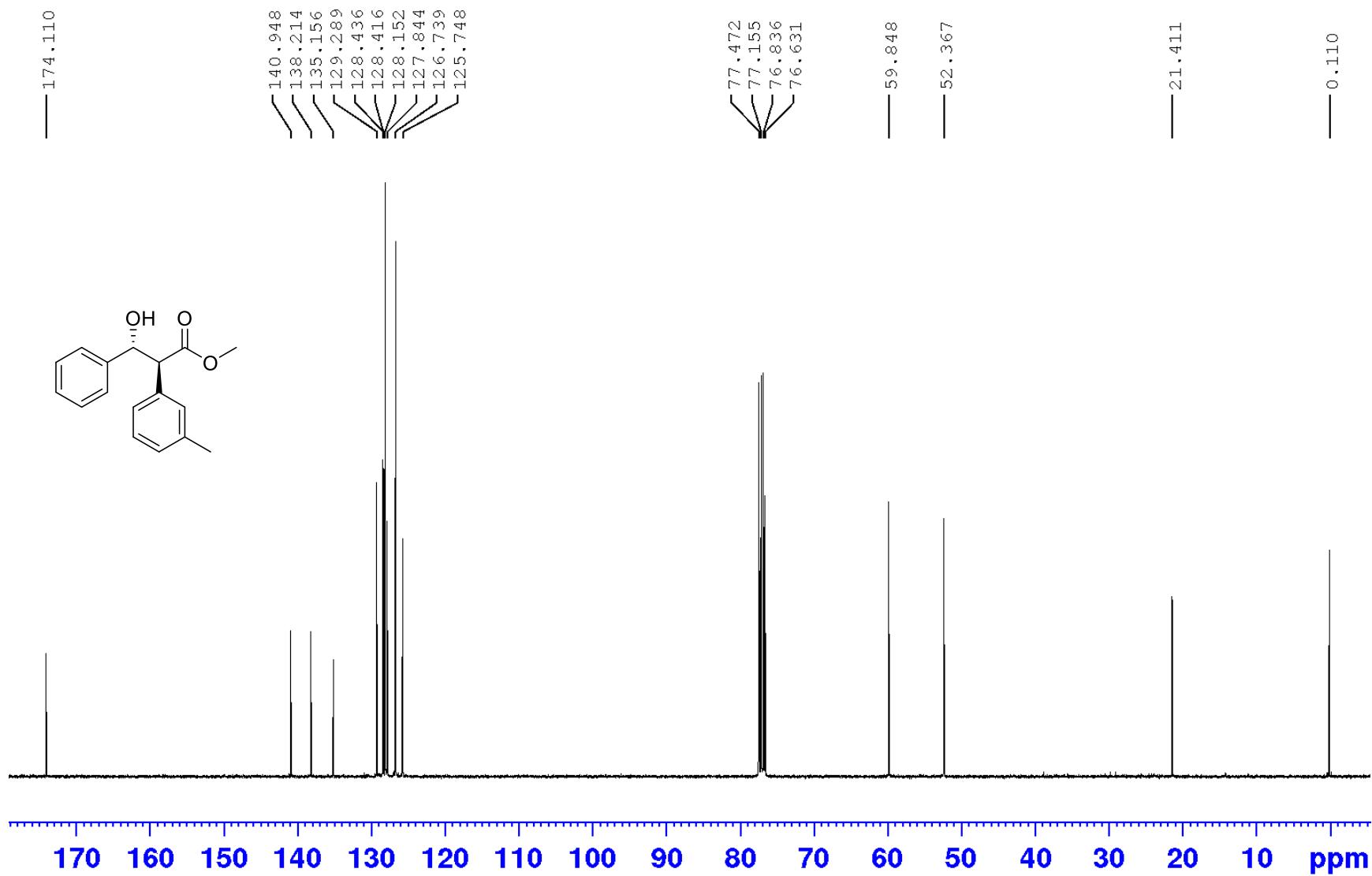


¹H NMR (400 MHz, CDCl₃) Spectrum of *syn*-methyl 3-hydroxy-3-phenyl-2-*m*-tolylpropanoate (**10b**)

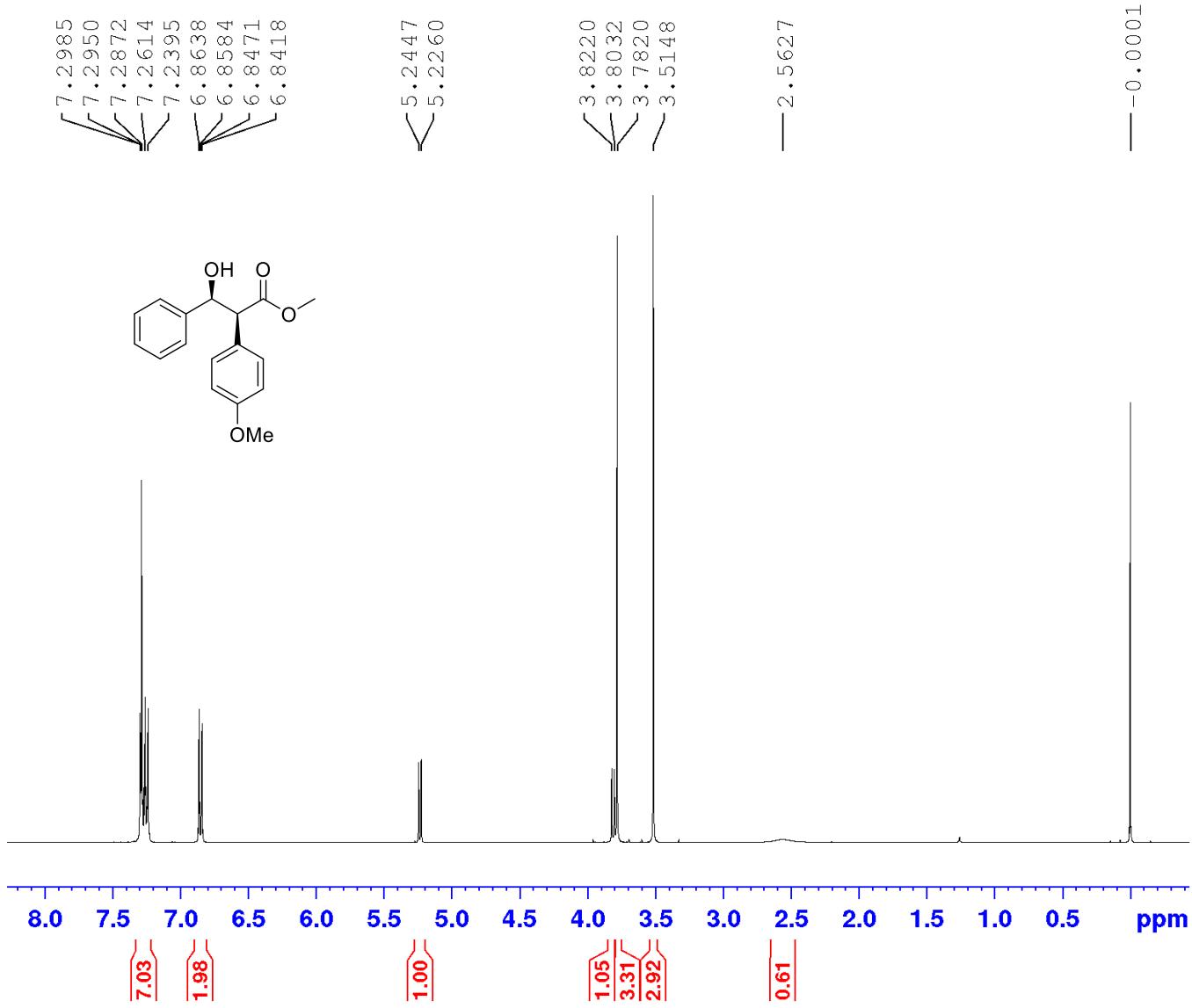




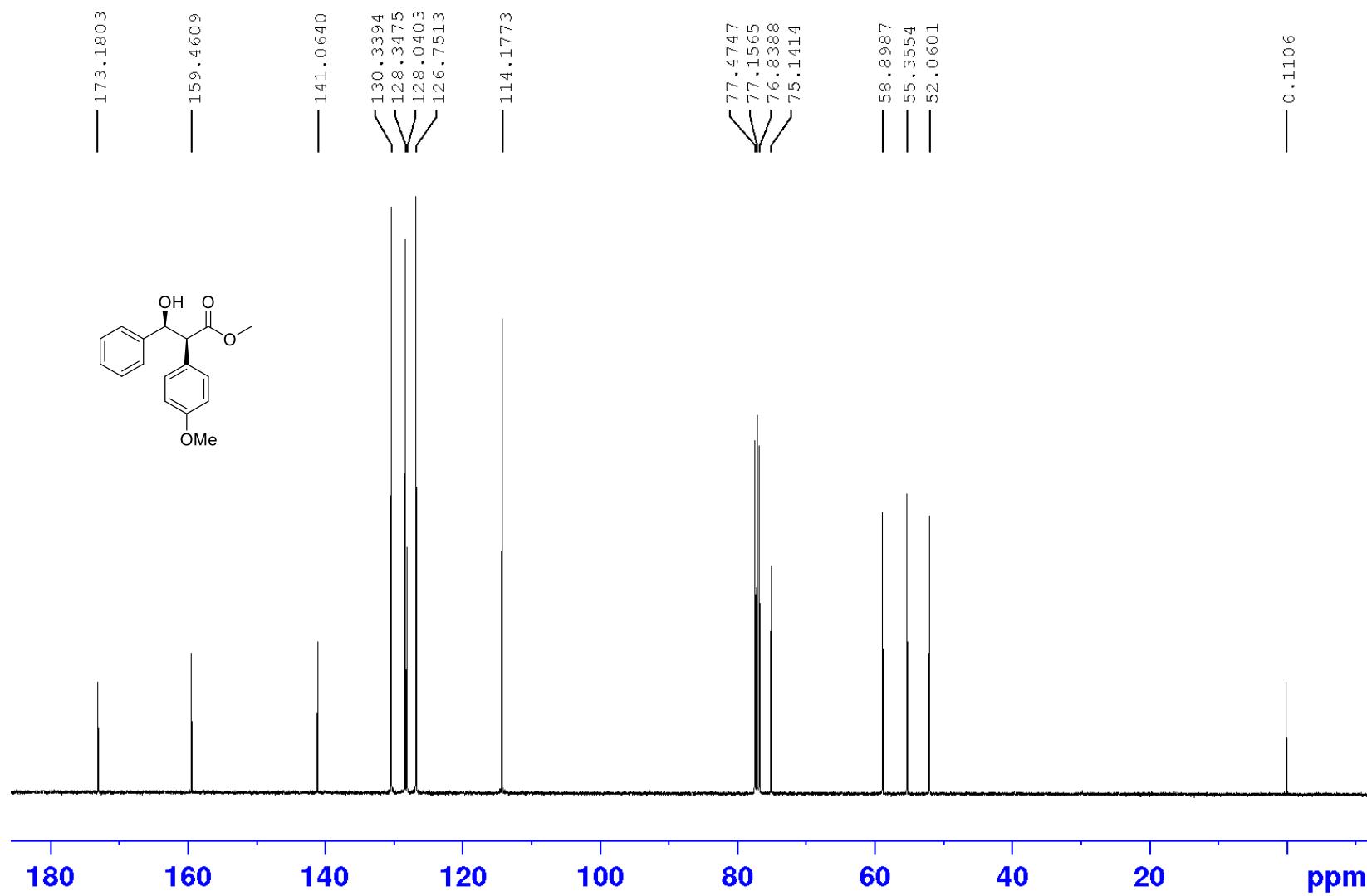
¹H NMR (400 MHz, CDCl₃) Spectrum of *anti*-methyl 3-hydroxy-3-phenyl-2-*m*-tolylpropanoate (**10b**)

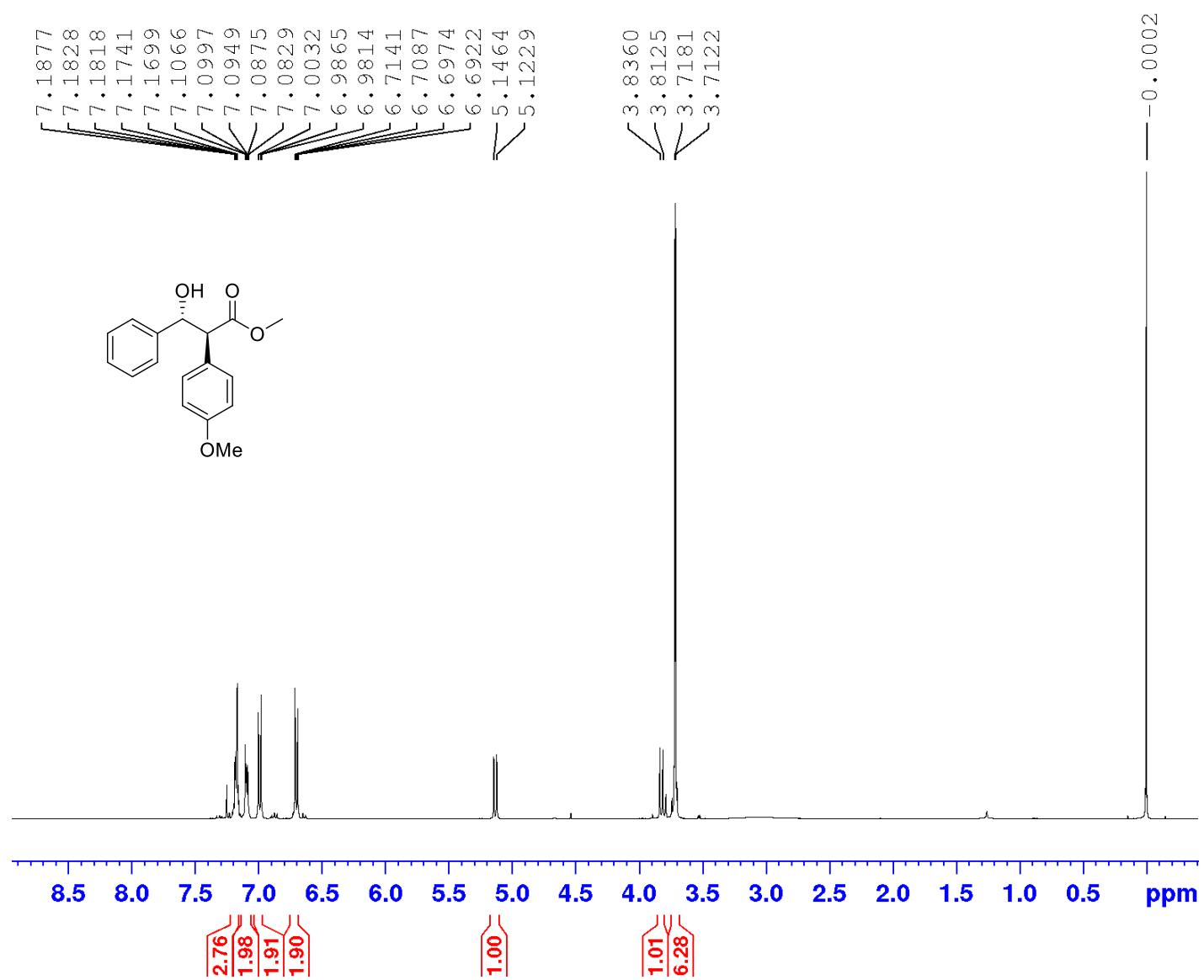


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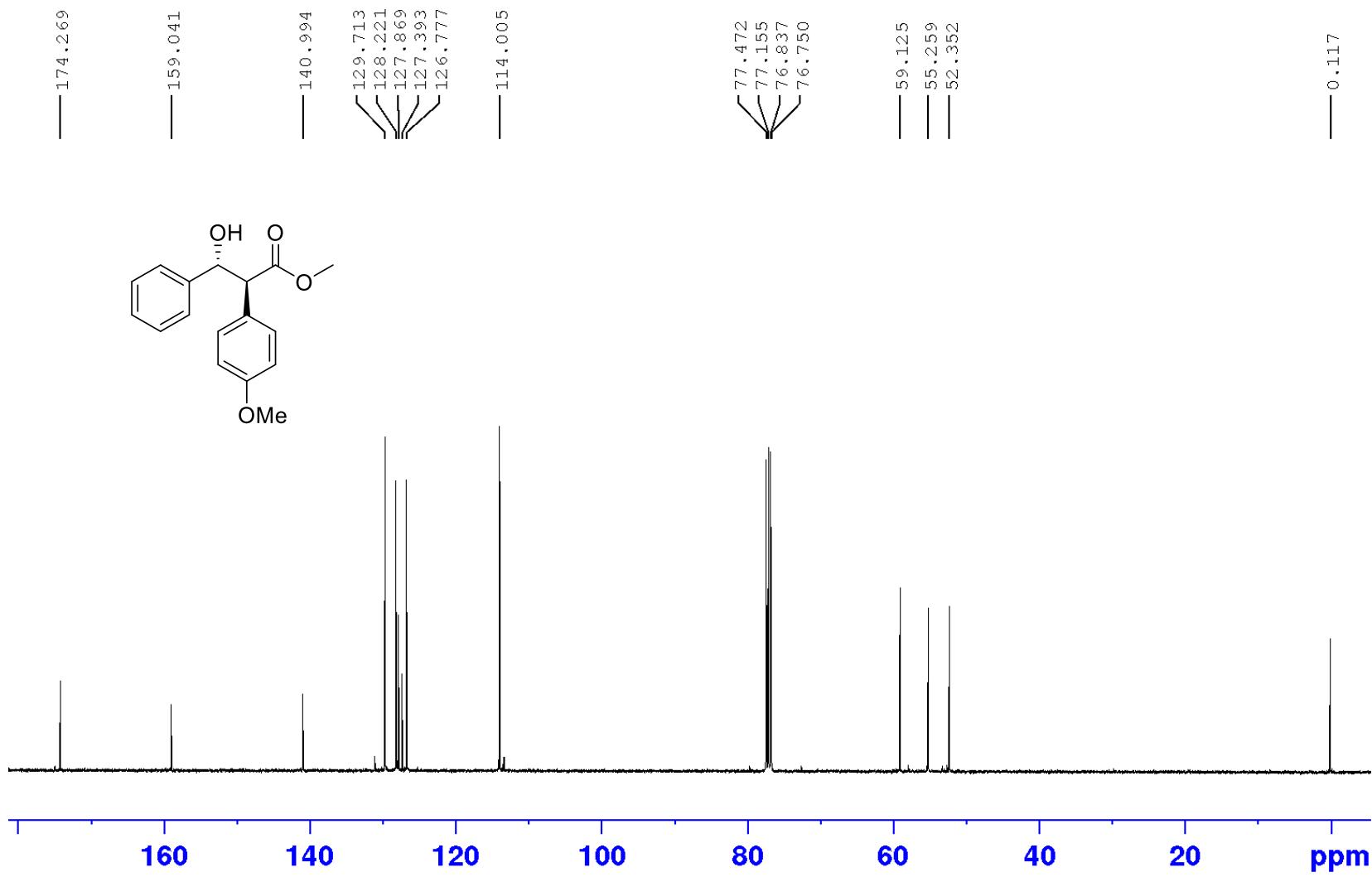


¹H NMR (400 MHz, CDCl₃) Spectrum of *syn*-methyl 3-hydroxy-2-(4-methoxyphenyl)-3-phenylpropanoate (**10c**)

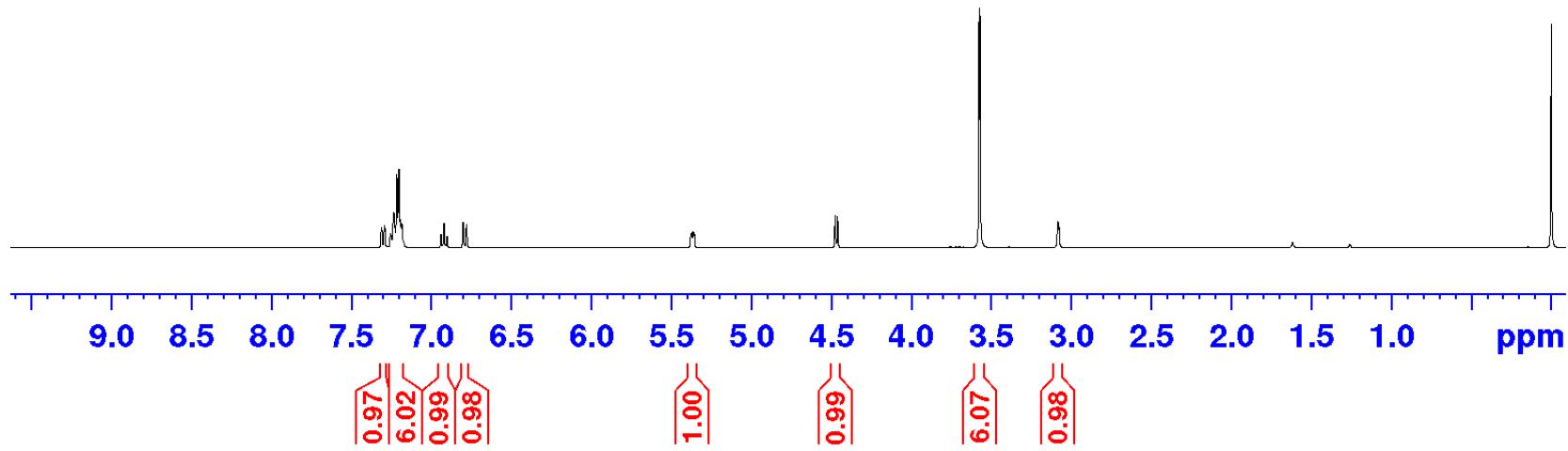
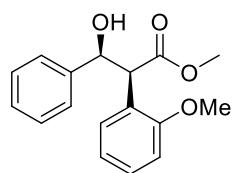




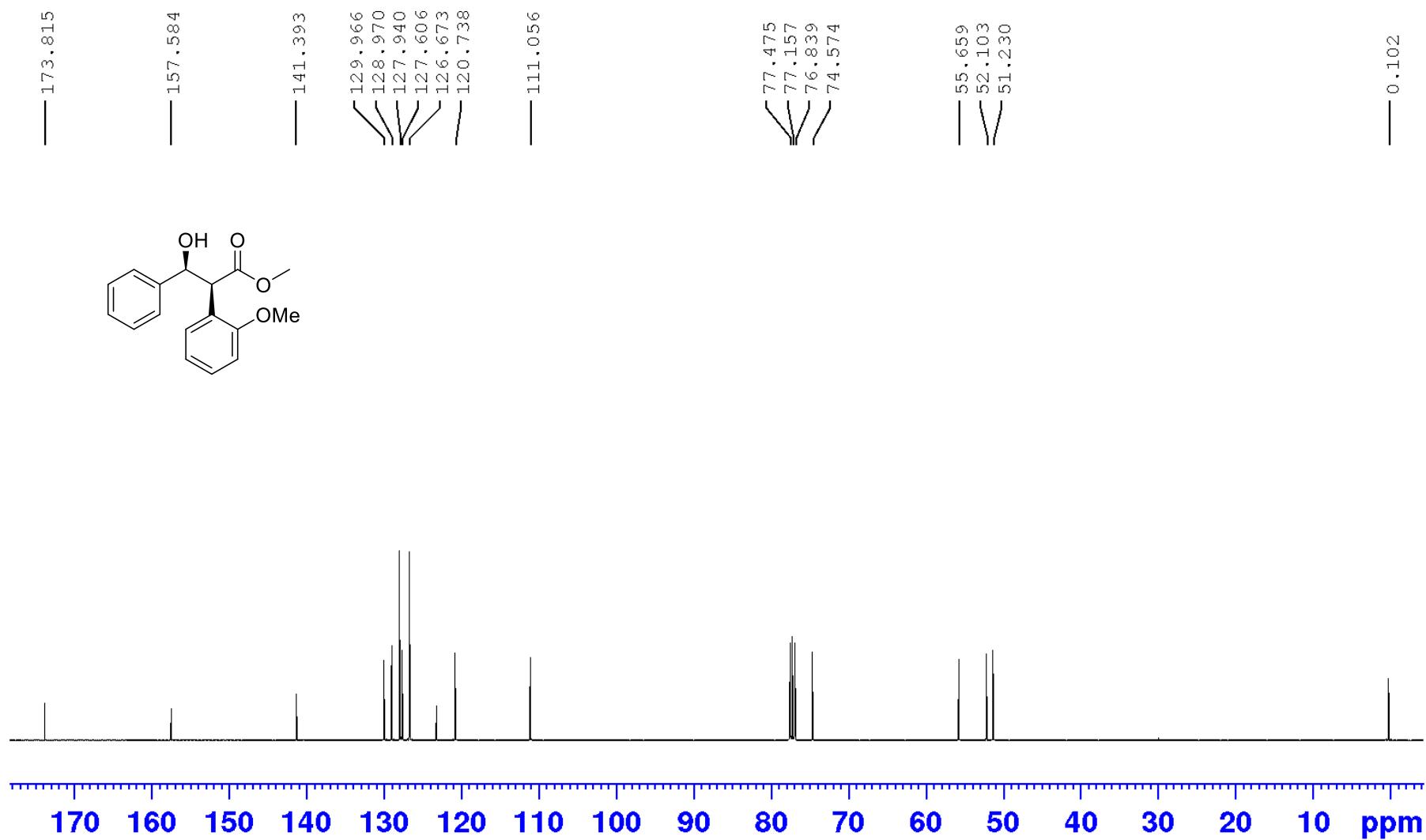
¹H NMR (400 MHz, CDCl₃) Spectrum of *anti*-methyl 3-hydroxy-2-(4-methoxyphenyl)-3-phenylpropanoate (**10c**)

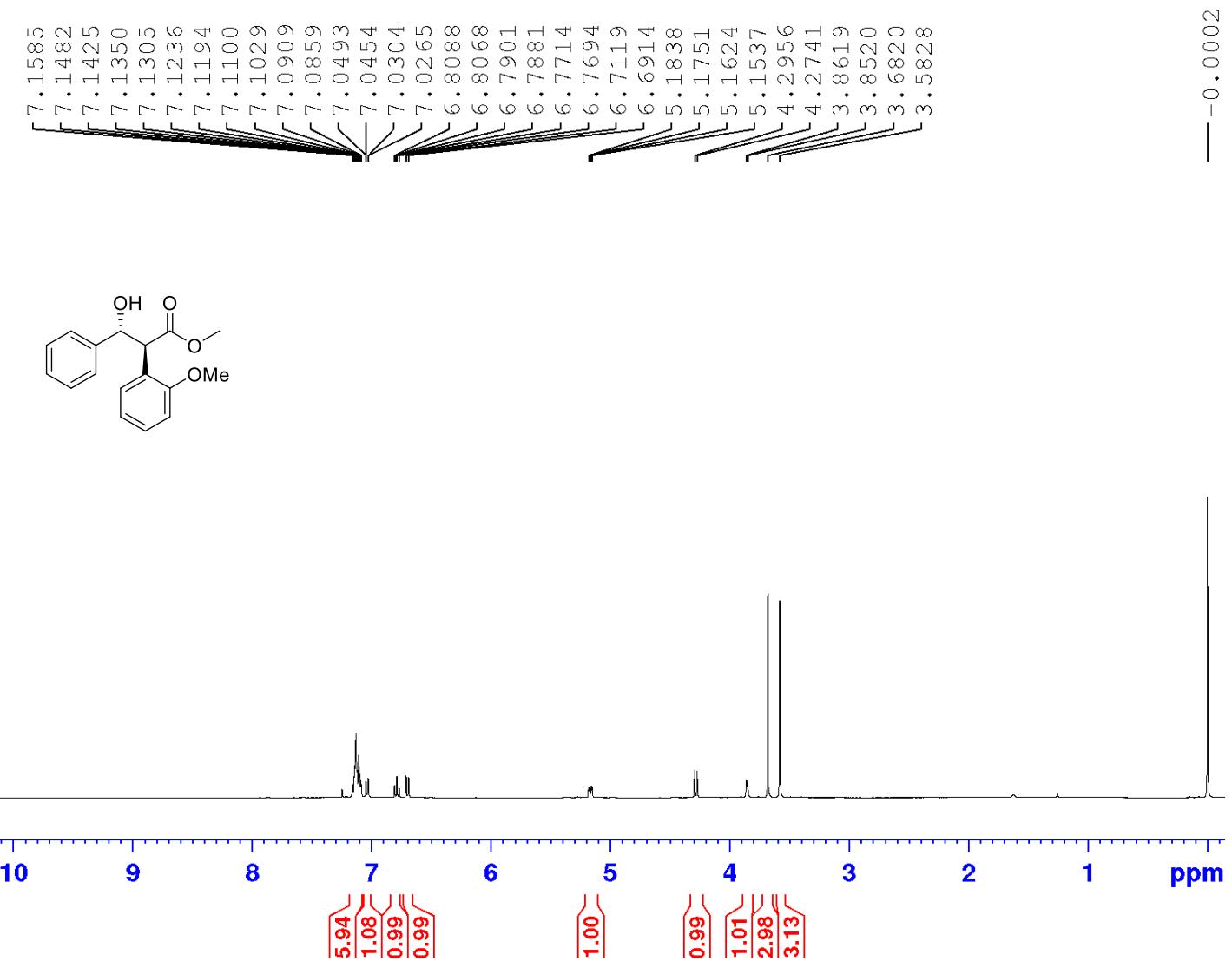


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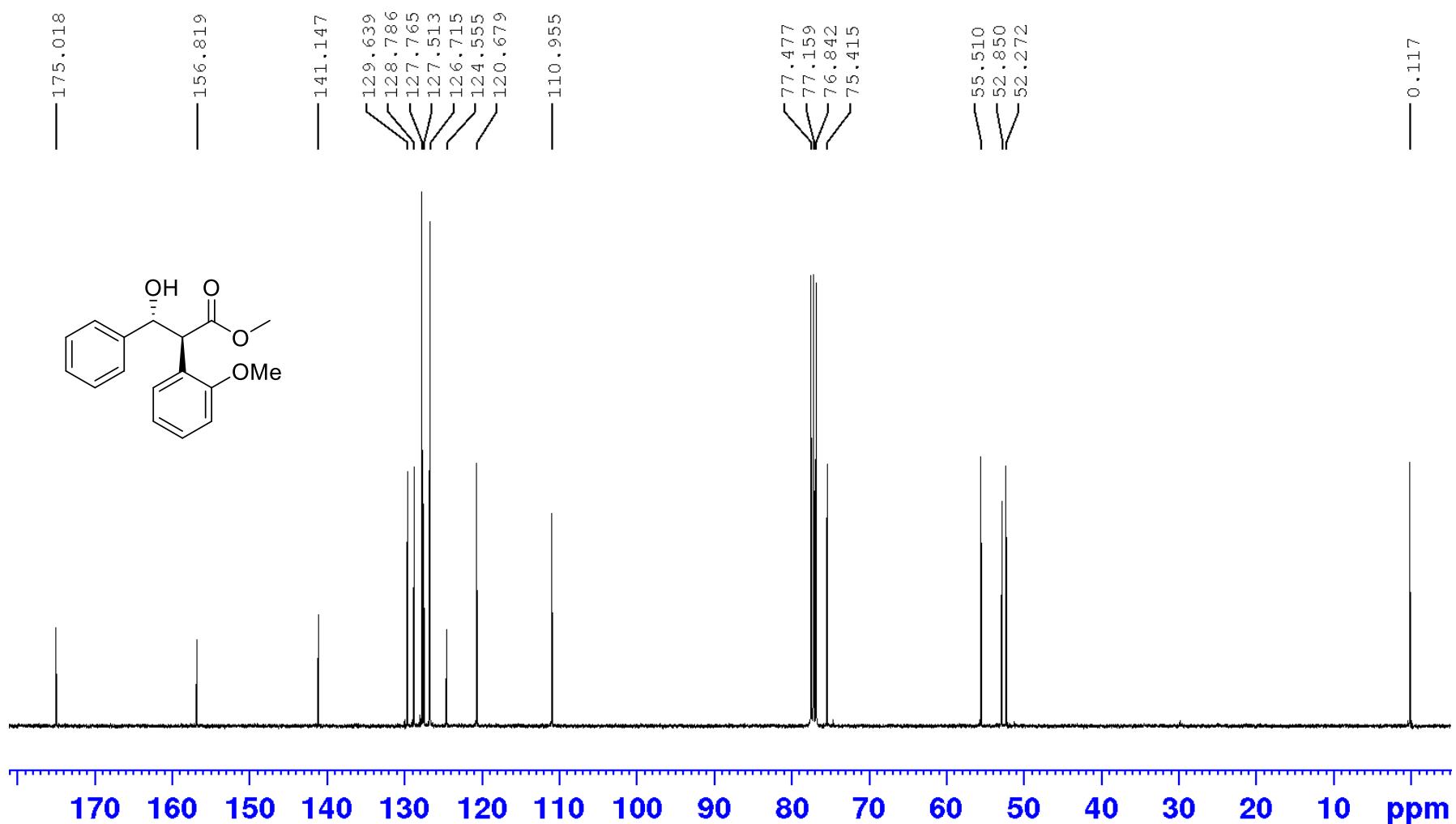


¹H NMR (400 MHz, CDCl₃) Spectrum of *syn*-methyl 3-hydroxy-2-(2-methoxyphenyl)-3-phenylpropanoate (**10d**)

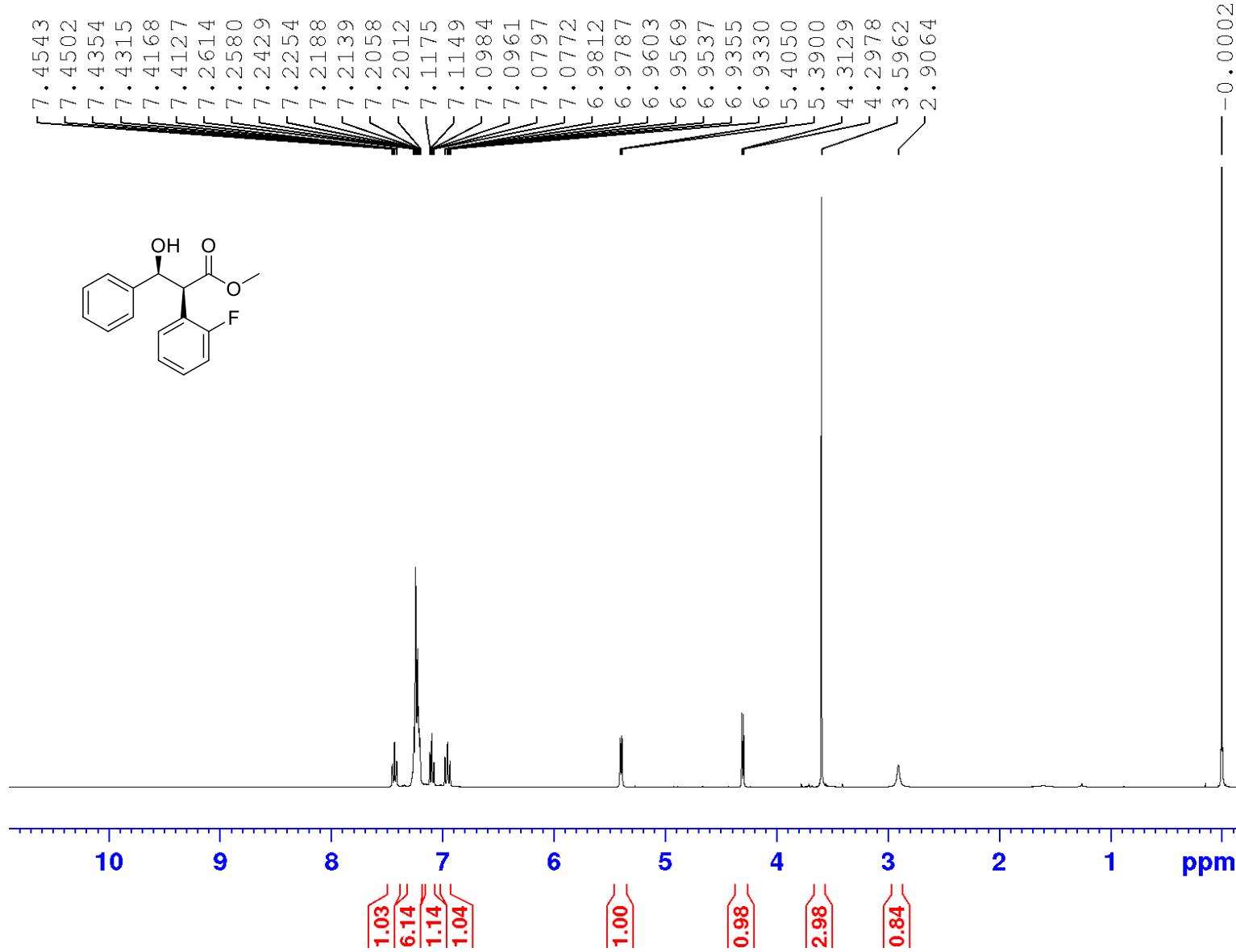




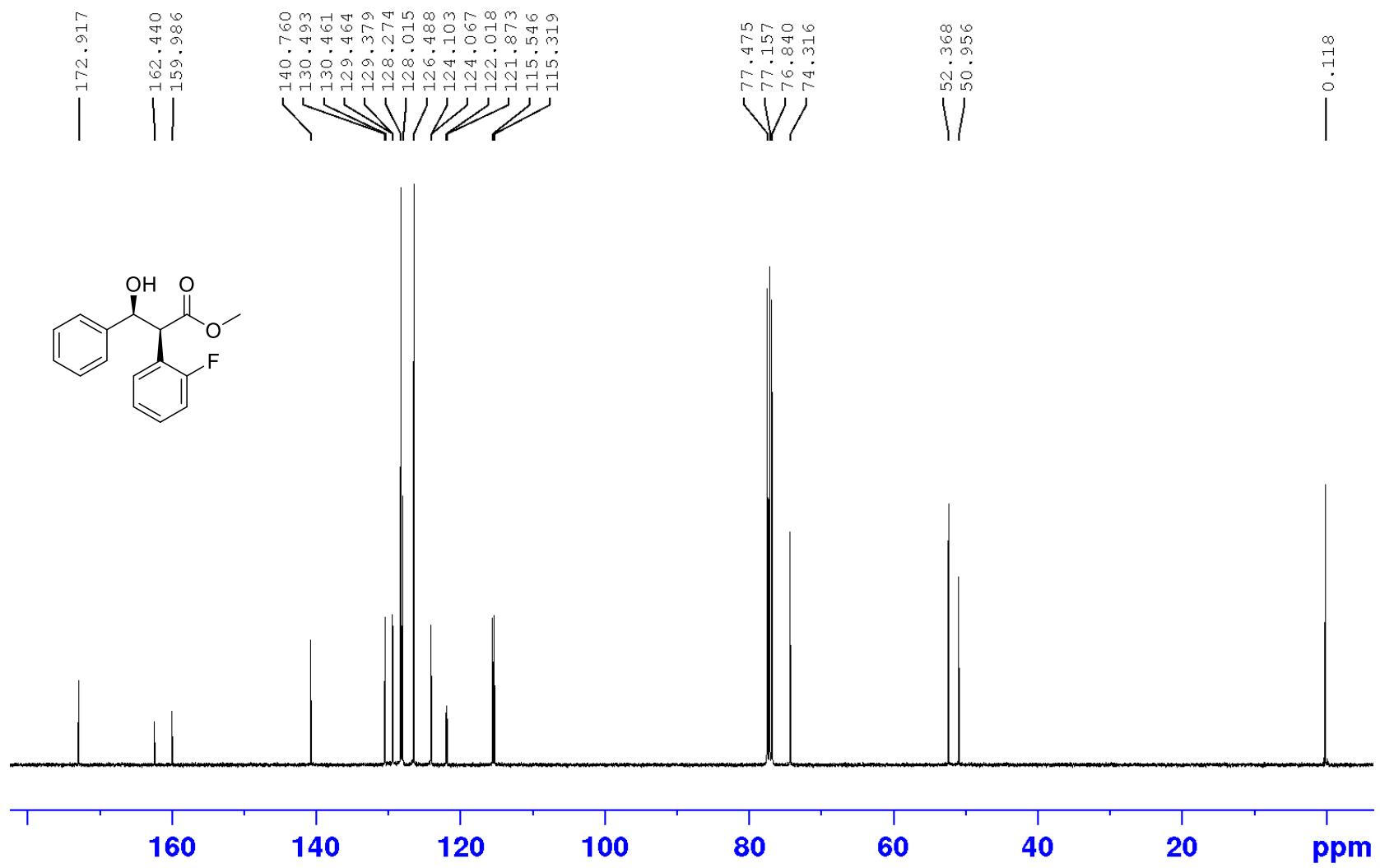
¹H NMR (400 MHz, CDCl₃) Spectrum of *anti*-methyl 3-hydroxy-2-(2-methoxyphenyl)-3-phenylpropanoate (**10d**)



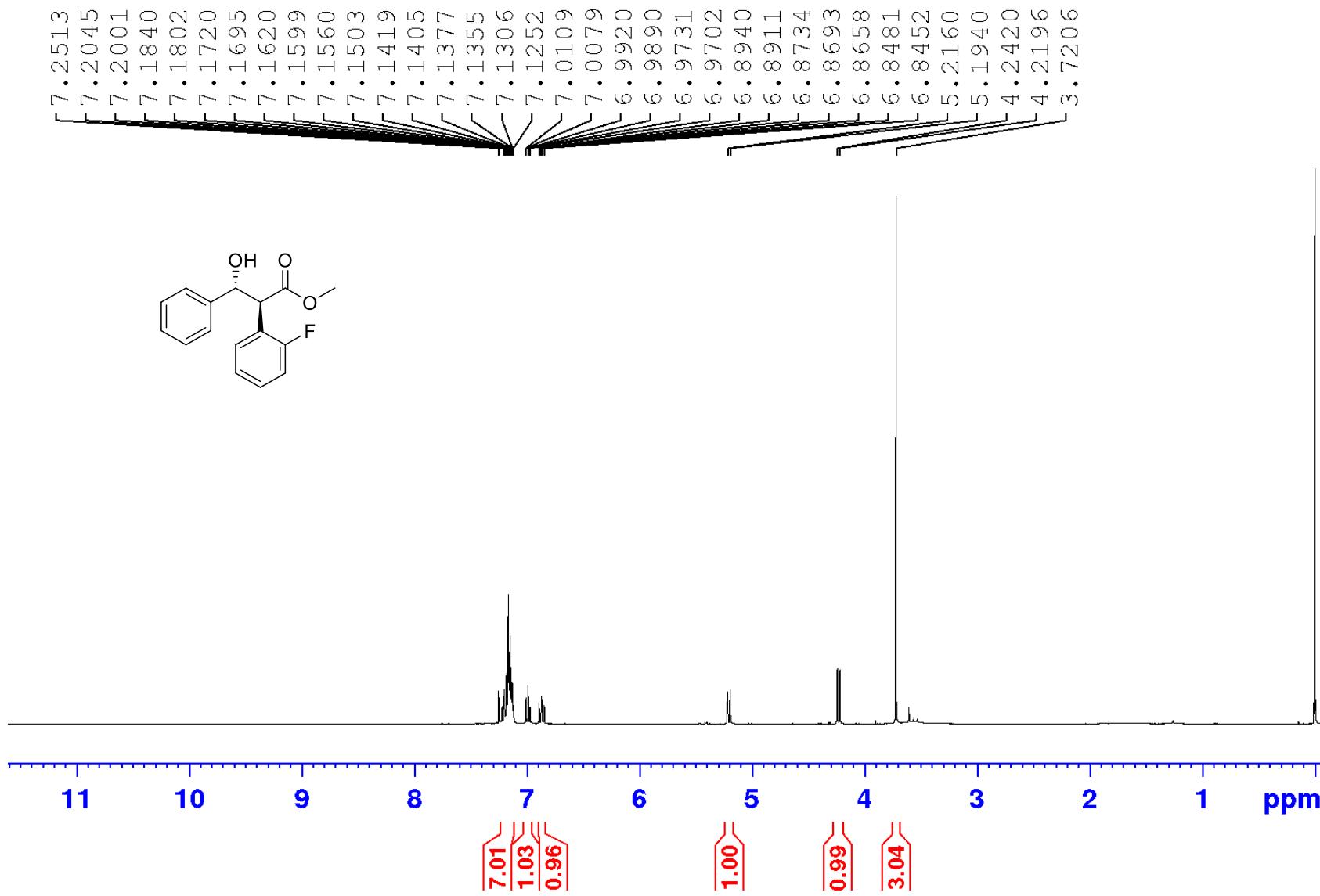
$^{13}\text{C}\{\text{H}\}$ NMR (100 MHz, CDCl_3) Spectrum of *anti*-methyl 3-hydroxy-2-(2-methoxyphenyl)-3-phenylpropanoate (**10d**)



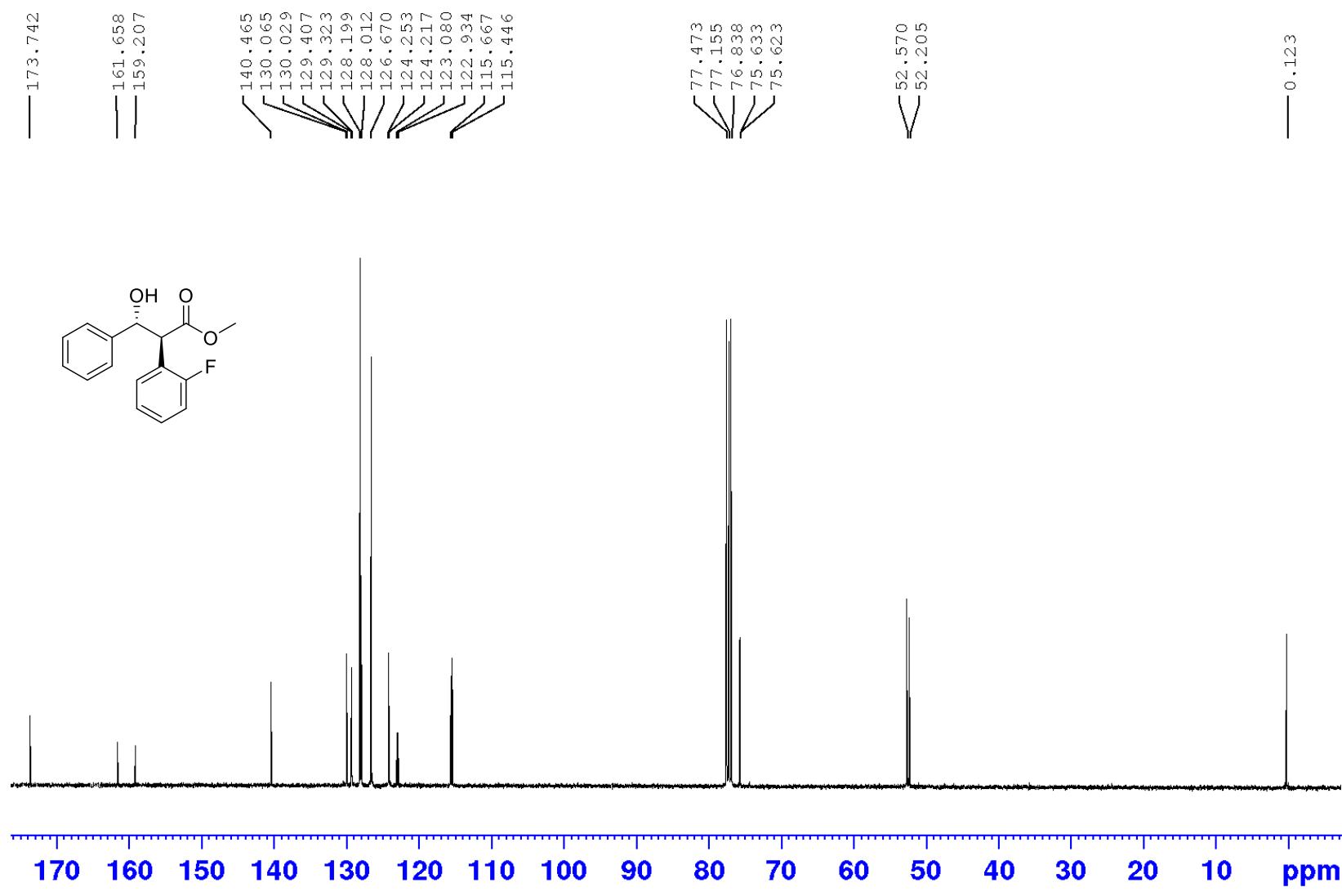
¹H NMR (400 MHz, CDCl₃) Spectrum of *syn*-methyl 2-(2-fluorophenyl)-3-hydroxy-3-phenylpropanoate (**10e**)

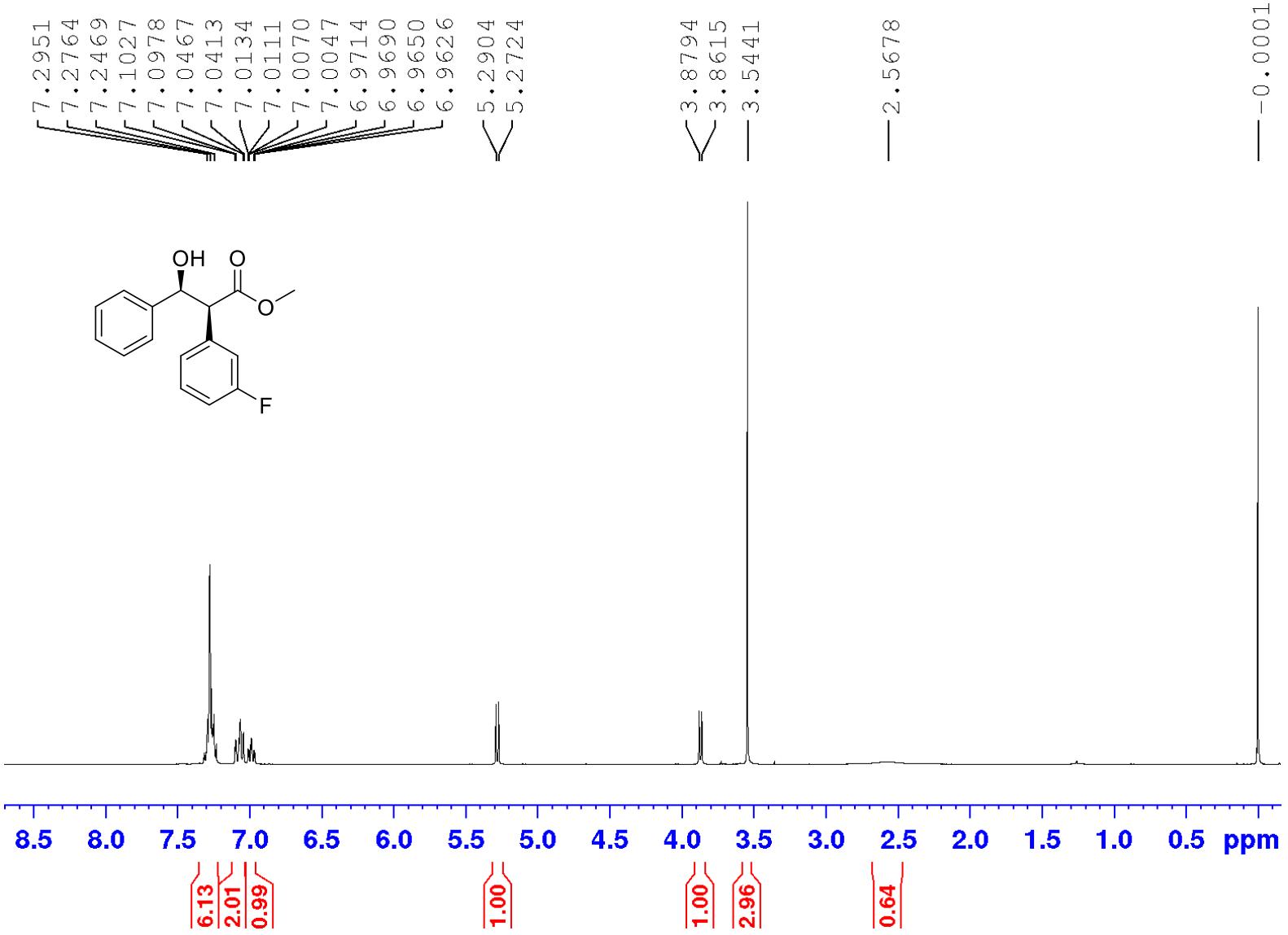


$^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3) Spectrum of *syn*-methyl 2-(2-fluorophenyl)-3-hydroxy-3-phenylpropanoate (**10e**)

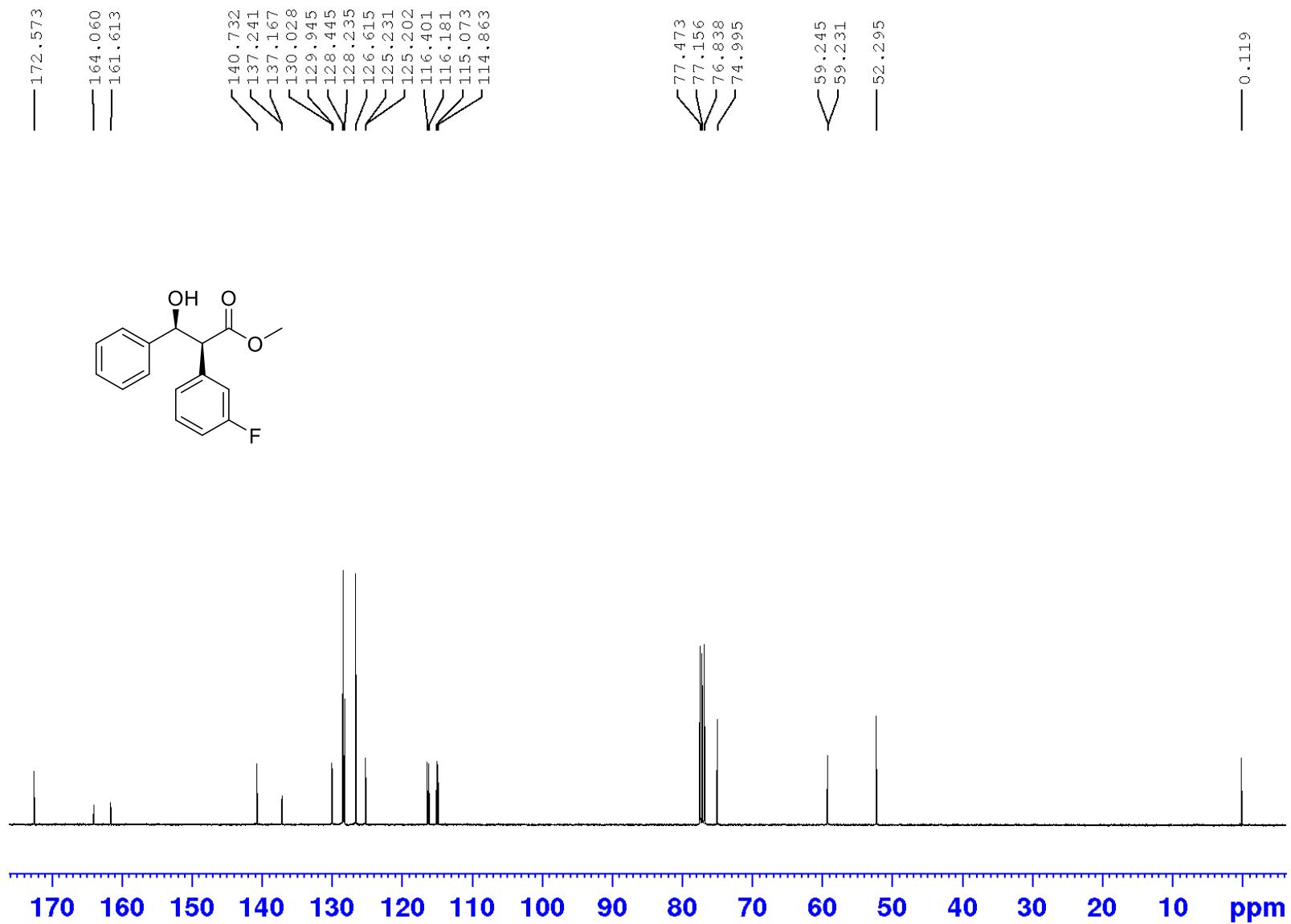


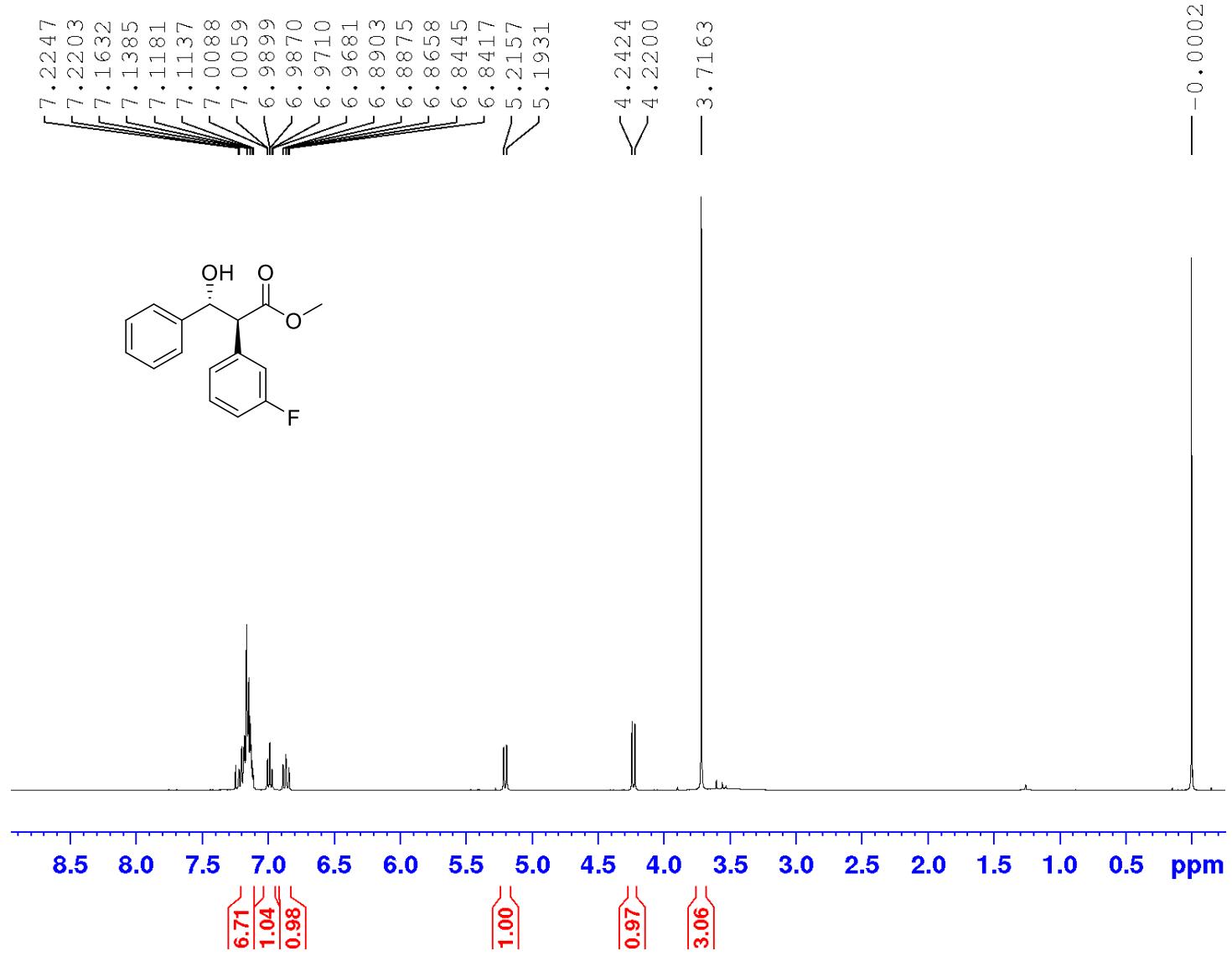
¹H NMR (400 MHz, CDCl₃) Spectrum of *anti*-methyl 2-(2-fluorophenyl)-3-hydroxy-3-phenylpropanoate (**10e**)

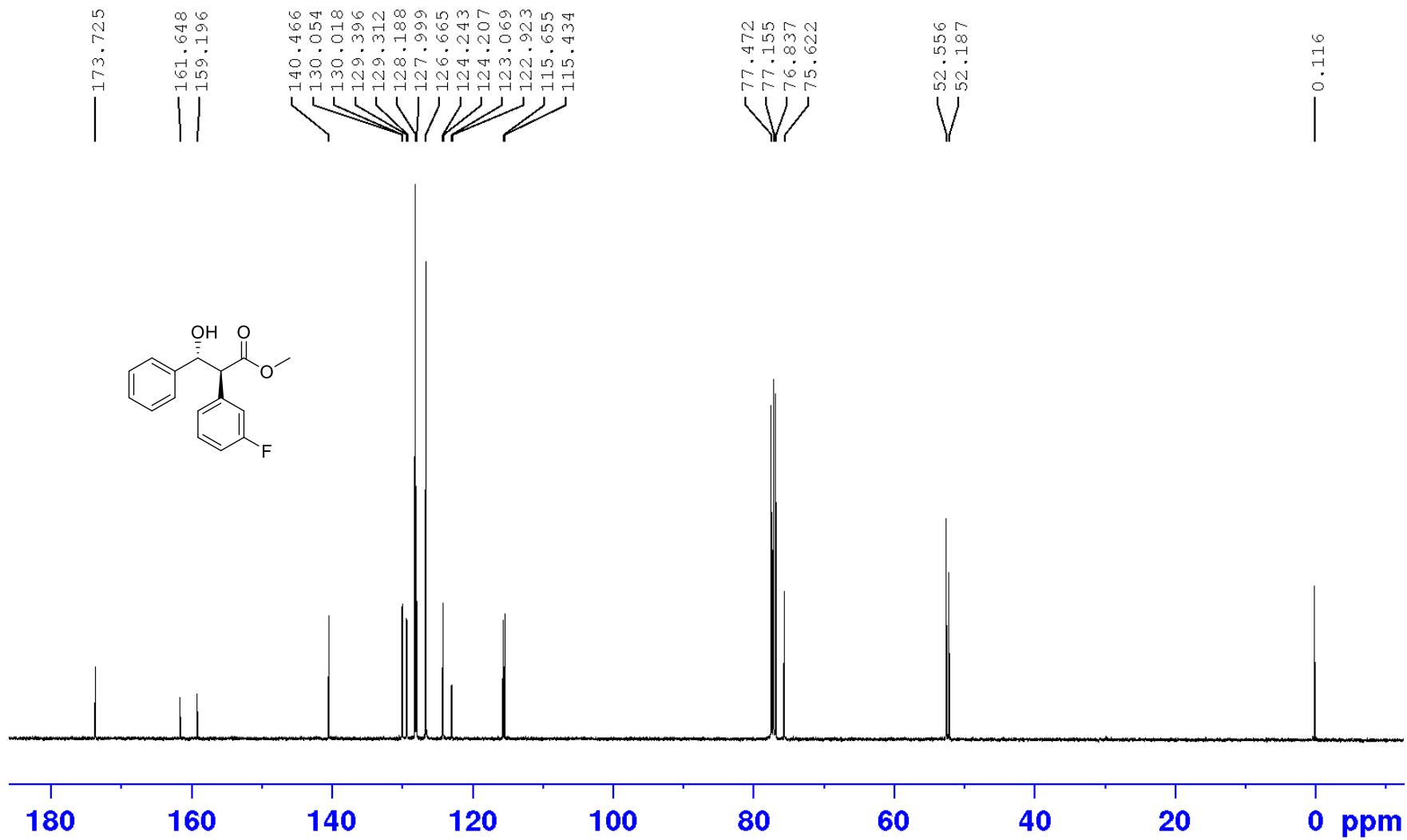


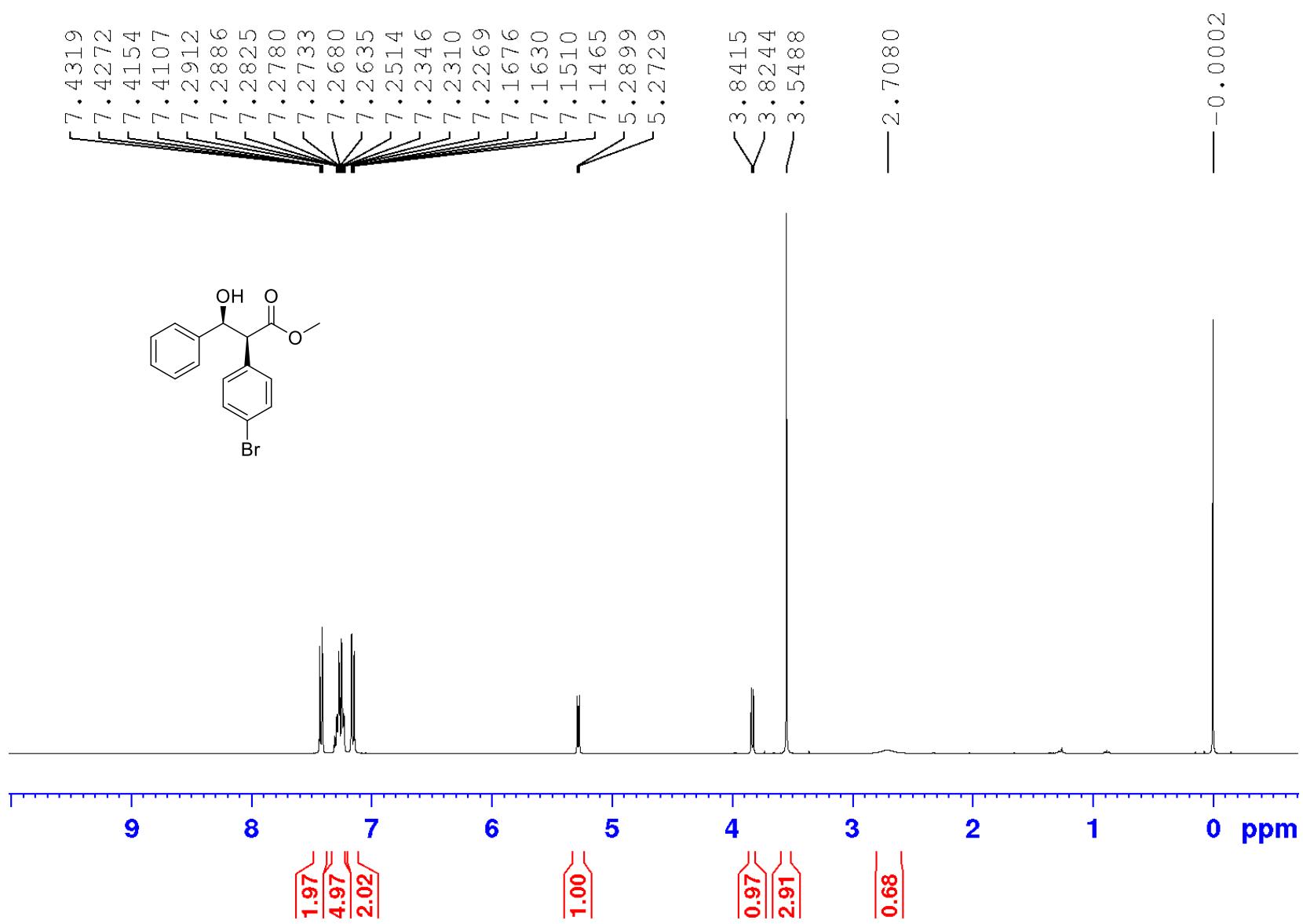


¹H NMR (400 MHz, CDCl₃) Spectrum of *syn*-methyl 2-(3-fluorophenyl)-3-hydroxy-3-phenylpropanoate (**10f**)

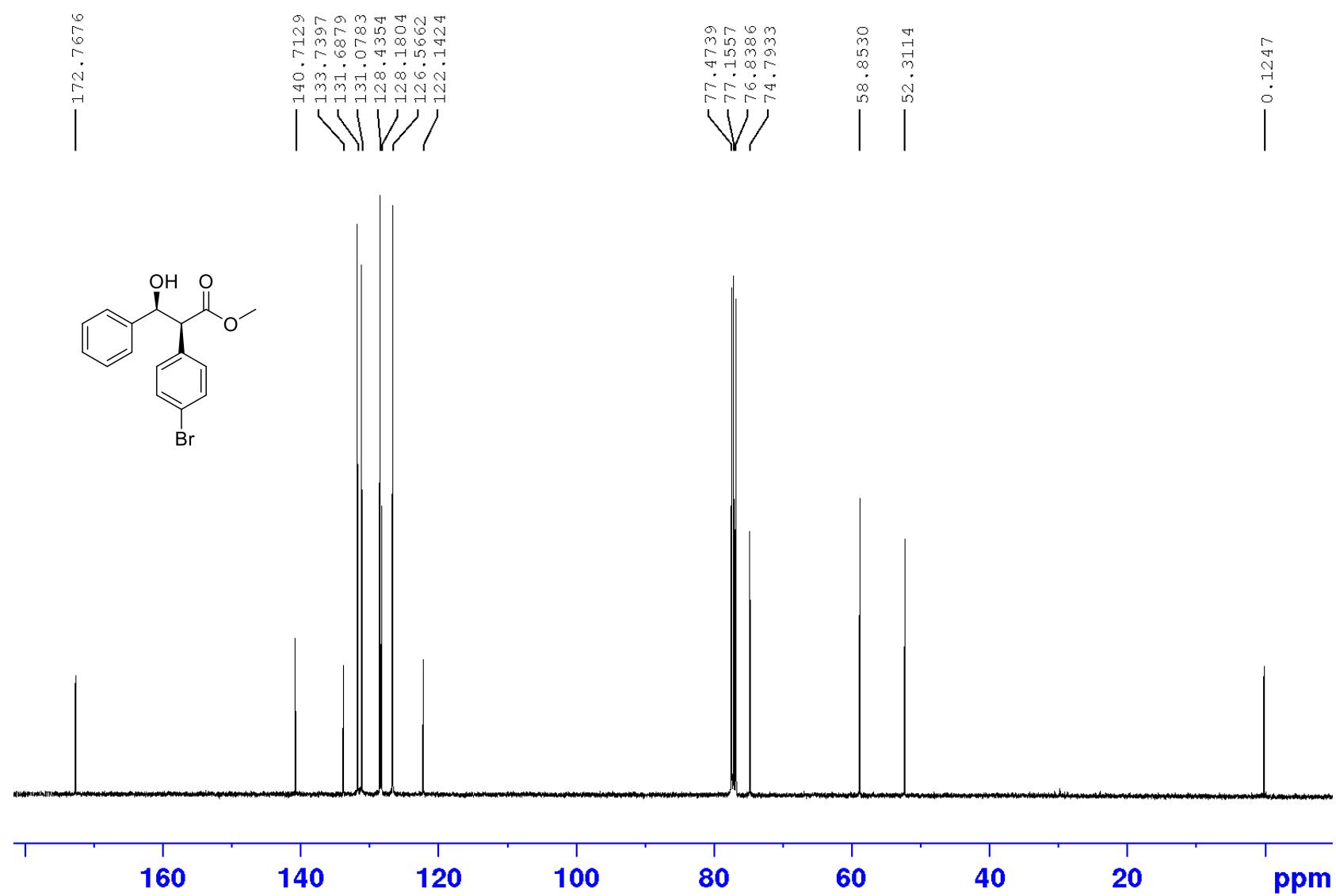




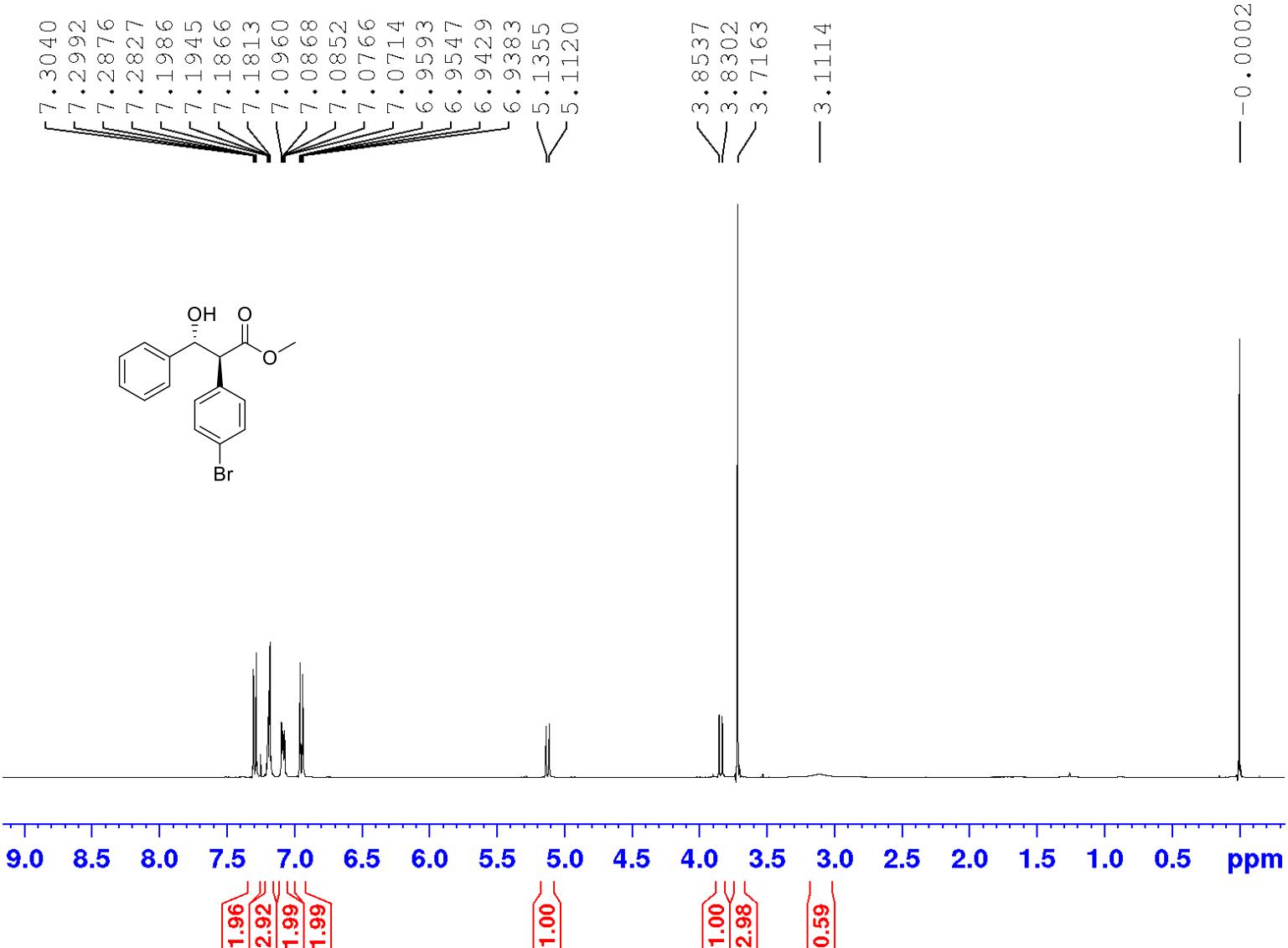




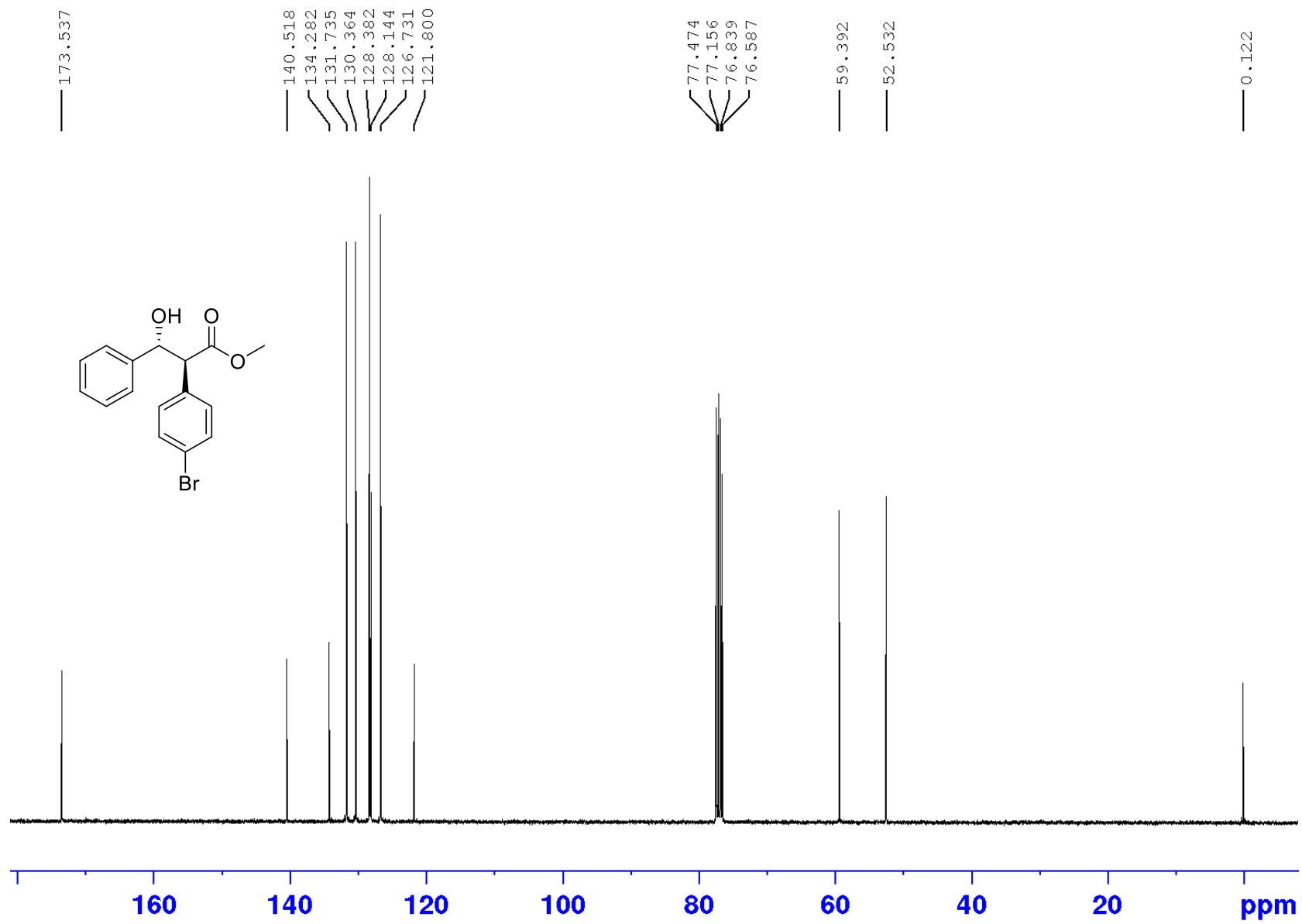
¹H NMR (400 MHz, CDCl₃) Spectrum of *syn*-methyl 2-(4-bromophenyl)-3-hydroxy-3-phenylpropanoate (**10g**)

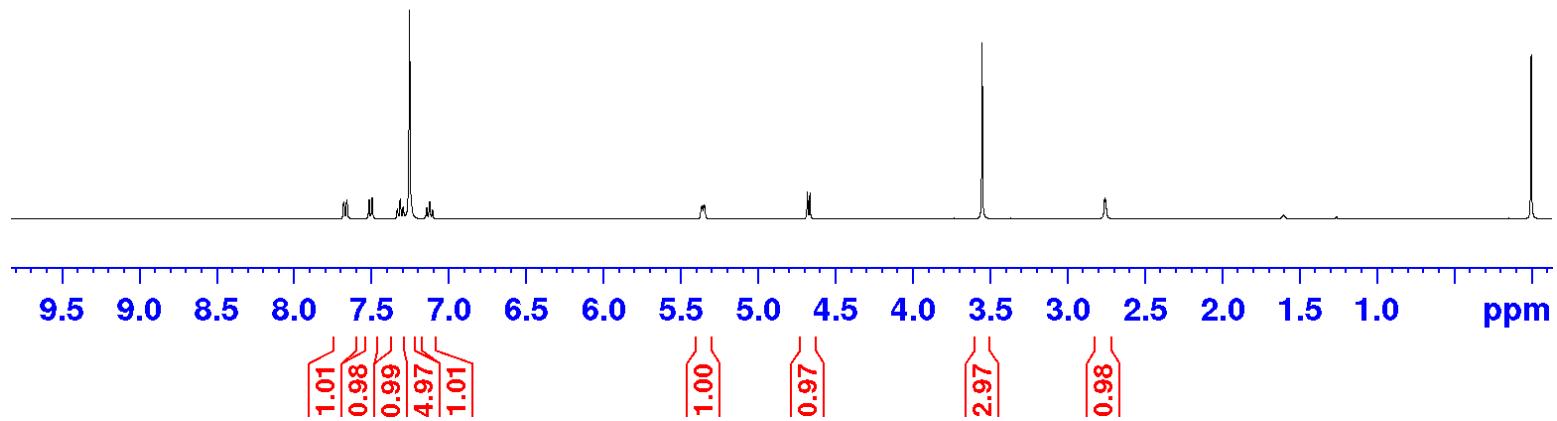
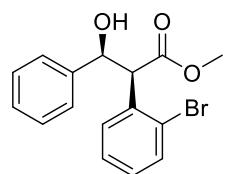
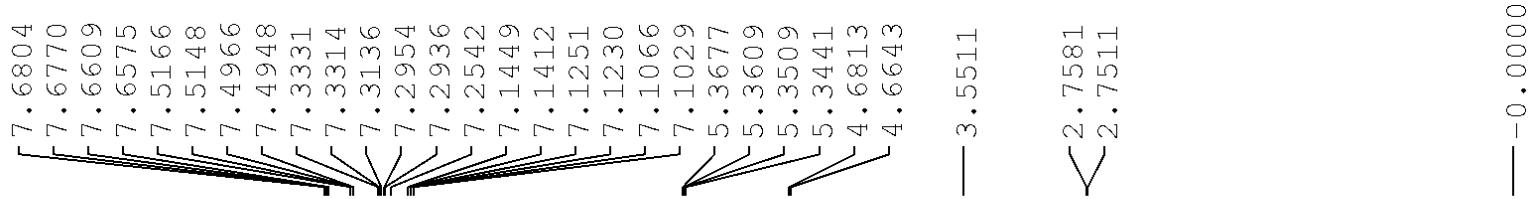


$^{13}\text{C}\{\text{H}\}$ NMR (100 MHz, CDCl_3) Spectrum of *syn*-methyl 2-(4-bromophenyl)-3-hydroxy-3-phenylpropanoate (**10g**)

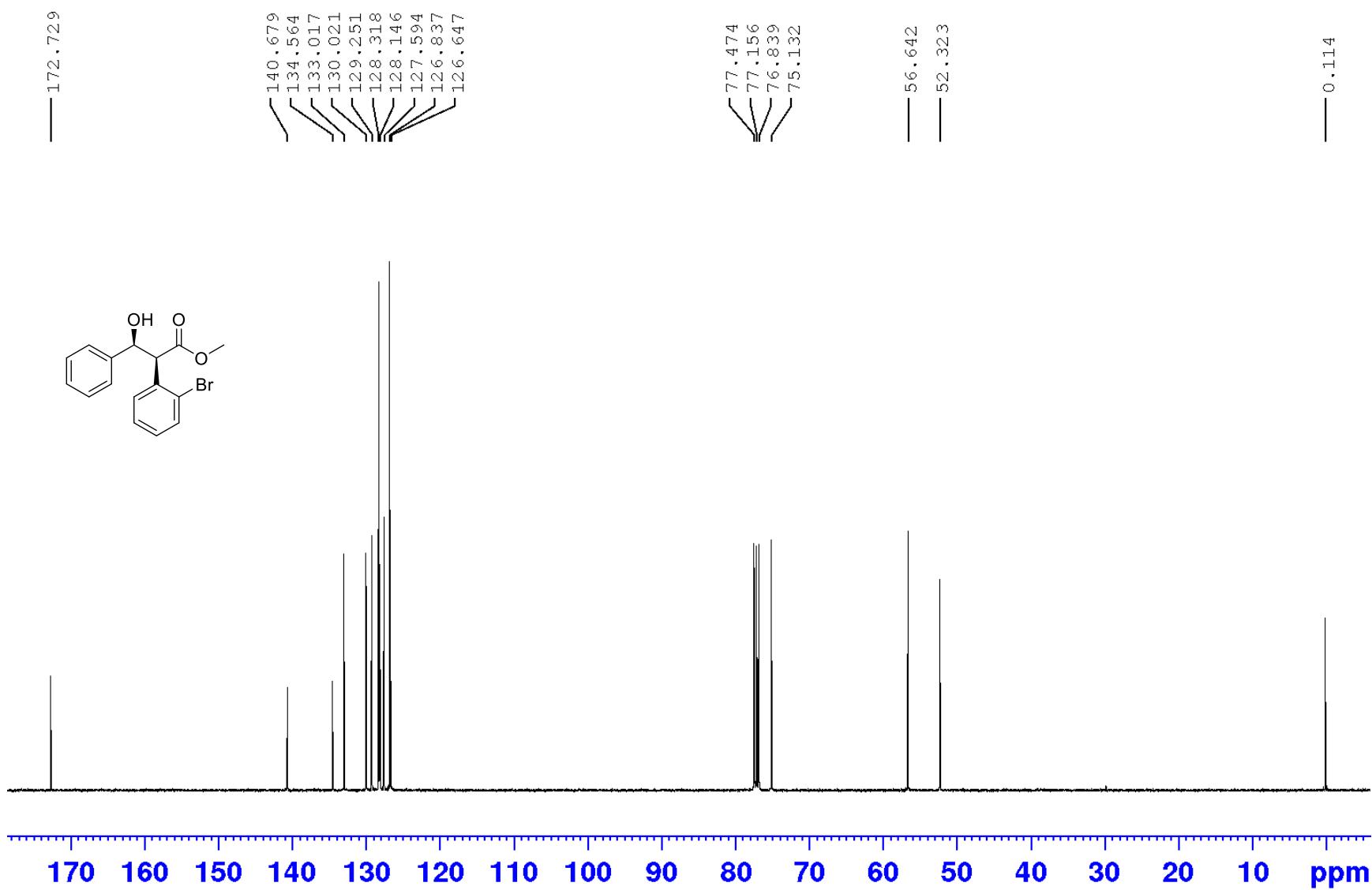


¹H NMR (400 MHz, CDCl₃) Spectrum of *anti*-methyl 2-(4-bromophenyl)-3-hydroxy-3-phenylpropanoate (**10g**)

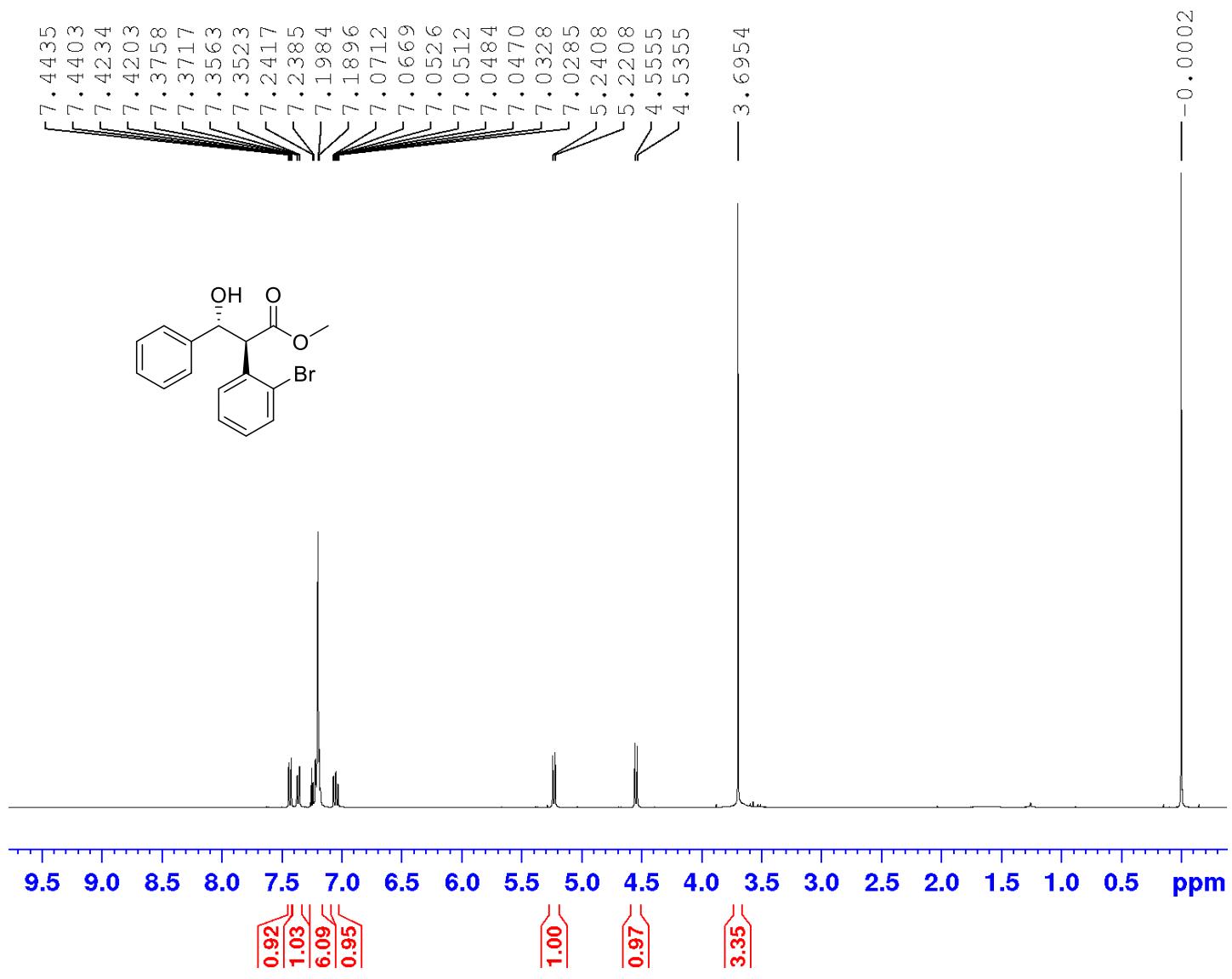




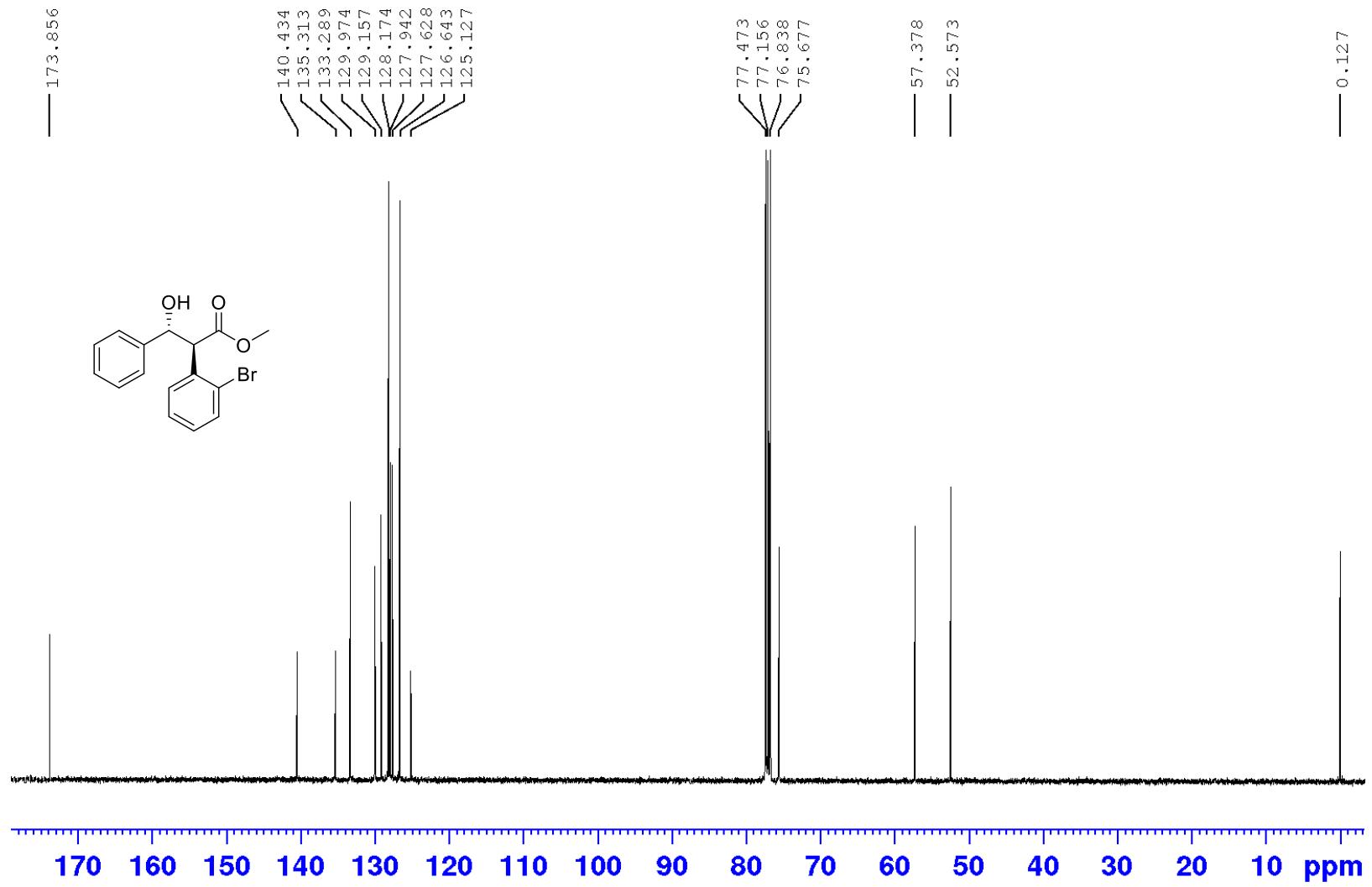
¹H NMR (400 MHz, CDCl₃) Spectrum of *syn*-methyl 2-(2-bromophenyl)-3-hydroxy-3-phenylpropanoate (**10h**)



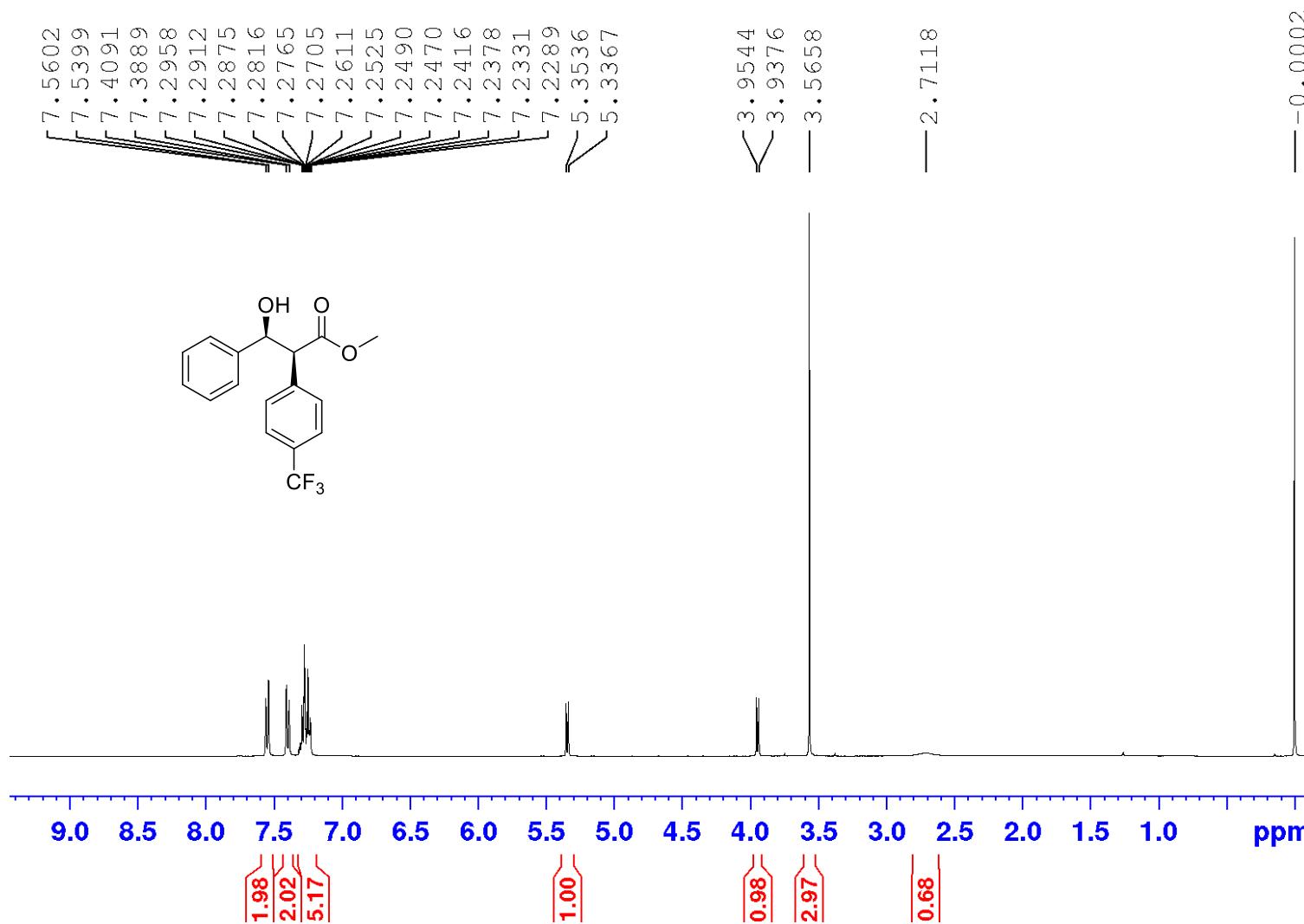
$^{13}\text{C}\{\text{H}\}$ NMR (100 MHz, CDCl_3) Spectrum of *syn*-methyl 2-(2-bromophenyl)-3-hydroxy-3-phenylpropanoate (**10h**)



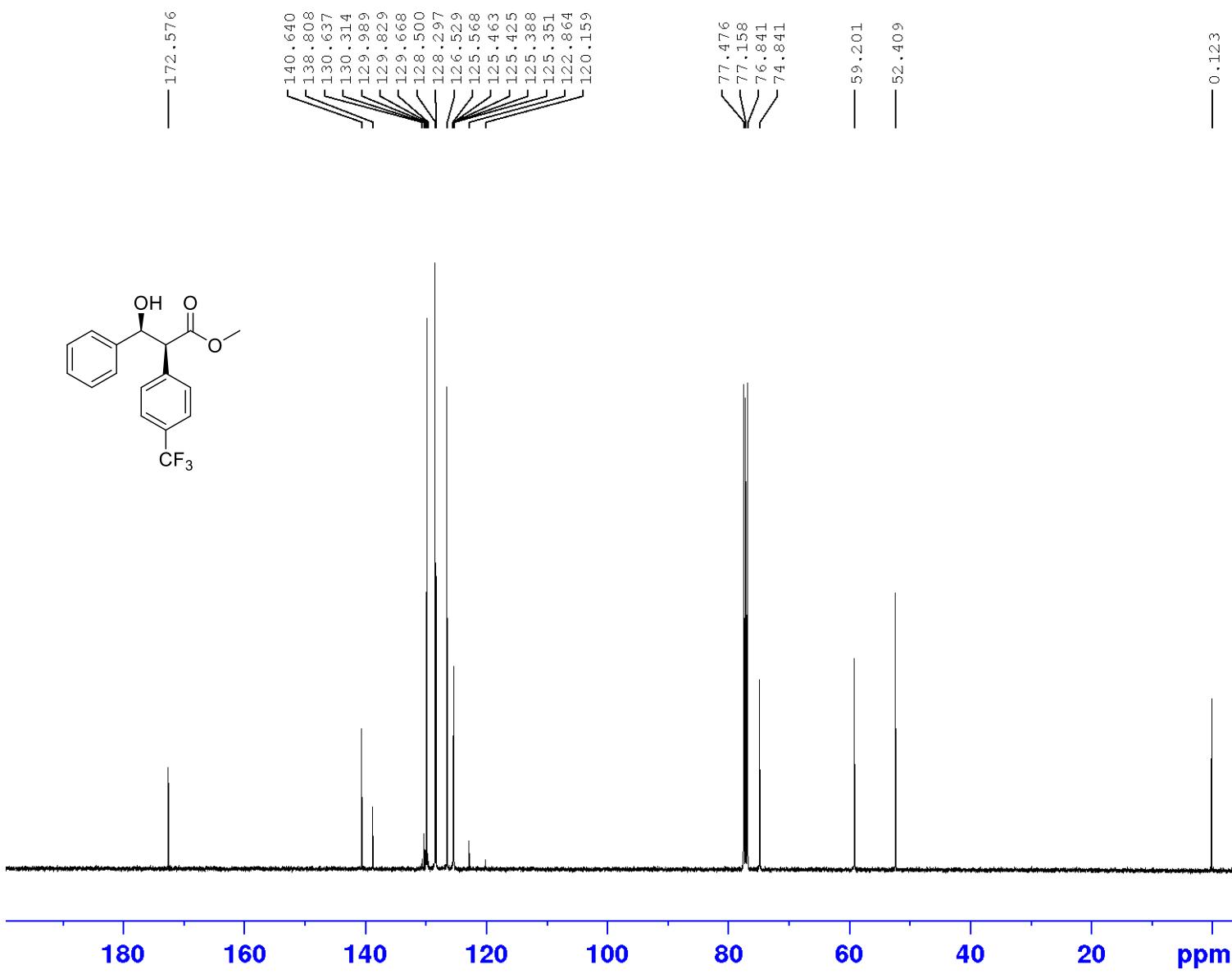
¹H NMR (400 MHz, CDCl₃) Spectrum of *anti*-methyl 2-(2-bromophenyl)-3-hydroxy-3-phenylpropanoate (**10h**)



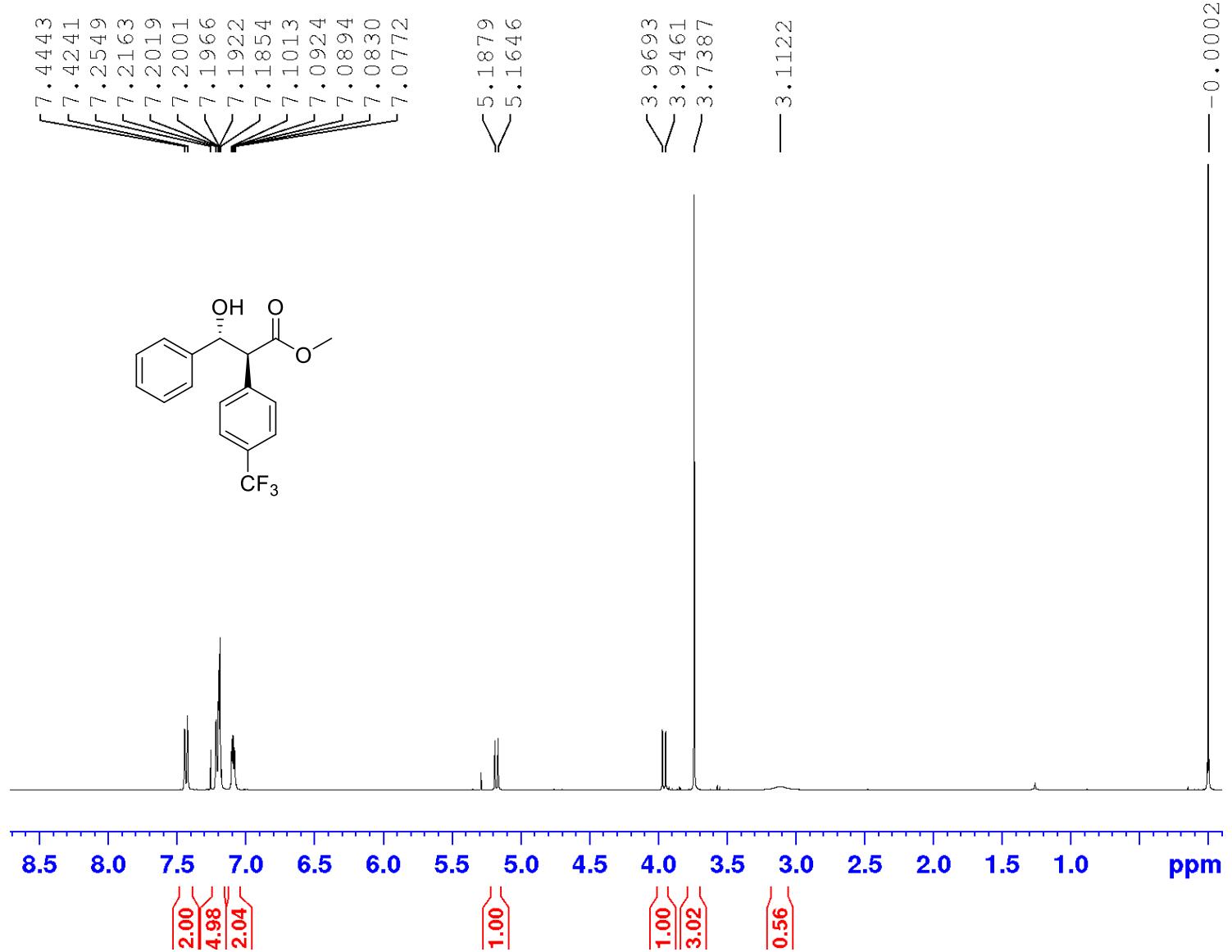
$^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3) Spectrum of *anti*-methyl 2-(2-bromophenyl)-3-hydroxy-3-phenylpropanoate (**10h**)



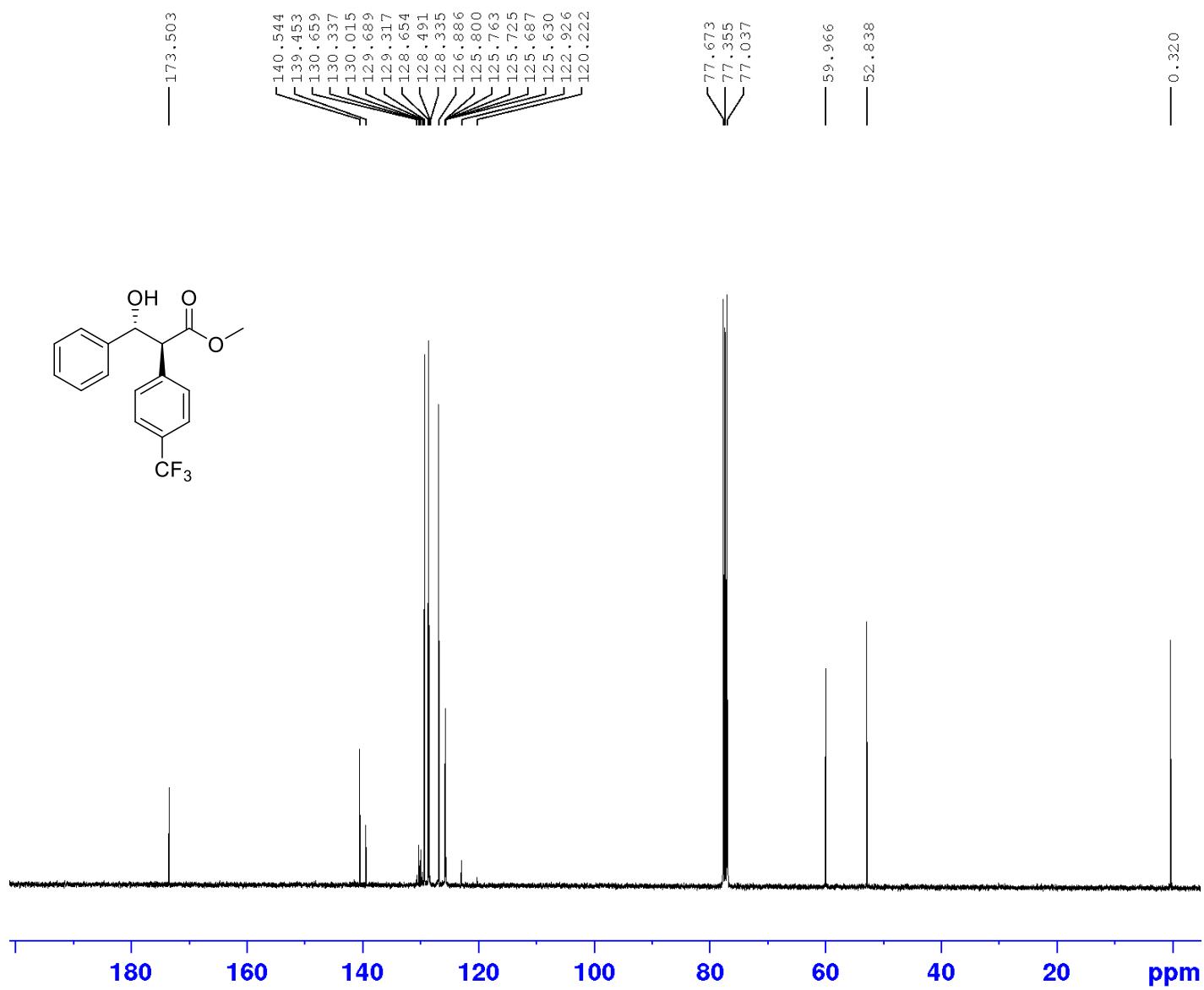
^1H NMR (400 MHz, CDCl_3) Spectrum of *syn*-methyl 3-hydroxy-3-phenyl-2-(4-trifluoromethyl)phenylpropanoate (**10i**)



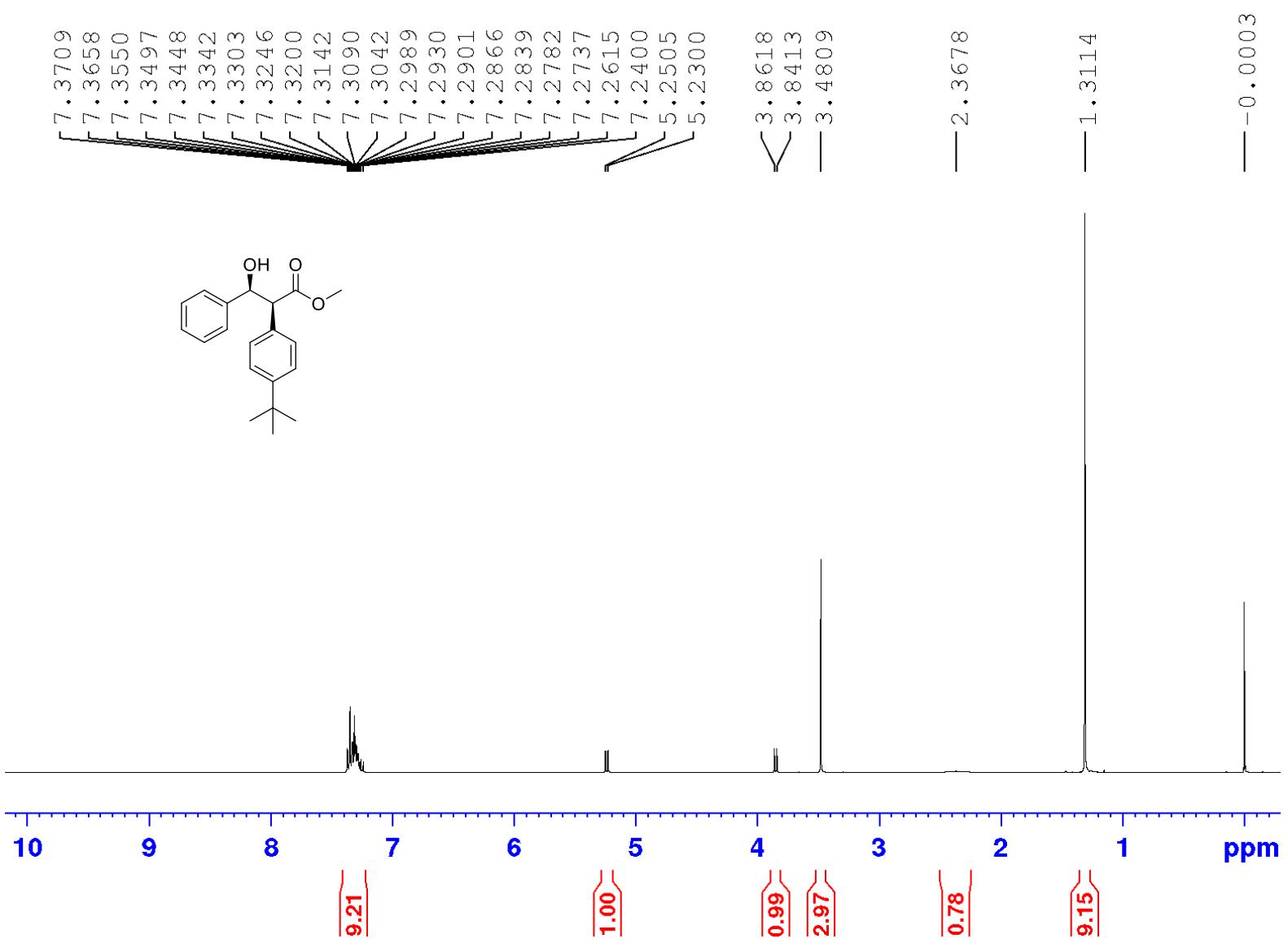
$^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3) Spectrum of *syn*-methyl 3-hydroxy-3-phenyl-2-(4-trifluoromethyl)phenylpropanoate (**10i**)



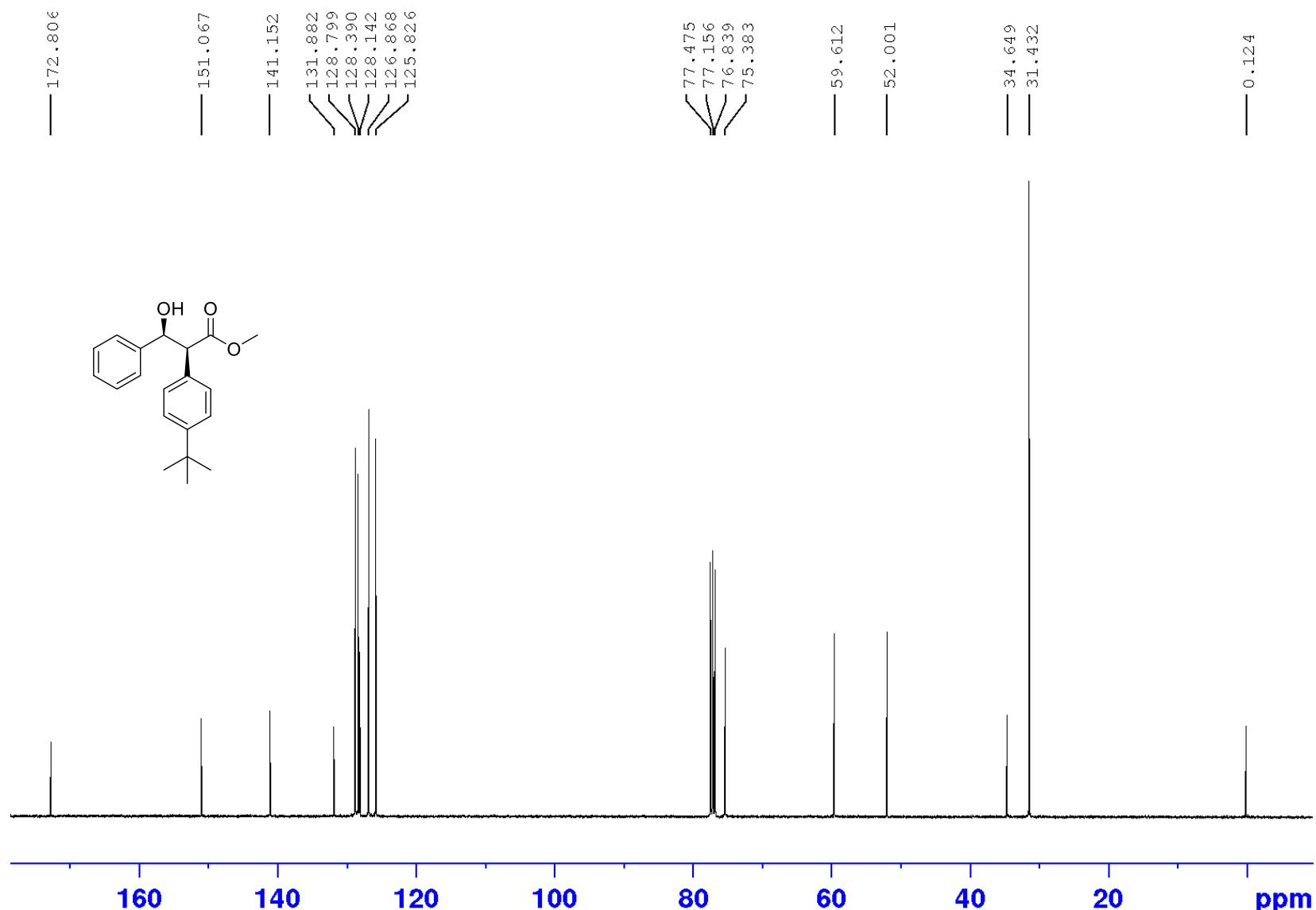
¹H NMR (400 MHz, CDCl₃) Spectrum of *anti*-methyl 3-hydroxy-3-phenyl-2-(4-trifluoromethyl)phenylpropanoate (**10i**)



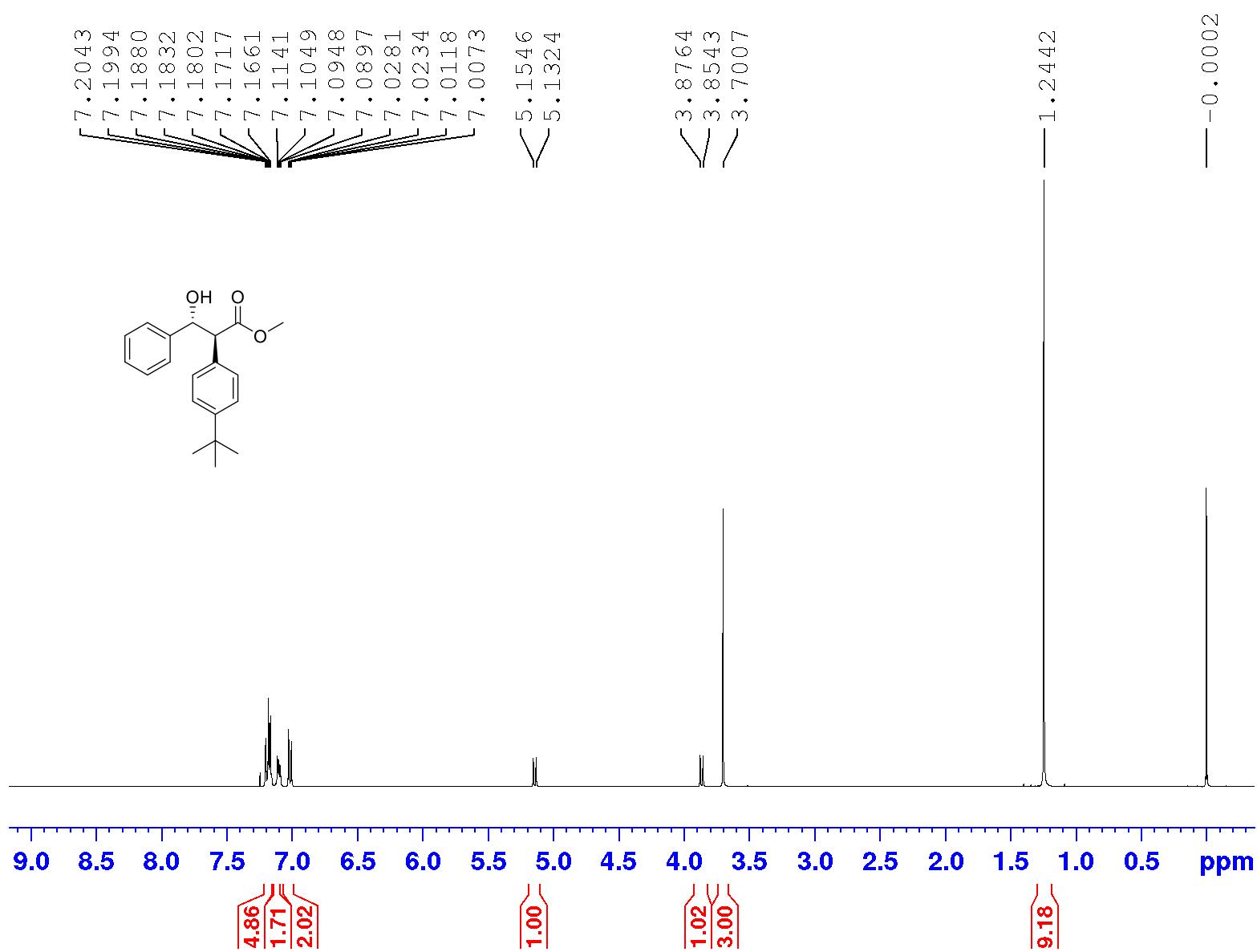
$^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3) Spectrum of *anti*-methyl 3-hydroxy-3-phenyl-2-(4-trifluoromethyl)phenylpropanoate (**10i**)



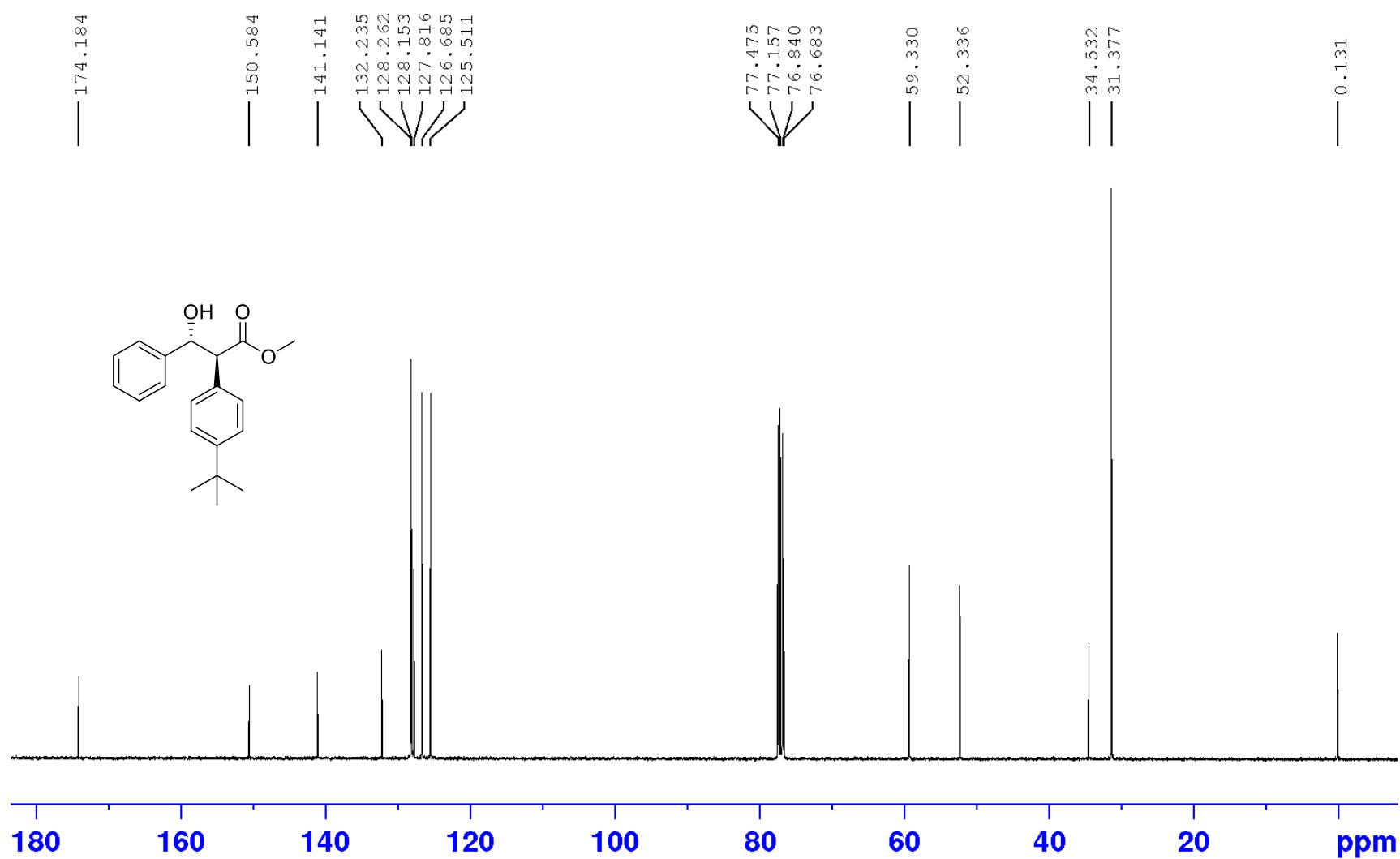
¹H NMR (400 MHz, CDCl₃) Spectrum of *syn*-methyl 2-(4-*tert*-butylphenyl)-3-hydroxy-3-phenylpropanoate (**10j**)

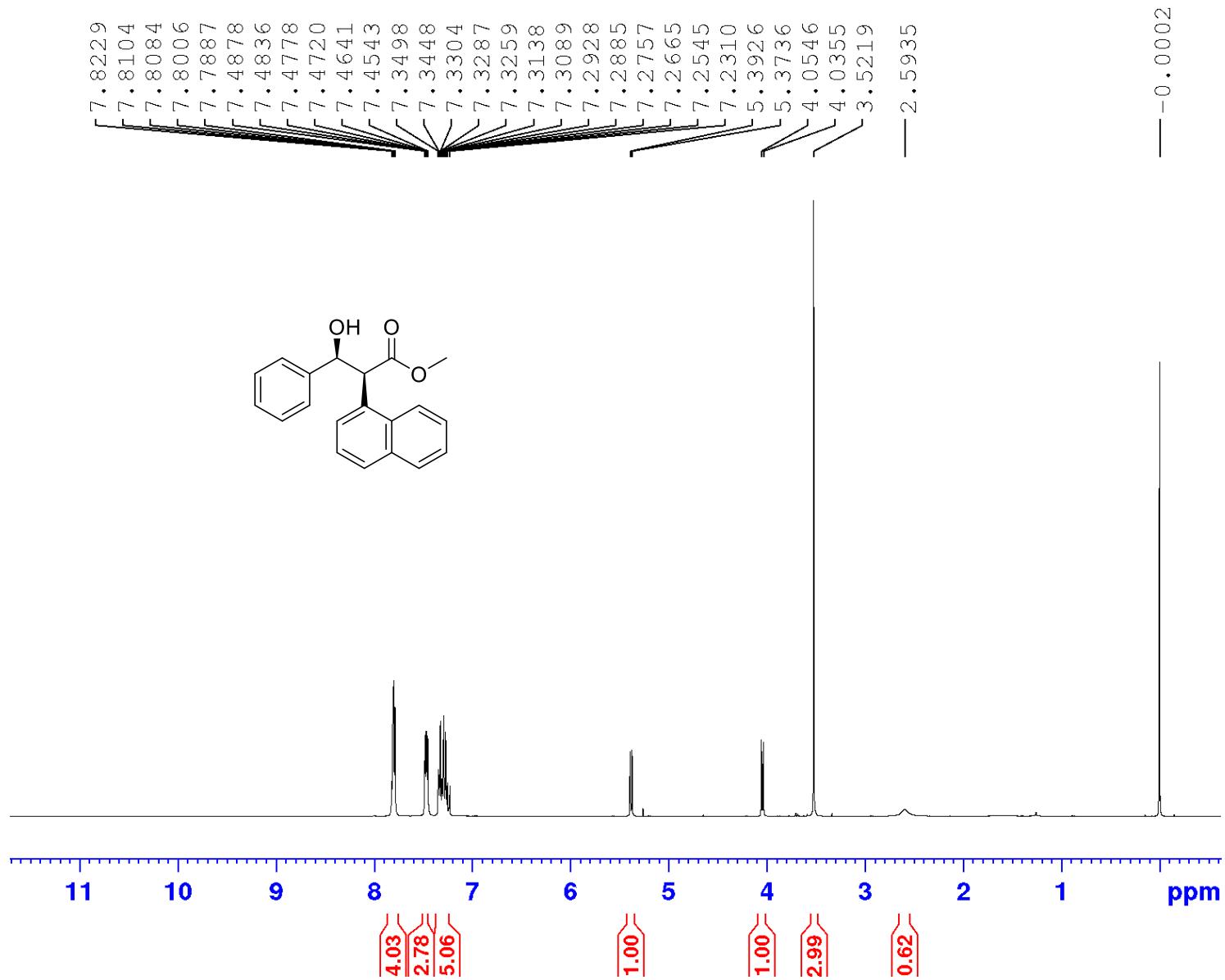


$^{13}\text{C}\{\text{H}\}$ NMR (100 MHz, CDCl_3) Spectrum of *syn*-methyl 2-(4-*tert*-butylphenyl)-3-hydroxy-3-phenylpropanoate (**10j**)

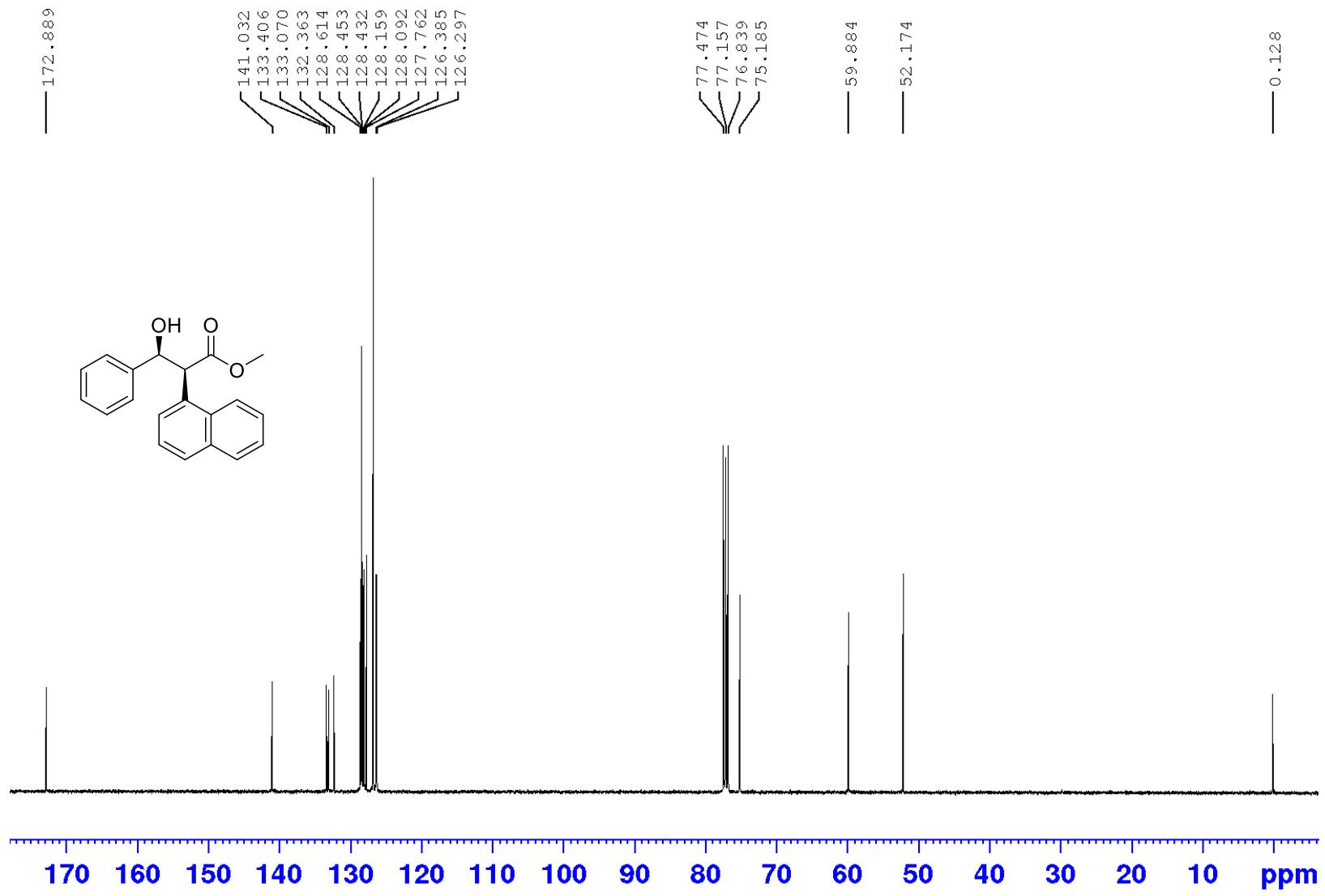


¹H NMR (400 MHz, CDCl₃) Spectrum of *anti*-methyl 2-(4-*tert*-butylphenyl)-3-hydroxy-3-phenylpropanoate (**10j**)

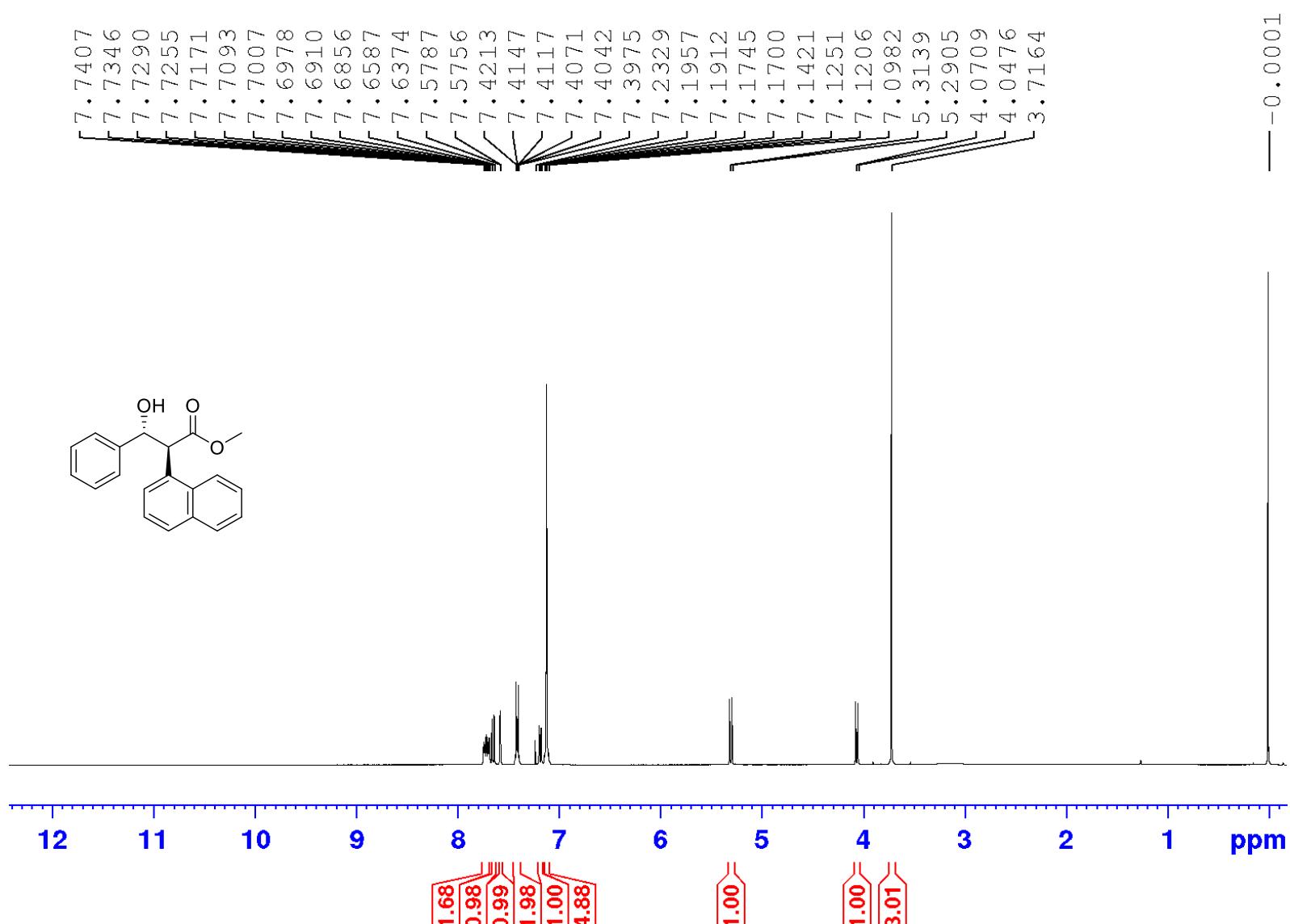




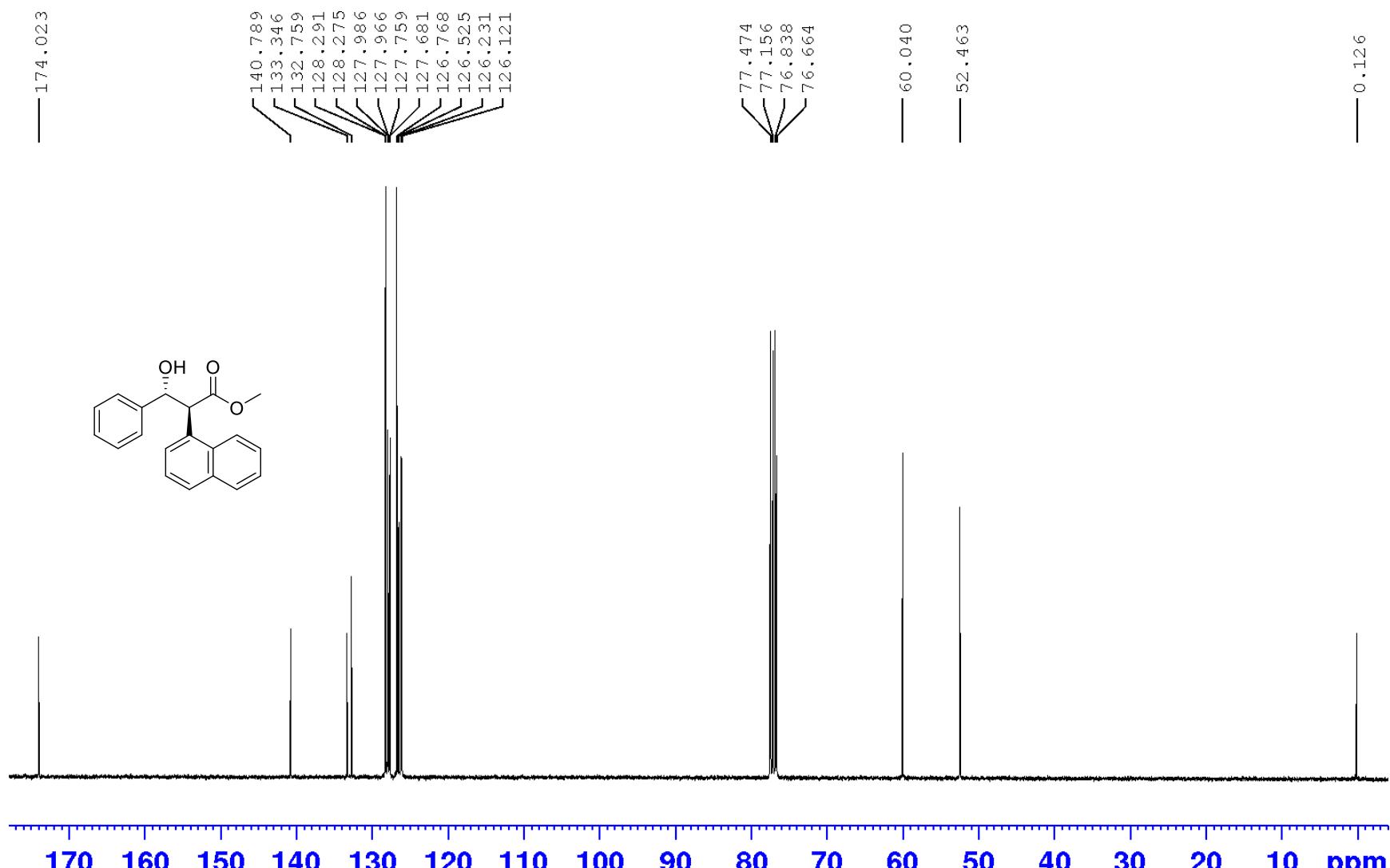
¹H NMR (400 MHz, CDCl₃) Spectrum of *syn*-methyl 3-hydroxy-2-(naphthalen-1-yl)-3-phenylpropanoate (**10k**)



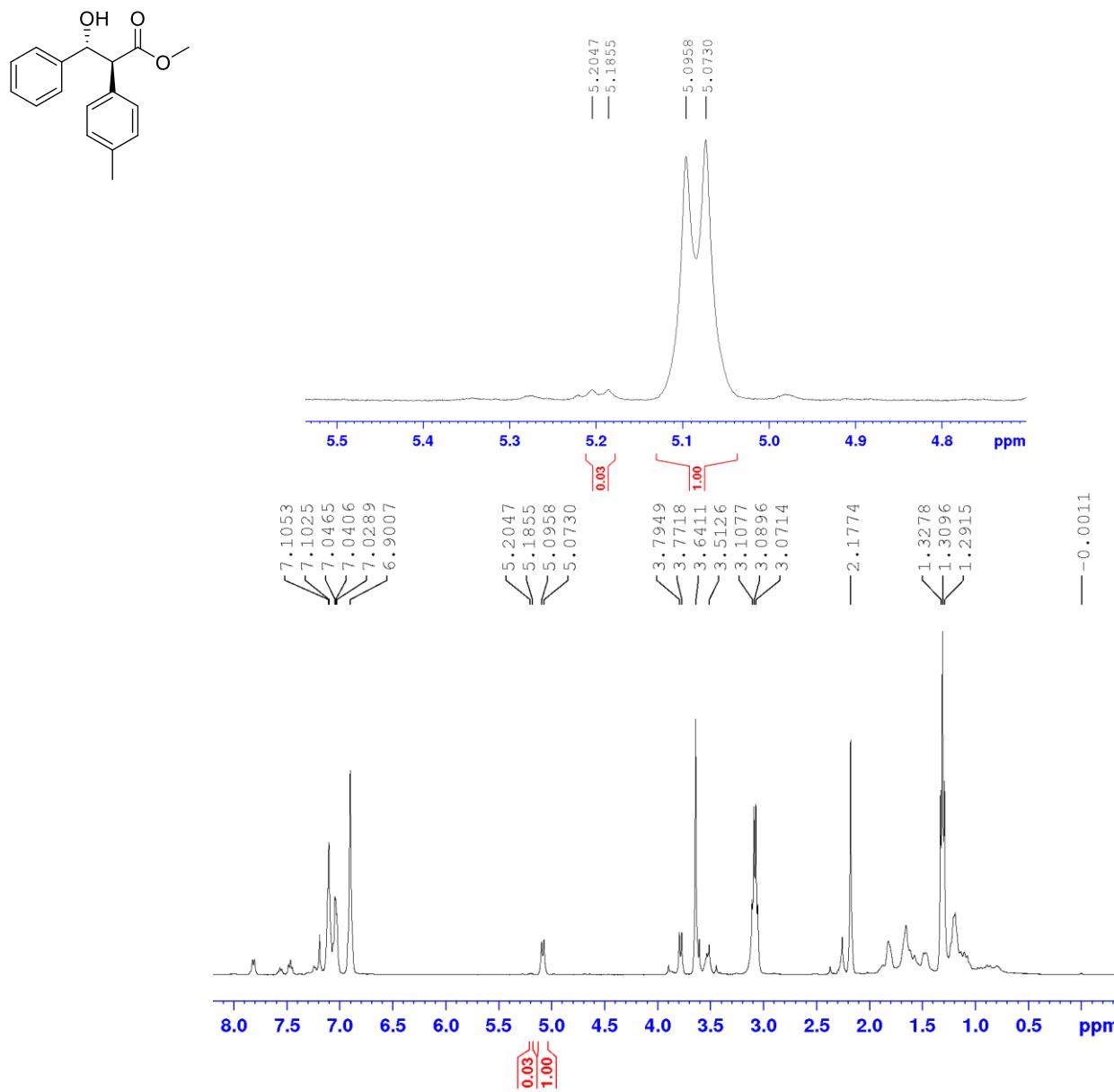
$^{13}\text{C}\{\text{H}\}$ NMR (100 MHz, CDCl_3) Spectrum of *syn*-methyl 3-hydroxy-2-(naphthalen-1-yl)-3-phenylpropanoate (**10k**)



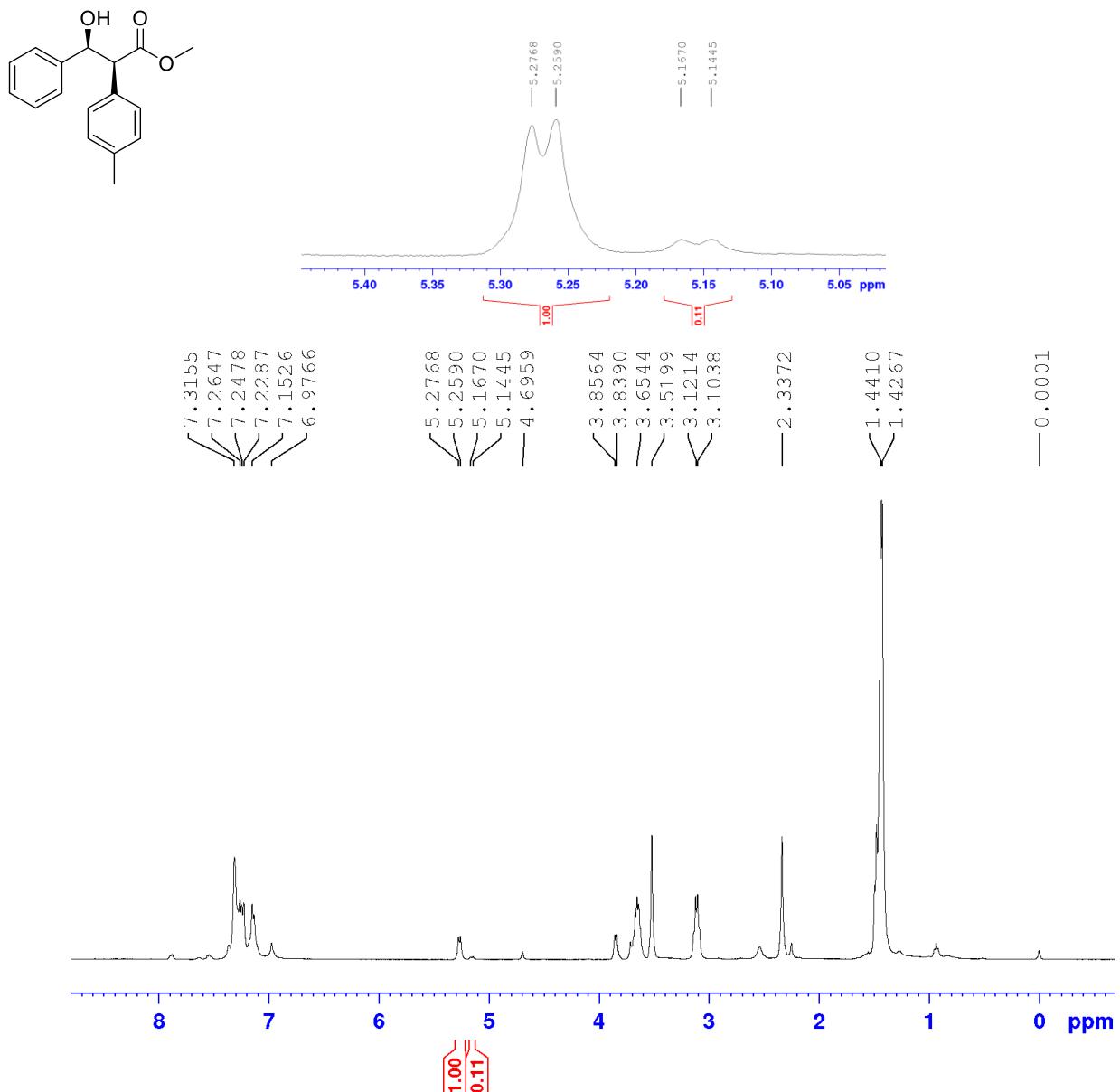
¹H NMR (400 MHz, CDCl₃) Spectrum of *anti*-methyl 3-hydroxy-2-(naphthalen-1-yl)-3-phenylpropanoate (**10k**)



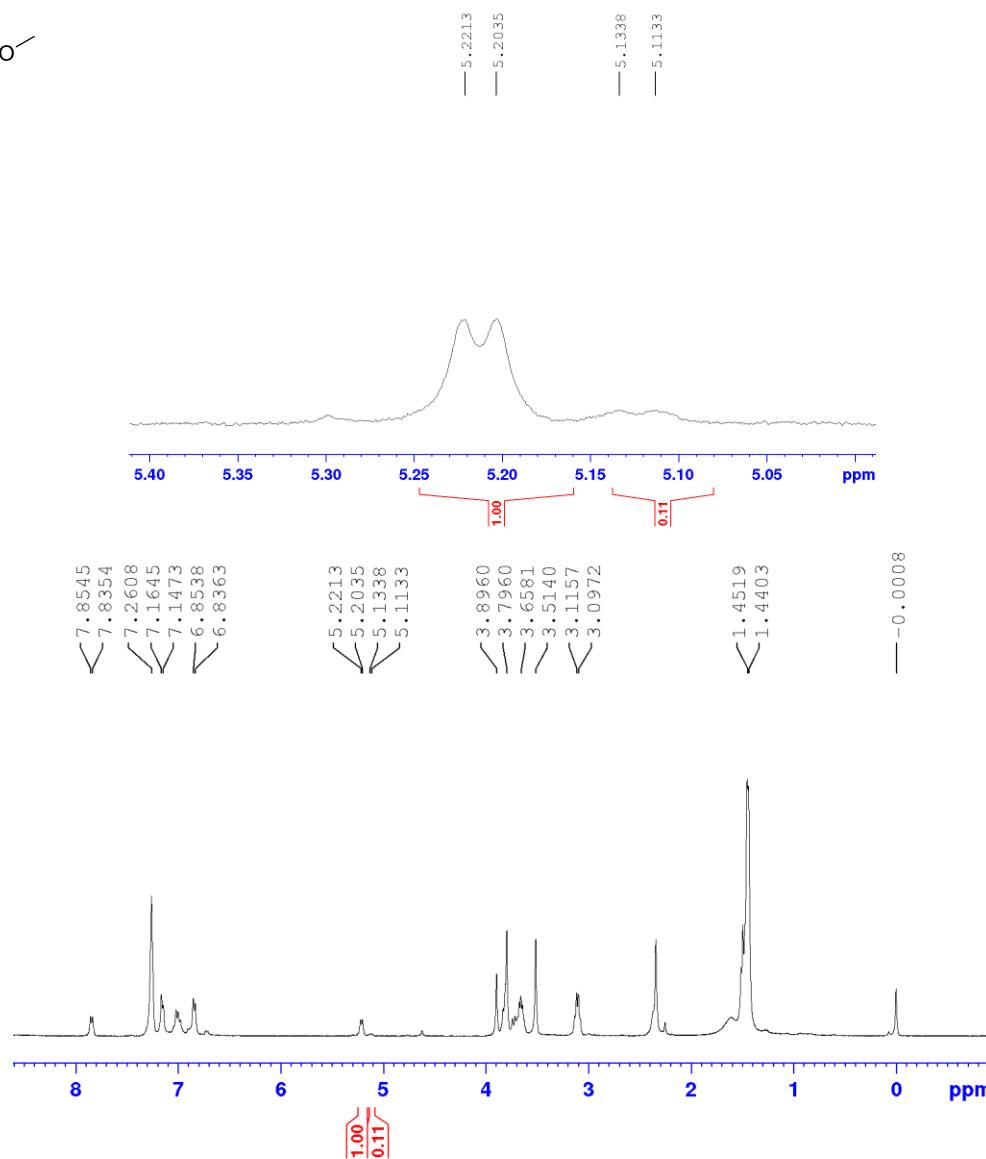
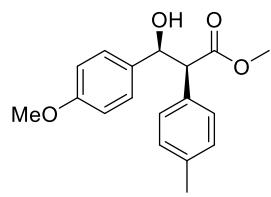
$^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3) Spectrum of *anti*-methyl 3-hydroxy-2-(naphthalen-1-yl)-3-phenylpropanoate (**10k**)

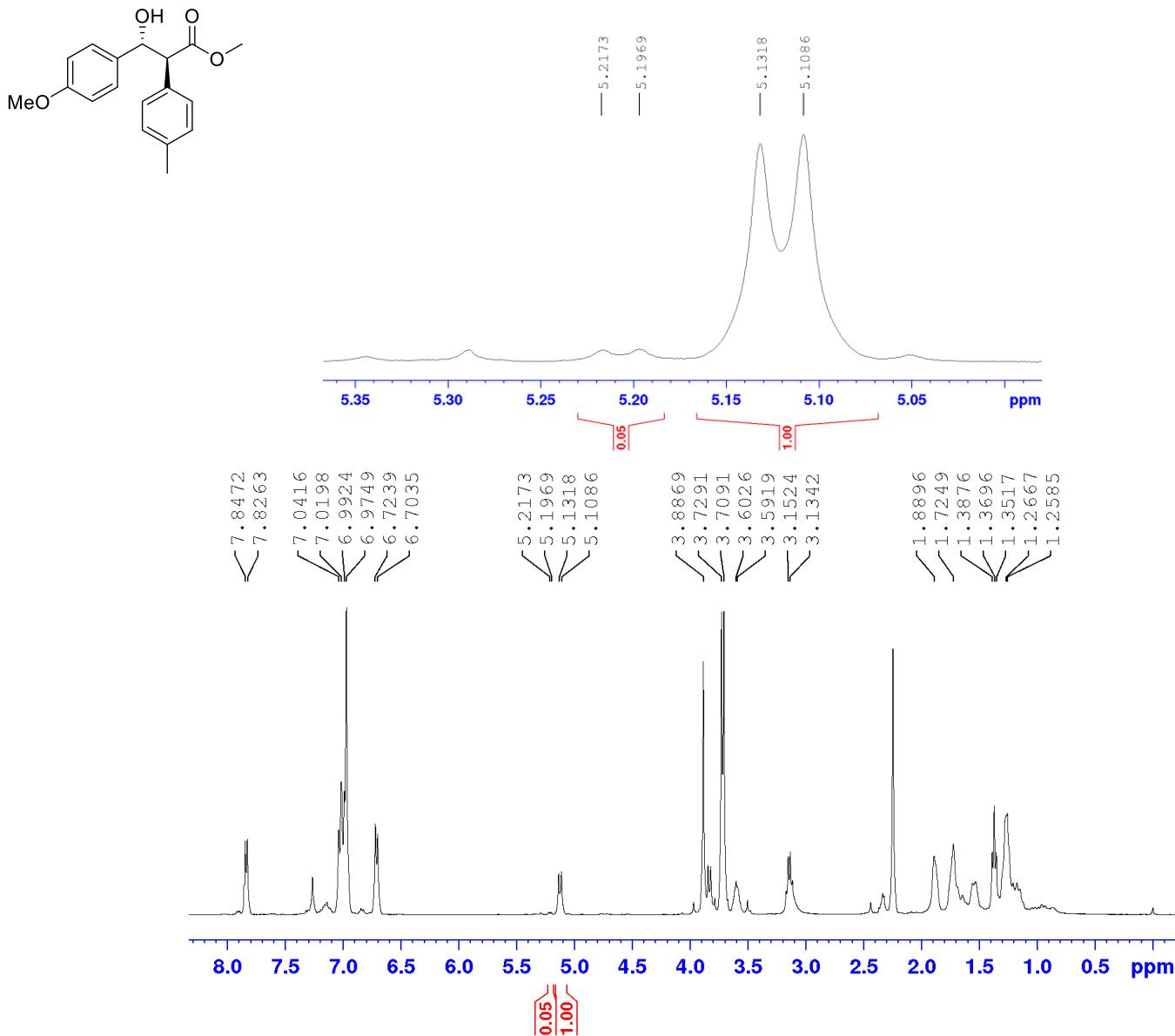


¹H NMR (400 MHz, CDCl₃) Spectrum of **crude *anti*-methyl 3-hydroxy-3-phenyl-2-*p*-tolylpropanoate**

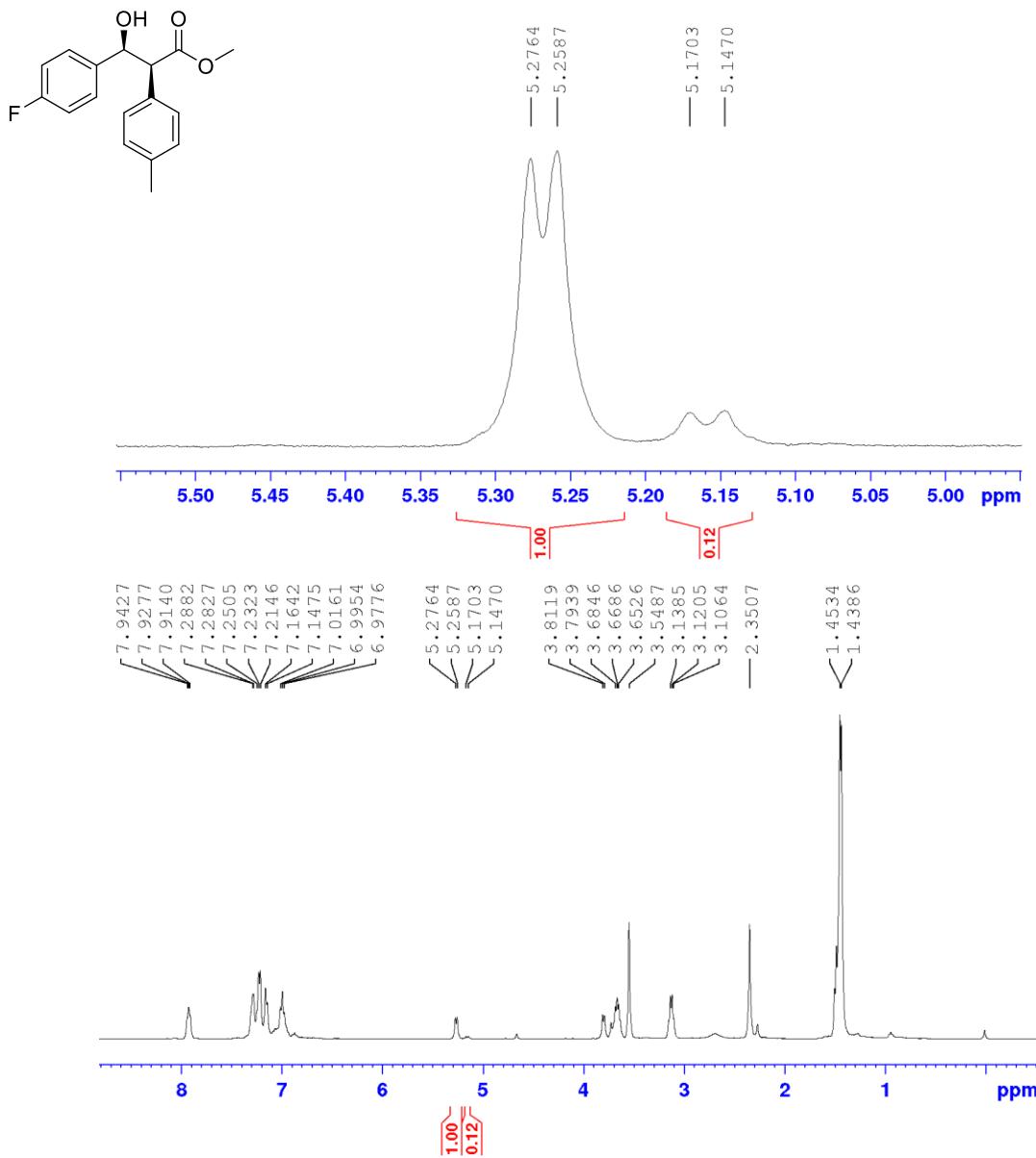


¹H NMR (400 MHz, CDCl₃) Spectrum of **crude** *syn*-methyl 3-hydroxy-3-phenyl-2-*p*-tolylpropanoate

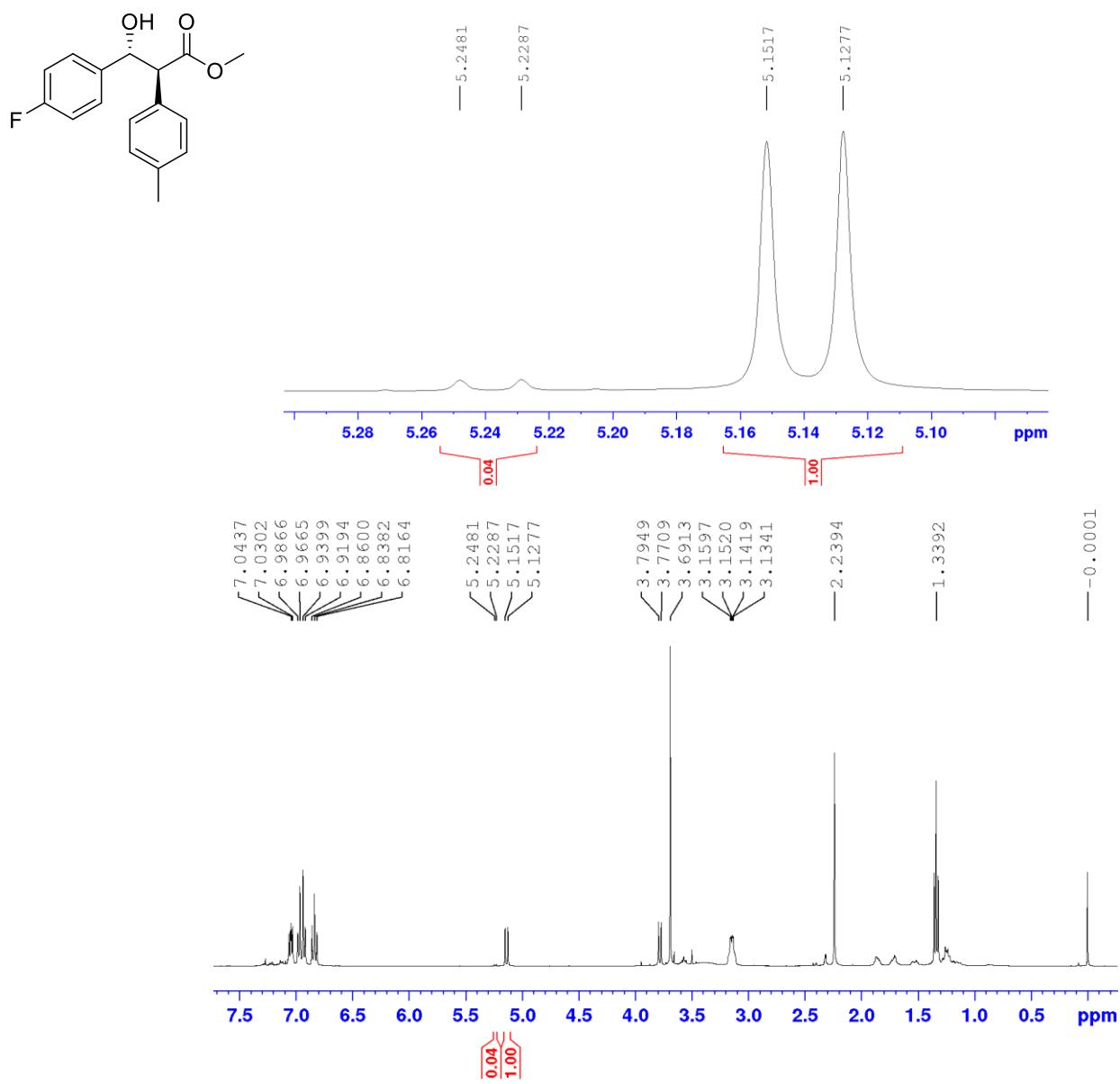




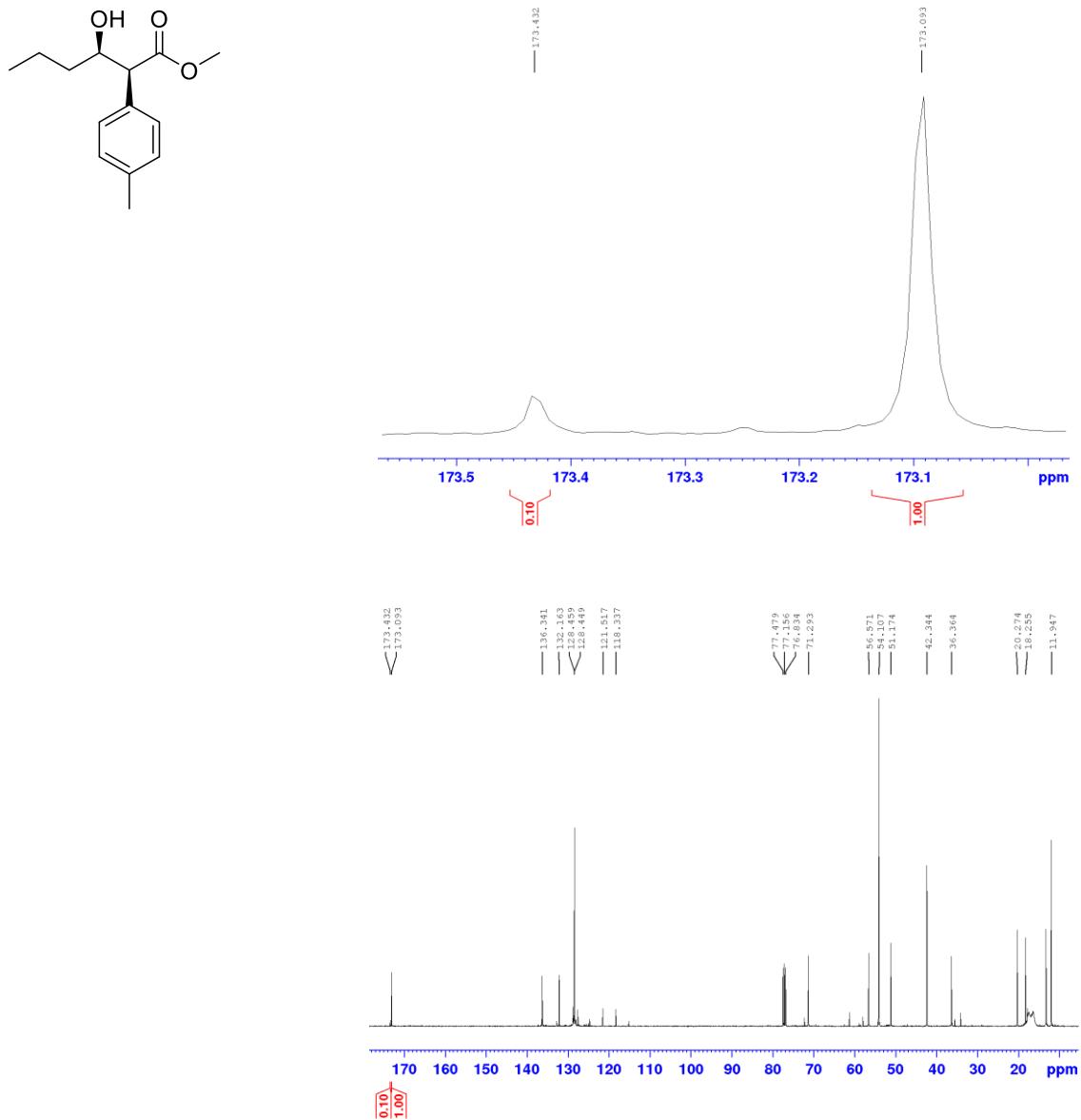
¹H NMR (400 MHz, CDCl₃) Spectrum of **crude** *anti*-methyl 3-hydroxy-3-(4-methoxyphenyl)-2-*p*-tolylpropanoate



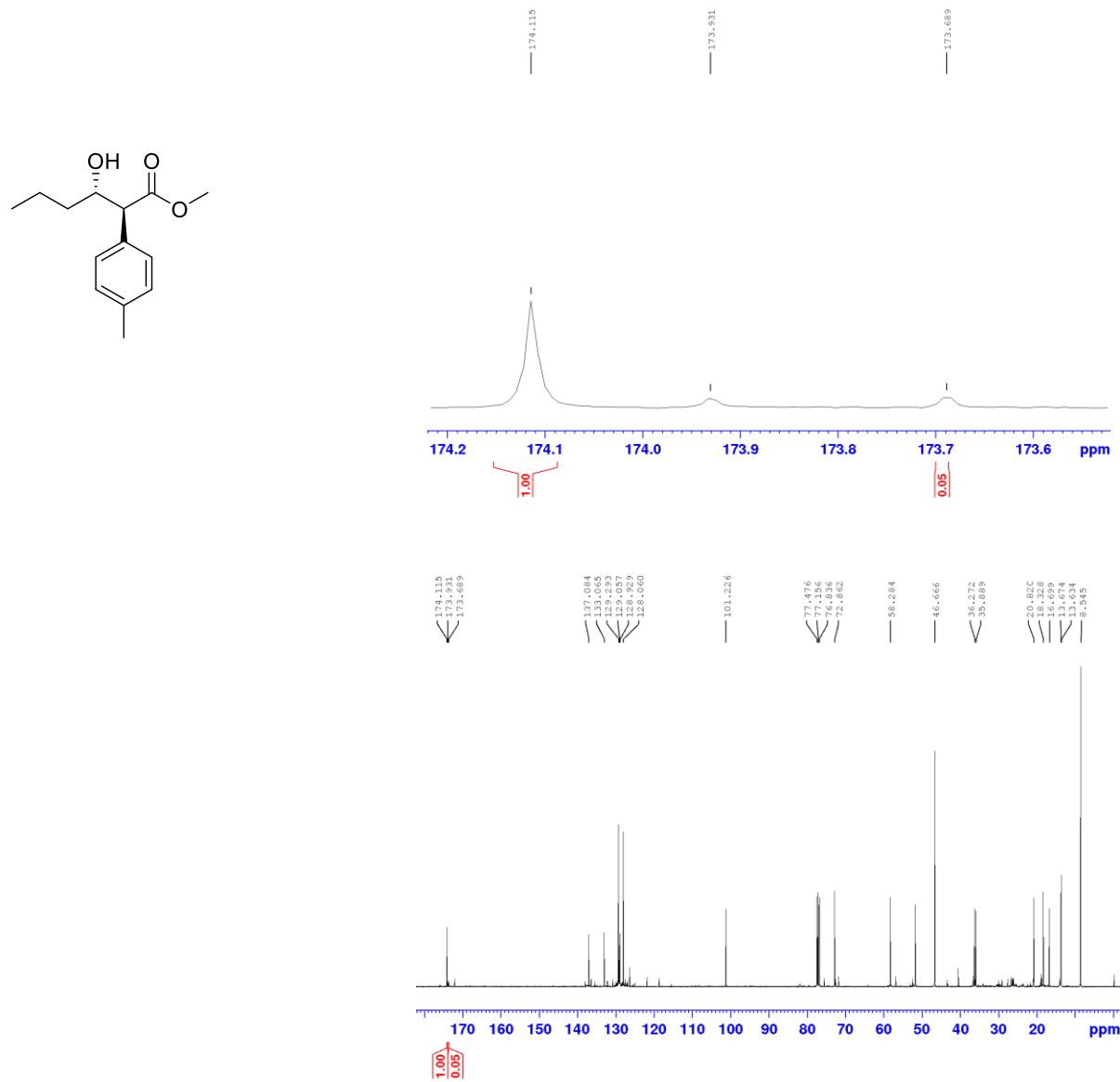
¹H NMR (400 MHz, CDCl₃) Spectrum of **crude** *syn*-methyl 3-(4-fluorophenyl)-3-hydroxy-2-*p*-tolylpropanoate



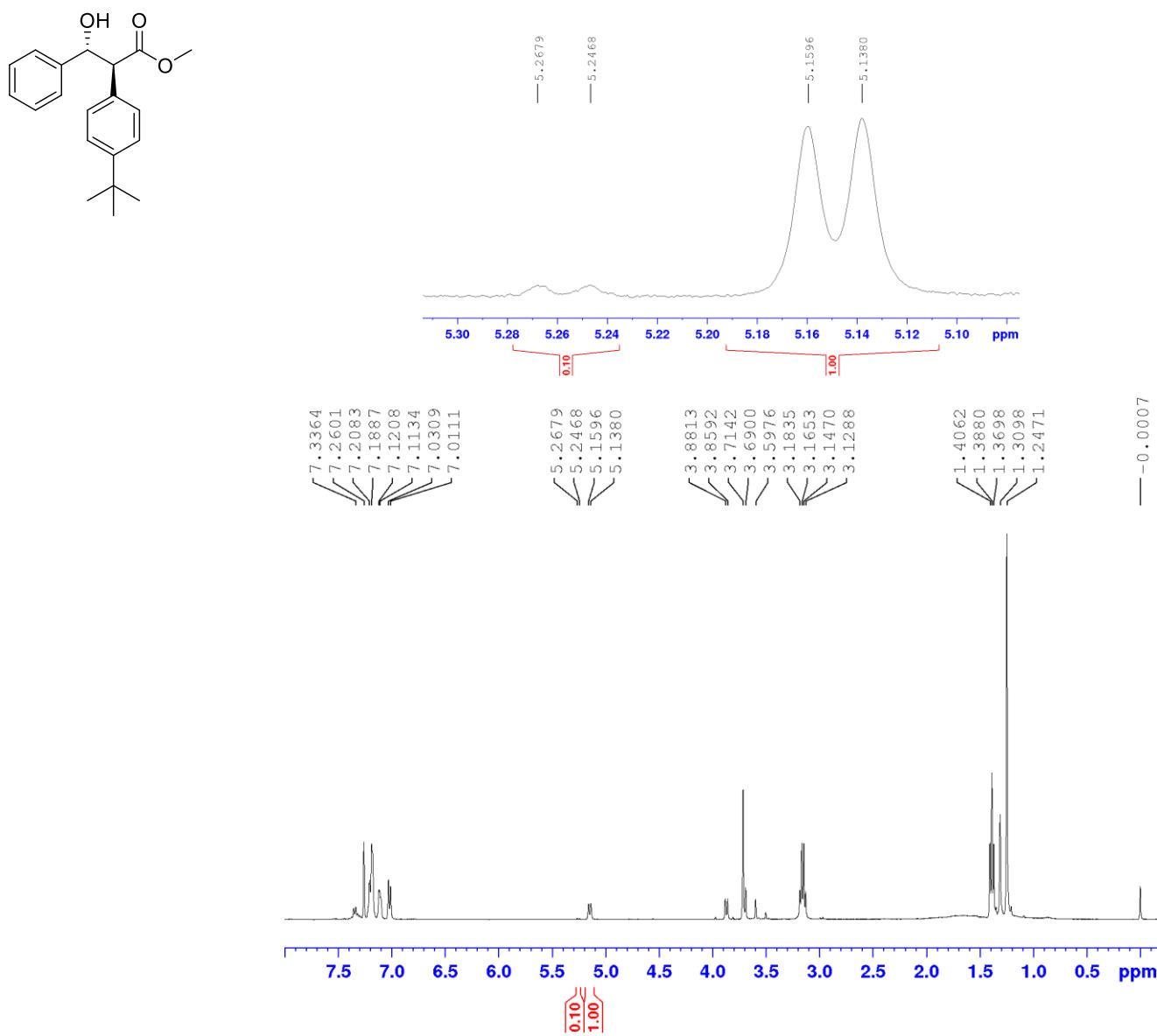
¹H NMR (400 MHz, CDCl₃) Spectrum of **crude anti-methyl 3-(4-fluorophenyl)-3-hydroxy-2-p-tolylpropanoate**



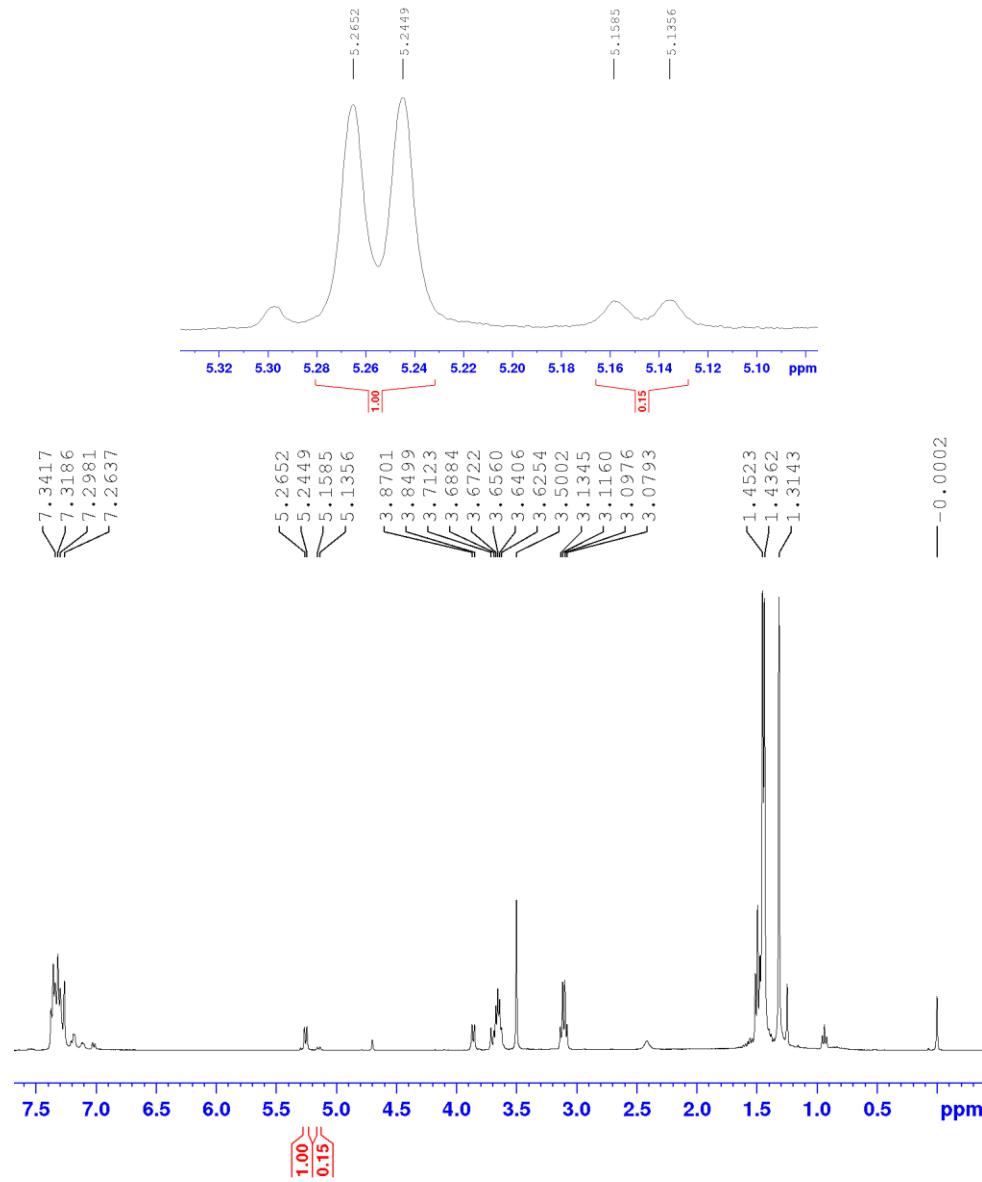
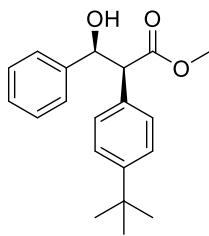
¹³C{¹H} NMR (100 MHz, CDCl₃) Spectrum of **crude** *syn*-methyl 3-hydroxy-2-*p*-tolylhexanoate (**7j**)



$^{13}\text{C}\{\text{H}\}$ NMR (100 MHz, CDCl_3) Spectrum of **crude anti-methyl 3-hydroxy-2-p-tolylhexanoate (7j)**



¹H NMR (400 MHz, CDCl₃) Spectrum of **crude anti-methyl 2-(4-*tert*-butylphenyl)-3-hydroxy-3-phenylpropanoate (10j)**



¹H NMR (400 MHz, CDCl₃) Spectrum of **crude** *syn*-methyl 2-(4-*tert*-butylphenyl)-3-hydroxy-3-phenylpropanoate (**10j**)