

### Section 3 of supporting information for

## Synthesis of Surfactants Based on Pentaerythritol. Part I. Cationic and Zwitterionic Gemini Surfactants

Nusrat Jahan,<sup>1</sup> Nawal Paul,<sup>†</sup> Christian J. Petropolis,<sup>†,‡</sup> D. Gerrard Marangoni,<sup>‡,\*</sup> and T. Bruce Grindley<sup>†,\*</sup>

<sup>†</sup>Department of Chemistry, Dalhousie University, Halifax, NS, Canada, B3H 4J3, and <sup>‡</sup>Department of Chemistry, St. Francis Xavier University, Antigonish, NS, Canada B2G 2W5

\*Corresponding authors

T. Bruce Grindley, email: bruce.grindley@dal.ca, telephone: 1-902-494-2041

D. Gerrard Marangoni, email: gmarango@stfx.ca, telephone: 1-902-867-2324

Note: The Table of Contents uses page numbering that starts in section 1a.

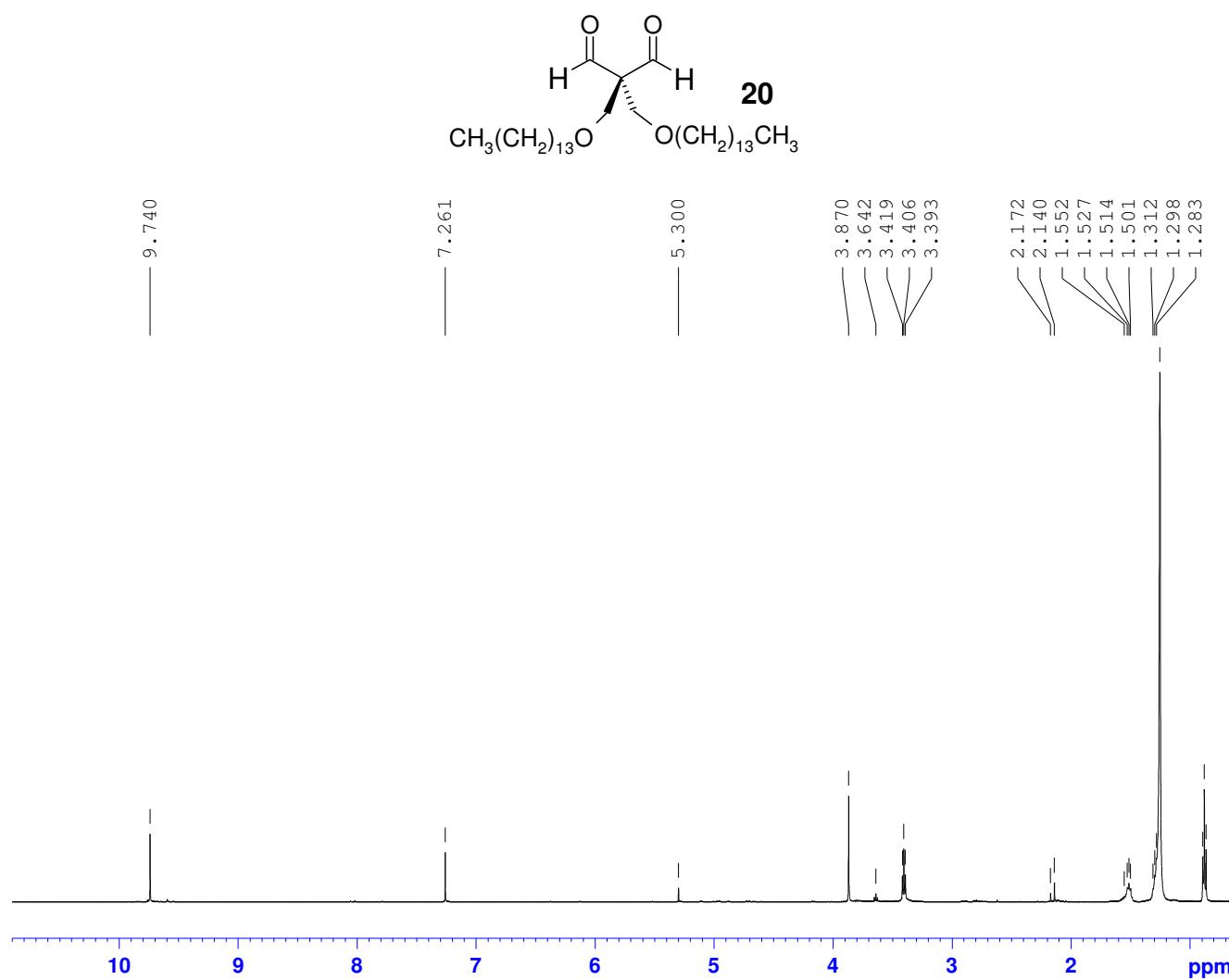
### Table of Contents

Item	Page No.
500.1 MHz <sup>1</sup> H NMR spectrum of 2, 2-bis(tetradecyloxymethyl)propanedial ( <b>20</b> ) in chloroform- <i>d</i>	S209
127.5 MHz <sup>13</sup> C NMR spectrum of 2, 2-bis(tetradecyloxymethyl)propanedial ( <b>20</b> ) in chloroform- <i>d</i>	S210
500.1 MHz <sup>1</sup> H NMR spectrum of <i>N,N,N',N'</i> -tetramethyl-4,4-bis(octyloxymethyl)-2,5-heptadienediamide ( <b>3.1</b> ) in chloroform- <i>d</i>	S211
127.5 MHz <sup>13</sup> C NMR spectrum of <i>N,N,N',N'</i> -tetramethyl-4,4-bis(octyloxymethyl)-2,5-heptadienediamide ( <b>3.1</b> ) in chloroform- <i>d</i>	S212
500.1 MHz <sup>1</sup> H NMR spectrum of 4,4-bis(decyloxymethyl)- <i>N,N,N',N'</i> -tetramethyl-2,5-heptadienediamide ( <b>3.2</b> ) in chloroform- <i>d</i>	S213
127.5 MHz <sup>13</sup> C NMR spectrum of 4,4-bis(decyloxymethyl)- <i>N,N,N',N'</i> -tetramethyl-2,5-heptadienediamide ( <b>3.2</b> ) in chloroform- <i>d</i>	S214
500.1 MHz <sup>1</sup> H NMR spectrum of 4,4-bis(dodecyloxymethyl)- <i>N,N,N',N'</i> -tetramethyl-2,5-heptadienediamide ( <b>3.3</b> ) in chloroform- <i>d</i>	S215
127.5 MHz <sup>13</sup> C NMR spectrum of 4,4-bis(dodecyloxymethyl)- <i>N,N,N',N'</i> -tetramethyl-2,5-heptadienediamide ( <b>3.3</b> ) in chloroform- <i>d</i>	S216
500.1 MHz <sup>1</sup> H NMR spectrum of <i>N,N,N',N'</i> -tetramethyl-4,4-bis(tetradecyloxymethyl)-	

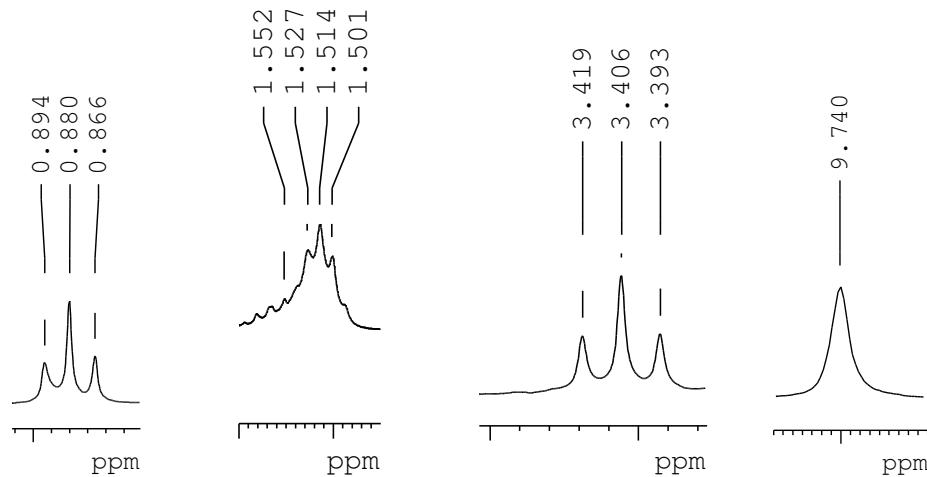
2,5-heptadienediamide ( <b>3.4</b> ) in chloroform- <i>d</i>	S217
127.5 MHz $^{13}\text{C}$ NMR spectrum of <i>N,N,N',N'</i> -tetramethyl-4, 4-bis(tetradecyloxymethyl)-2,5-heptadienediamide ( <b>3.4</b> ) in chloroform- <i>d</i>	S219
500.1 MHz $^1\text{H}$ NMR spectrum of <i>N,N,N',N'</i> -tetramethyl-4, 4-bis(octyloxymethyl)-heptanediamide ( <b>3.5</b> ) in chloroform- <i>d</i>	S220
127.5 MHz $^{13}\text{C}$ NMR spectrum of <i>N,N,N',N'</i> -tetramethyl-4, 4-bis(octyloxymethyl)-heptanediamide ( <b>3.5</b> ) in chloroform- <i>d</i>	S222
500.1 MHz $^1\text{H}$ NMR spectrum of 4, 4-bis(decyloxymethyl)- <i>N,N,N',N'</i> -tetramethylheptanediamide ( <b>3.6</b> ) in chloroform- <i>d</i>	S224
127.5 MHz $^{13}\text{C}$ NMR spectrum of 4, 4-bis(decyloxymethyl)- <i>N,N,N',N'</i> -tetramethylheptanediamide ( <b>3.6</b> ) in chloroform- <i>d</i>	S226
500.1 MHz $^1\text{H}$ NMR spectrum of 4, 4-bis(dodecyloxymethyl)- <i>N,N,N',N'</i> -tetramethylheptanediamide ( <b>3.7</b> ) in chloroform- <i>d</i>	S227
127.5 MHz $^{13}\text{C}$ NMR spectrum of 4, 4-bis(dodecyloxymethyl)- <i>N,N,N',N'</i> -tetramethylheptanediamide ( <b>3.7</b> ) in chloroform- <i>d</i>	S229
500.1 MHz $^1\text{H}$ NMR spectrum of <i>N,N,N',N'</i> -tetramethyl-4, 4-bis(tetradecyloxymethyl)-heptanediamide ( <b>3.8</b> ) in chloroform- <i>d</i>	S230
127.5 MHz $^{13}\text{C}$ NMR spectrum of <i>N,N,N',N'</i> -tetramethyl-4, 4-bis(tetradecyloxymethyl)-heptanediamide ( <b>3.8</b> ) in chloroform- <i>d</i>	S231
500.1 MHz $^1\text{H}$ NMR spectrum of <i>N,N,N',N'</i> -tetramethyl-4,4-bis(octyloxymethyl)-1,7-heptanediamine ( <b>3.9</b> ) in chloroform- <i>d</i>	S232
127.5 MHz $^{13}\text{C}$ NMR spectrum of <i>N,N,N',N'</i> -tetramethyl-4,4-bis(octyloxymethyl)-1,7-heptanediamine ( <b>3.9</b> ) in chloroform- <i>d</i>	S233
500.1 MHz $^1\text{H}$ NMR spectrum of 4,4-bis(decyloxymethyl)- <i>N,N,N',N'</i> -tetramethyl-1,7-heptanediamine ( <b>3.10</b> ) in chloroform- <i>d</i>	S235
127.5 MHz $^{13}\text{C}$ NMR spectrum of 4,4-bis(decyloxymethyl)- <i>N,N,N',N'</i> -tetramethyl-1,7-heptanediamine ( <b>3.10</b> ) in chloroform- <i>d</i>	S237
500.1 MHz $^1\text{H}$ NMR spectrum of 4,4-bis(dodecyloxymethyl)- <i>N,N,N',N'</i> -tetramethyl-1,7-heptanediamine ( <b>3.11</b> ) in chloroform- <i>d</i>	S238
127.5 MHz $^{13}\text{C}$ NMR spectrum of 4,4-bis(dodecyloxymethyl)- <i>N,N,N',N'</i> -tetramethyl-1,7-heptanediamine ( <b>3.11</b> ) in chloroform- <i>d</i>	S240
500.1 MHz $^1\text{H}$ NMR spectrum of <i>N,N,N',N'</i> -tetramethyl-4,4-bis(tetradecyloxymethyl)-1,7-heptanediamine ( <b>3.12</b> ) in chloroform- <i>d</i>	S241
127.5 MHz $^{13}\text{C}$ NMR spectrum of <i>N,N,N',N'</i> -tetramethyl-4,4-bis(tetradecyloxymethyl)-1,7-heptanediamine ( <b>3.12</b> ) in chloroform- <i>d</i>	S243
500.1 MHz $^1\text{H}$ NMR spectrum of <i>N,N,N',N',N'</i> -hexamethyl-4,4-bis(octyloxymethyl)-1,7-heptanediammonium diiodide ( <b>3.13</b> ) in chloroform- <i>d</i>	S244
127.5 MHz $^{13}\text{C}$ NMR spectrum of <i>N,N,N',N',N'</i> -hexamethyl-4,4-bis(octyloxymethyl)-1,7-heptanediammonium diiodide ( <b>3.13</b> ) in chloroform- <i>d</i>	S246
500.1 MHz $^1\text{H}$ NMR spectrum of 4,4-bis(decyloxymethyl)- <i>N,N,N',N',N'</i> -hexamethyl-1,7-heptanediammonium diiodide ( <b>3.14</b> ) in chloroform- <i>d</i>	S247
127.5 MHz $^{13}\text{C}$ NMR spectrum of 4,4-bis(decyloxymethyl)- <i>N,N,N',N',N'</i> -hexamethyl-1,7-heptanediammonium diiodide ( <b>3.14</b> ) in chloroform- <i>d</i>	S249
500.1 MHz $^1\text{H}$ NMR spectrum of 4,4-bis(dodecyloxymethyl)- <i>N,N,N',N',N'</i> -hexamethyl-1,7-heptanediammonium diiodide ( <b>3.15</b> ) in chloroform- <i>d</i>	S250
127.5 MHz $^{13}\text{C}$ NMR spectrum of 4,4-bis(dodecyloxymethyl)- <i>N,N,N',N',N'</i> -hexamethyl-1,7-heptanediammonium diiodide ( <b>3.15</b> ) in chloroform- <i>d</i>	S252
500.1 MHz $^1\text{H}$ NMR spectrum of <i>N,N,N',N',N'</i> -hexamethyl-4,4-bis(tetradecyloxymethyl)-1,7-	

heptanediammonium diiodide ( <b>3.16</b> ) in chloroform- <i>d</i>	S253
127.5 MHz $^{13}\text{C}$ NMR spectrum of <i>N,N,N,N',N',N'</i> -hexamethyl-4,4-bis(tetradecyloxymethyl)-1,7-heptanediammonium diiodide( <b>3.16</b> ) in chloroform- <i>d</i>	S255

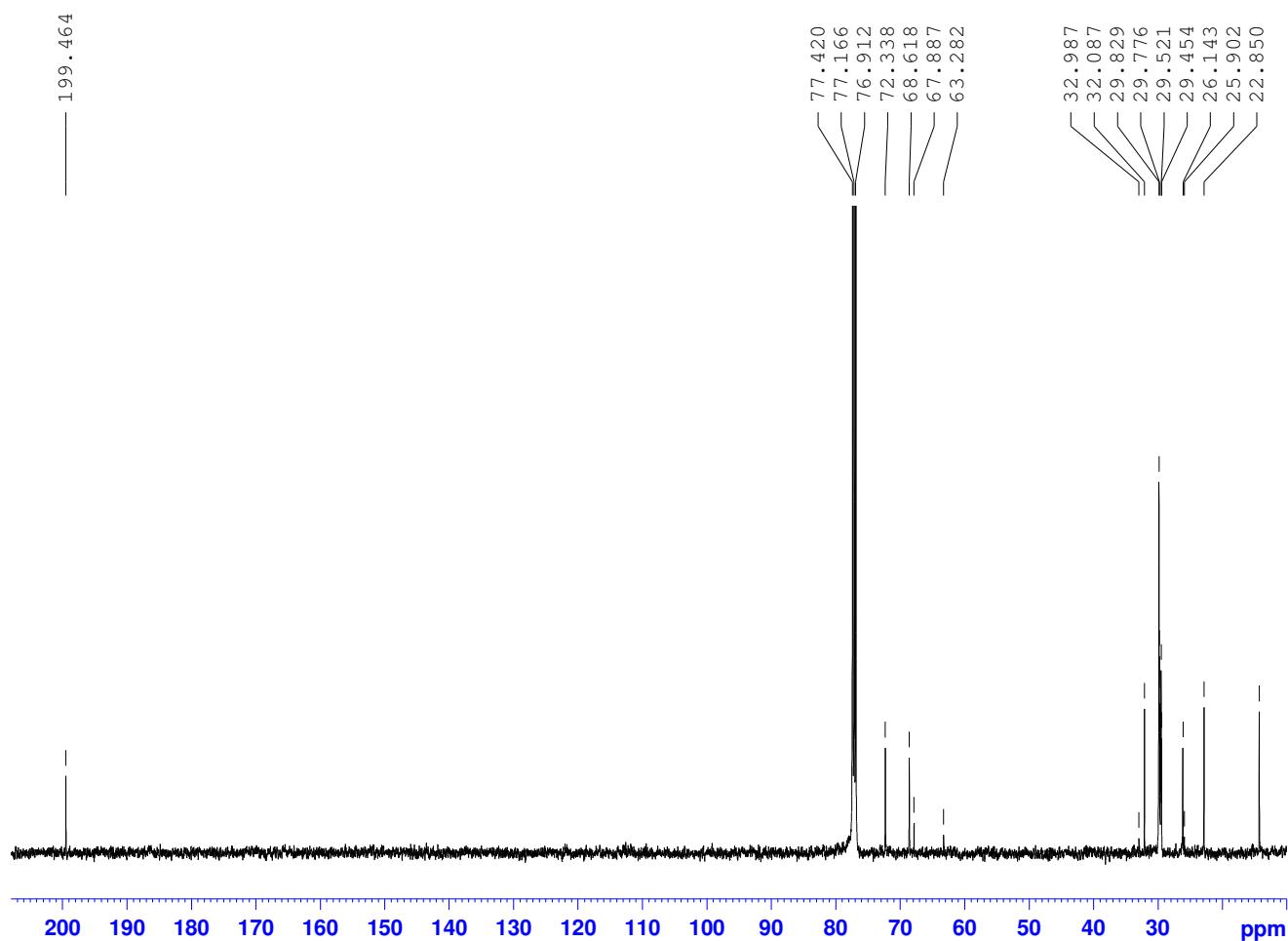
500.1 MHz  $^1\text{H}$  NMR spectrum of 2, 2-bis(tetradecyloxymethyl)propanedial (**20**) in chloroform-*d*



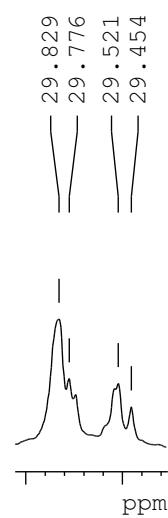
Expansions of parts of the 500.1 MHz  $^1\text{H}$  NMR spectrum of 2,2-bis(tetradecyloxymethyl)-propanedial (**20**) in chloroform-*d*



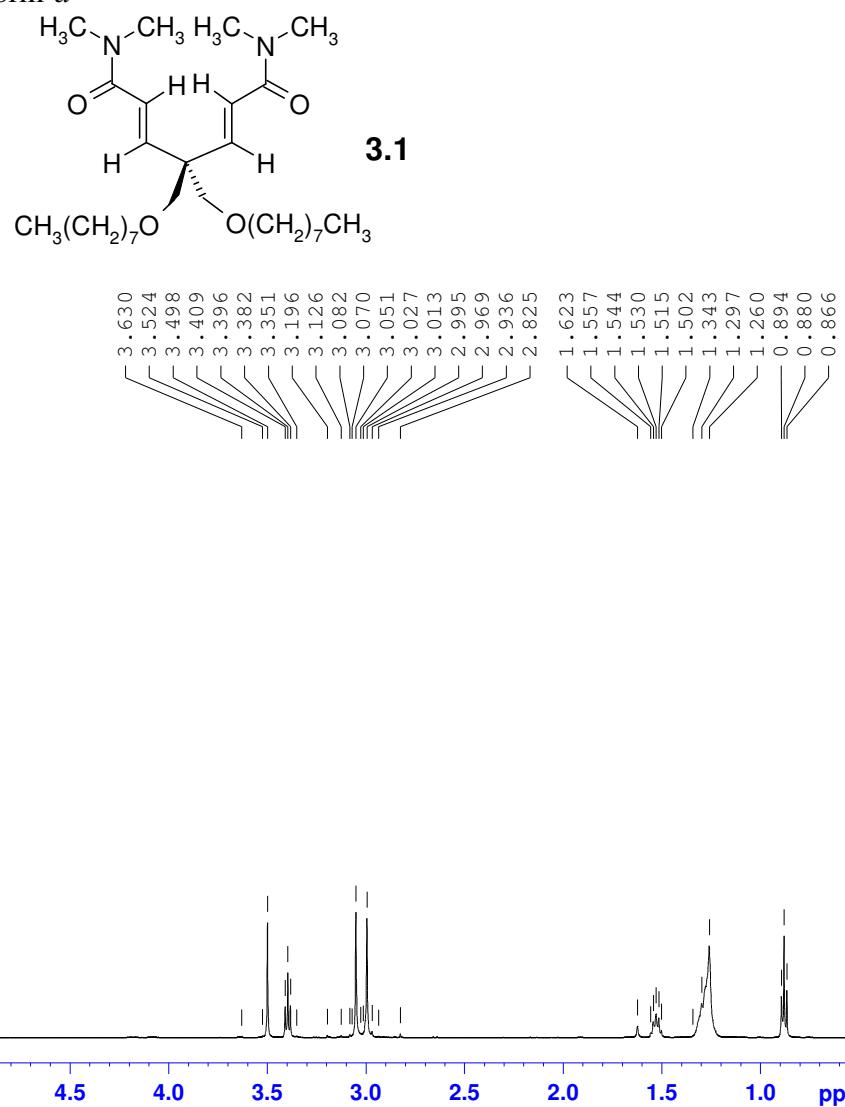
127.5 MHz  $^{13}\text{C}$  NMR spectrum of 2, 2-bis(tetradecyloxymethyl)propanedial (**20**) in chloroform-*d*



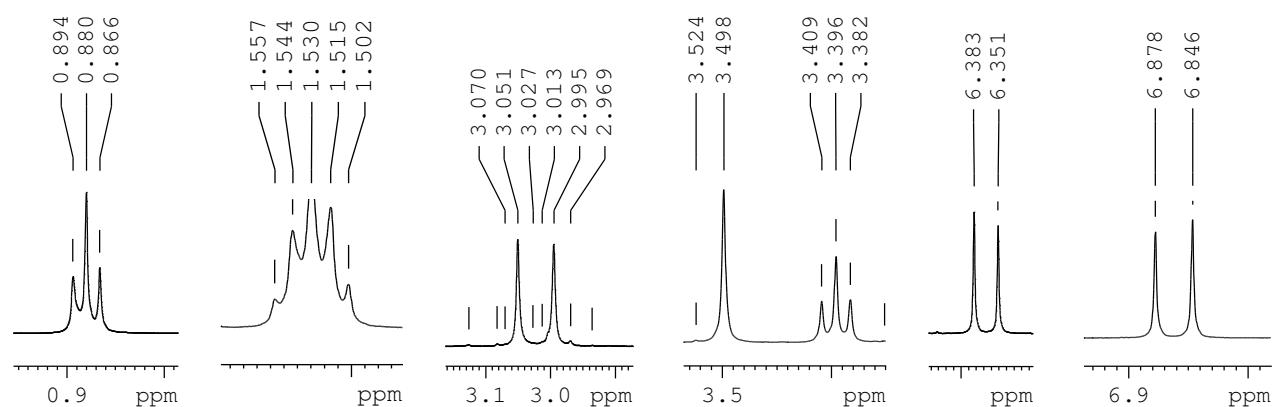
An expansion of part of the 127.5 MHz  $^{13}\text{C}$  NMR spectrum of 2,2-bis(tetradecyloxymethyl)-propanedial (**18**) in chloroform-*d*



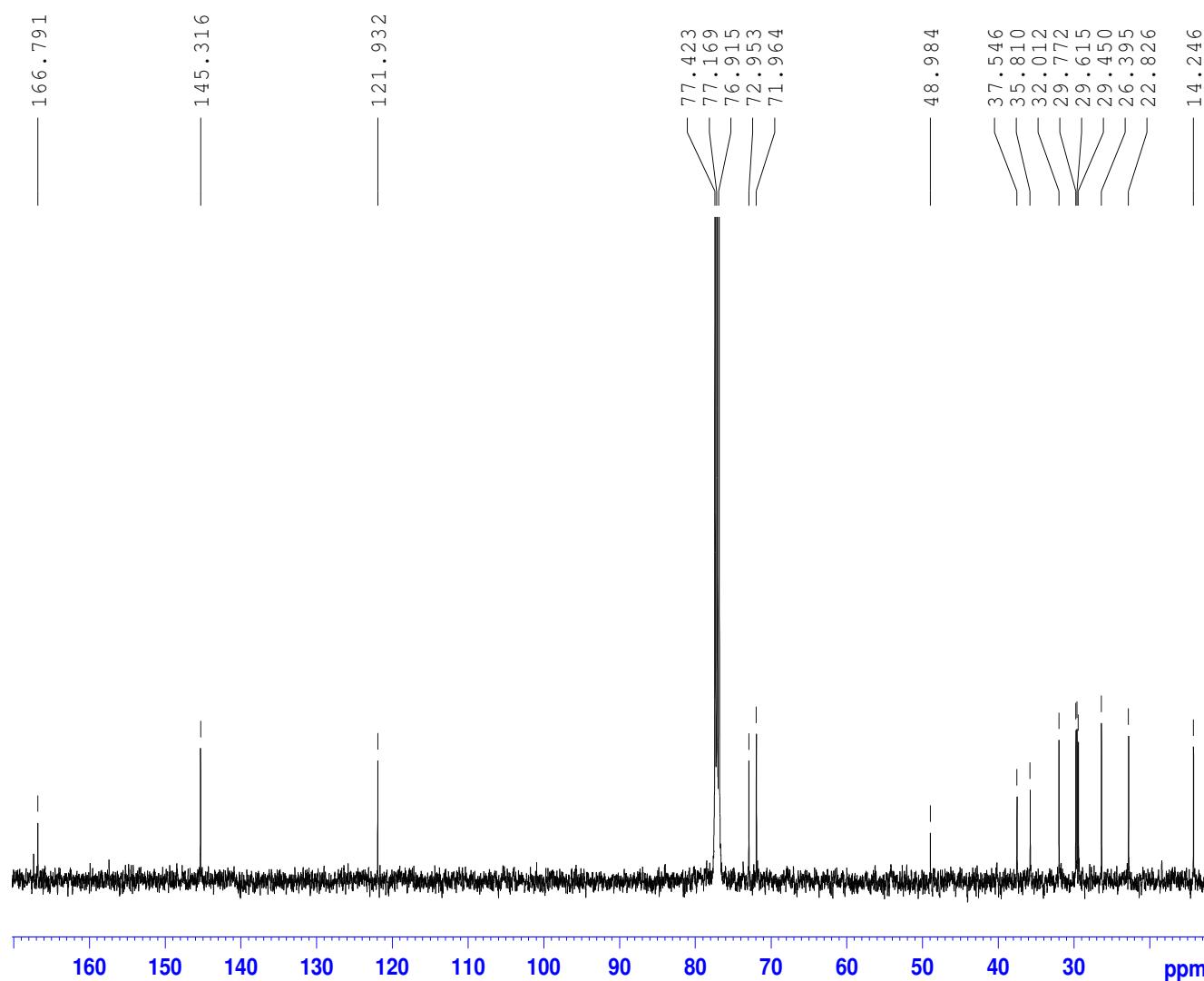
500.1 MHz  $^1\text{H}$  NMR spectrum of *-N,N,N',N'*-tetramethyl-4,4-bis(octyloxymethyl)2,5-heptadienediamide (**3.1**) in chloroform-*d*



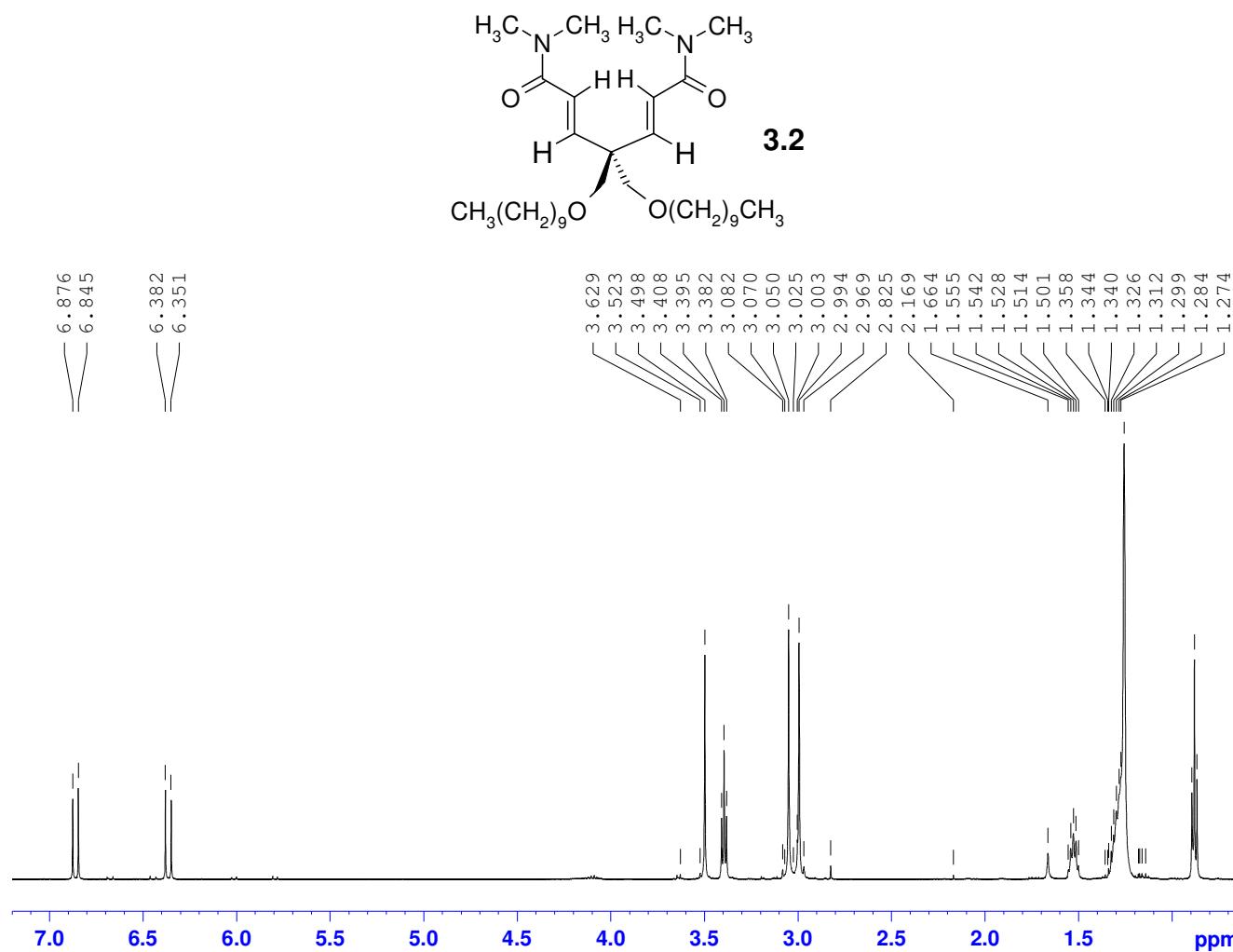
Expansions of parts of the 500.1 MHz  $^1\text{H}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(octyloxymethyl)-2,5-heptadienediamide (**3.1**) in chloroform-*d*



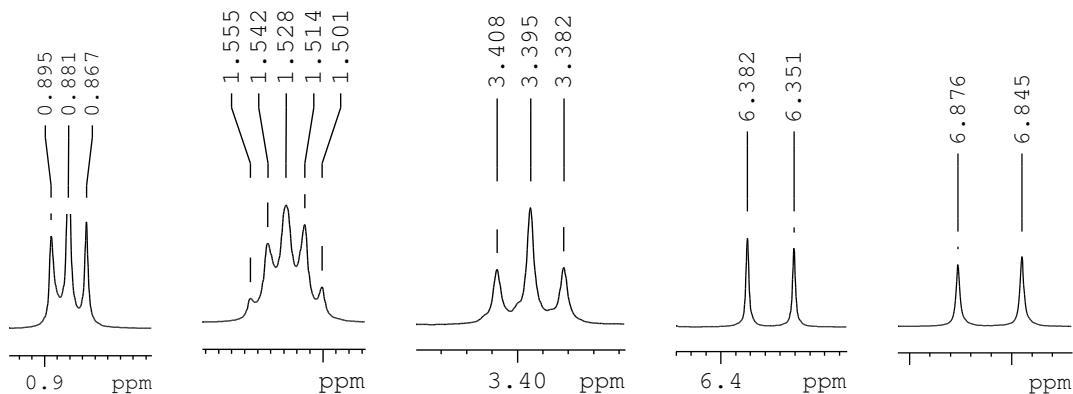
127.5 MHz  $^{13}\text{C}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(octyloxymethyl)-2,5-heptadienediamide (**3.1**) in chloroform-*d*



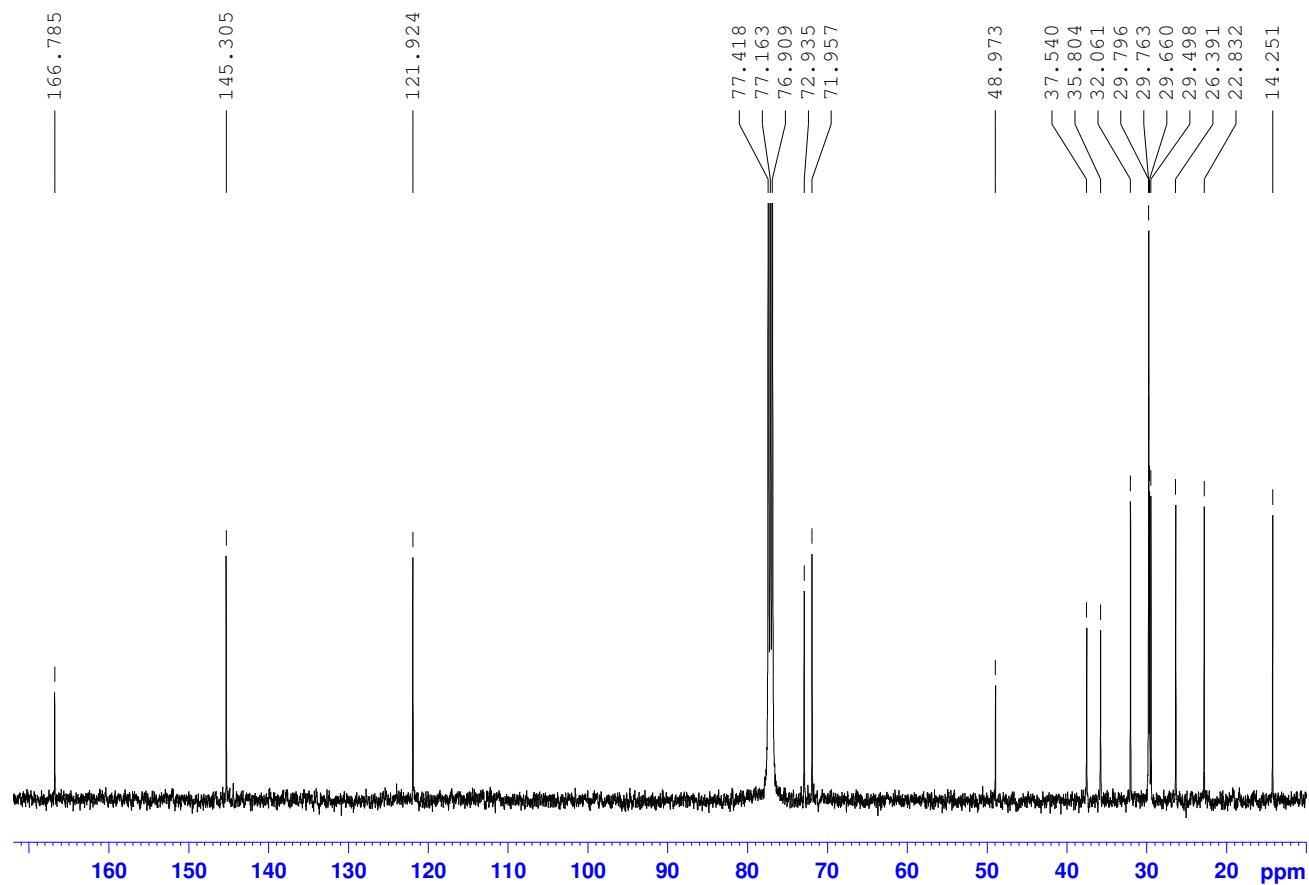
500.1 MHz  $^1\text{H}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(decyloxymethyl)-2,5-heptadienediamide (**3.2**) in chloroform-*d*



Expansions of parts of the 500.1 MHz  $^1\text{H}$  NMR spectrum of 4,4-bis(decyloxymethyl)-*N,N,N',N'*-tetramethyl-2,5-heptadienediamide (**3.2**) in chloroform-*d*



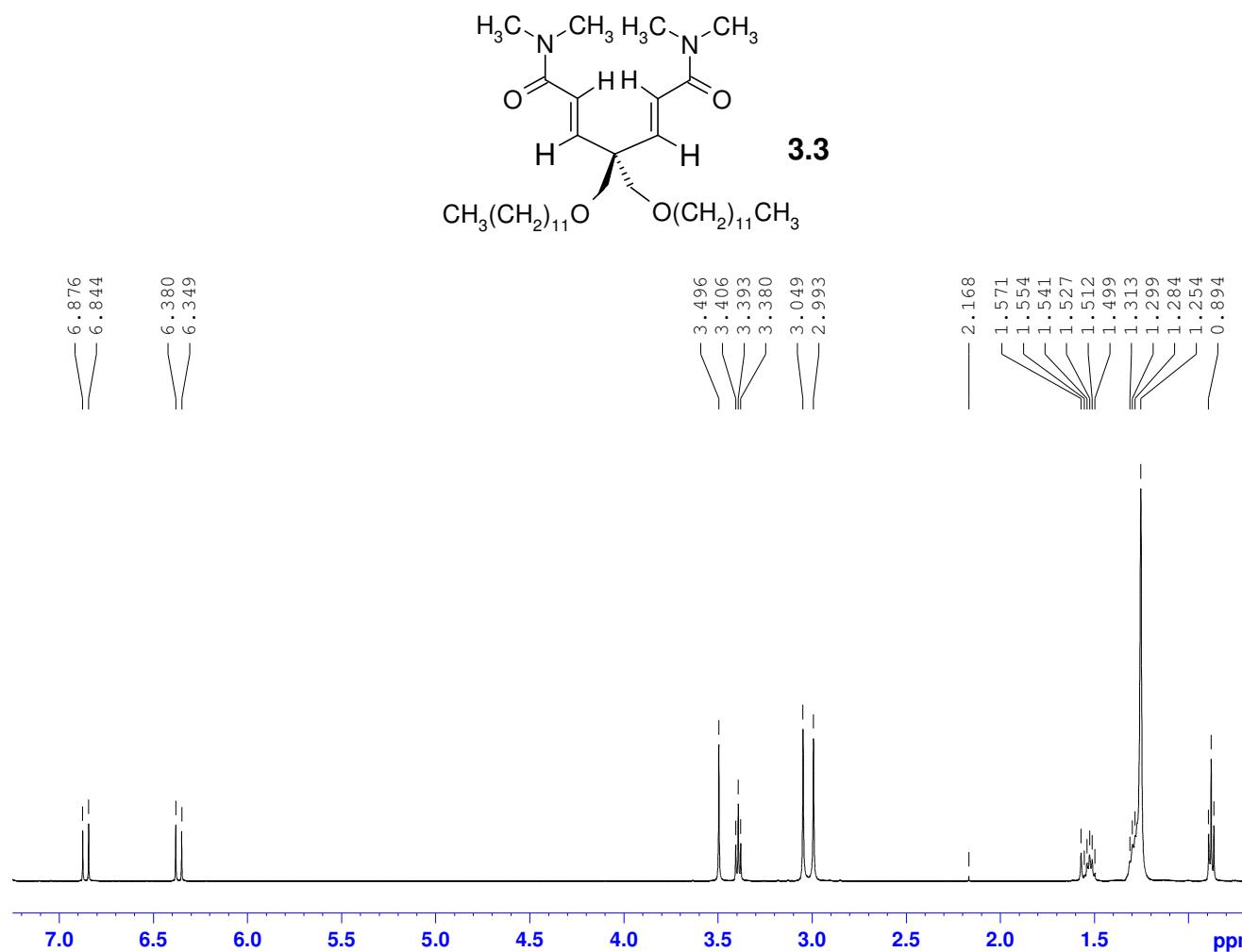
127.5 MHz  $^{13}\text{C}$  NMR spectrum of 4,4-bis(decyloxymethyl)- $N,N,N',N'$ -tetramethyl-2,5-heptadienediamide (**3.2**) in chloroform-*d*



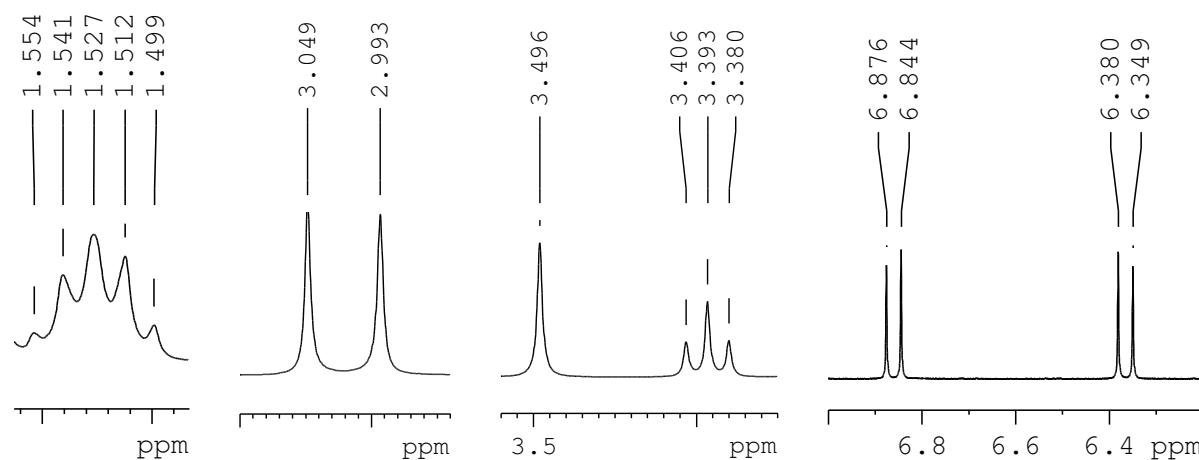
Expansion of a part of the 127.5 MHz  $^{13}\text{C}$  NMR spectrum of 4,4-bis(decyloxymethyl)- $N,N,N',N'$ -tetramethyl-2,5-heptadienediamide (**3.2**) in chloroform-*d*



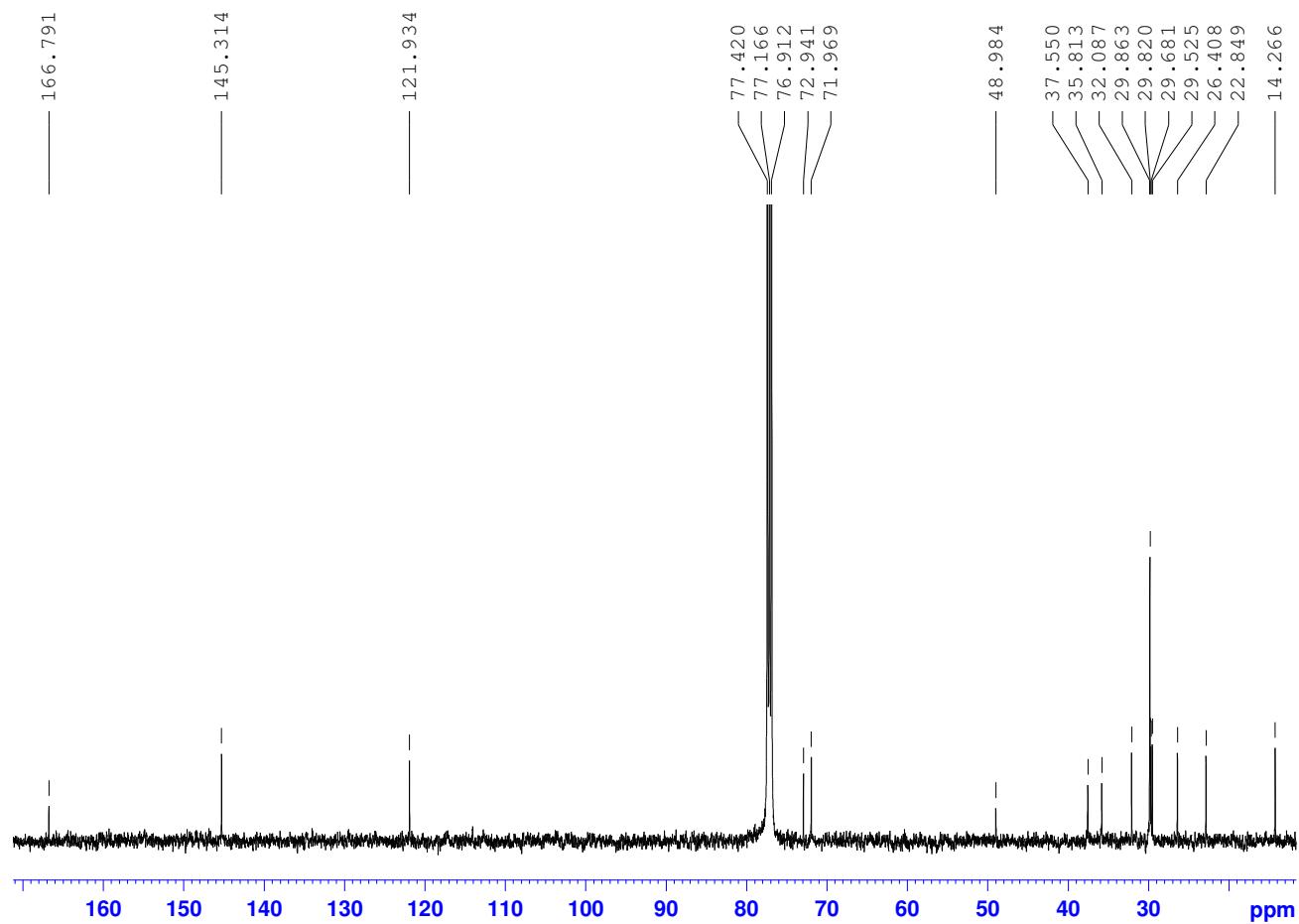
500.1 MHz  $^1\text{H}$  NMR spectrum of 4,4-bis(dodecyloxymethyl)- $N,N,N',N'$ -tetramethyl-2,5-heptadienediamide (**3.3**) in chloroform-*d*



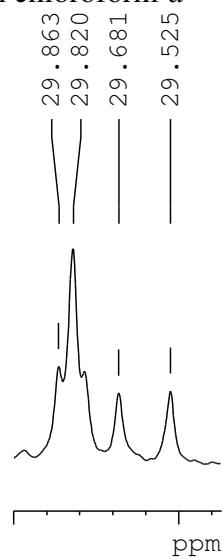
Expansions of parts of the 500.1 MHz  $^1\text{H}$  NMR spectrum of 4,4-bis(dodecyloxymethyl)- $N,N,N',N'$ -tetramethyl-2,5-heptadienediamide (**3.3**) in chloroform-*d*



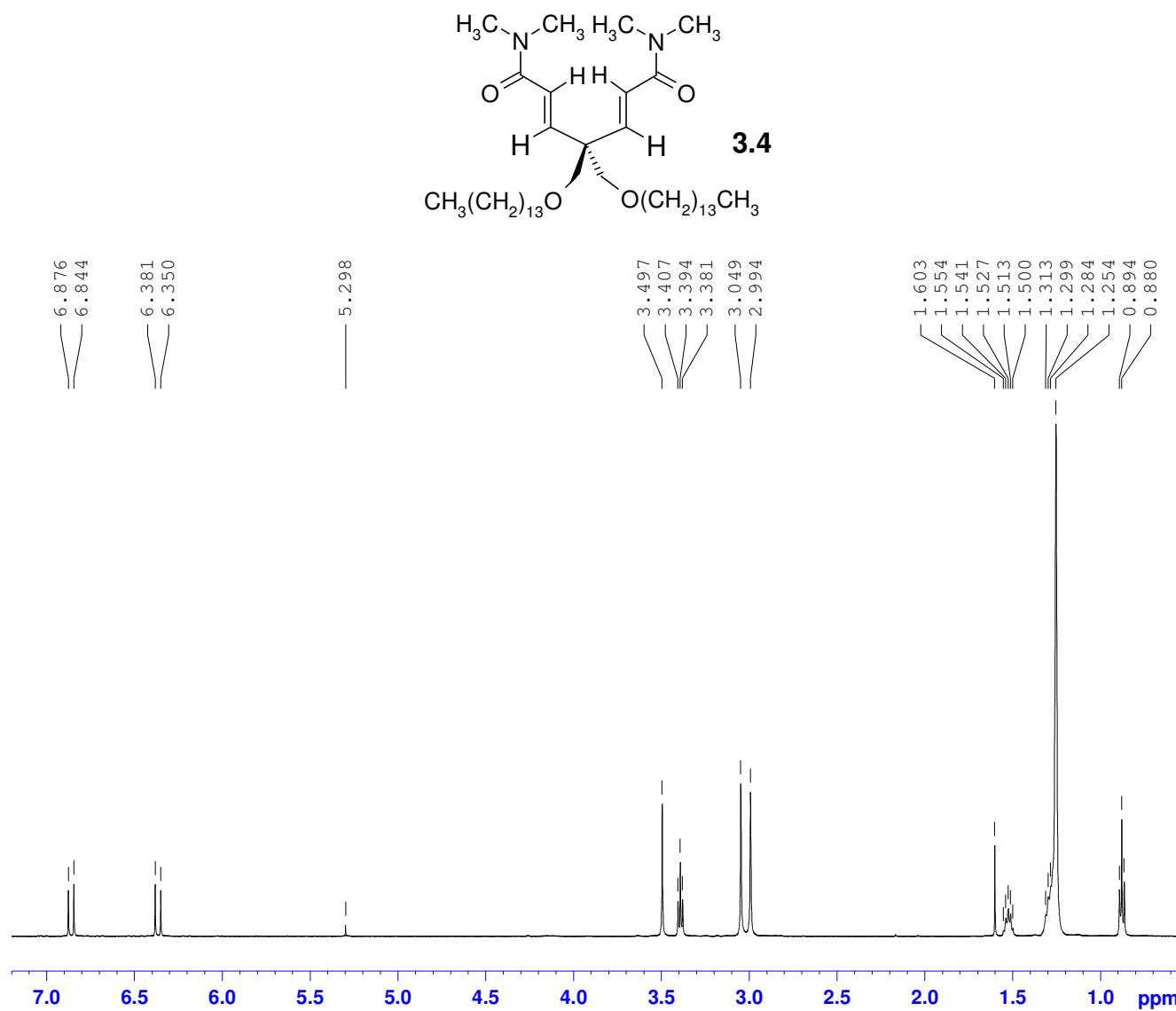
127.5 MHz  $^{13}\text{C}$  NMR spectrum of 4,4-bis(dodecyloxymethyl)- $N,N,N',N'$ -tetramethyl-2,5-heptadienediamide (**3.3**) in chloroform-*d*



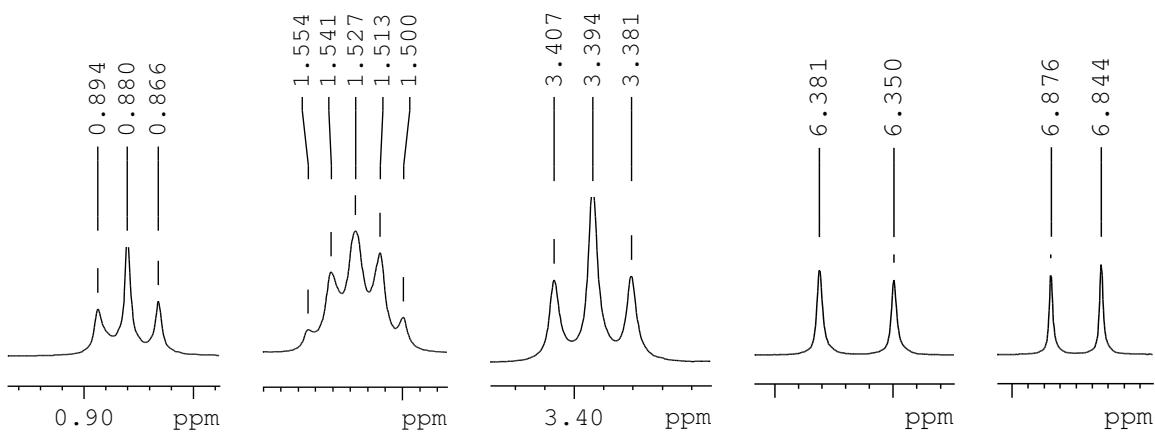
Expansion of a part of the 127.5 MHz  $^{13}\text{C}$  NMR spectrum of 4,4-bis(dodecyloxymethyl)- $N,N,N',N'$ -tetramethyl-2,5-heptadienediamide (**3.3**) in chloroform-*d*



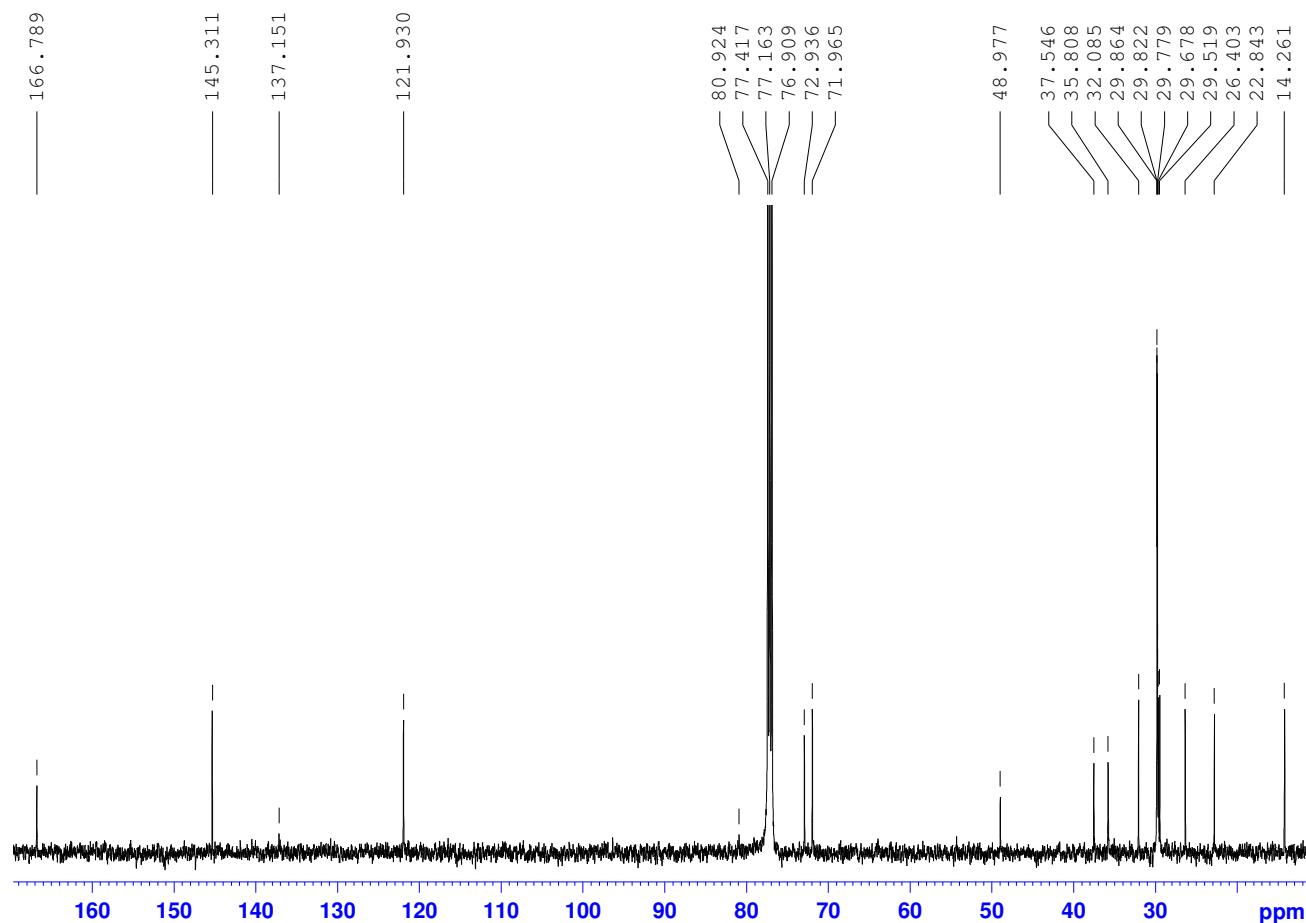
500.1 MHz  $^1\text{H}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(tetradecyloxymethyl)-2,5-heptadienediamide (**3.4**) in chloroform-*d*



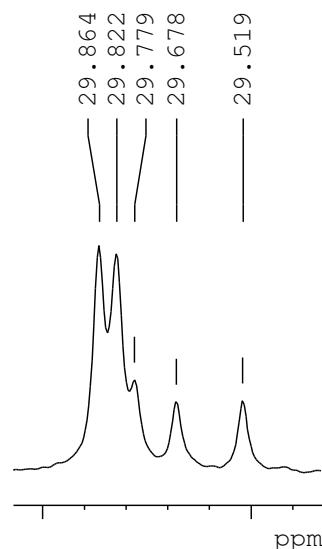
Expansions of parts of the 500.1 MHz  $^1\text{H}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(tetradecyloxymethyl)-2,5-heptadienediamide (**3.4**) in chloroform-*d*



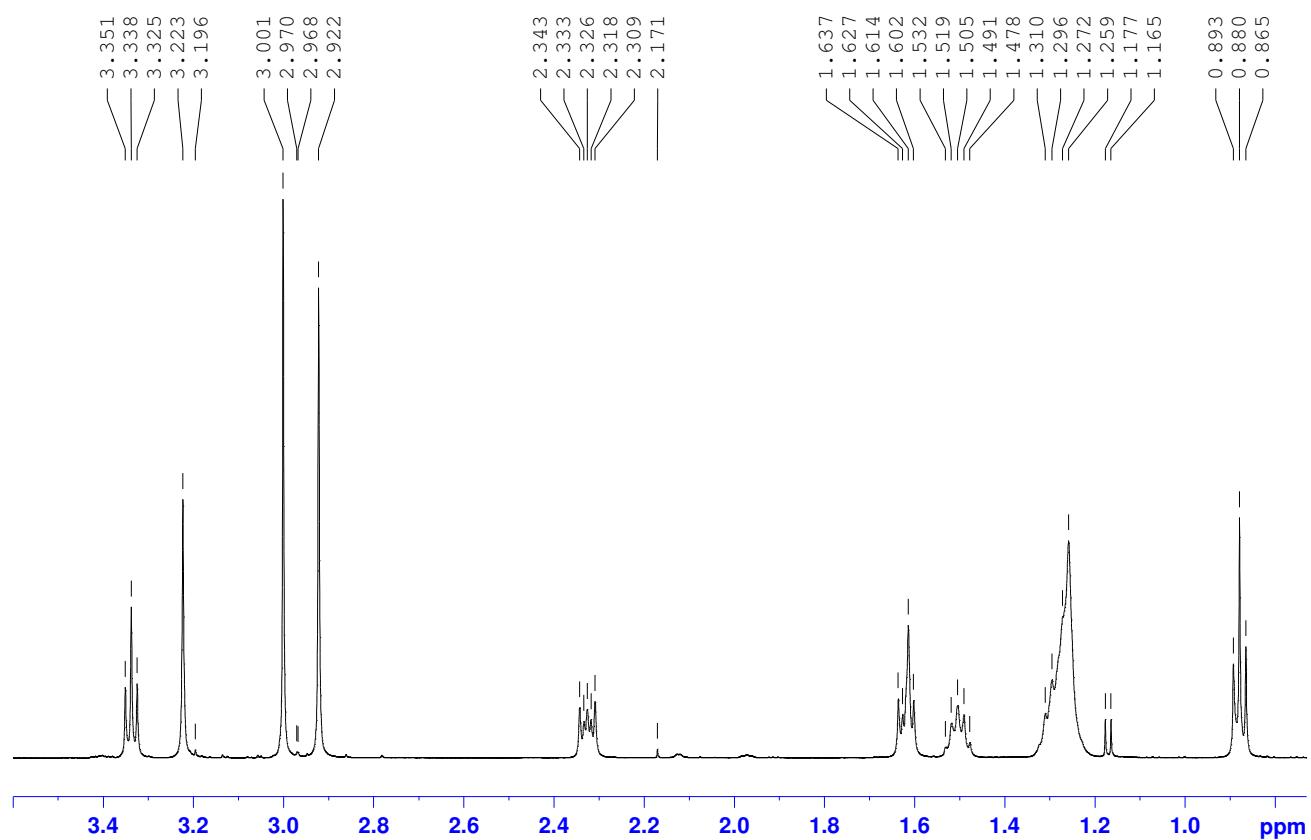
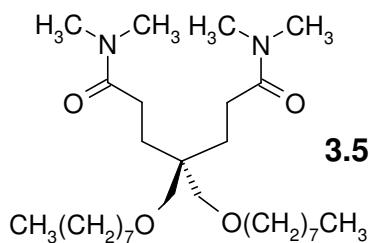
127.5 MHz  $^{13}\text{C}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(tetradecyloxymethyl)-2,5-heptadienediamide (**3.4**) in chloroform-*d*



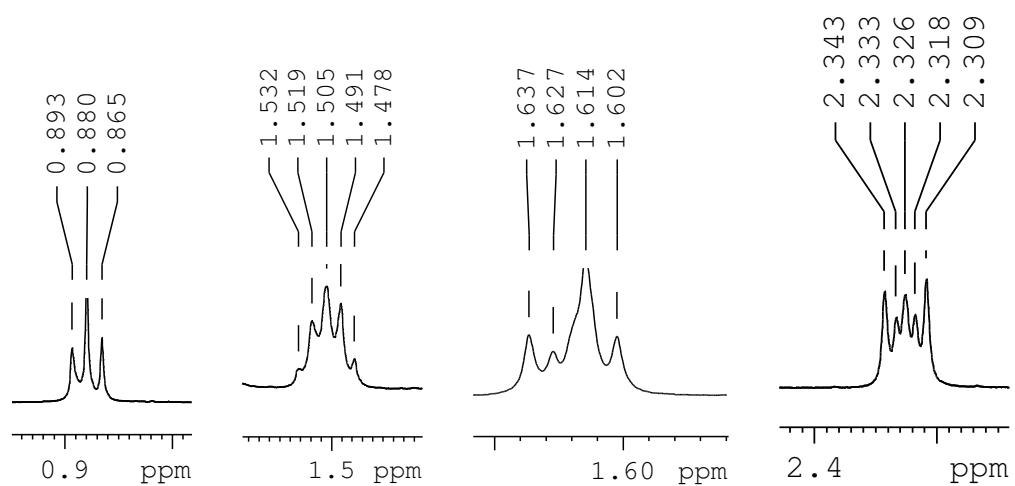
Expansion of a part of the 127.5 MHz  $^{13}\text{C}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(tetradecyloxymethyl)-2,5-heptadienediamide (**3.4**) in chloroform-*d*



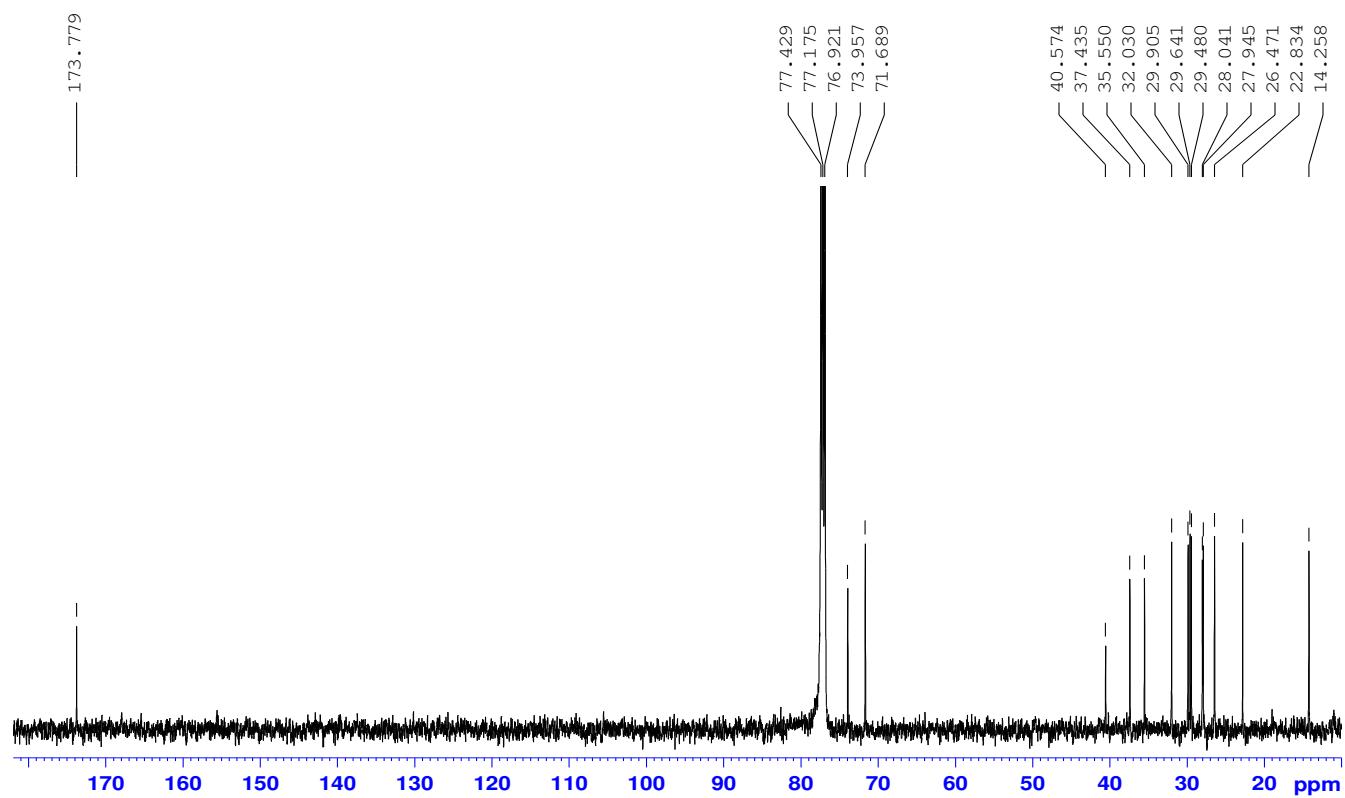
500.1 MHz  $^1\text{H}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(octyloxymethyl)heptanediamide (**3.5**) in chloroform-*d*



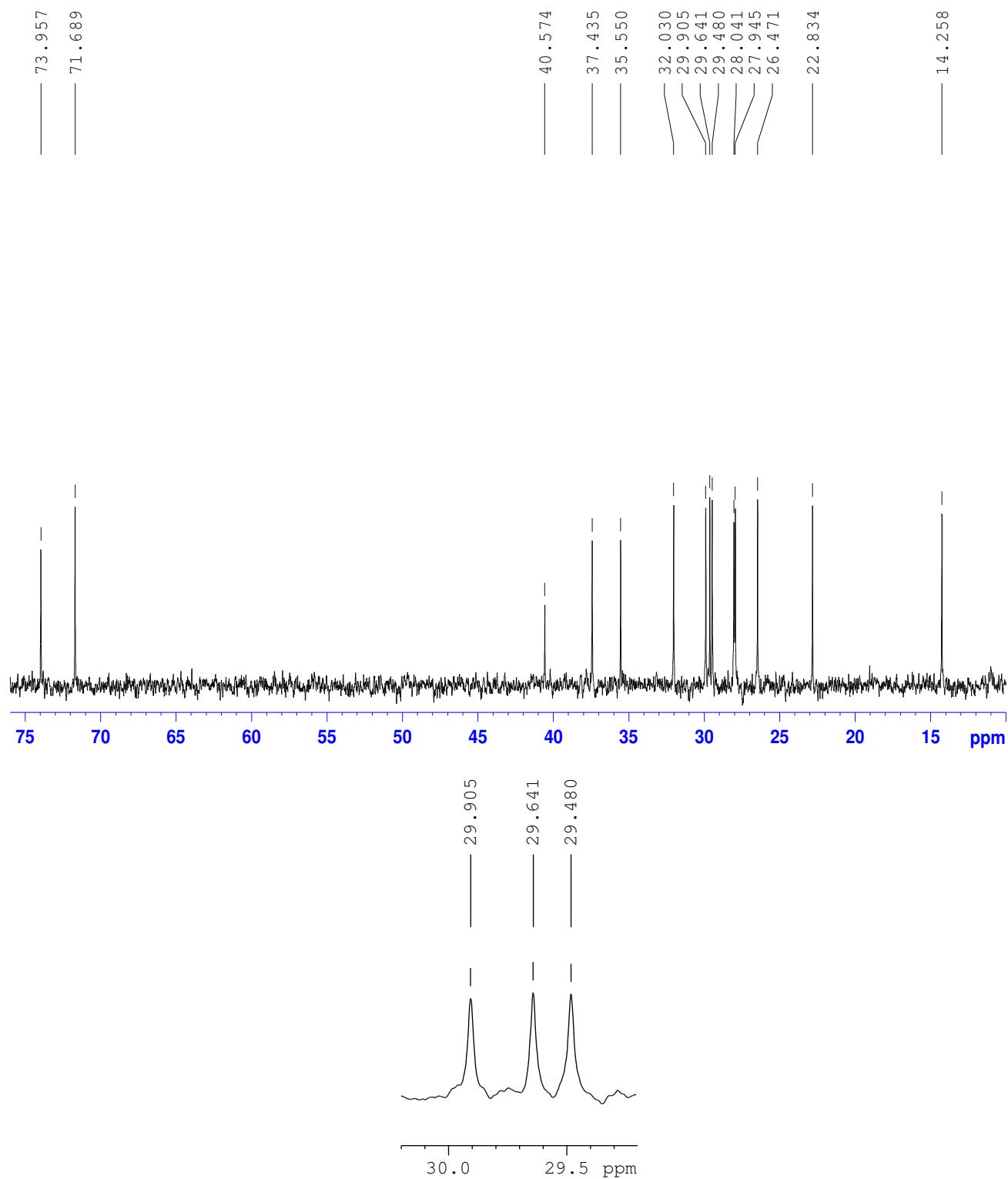
Expansions of parts of the 500.1 MHz  $^1\text{H}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(octyloxymethyl)heptanediamide (**3.5**) in chloroform-*d*



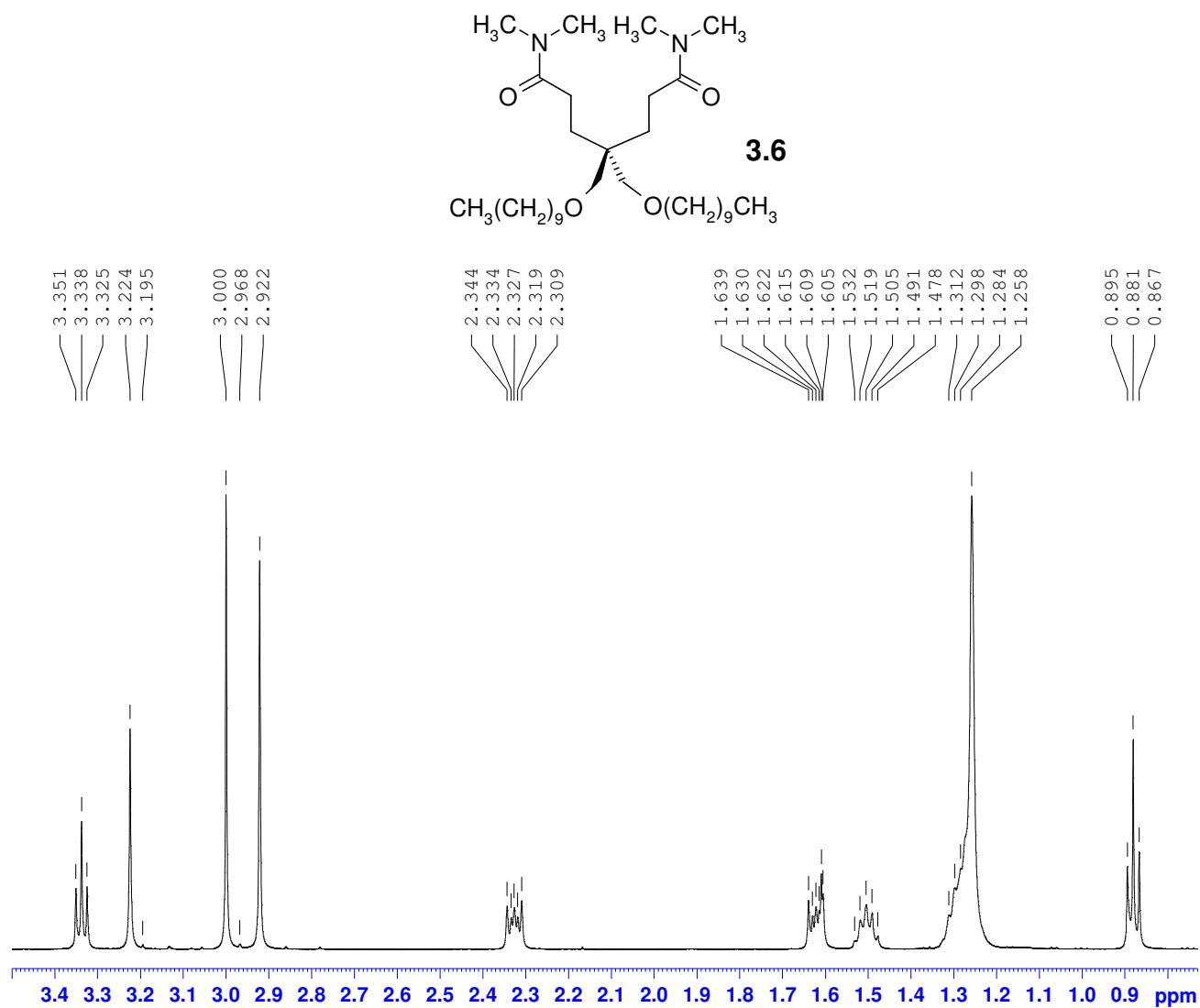
127.5 MHz  $^{13}\text{C}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(octyloxymethyl)heptanediamide (**3.5**) in chloroform-*d*



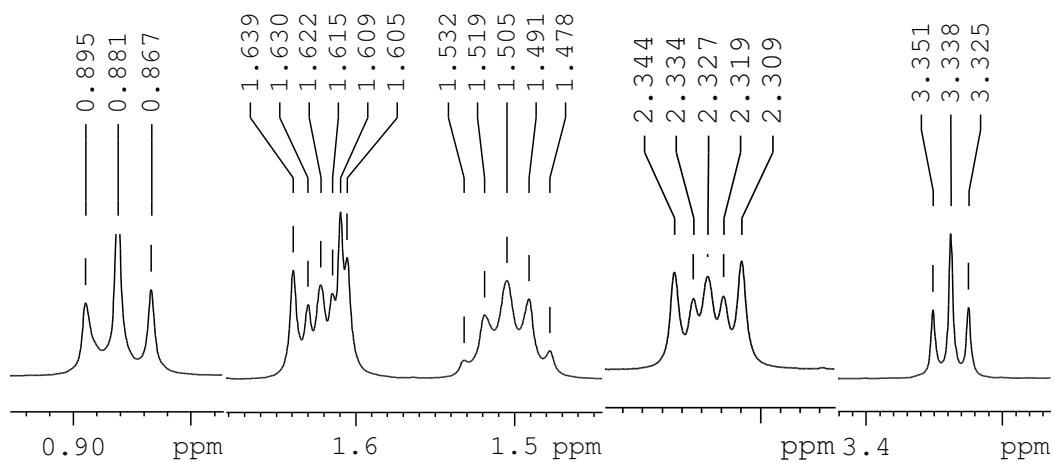
Expansions of parts of the 127.5 MHz  $^{13}\text{C}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(octyloxymethyl)-heptanediamide (**3.5**) in chloroform-*d*



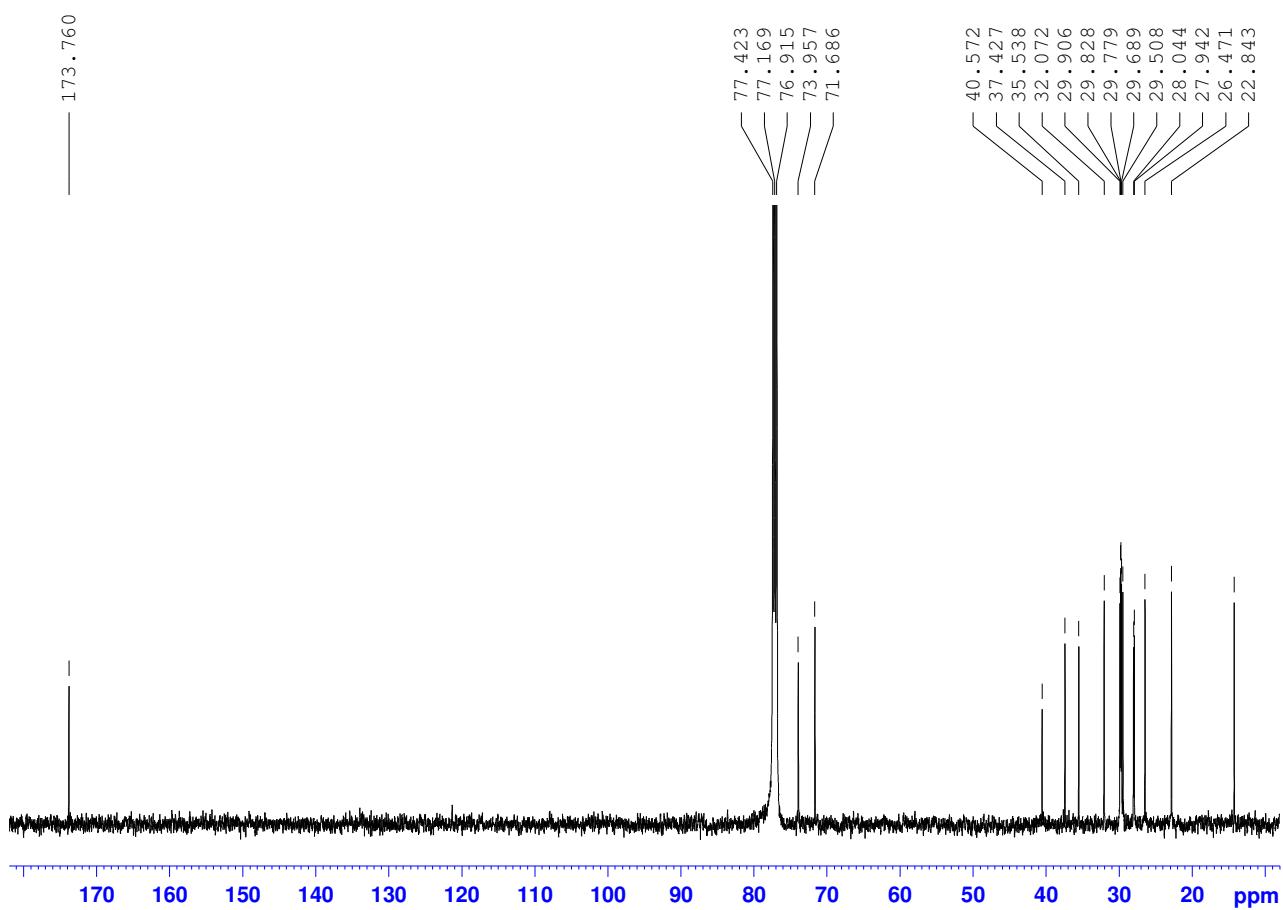
500.1 MHz  $^1\text{H}$  NMR spectrum of 4,4-bis(decyloxymethyl)- $N,N,N',N'$ -tetramethylheptanediamide (**3.6**) in chloroform-*d*



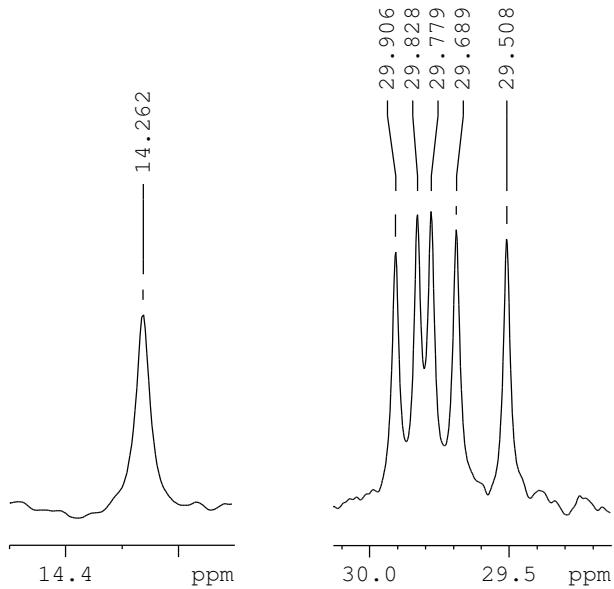
Expansions of parts of the 500.1 MHz  $^1\text{H}$  NMR spectrum of 4,4-bis(decyloxymethyl)-*N,N,N',N'*-tetramethylheptanediamide (**3.6**) in chloroform-*d*



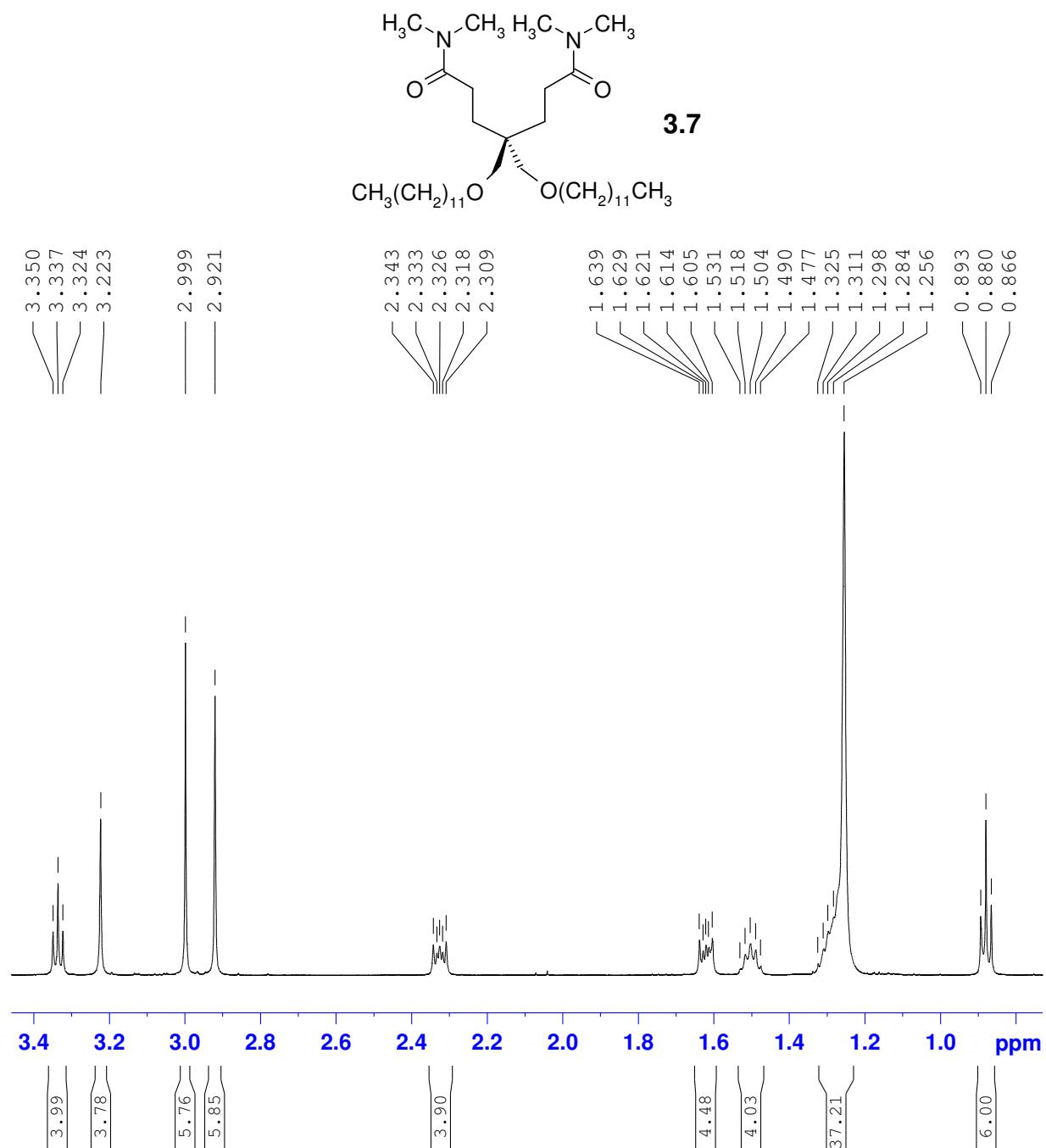
127.5 MHz  $^{13}\text{C}$  NMR spectrum of 4,4-bis(decyloxymethyl)- $N,N,N',N'$ -tetramethylheptanediamide (**3.6**) in chloroform-*d*



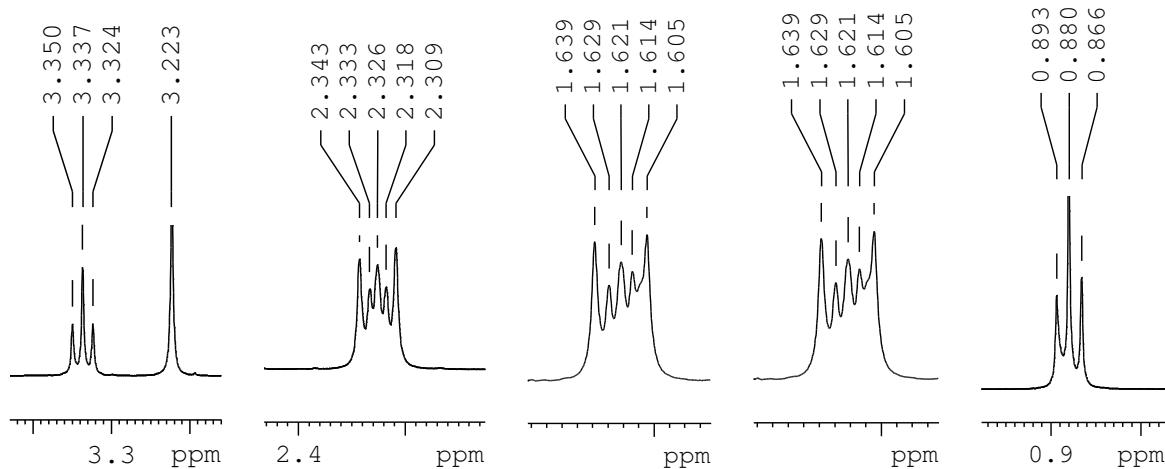
Expansions of parts of the 127.5 MHz  $^{13}\text{C}$  NMR spectrum of 4,4-bis(decyloxymethyl)- $N,N,N',N'$ -tetramethylheptanediamide (**3.6**) in chloroform-*d*



500.1 MHz  $^1\text{H}$  NMR spectrum of 4,4-bis(dodecyloxymethyl)-*N,N,N',N'*-tetramethyl-heptanediamide (**3.7**) in chloroform-*d*

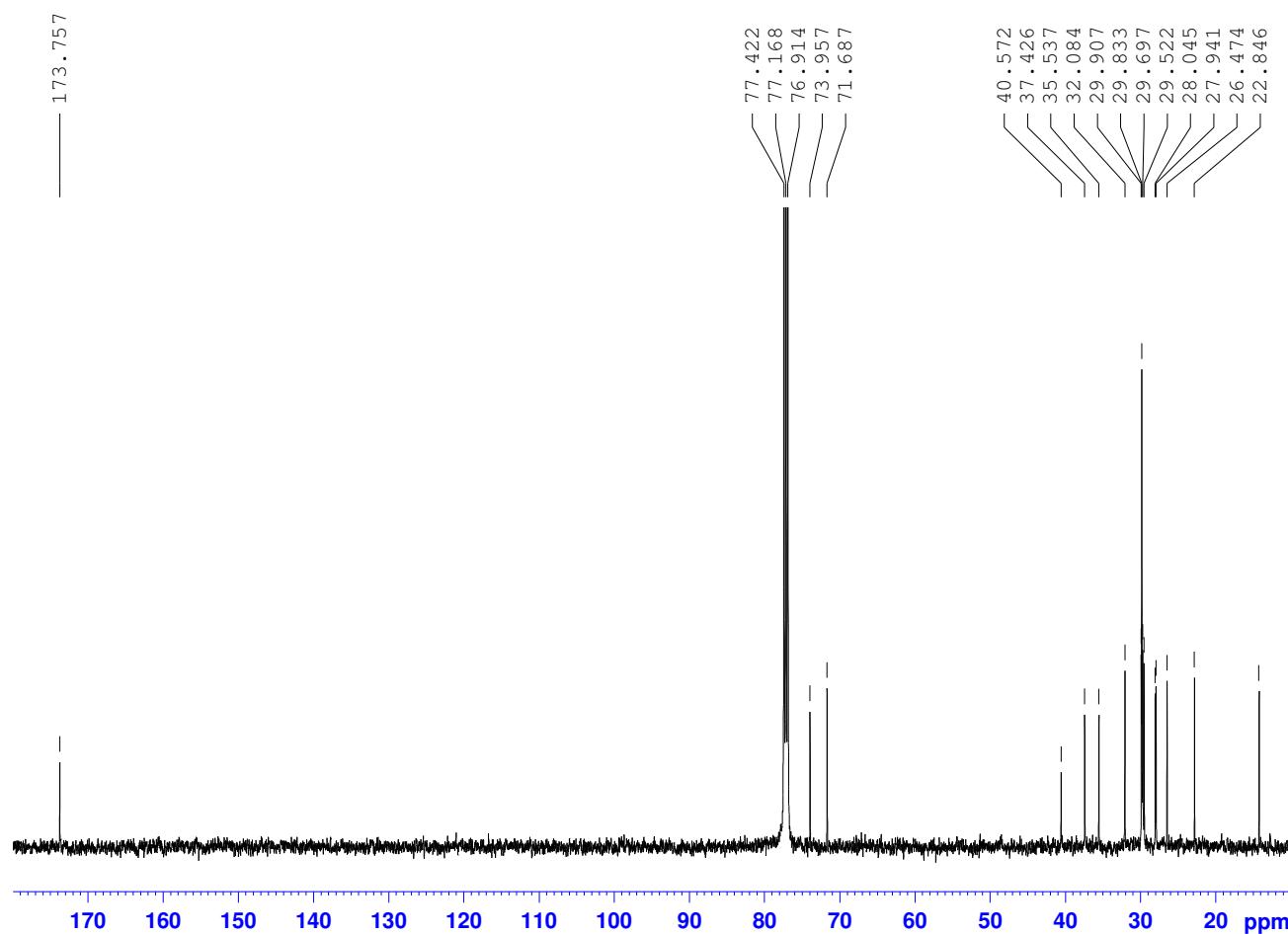


Expansions of parts of the 500.1 MHz  $^1\text{H}$  NMR spectrum of 4,4-bis(dodecyloxymethyl)-*N,N,N',N'*-tetramethylheptanediamide (**3.7**) in chloroform-*d*

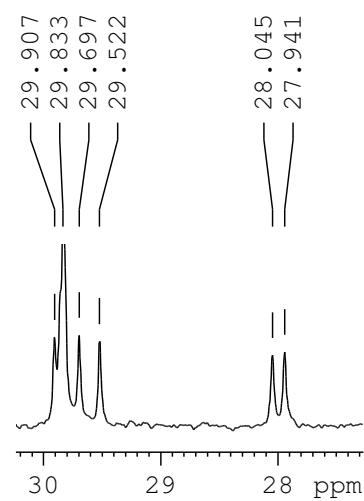


1

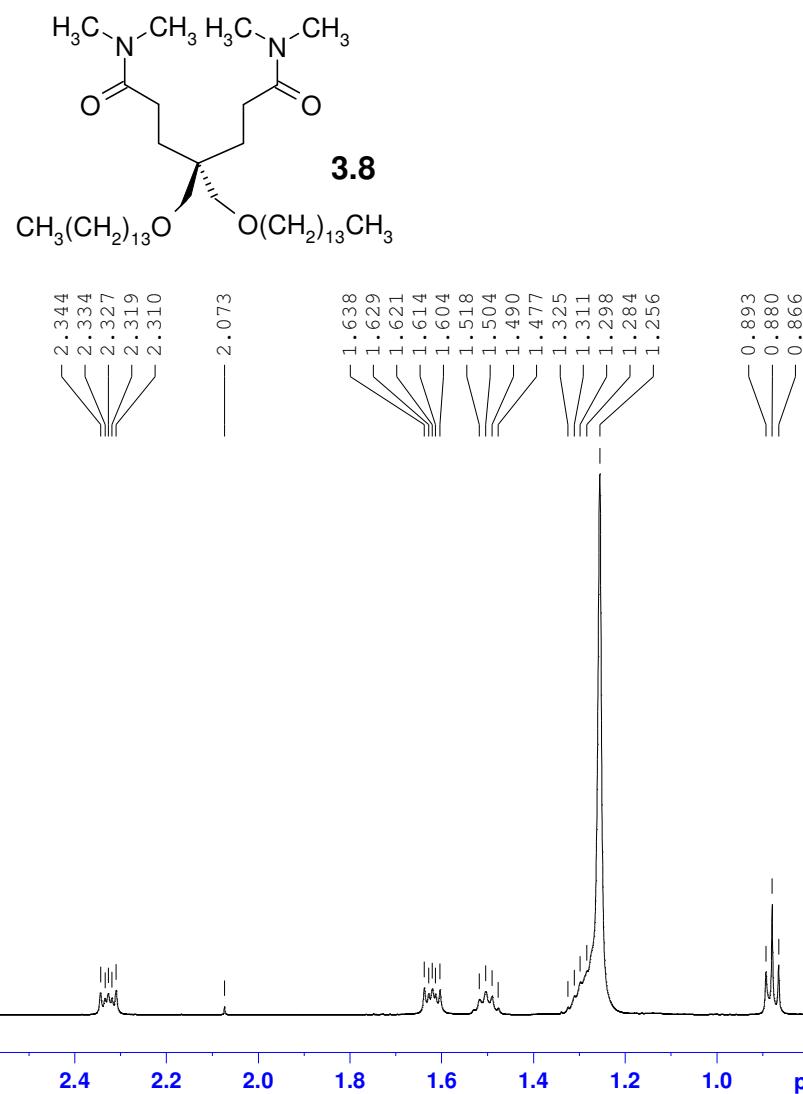
127.5 MHz  $^{13}\text{C}$  NMR spectrum of 4,4-bis(dodecyloxymethyl)- $N,N,N',N'$ -tetramethyl-heptanediamide (**3.7**) in chloroform-*d*



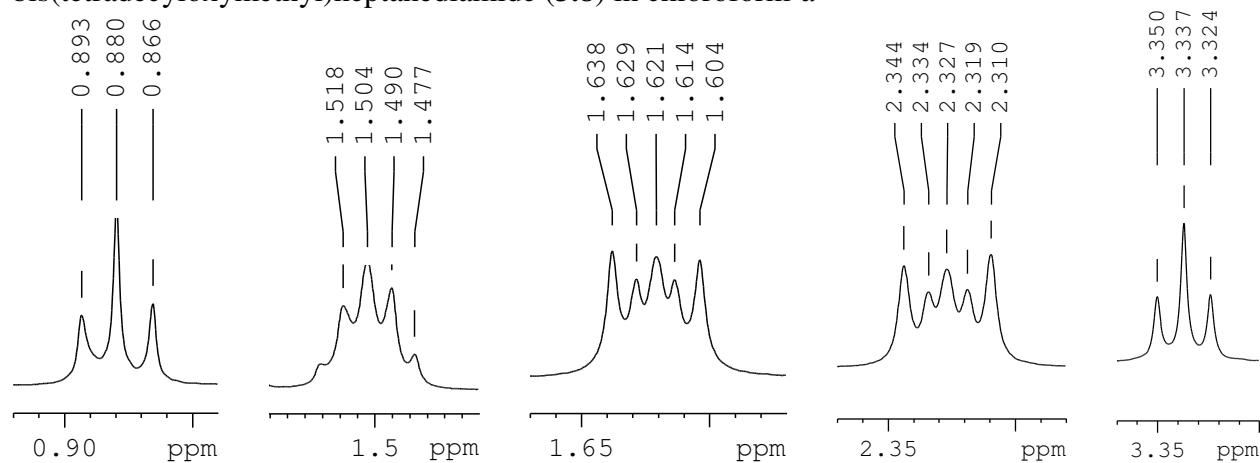
Expansion of part of the 127.5 MHz  $^{13}\text{C}$  NMR spectrum of 4,4-bis(dodecyloxymethyl)- $N,N,N',N'$ -tetramethylheptanediamide (**3.7**) in chloroform-*d*



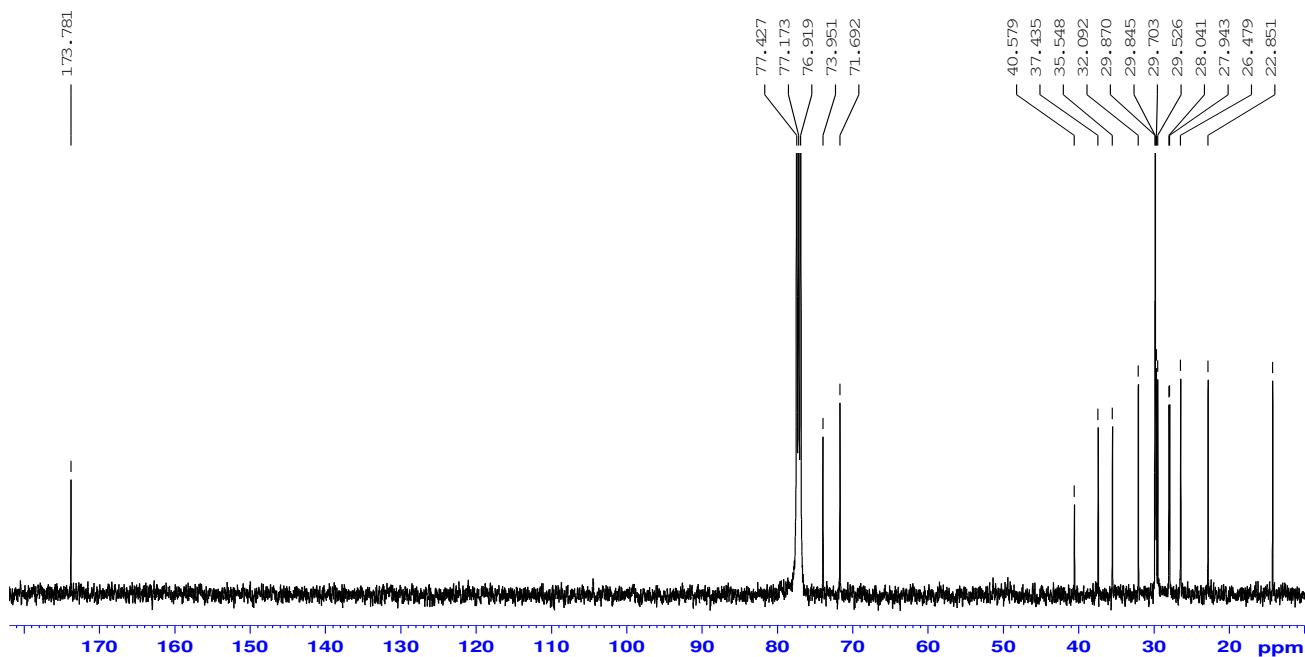
500.1 MHz  $^1\text{H}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(tetradecyloxymethyl)-heptanediamide (**3.8**) in chloroform-*d*



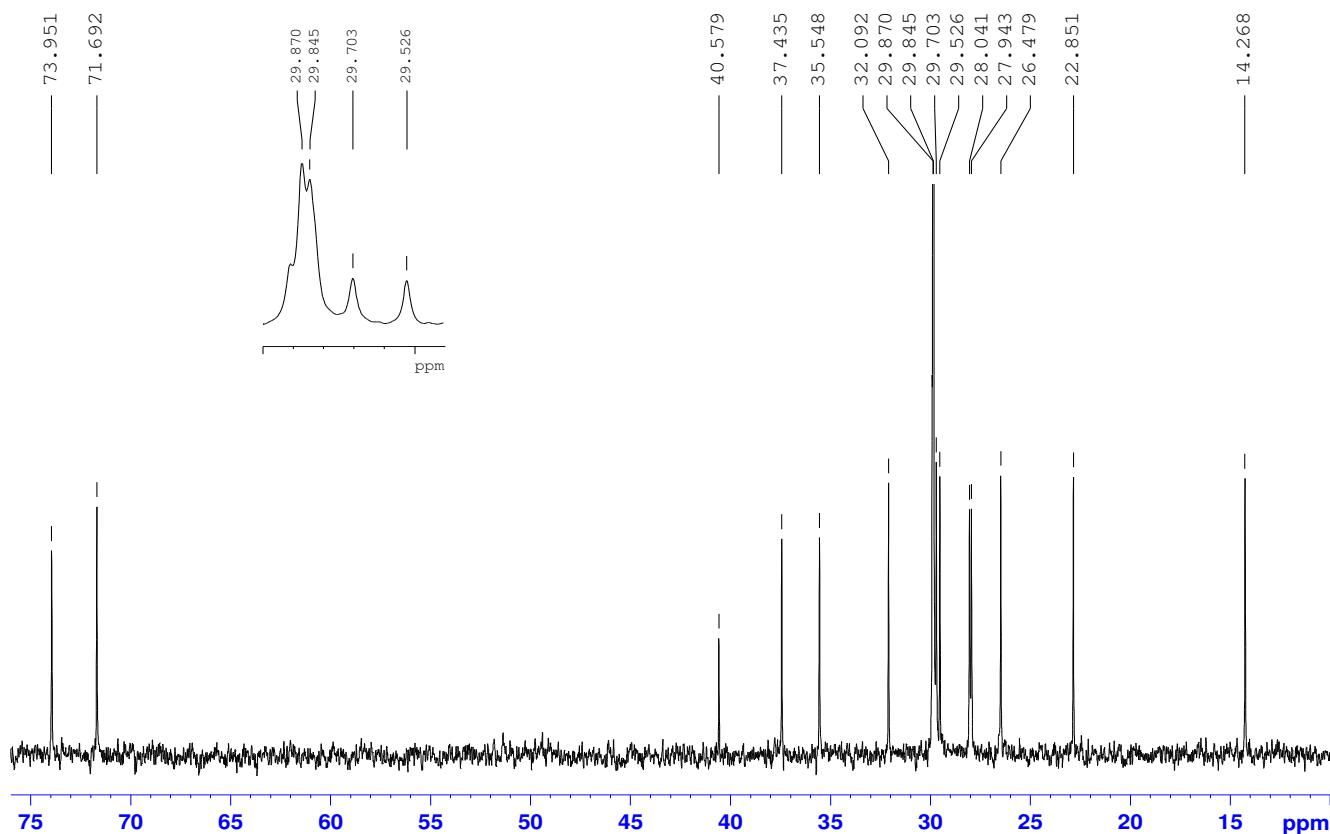
Expansions of parts of the 500.1 MHz  $^1\text{H}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(tetradecyloxymethyl)heptanediamide (**3.8**) in chloroform-*d*



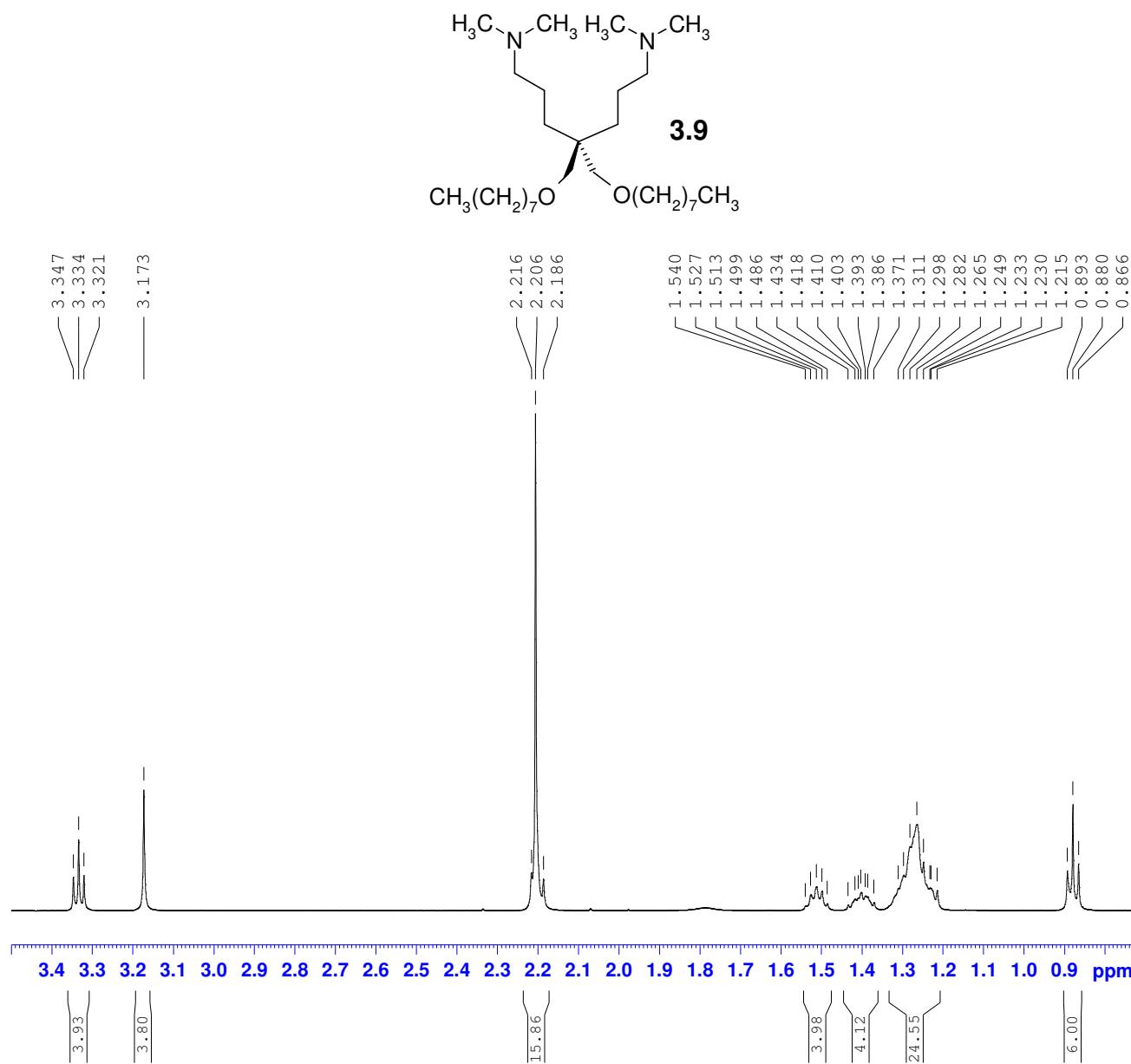
127.5 MHz  $^{13}\text{C}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(tetradecyloxymethyl)-heptanediamide (**3.8**) in chloroform-*d*



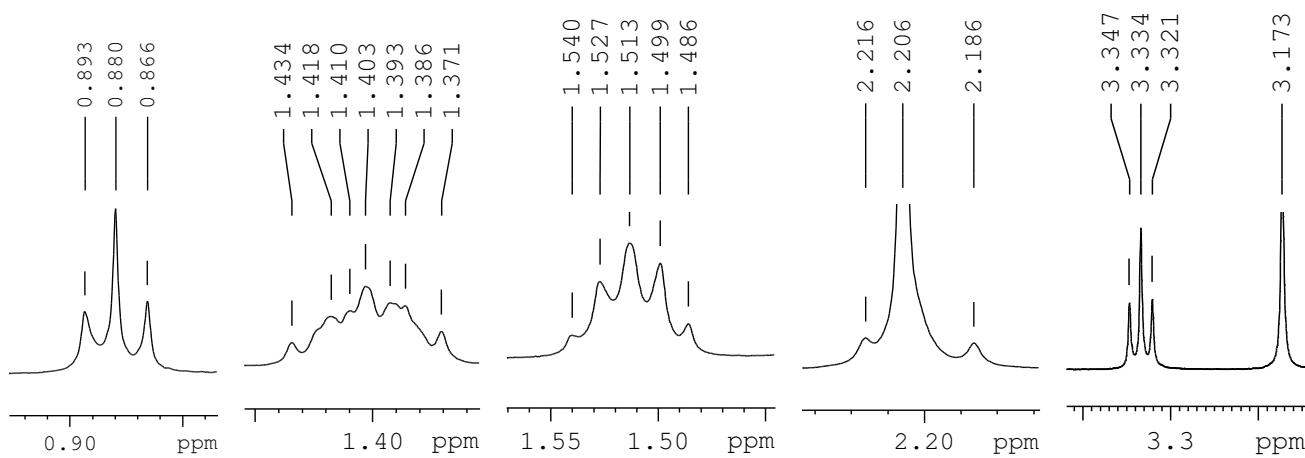
Expansions of parts of the 127.5 MHz  $^{13}\text{C}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(tetradecyloxymethyl)heptanediamide (**3.8**) in chloroform-*d*



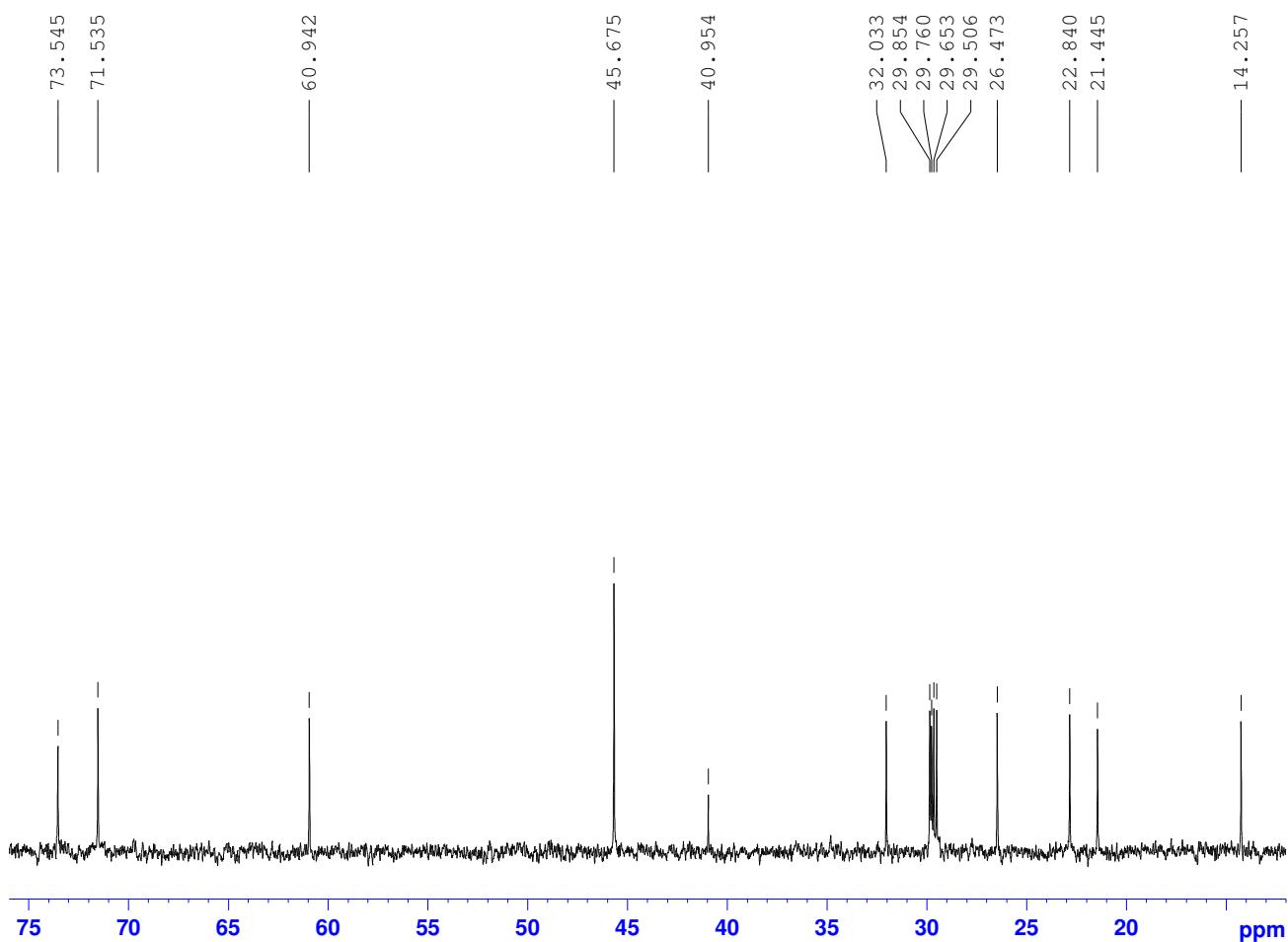
500.1 MHz  $^1\text{H}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis-(octyloxymethyl)-1,7-heptanediamine (**3.9**) in chloroform-*d*



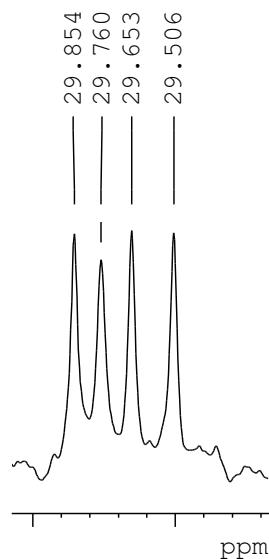
Expansions of parts of the 500.1 MHz  $^1\text{H}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(octyloxymethyl)-1,7-heptanediamine (**3.9**) in chloroform-*d*



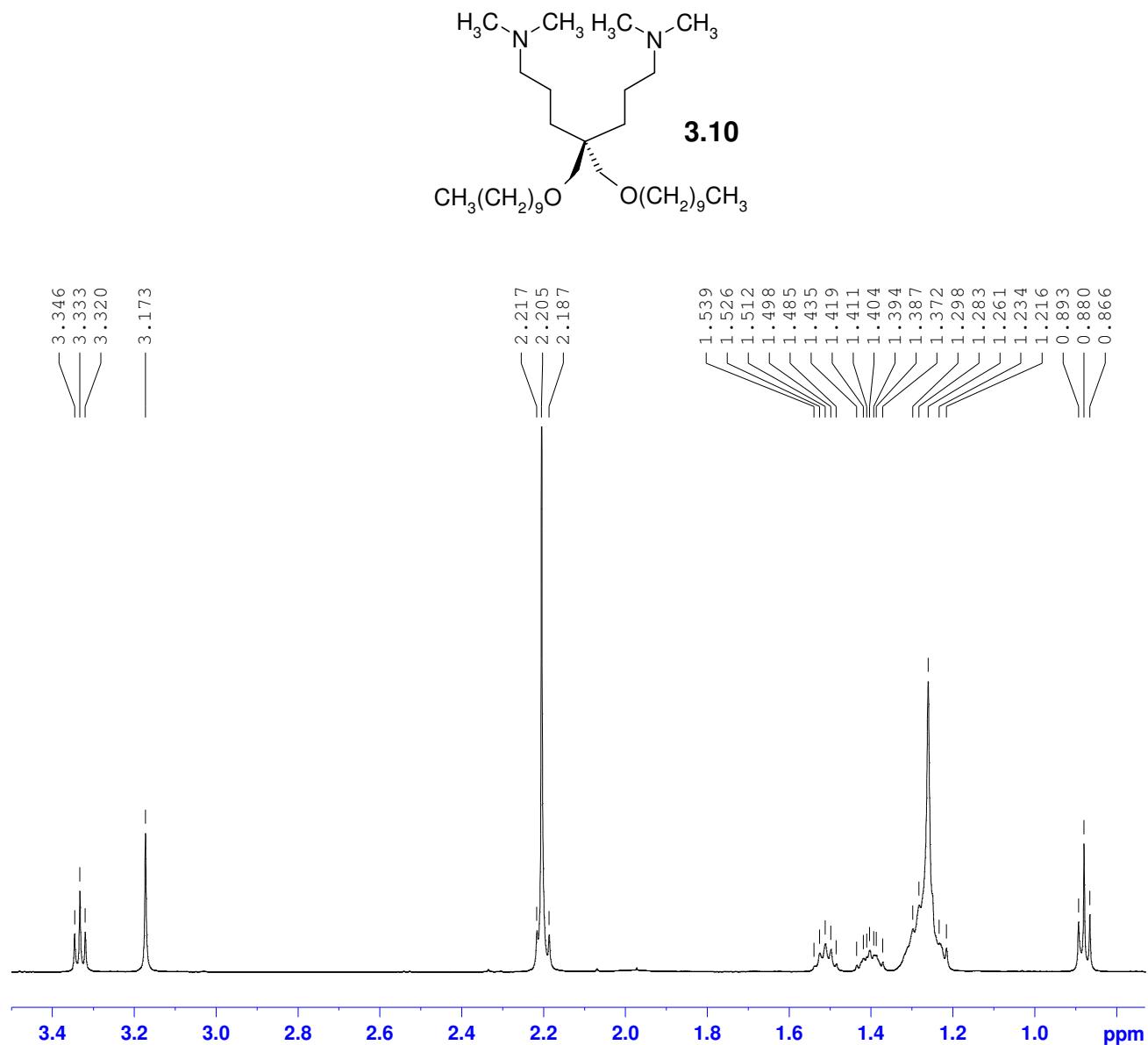
127.5 MHz  $^{13}\text{C}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(octyloxymethyl)-1,7-heptanediamine (**3.9**) in chloroform-*d*



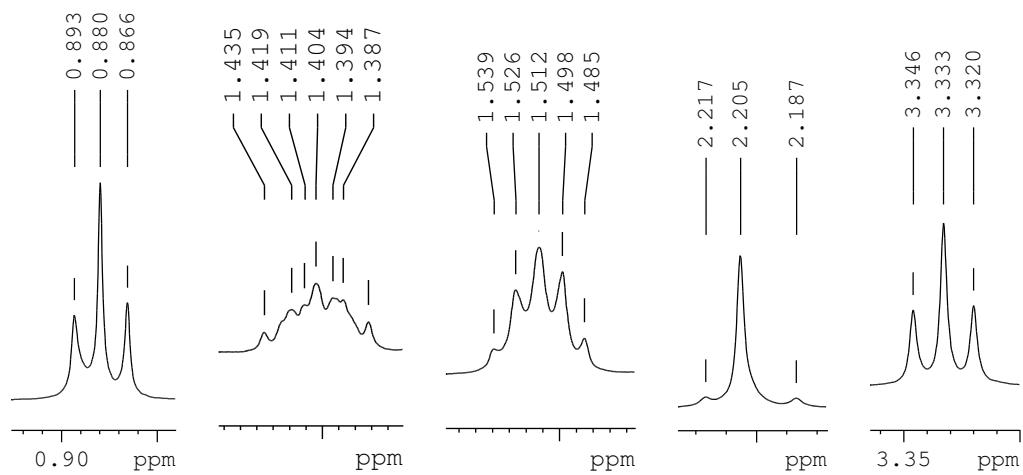
Expansion of part of the 127.5 MHz  $^{13}\text{C}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(octyloxymethyl)-1,7-heptanediamine (**3.9**) in chloroform-*d*



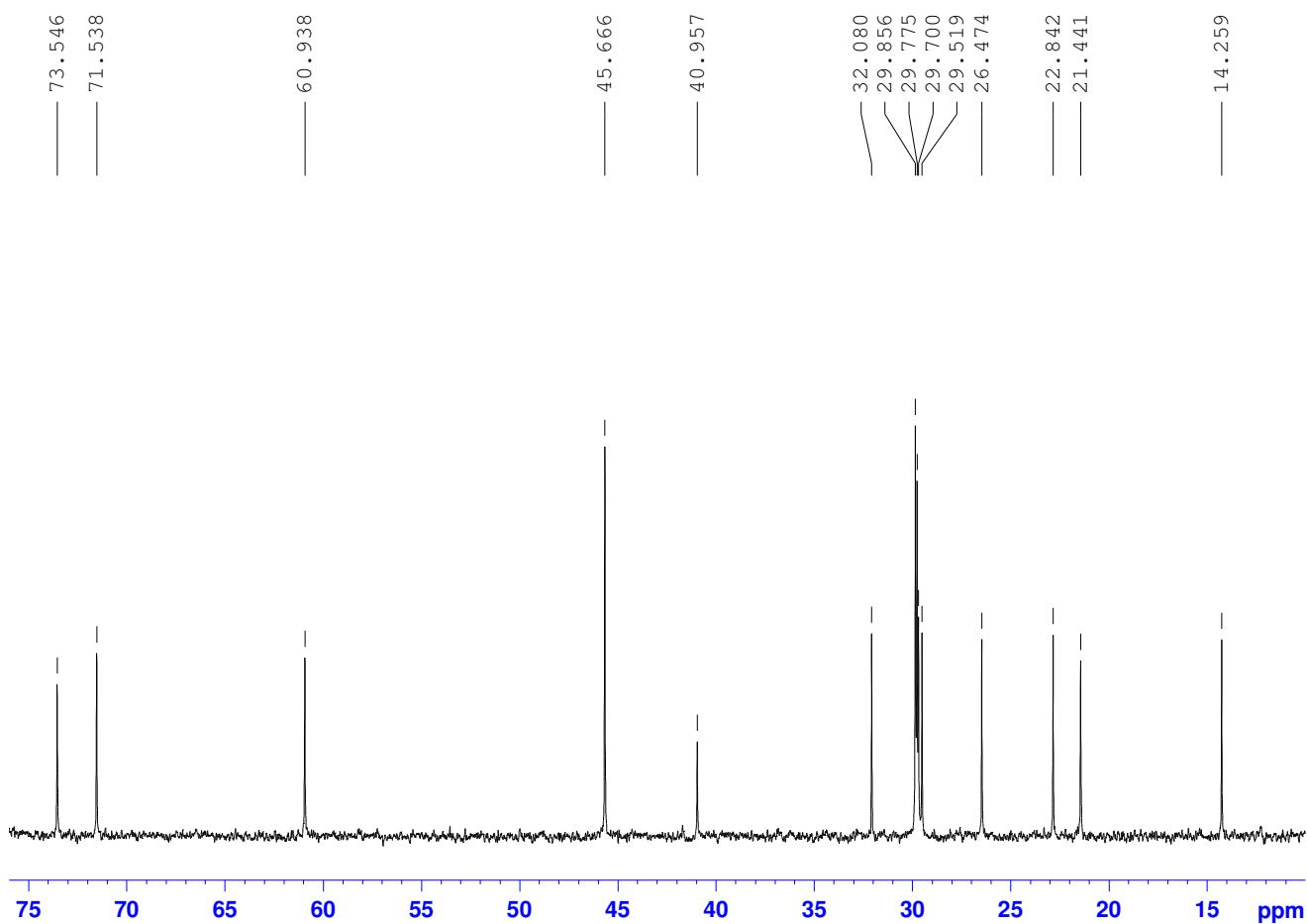
500.1 MHz  $^1\text{H}$  NMR spectrum of 4,4-bis-(decyloxymethyl)- $N,N,N',N'$ -tetramethyl-1,7-heptanediamine (**3.10**) in chloroform-*d*



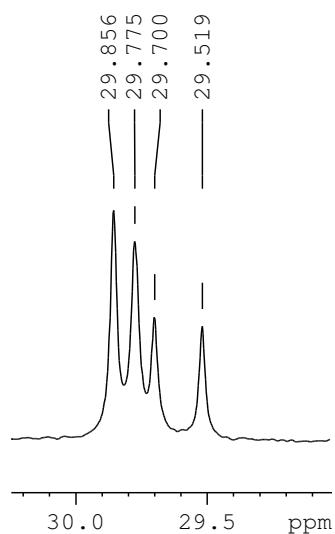
Expansions of parts of the 500.1 MHz  $^1\text{H}$  NMR spectrum of 4,4-bis(decyloxymethyl)- $N,N,N',N'$ -tetramethyl-1,7-heptanediamine (**3.10**) in chloroform-*d*



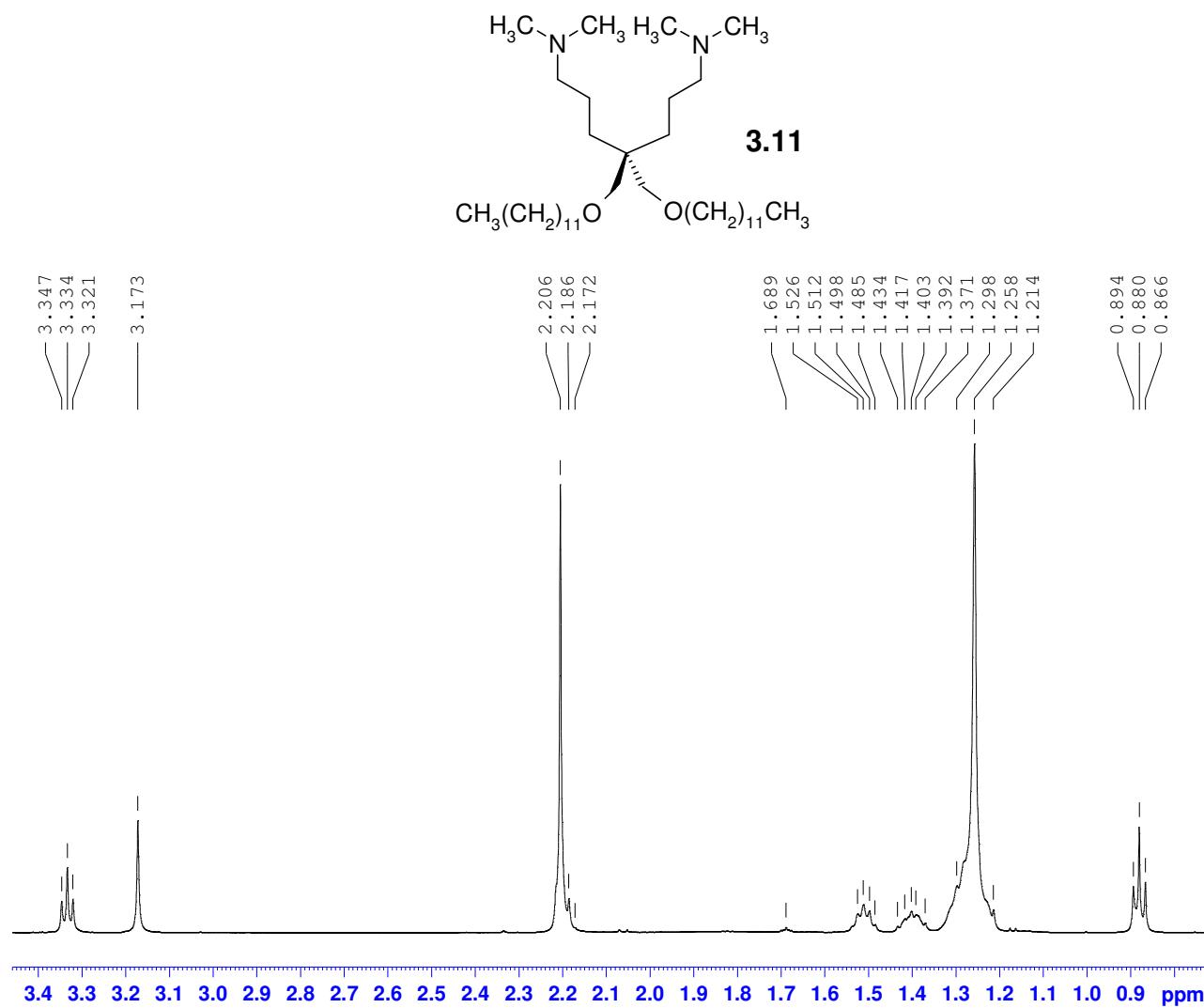
127.5 MHz  $^{13}\text{C}$  NMR spectrum of 4,4-bis(decyloxymethyl)- $N,N,N',N'$ -tetramethyl-1,7-heptanediamine (**3.10**) in chloroform-*d*



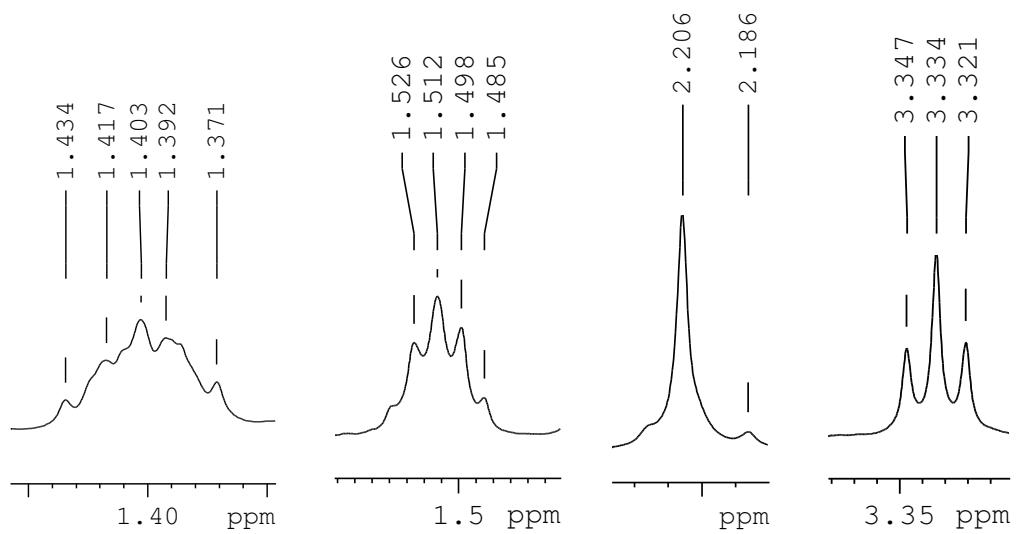
Expansions of parts of the 127.5 MHz  $^{13}\text{C}$  NMR spectrum of 4,4-bis(decyloxymethyl)- $N,N,N',N'$ -tetramethyl-1,7-heptanediamine (**3.10**) in chloroform-*d*



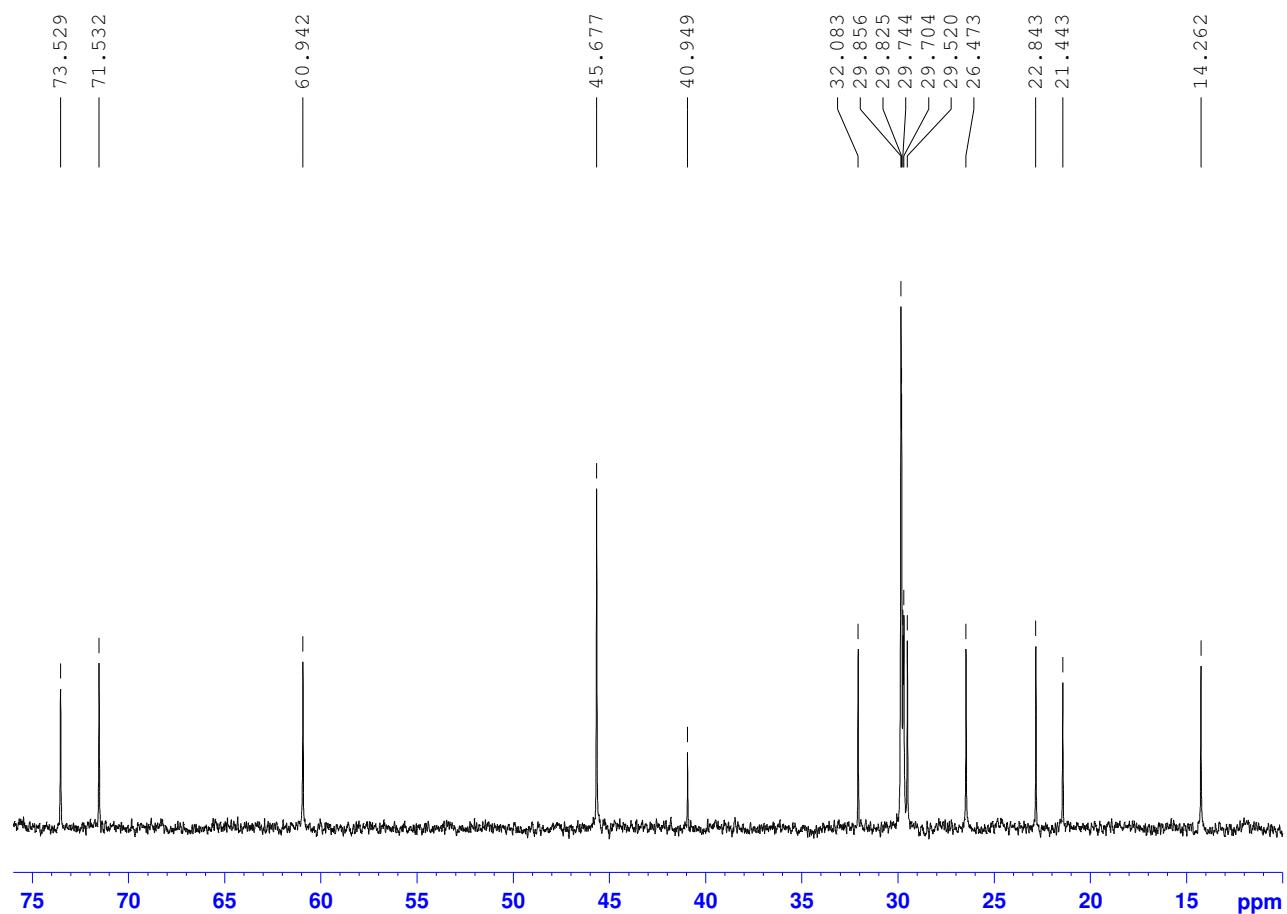
500.1 MHz  $^1\text{H}$  NMR spectrum of 4,4-bis-(dodecyloxymethyl)- $N,N,N',N'$ -tetramethyl-1,7-heptanediamine (**3.11**) in chloroform-*d*



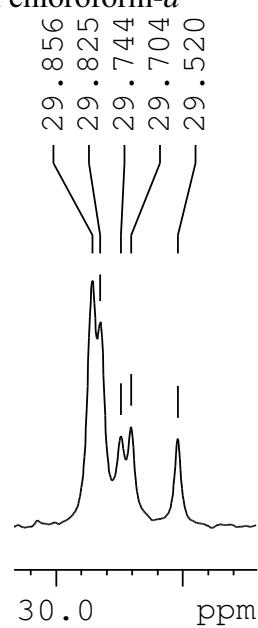
Expansions of parts of the 500.1 MHz  $^1\text{H}$  NMR spectrum of 4,4-bis(dodecyloxymethyl)-*N,N,N',N'*-tetramethyl-1,7-heptanediamine (**3.11**) in chloroform-*d*



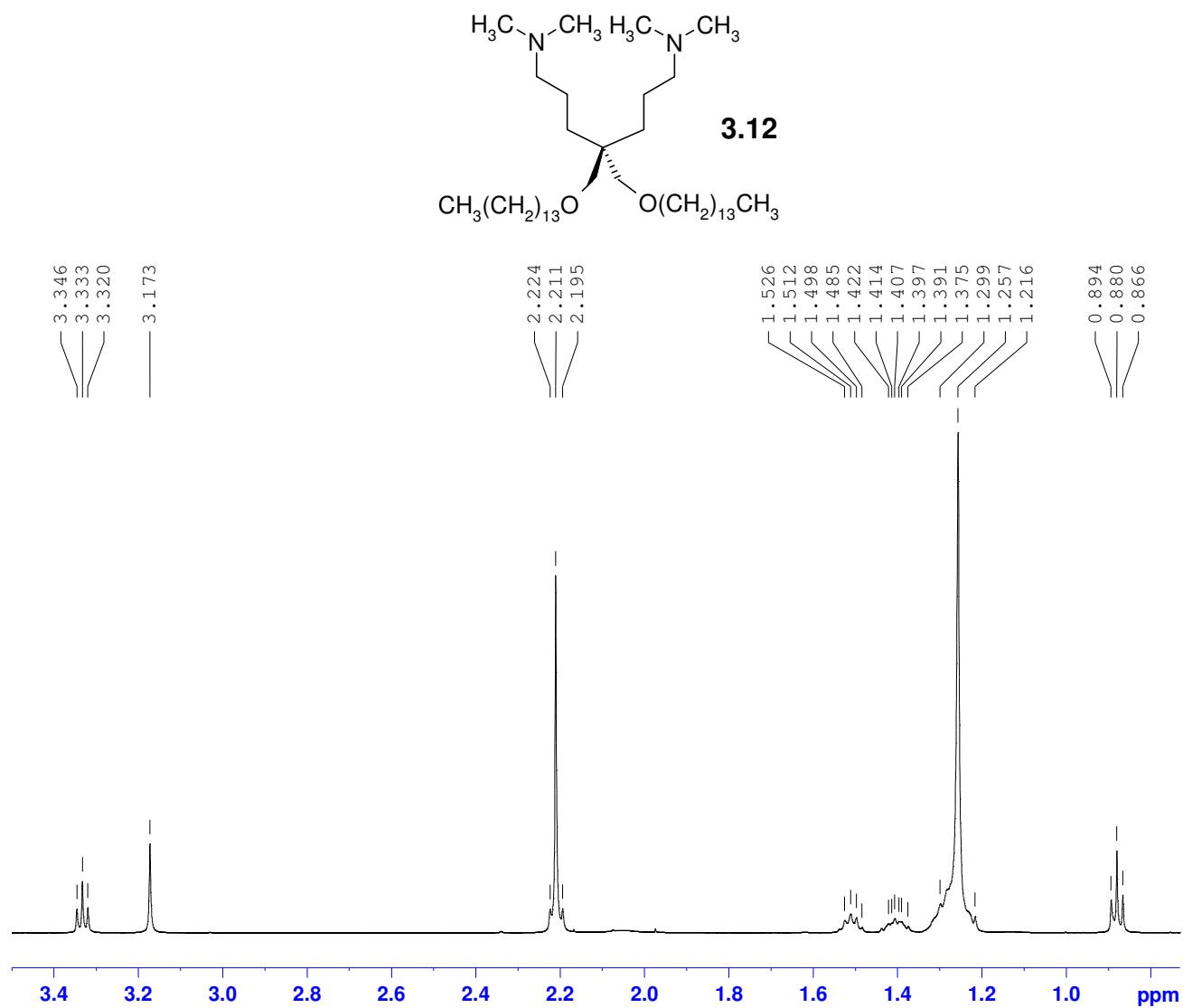
127.5 MHz  $^{13}\text{C}$  NMR spectrum of 4,4-bis(dodecyloxymethyl)- $N,N,N',N'$ -tetramethyl-1,7-heptanediamine (**3.11**) in chloroform-*d*



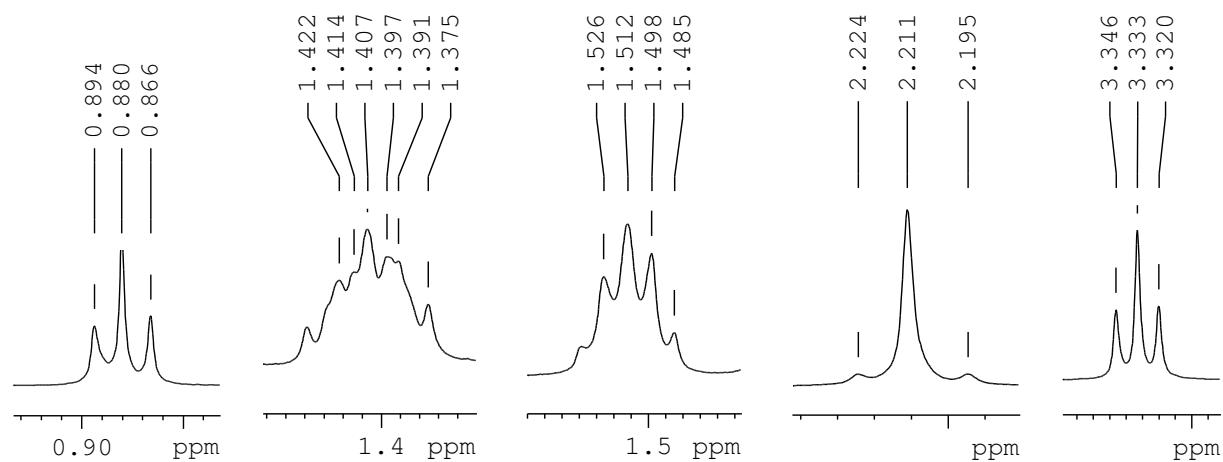
Expansion of part of the 127.5 MHz  $^{13}\text{C}$  NMR spectrum of 4,4-bis(dodecyloxymethyl)- $N,N,N',N'$ -tetramethyl-1,7-heptanediamine (**3.11**) in chloroform-*d*



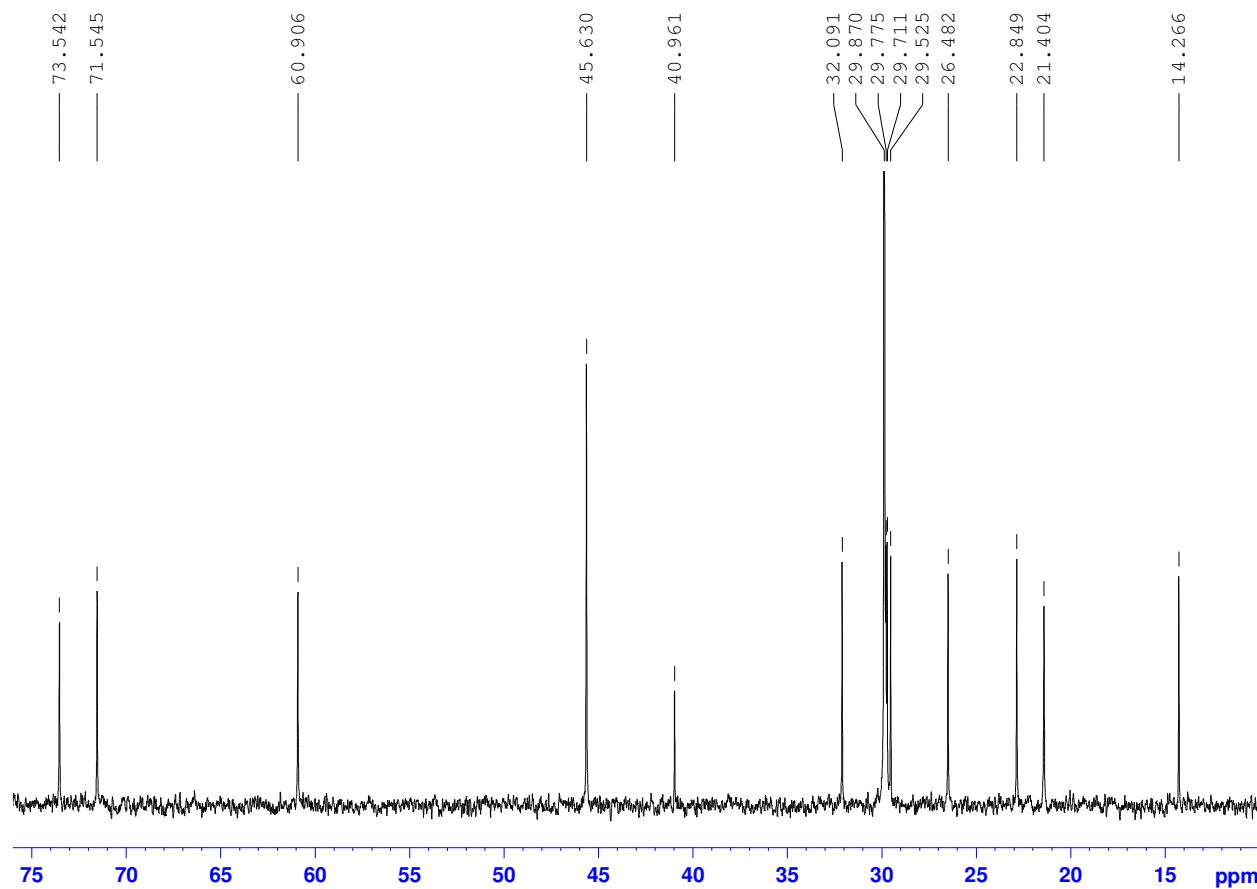
500.1 MHz  $^1\text{H}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(tetradecyloxymethyl)-1,7-heptanediamine (**3.12**) in chloroform-*d*



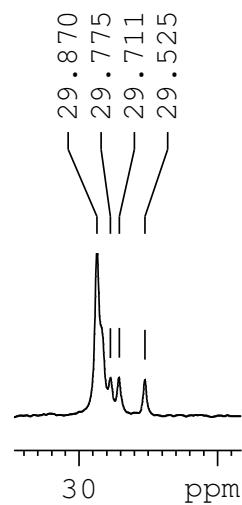
Expansions of parts of the 500.1 MHz  $^1\text{H}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(tetradecyloxymethyl)-1,7-heptanediamine (**3.12**) in chloroform-*d*



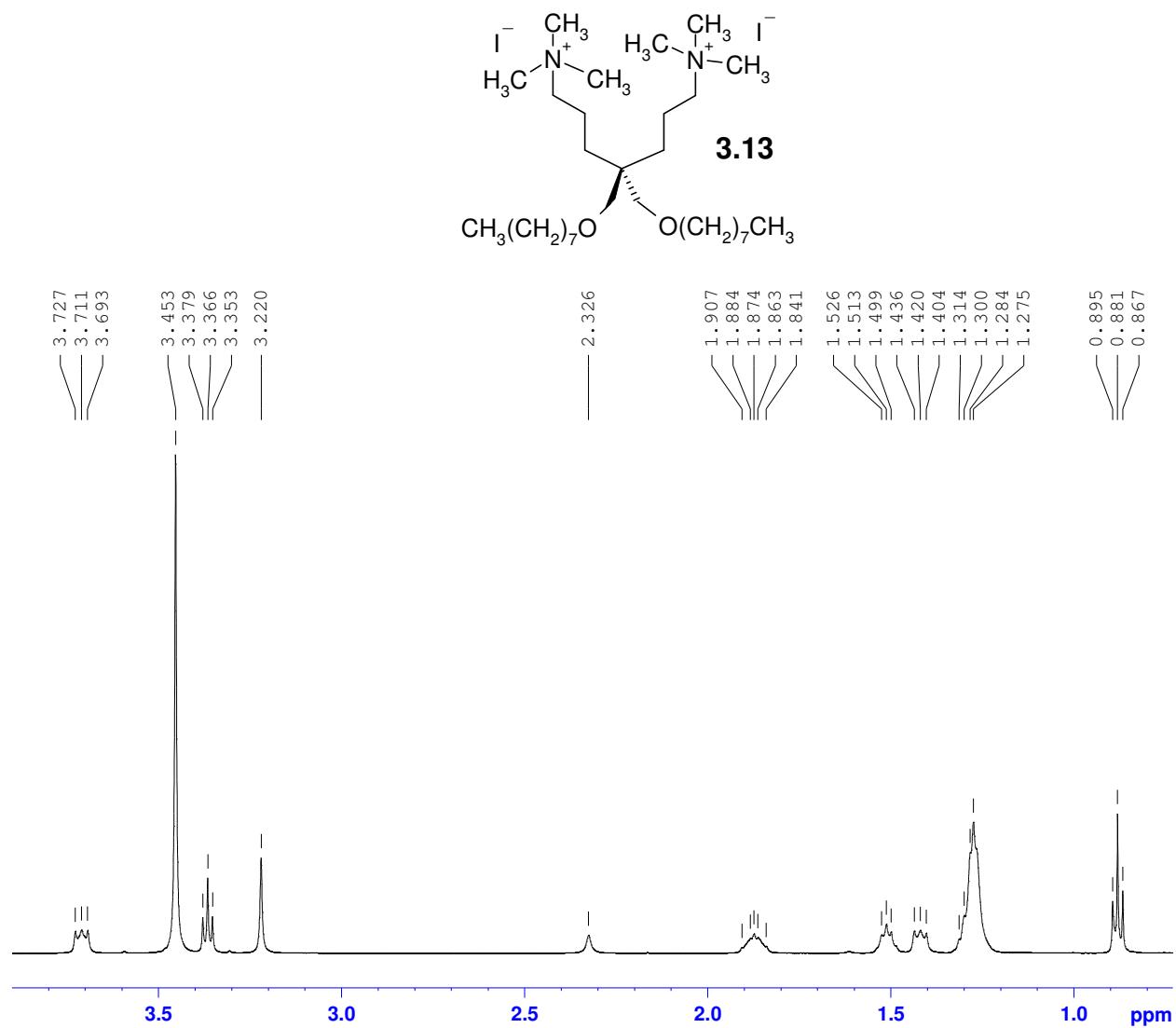
127.5 MHz  $^{13}\text{C}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(tetradecyloxymethyl)-1,7-heptanediamine (**3.12**) in chloroform-*d*



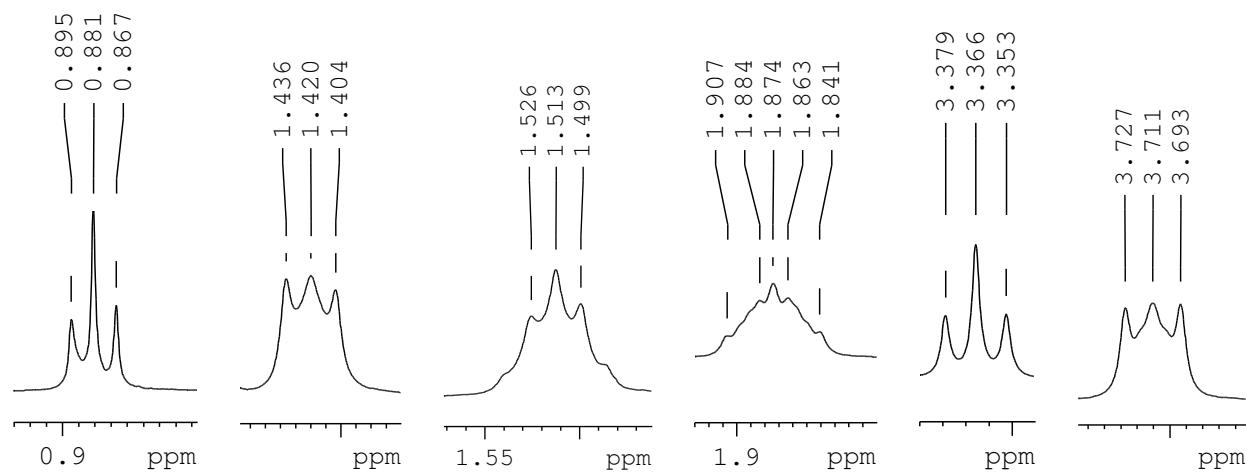
Expansion of part of the 127.5 MHz  $^{13}\text{C}$  NMR spectrum of *N,N,N',N'*-tetramethyl-4,4-bis(tetradecyloxymethyl)-1,7-heptanediamine (**3.12**) in chloroform-*d*



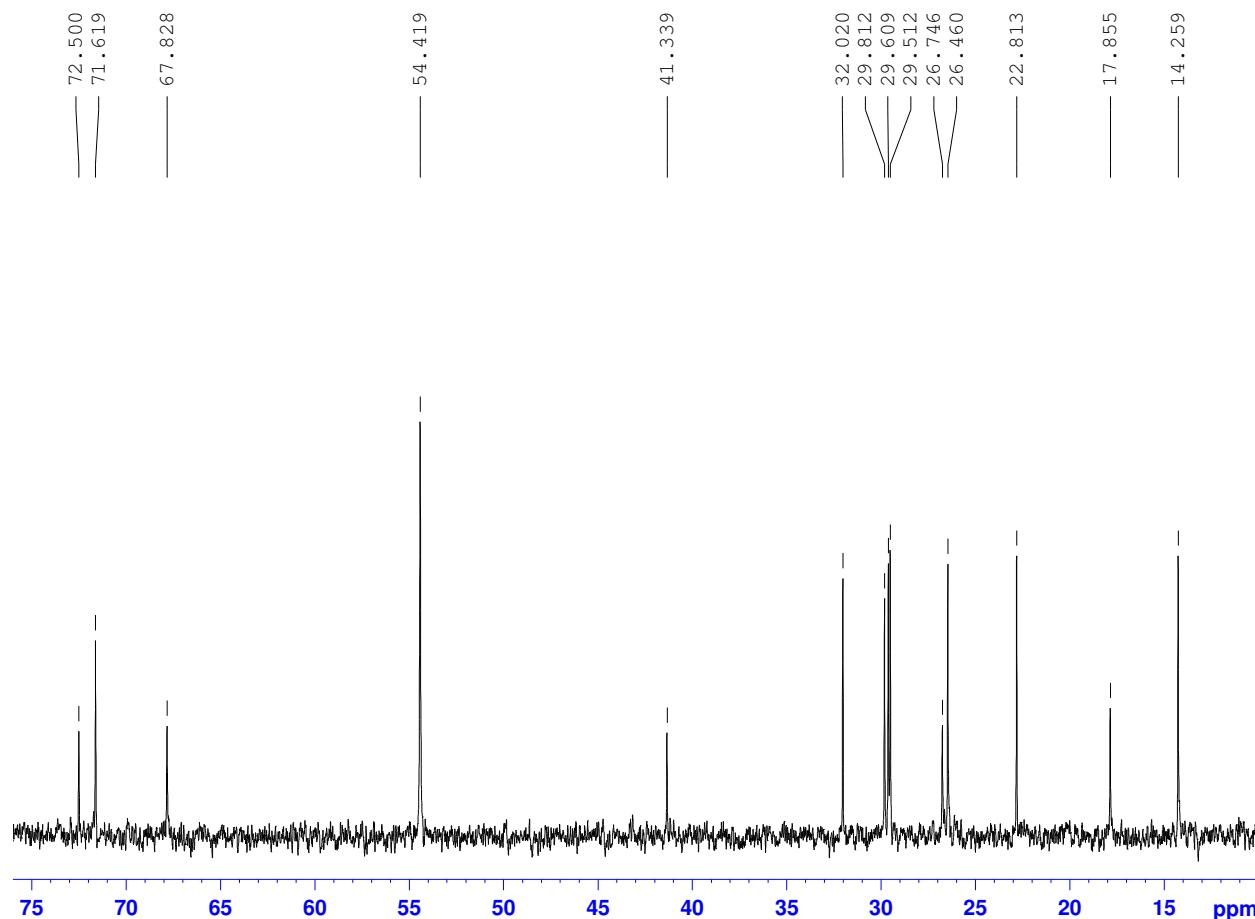
500.1 MHz  $^1\text{H}$  NMR spectrum of *N,N,N',N'-hexamethyl-4,4-bis(octyloxymethyl)-1,7-heptanediammonium diiodide* (**3.13**) in chloroform-*d*



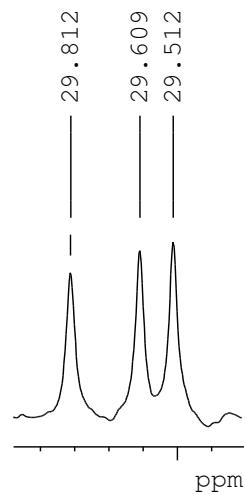
Expansions of parts of the 500.1 MHz  $^1\text{H}$  NMR spectrum of *N,N,N,N',N',N'-hexamethyl-4,4-bis(octyloxymethyl)-1,7-heptanediammonium diiodide* (**3.13**) in chloroform-*d*



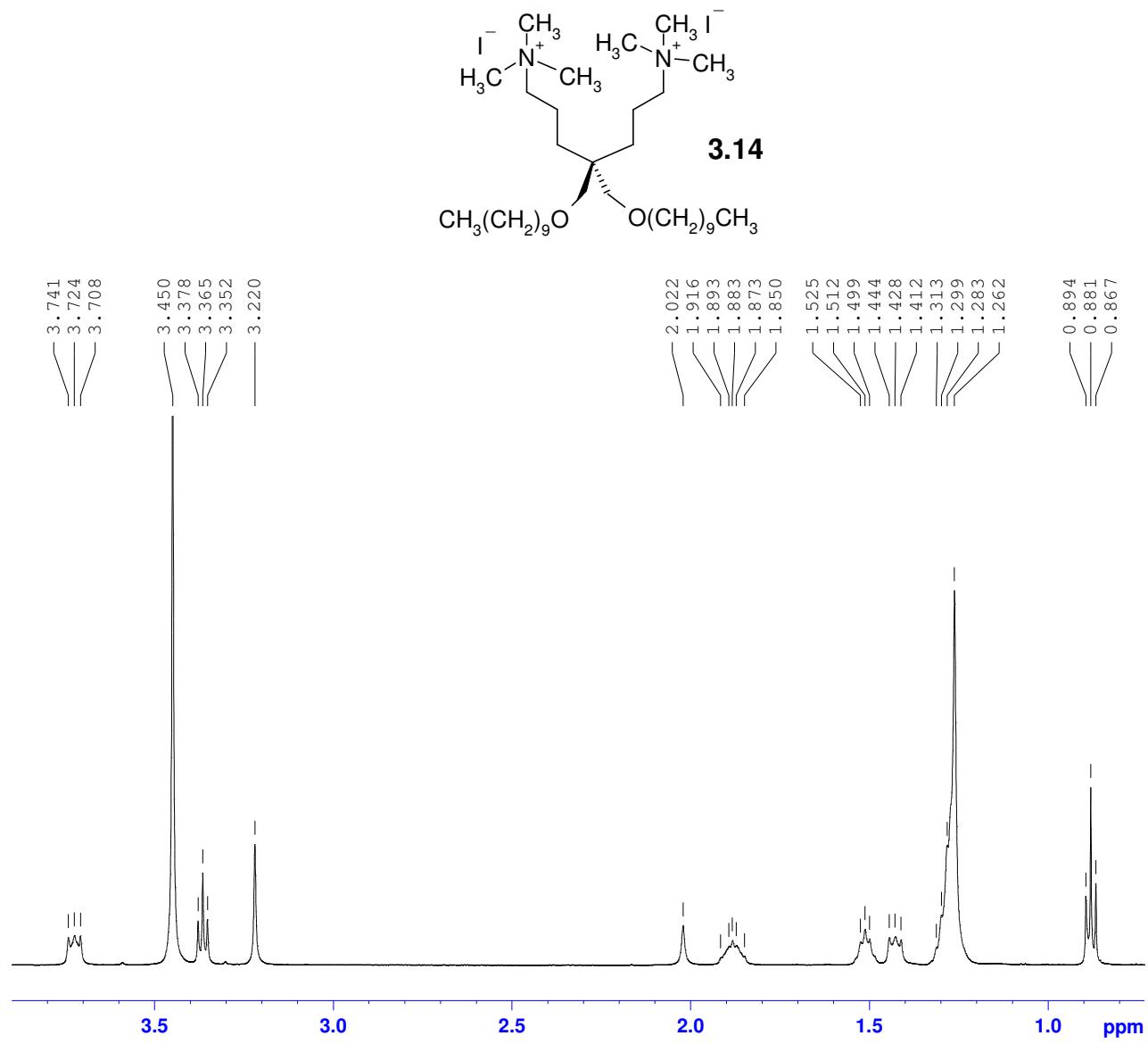
127.5 MHz  $^{13}\text{C}$  NMR spectrum of *N,N,N,N',N',N'*-hexamethyl-4,4-bis(ocyloxymethyl)-1,7-heptanediammonium diiodide(**3.13**) in chloroform-*d*



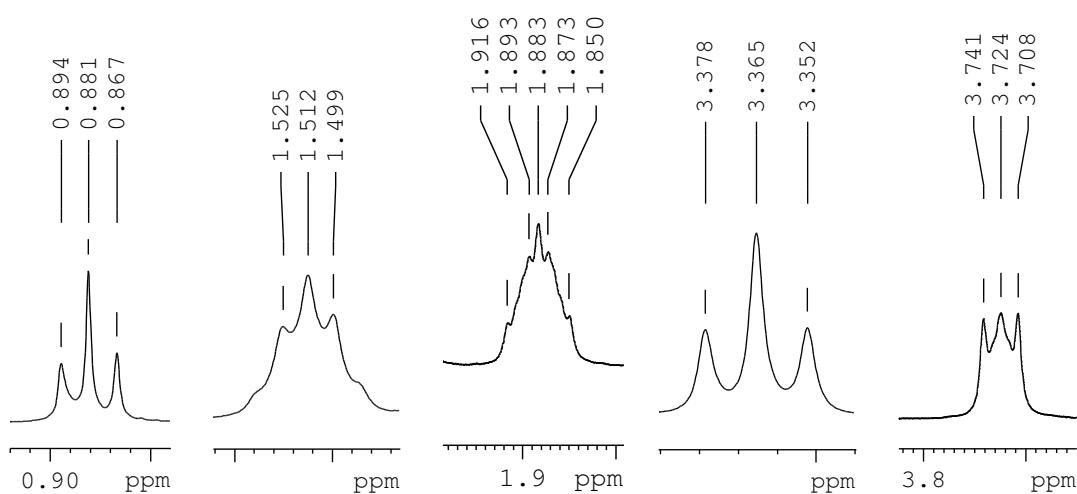
Expansion of part of the 127.5 MHz  $^{13}\text{C}$  NMR spectrum *N,N,N,N',N',N'*-hexamethyl-4,4-bis(ocyloxymethyl)-1,7-heptanediammonium diiodide (**3.13**) in chloroform-*d*



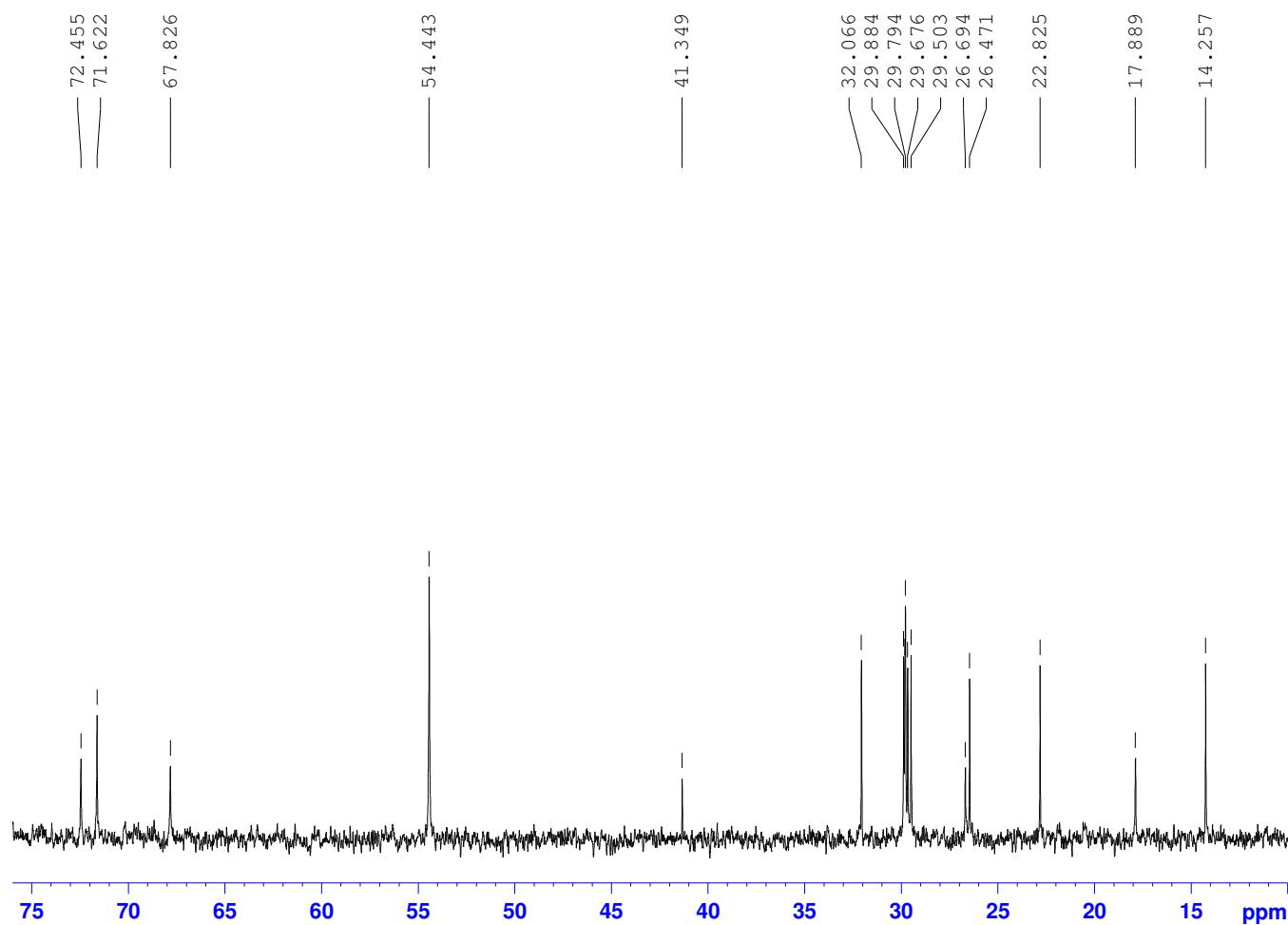
500.1 MHz  $^1\text{H}$  NMR spectrum of 4,4-bis-(decyloxymethyl)- $N,N,N',N'$ -hexamethyl-1,7-heptanediammonium diiodide (**3.14**) in chloroform-*d*



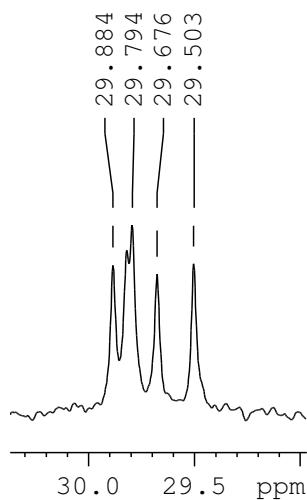
Expansions of parts of the 500.1 MHz  $^1\text{H}$  NMR spectrum of 4,4-bis(decyloxymethyl)-*N,N,N,N',N',N'*-hexamethyl-1,7-heptanediammonium diiodide (**3.14**) in chloroform-*d*



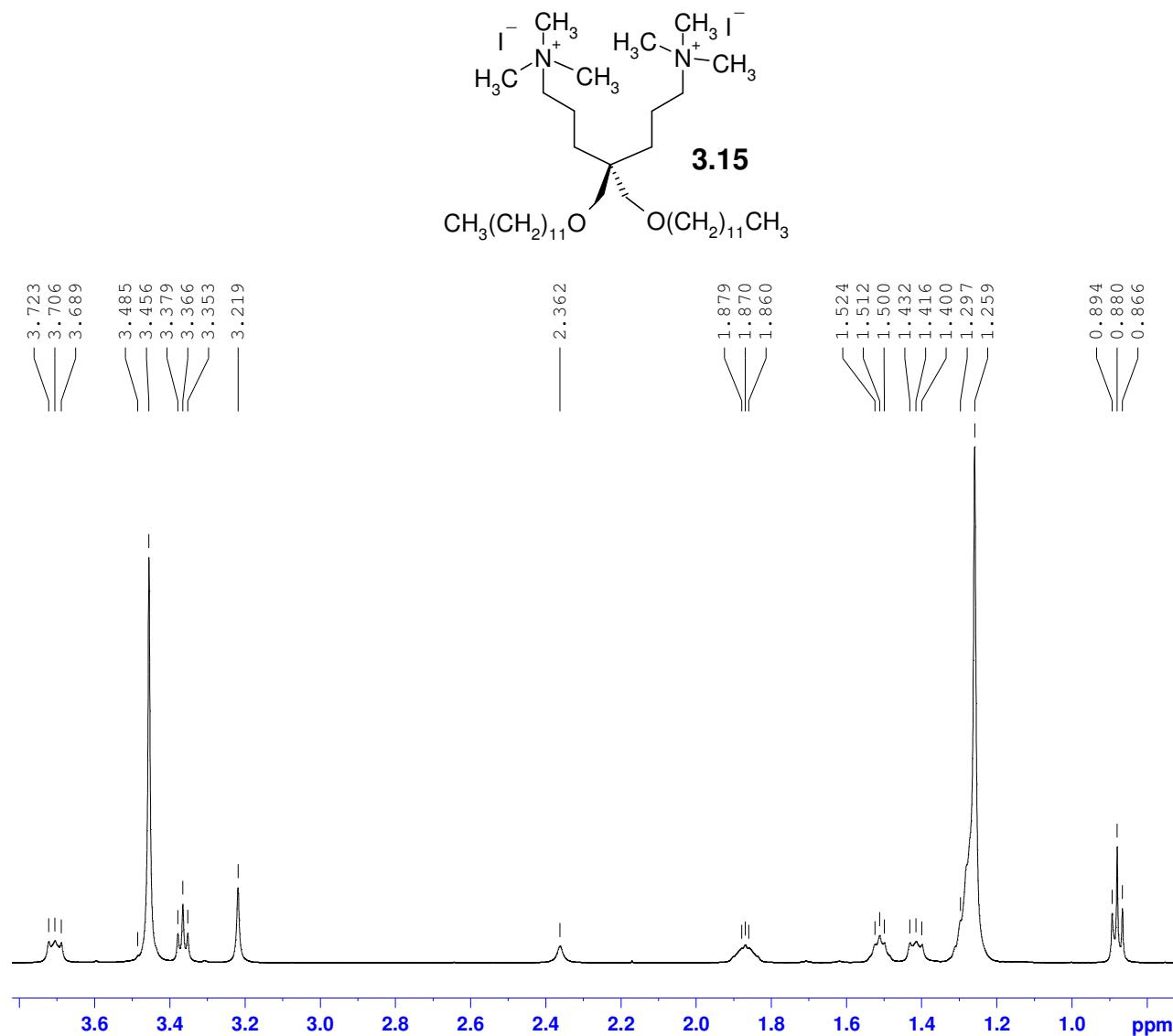
127.5 MHz  $^{13}\text{C}$  NMR spectrum of 4,4-bis(decyloxymethyl)- $N,N,N',N',N'$ -hexamethyl-1,7-heptanediammonium diiodide (**3.14**) in chloroform-*d*



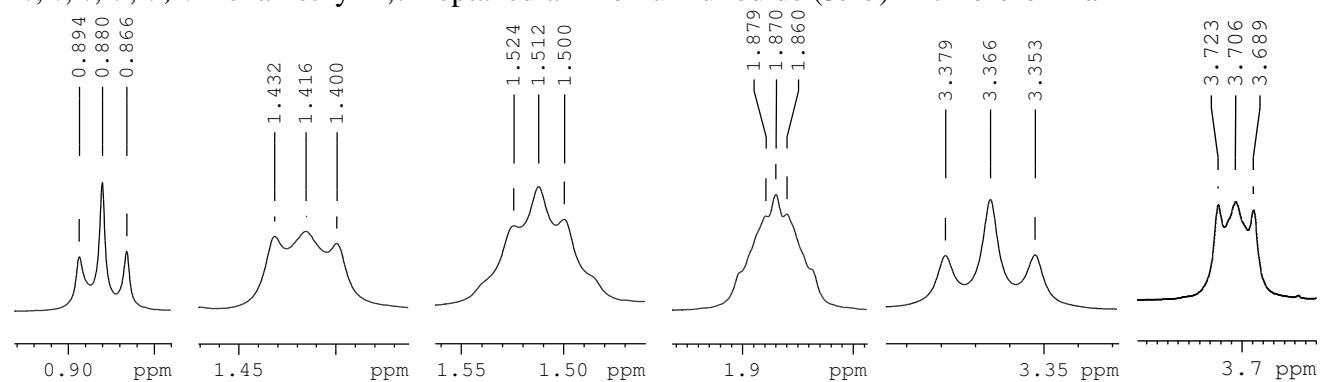
Expansion of part of the 127.5 MHz  $^{13}\text{C}$  NMR spectrum of 4,4-bis(decyloxymethyl)- $N,N,N',N',N'$ -hexamethyl-1,7-heptanediammonium diiodide (**3.14**) in chloroform-*d*



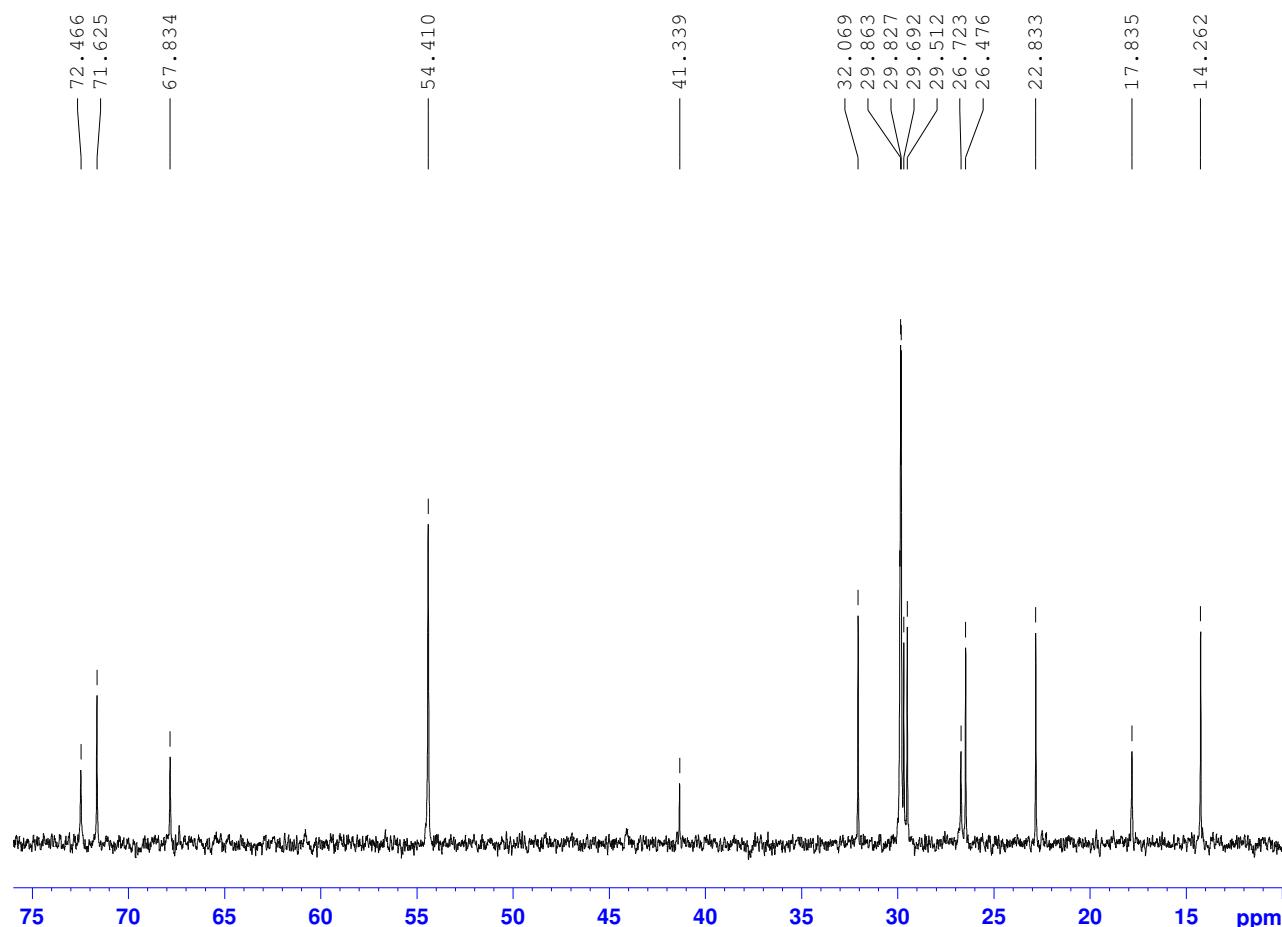
500.1 MHz  $^1\text{H}$  NMR spectrum of 4,4-bis(dodecyloxymethyl)-*N,N,N,N'*-hexamethyl-1,7-heptanediammonium diiodide (**3.15**) in chloroform-*d*



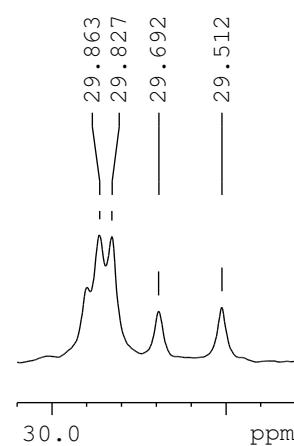
Expansions of parts of the 500.1 MHz  $^1\text{H}$  NMR spectrum of 4,4-bis(dodecyloxymethyl)- $N,N,N,N',N',N'$ -hexamethyl-1,7-heptanediammonium diiodide (**3.15**) in chloroform-*d*



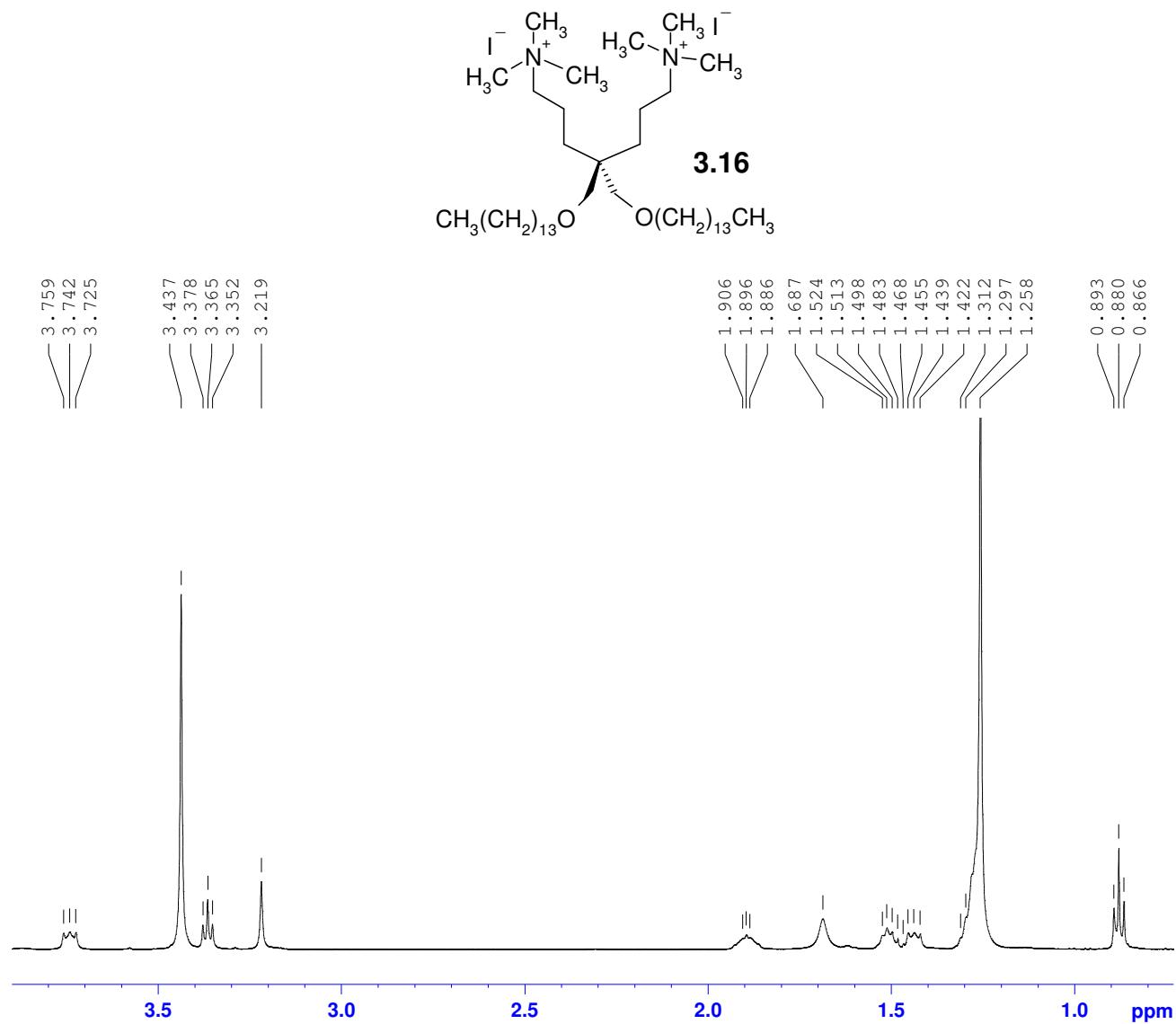
127.5 MHz  $^{13}\text{C}$  NMR spectrum of 4,4-bis(dodecyloxymethyl)- $N,N,N,N',N',N'$ -hexamethyl-1,7-heptanediammonium diiodide (**3.15**) in chloroform-*d*



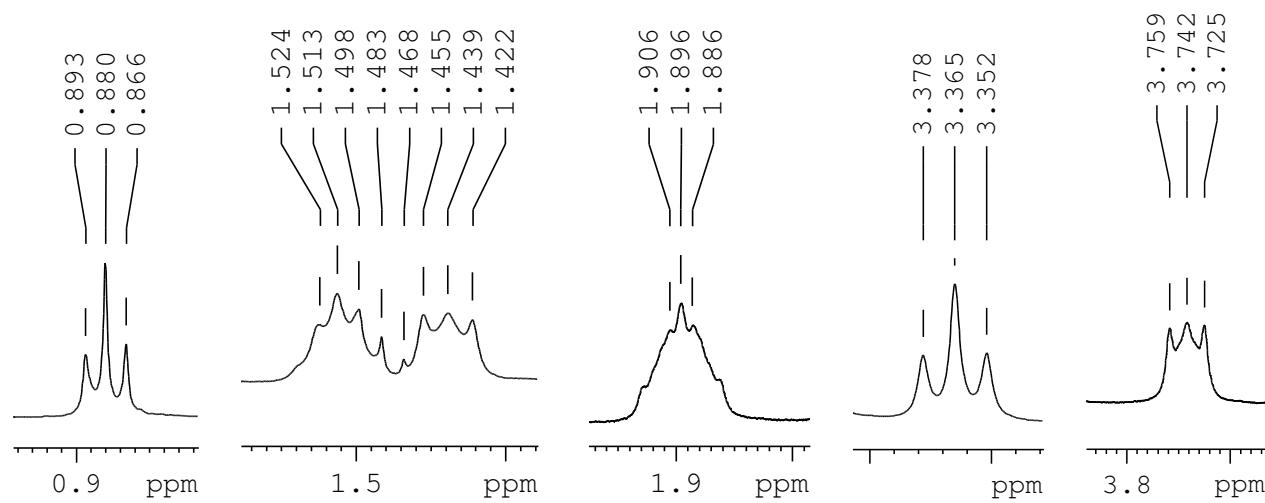
Expansion of part of the 127.5 MHz  $^{13}\text{C}$  NMR spectrum of 4,4-bis(dodecyloxymethyl)- $N,N,N,N',N',N'$ -hexamethyl-1,7-heptanediammonium diiodide (**3.15**) in chloroform-*d*



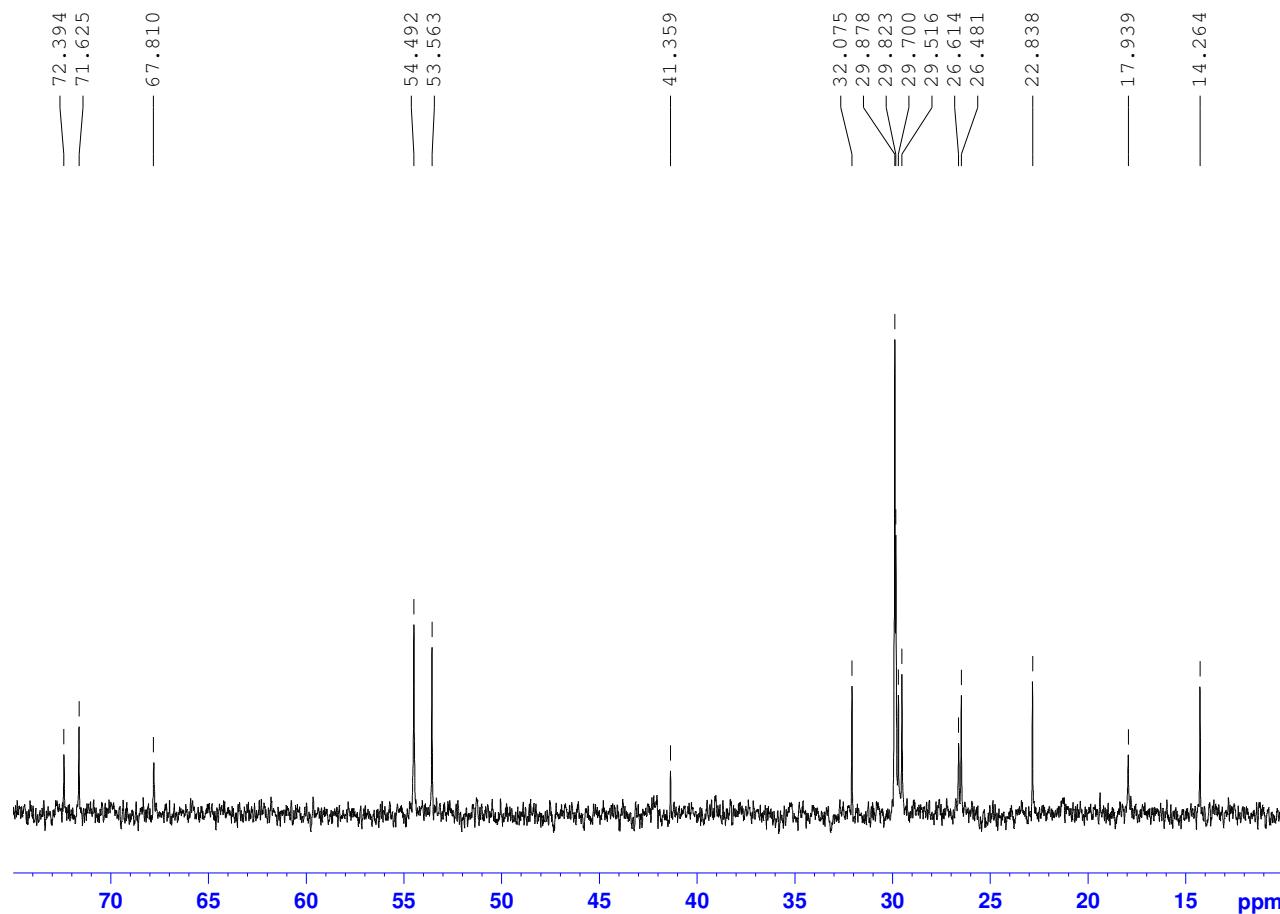
500.1 MHz  $^1\text{H}$  NMR spectrum of *N,N,N',N'-hexamethyl-4,4-bis (tetradecyloxymethyl)-1,7-heptanediammonium diiodide* (**3.16**) in chloroform-*d*



Expansions of parts of the 500.1 MHz  $^1\text{H}$  NMR spectrum of *N,N,N,N',N',N'-hexamethyl-4,4-bis(tetradecyloxymethyl)-1,7-heptane diammonium diiodide* (**3.16**) in chloroform-*d*



127.5 MHz  $^{13}\text{C}$  NMR spectrum of *N,N,N,N',N',N'*-hexamethyl-4,4-bis(tetradecyloxymethyl)-1,7-heptane diammonium diiodide (**3.16**) in chloroform-*d*



Expansion of part of the 127.5 MHz  $^{13}\text{C}$  NMR spectrum of *N,N,N,N',N',N'*-hexamethyl-4,4-bis(tetradecyloxymethyl)-1,7-heptanediammonium diiodide (**3.16**) in chloroform-*d*

