

SUPPORTING INFORMATION

PROTON NMR AND SELECTED CARBON NMR SPECTRA

for the  
communication  
entitled

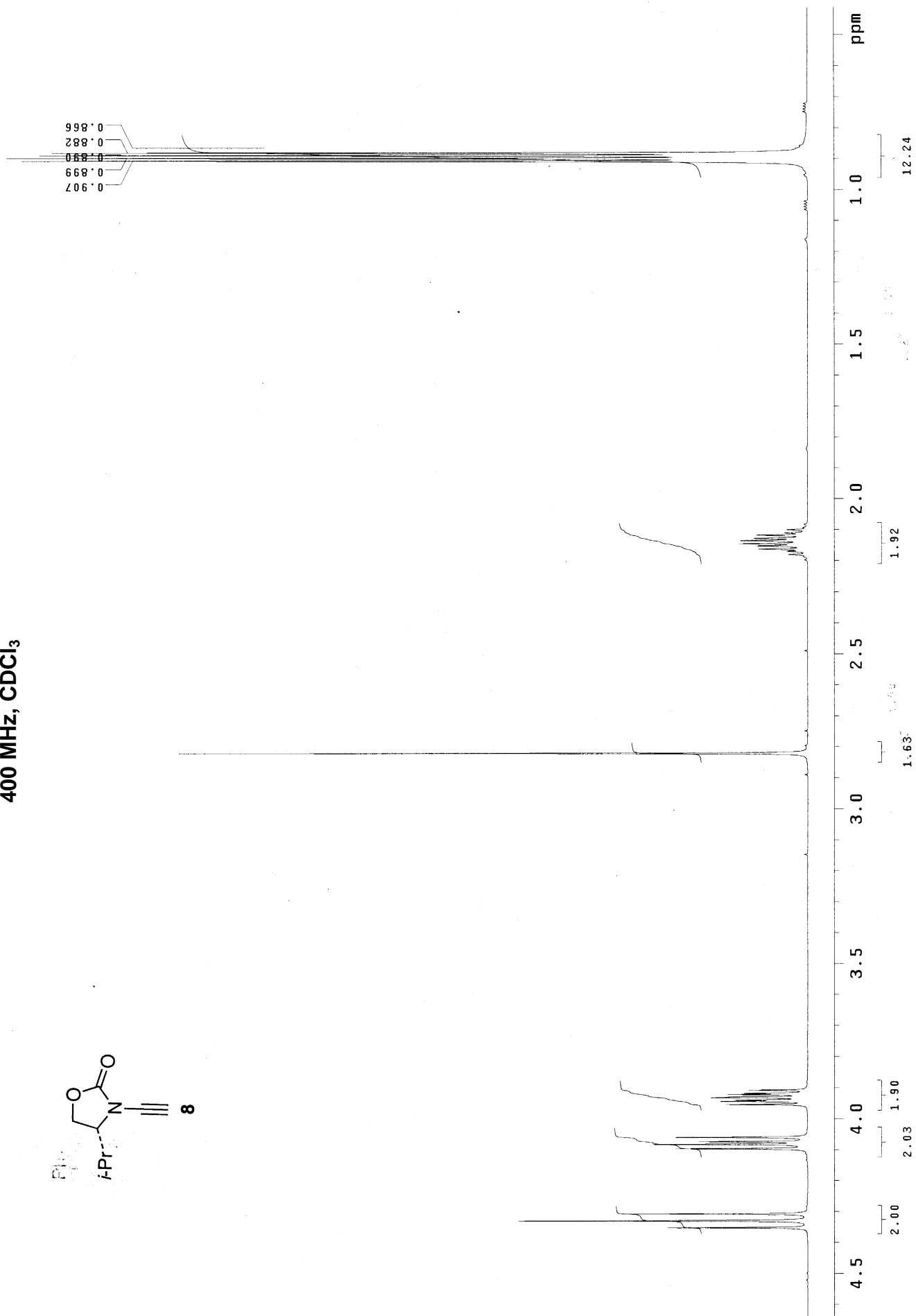
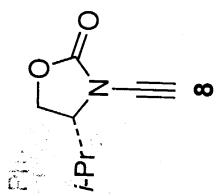
**A Highly Stereoselective Synthesis of Chiral  $\alpha$ -Amino- $\beta$ -Lactams via the Kinugasa Reaction  
Employing Ynamides.**

authored by

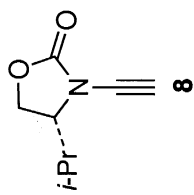
Xuejun Zhang, Richard P. Hsung\*, Hongyan Li, Yu Zhang, Whiteny L. Johnson, and Ruth Figueroa

*Division of Pharmaceutical Sciences and Department of Chemistry, 7111 Rennebohm Hall, 777 Highland Avenue  
University of Wisconsin at Madison, Madison, WI 53705-2222*

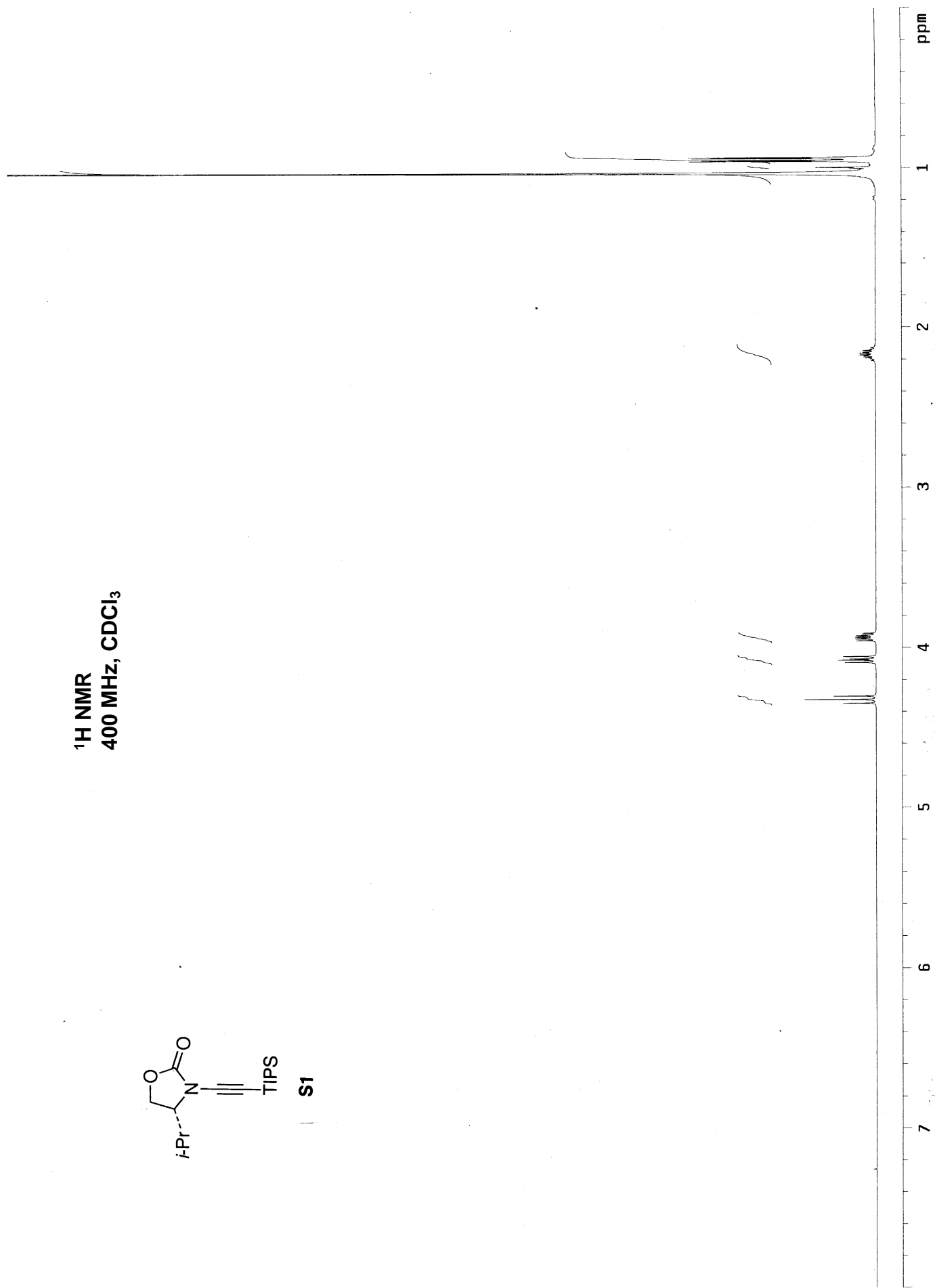
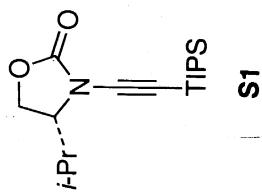
**<sup>1</sup>H NMR**  
**400 MHz, CDCl<sub>3</sub>**



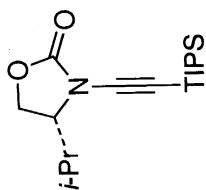
<sup>13</sup>C NMR  
100 MHz, CDCl<sub>3</sub>



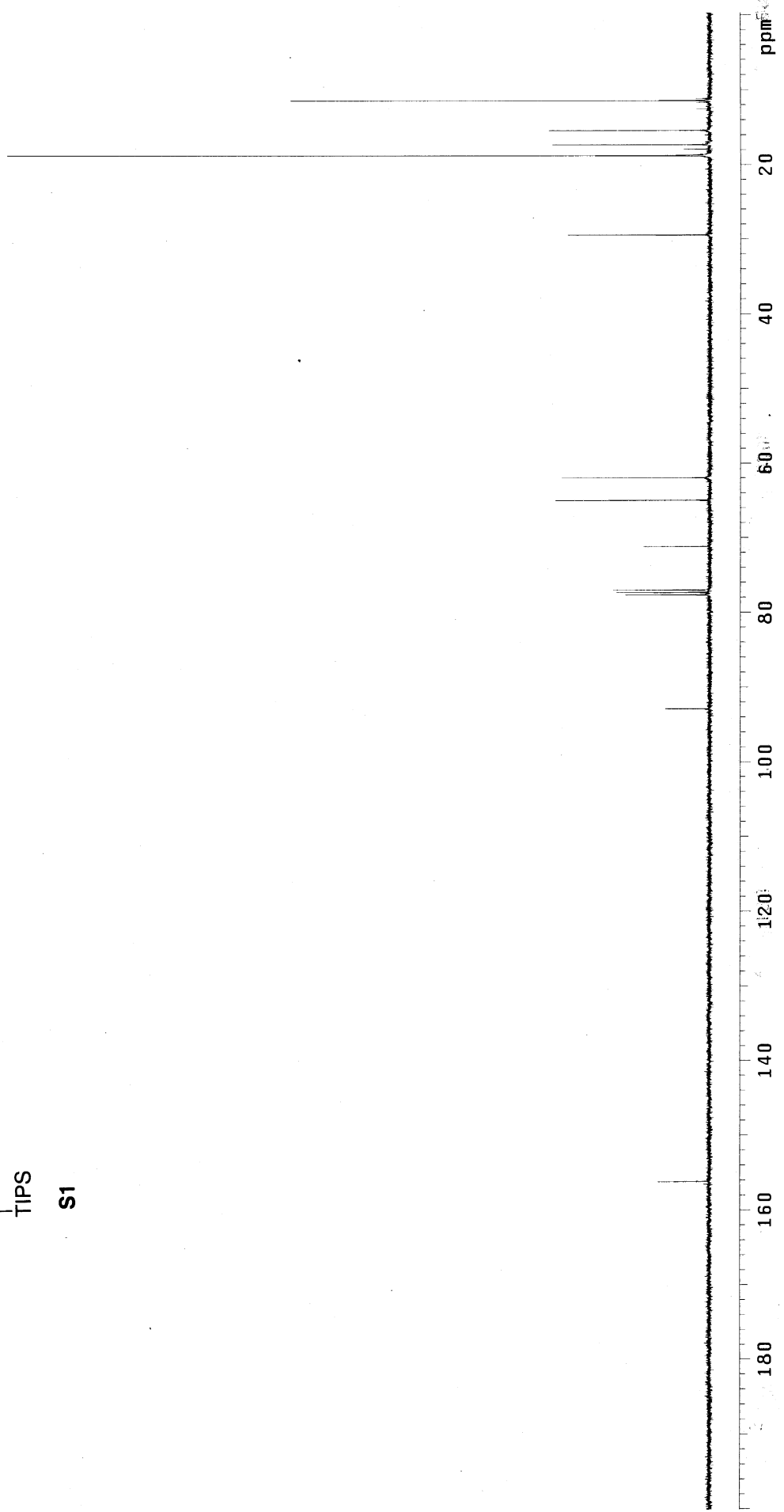
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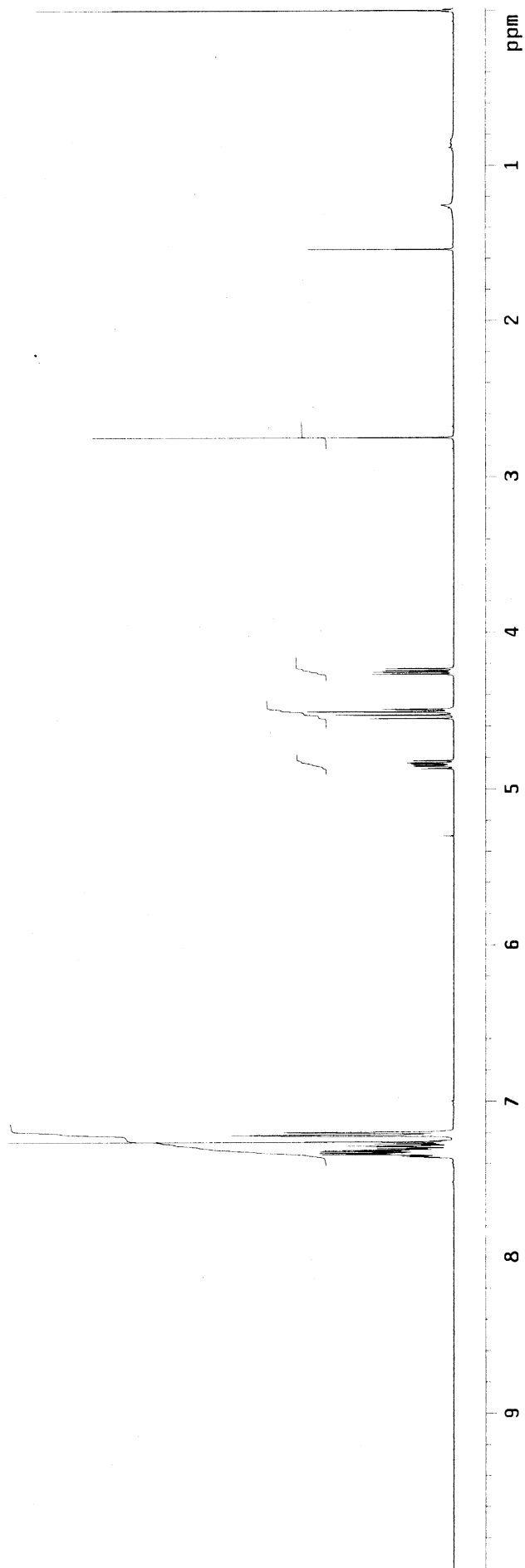
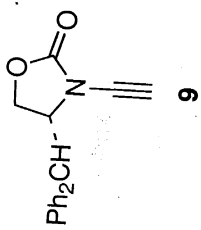
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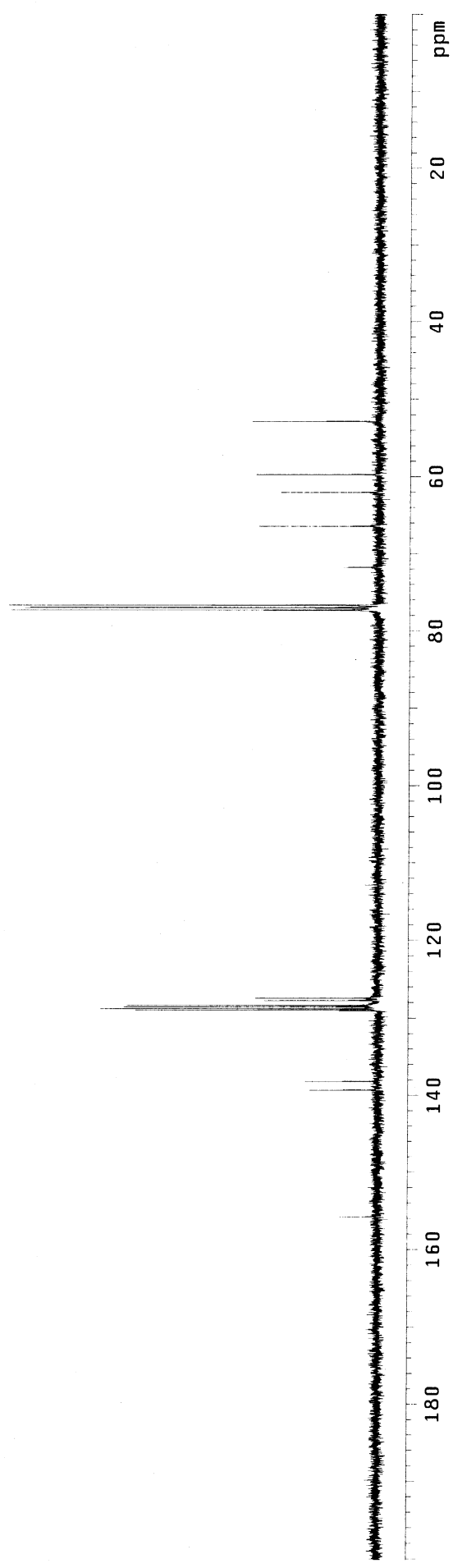
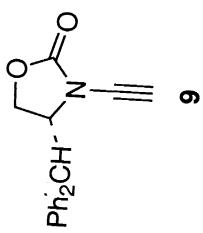
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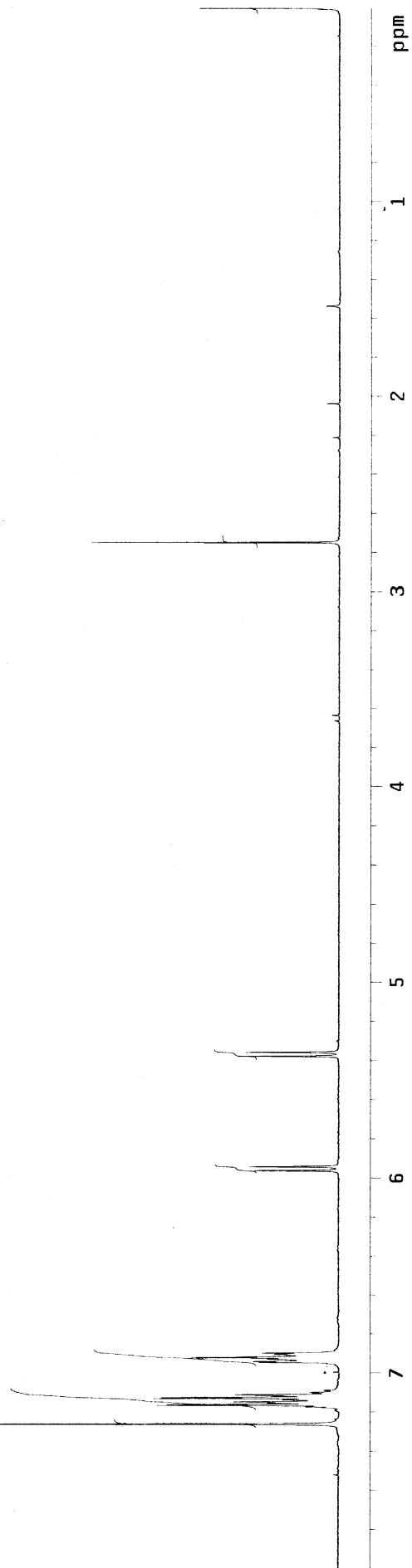
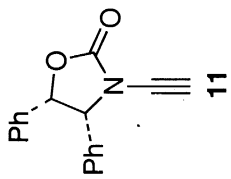
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400 MHz, CDCl<sub>3</sub>



<sup>13</sup>C NMR  
100 MHz, CDCl<sub>3</sub>

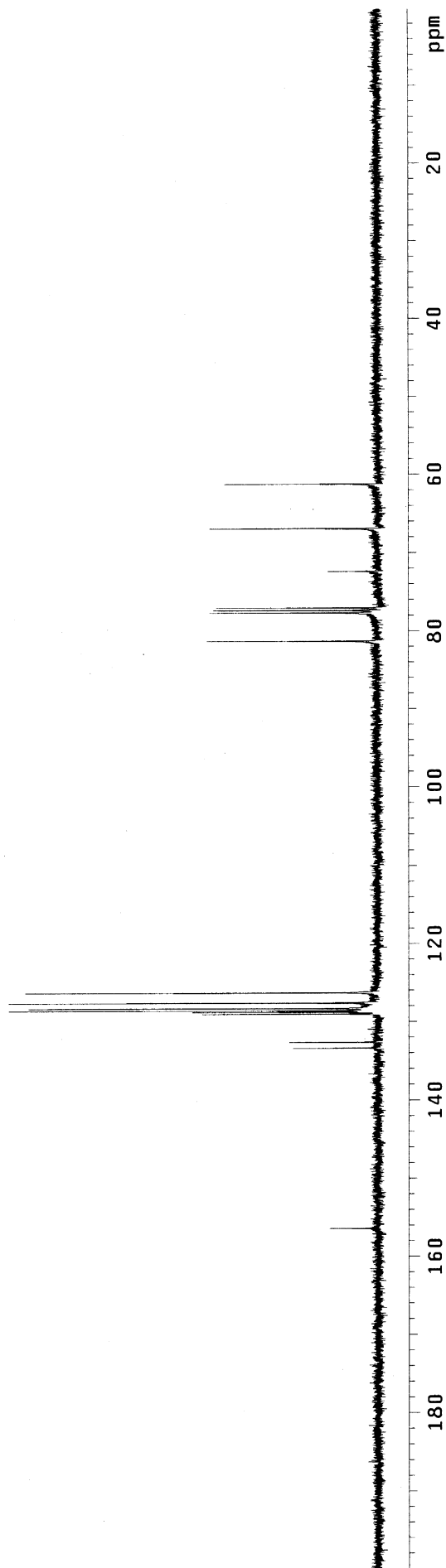
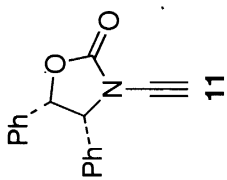


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400 MHz, CDCl<sub>3</sub>

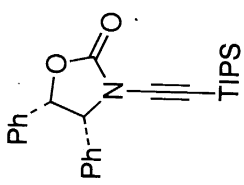




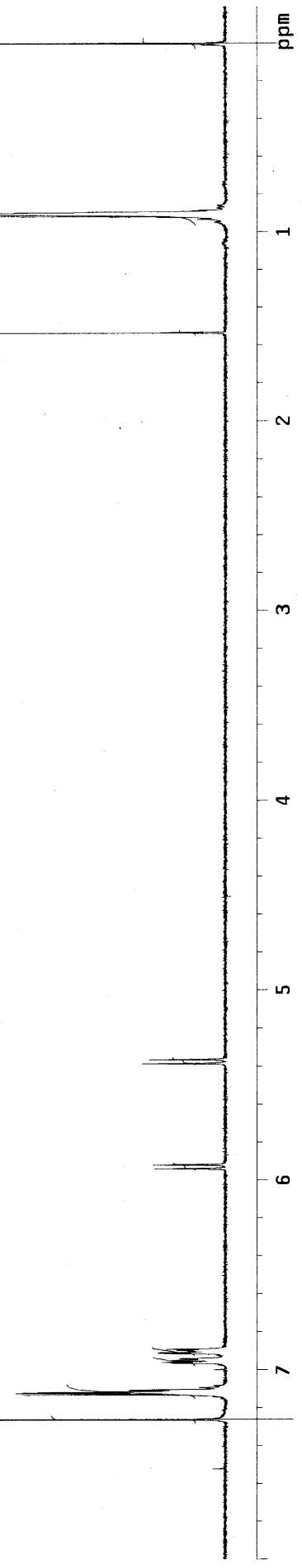
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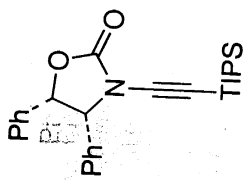
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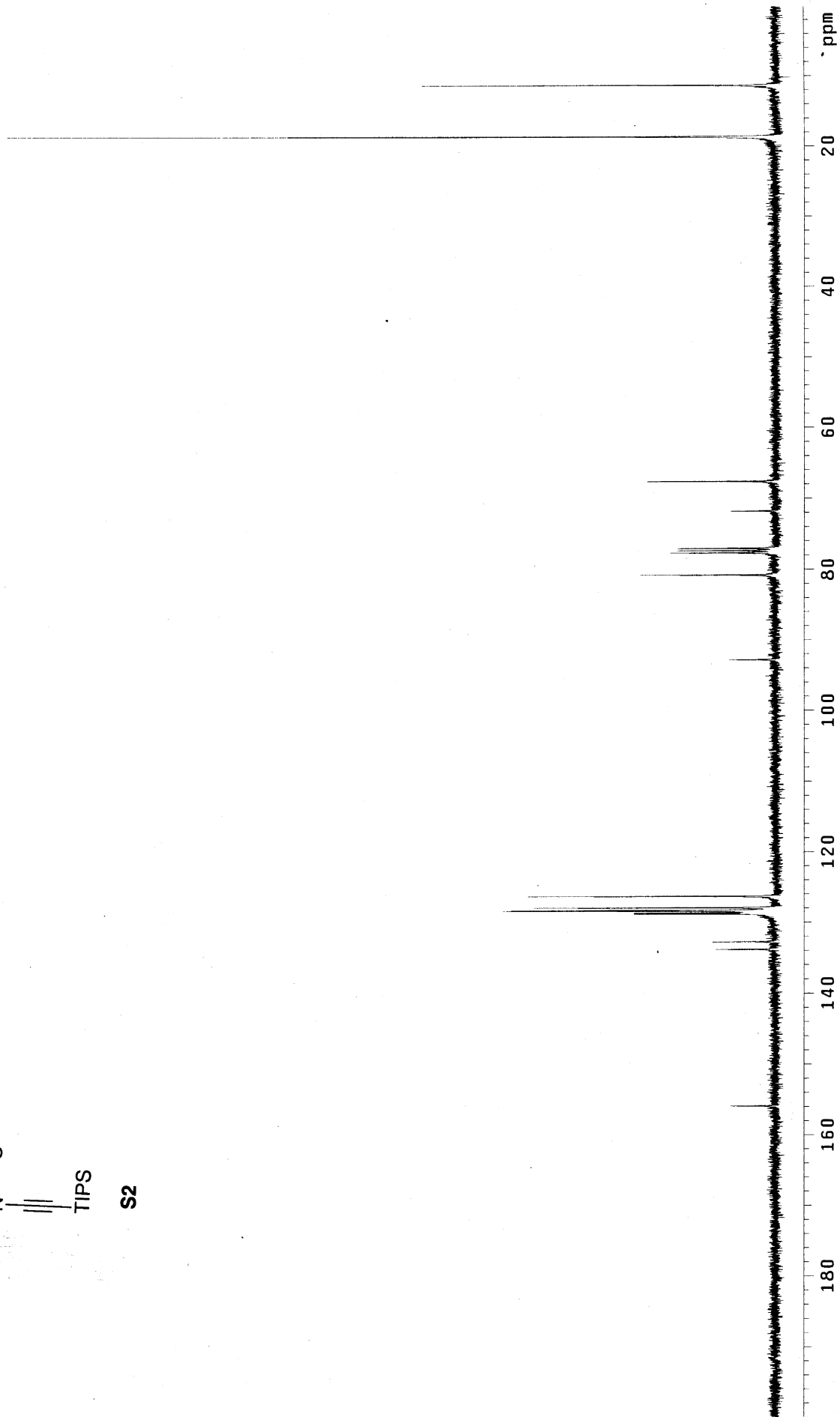
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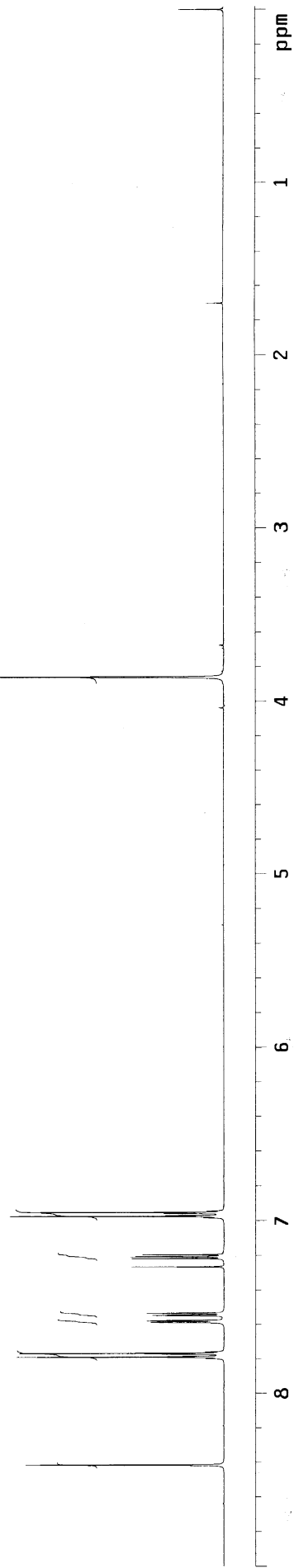
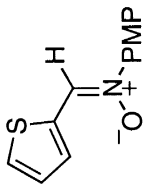
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100 MHz, CDCl<sub>3</sub>



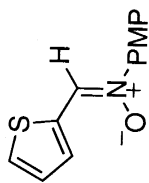
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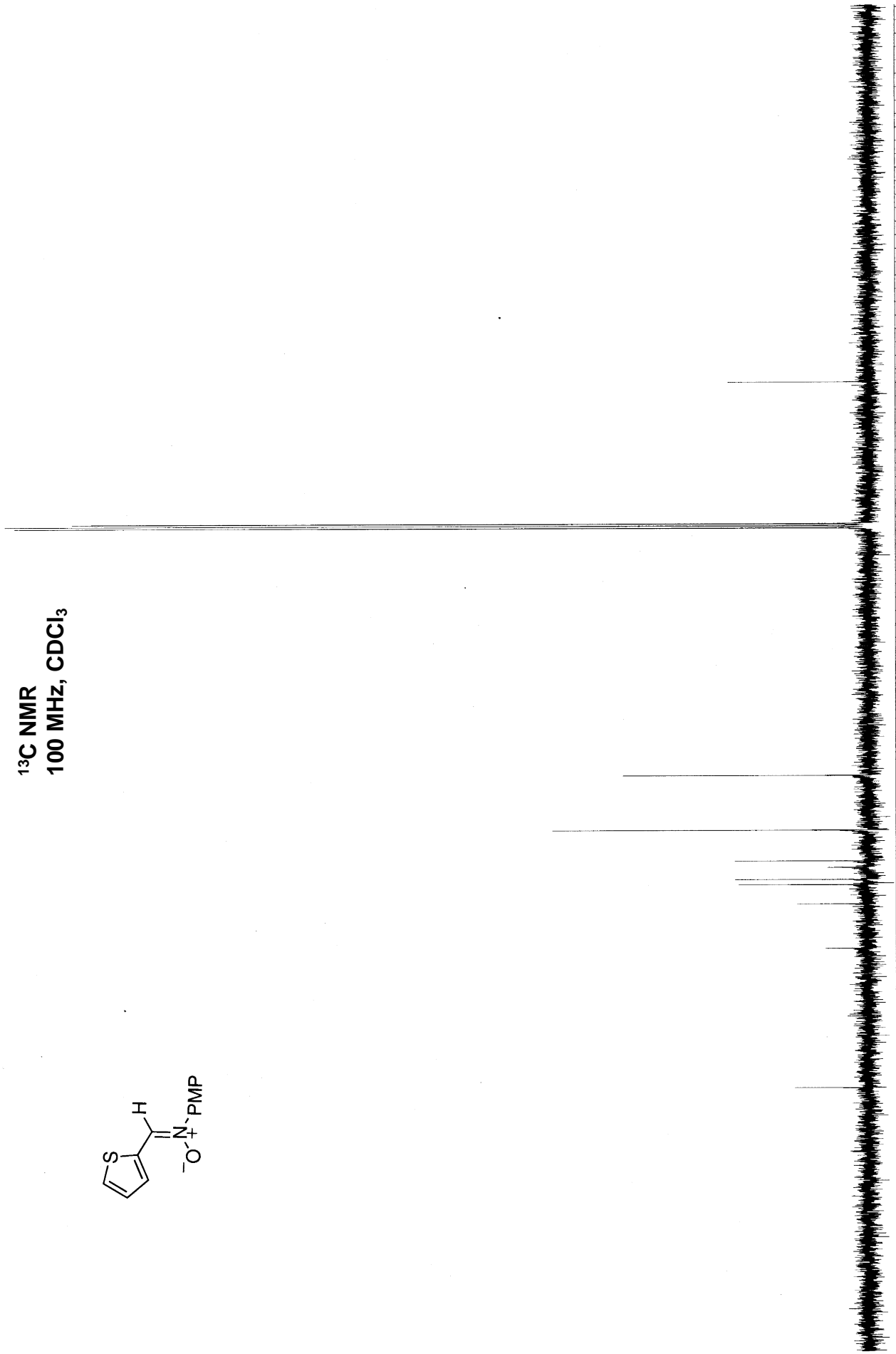
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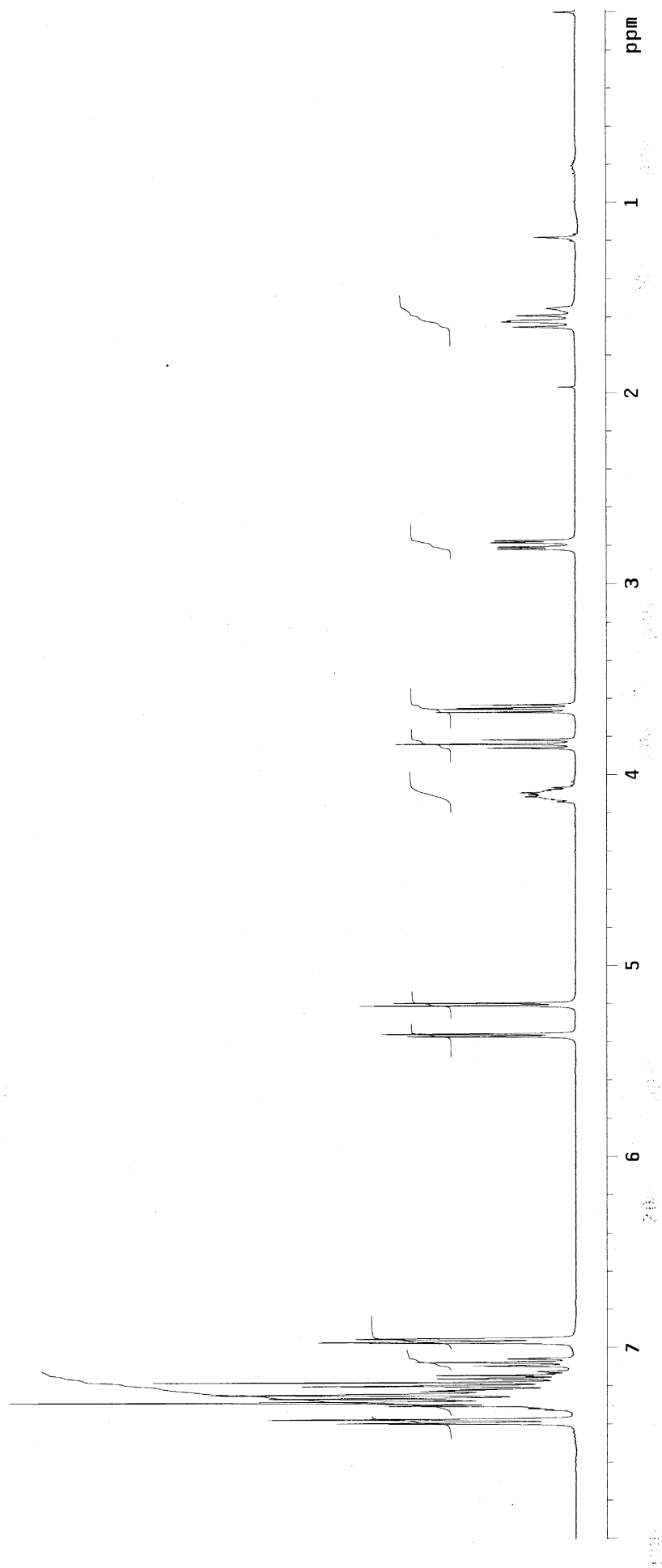
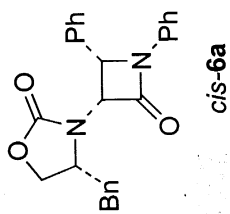
<sup>13</sup>C NMR  
100 MHz, CDCl<sub>3</sub>



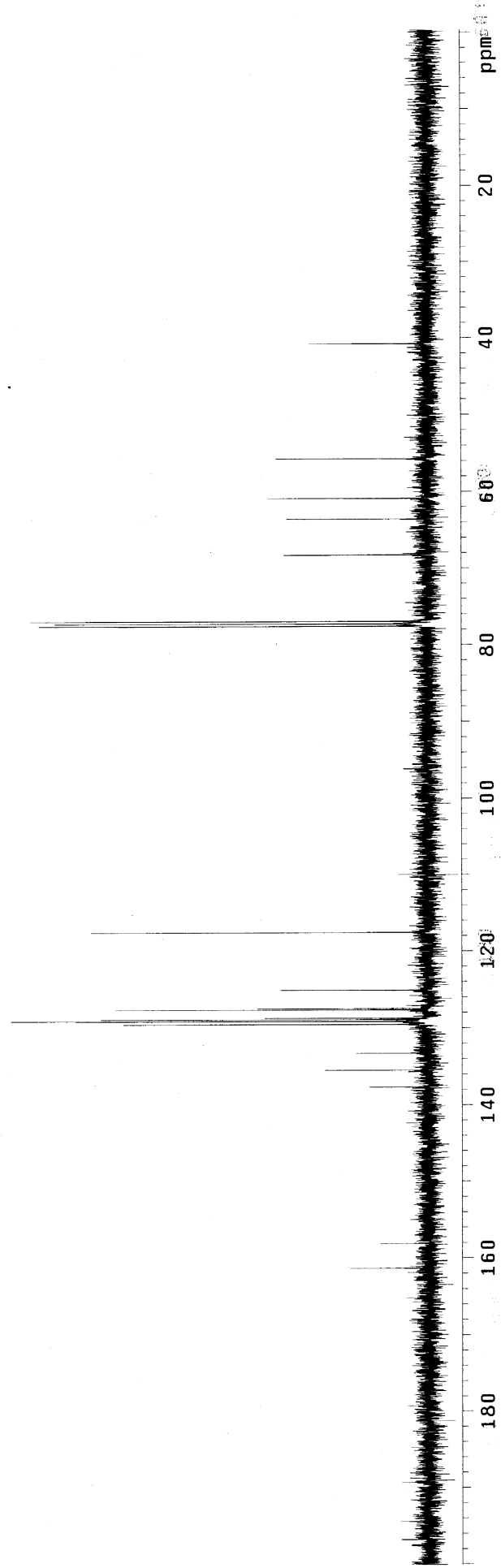
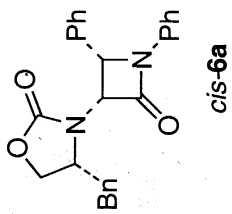
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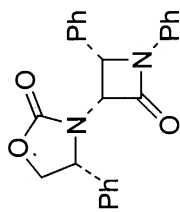
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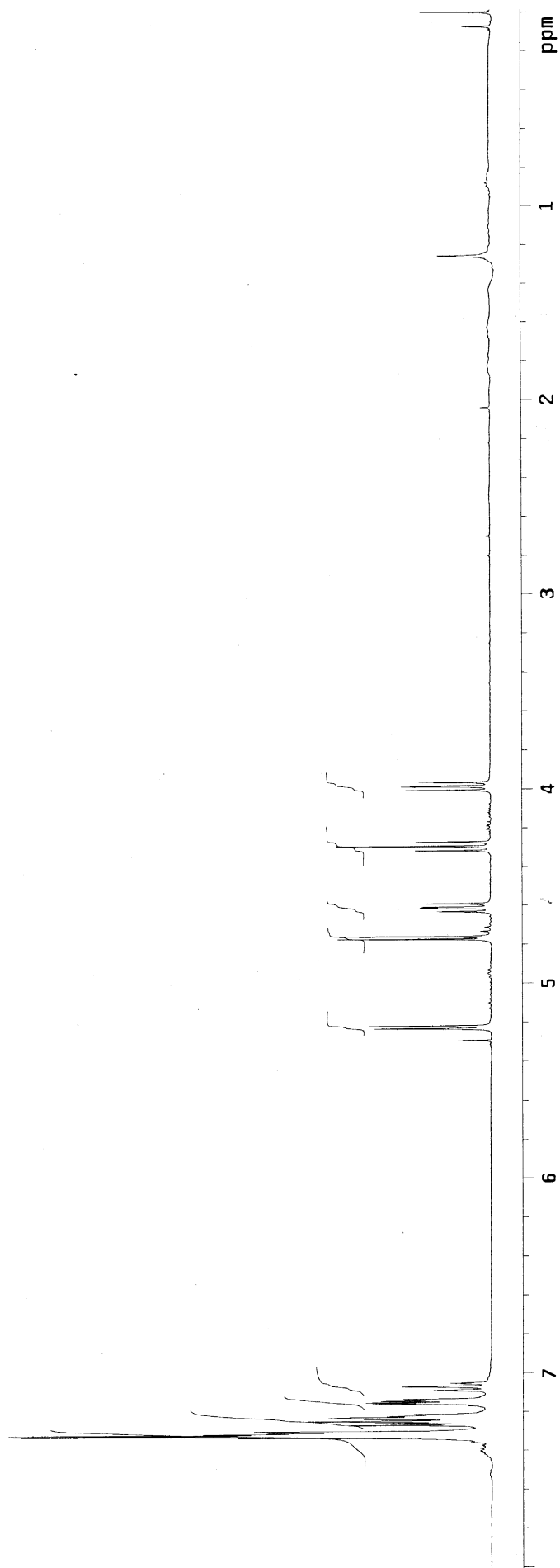
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100 MHz, CDCl<sub>3</sub>



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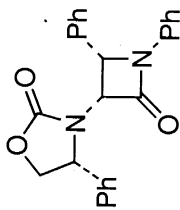


*cis*-12

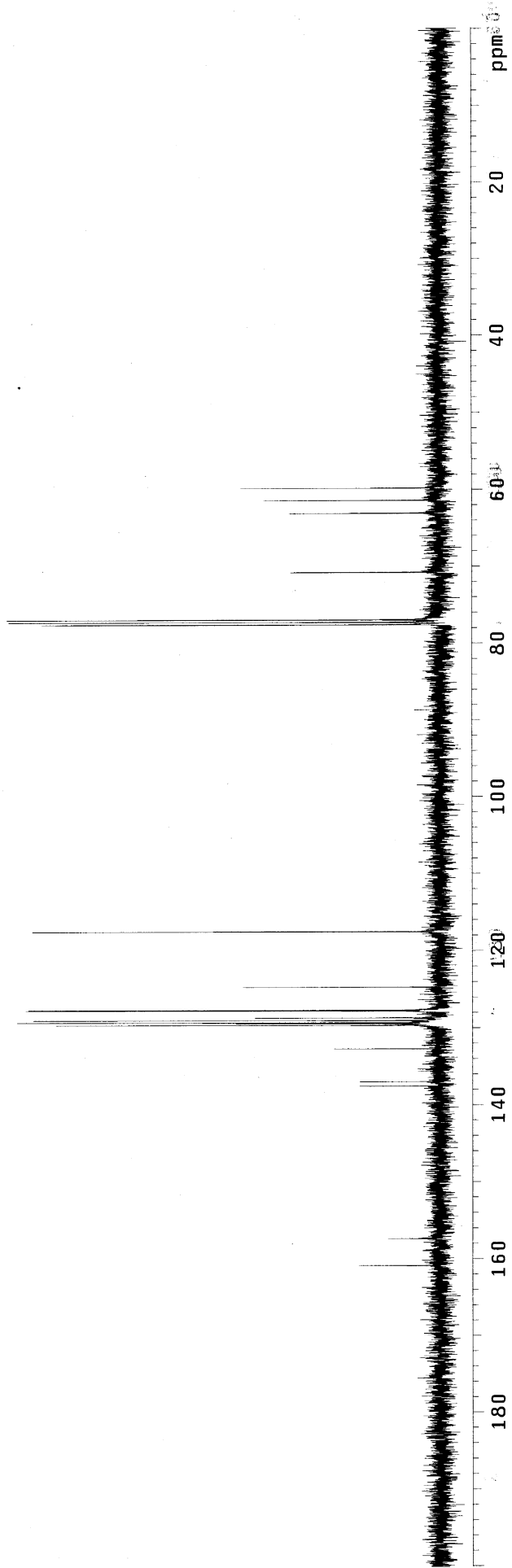




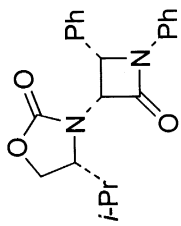
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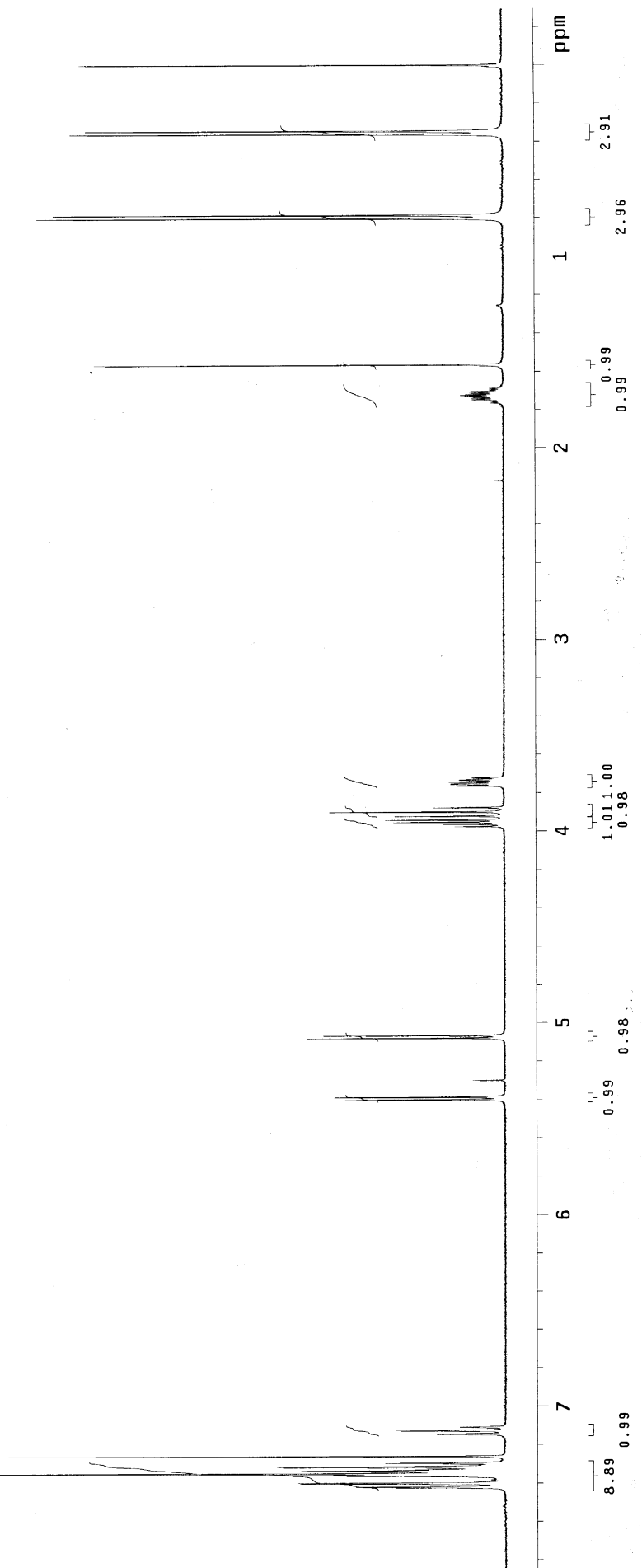
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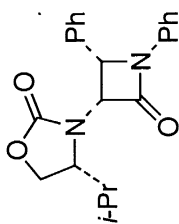
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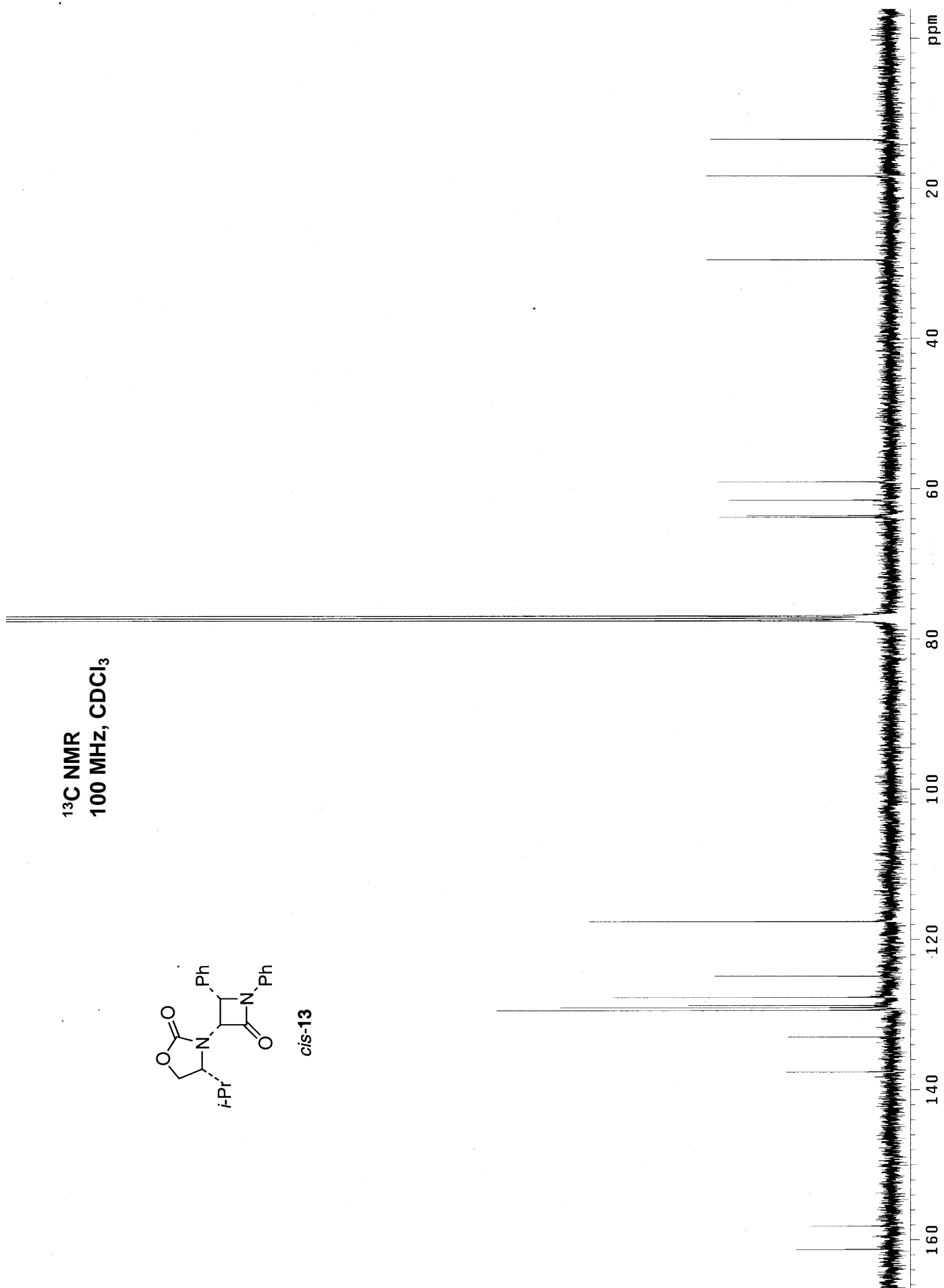
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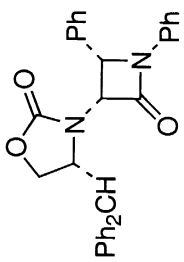
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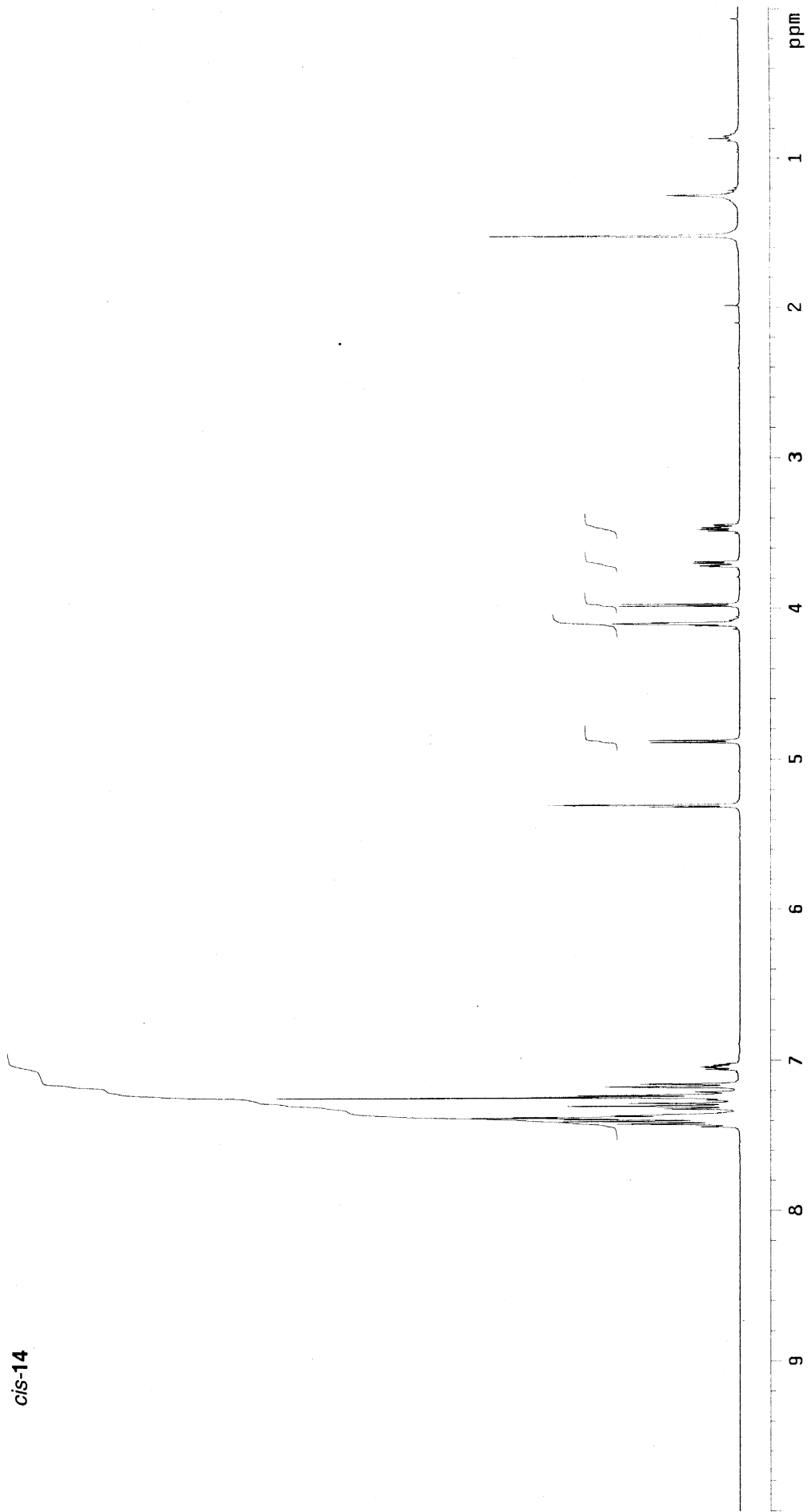
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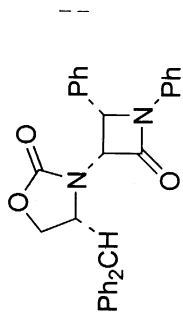
**<sup>1</sup>H NMR**  
**400 MHz, CD<sub>2</sub>Cl<sub>2</sub>**



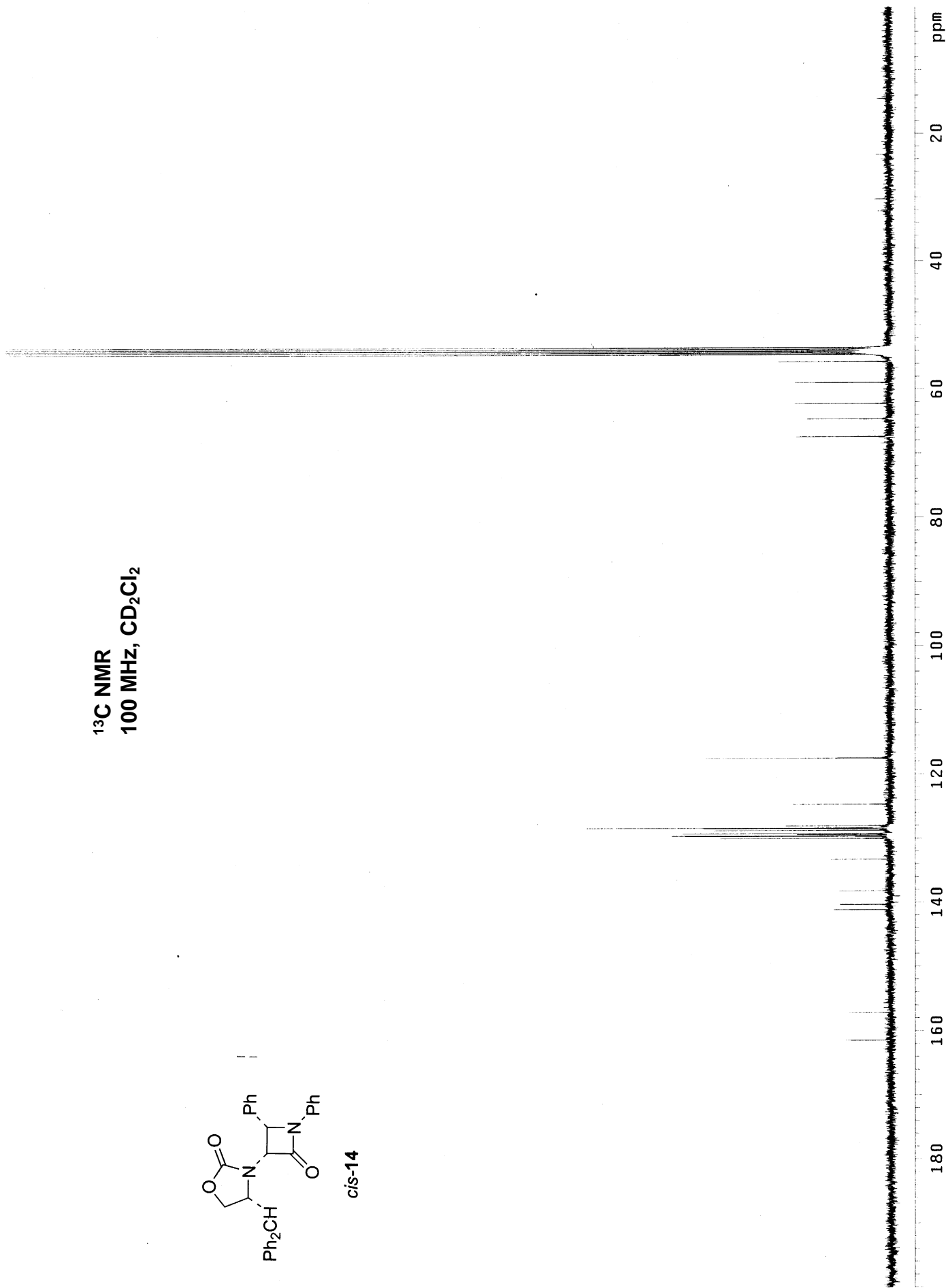
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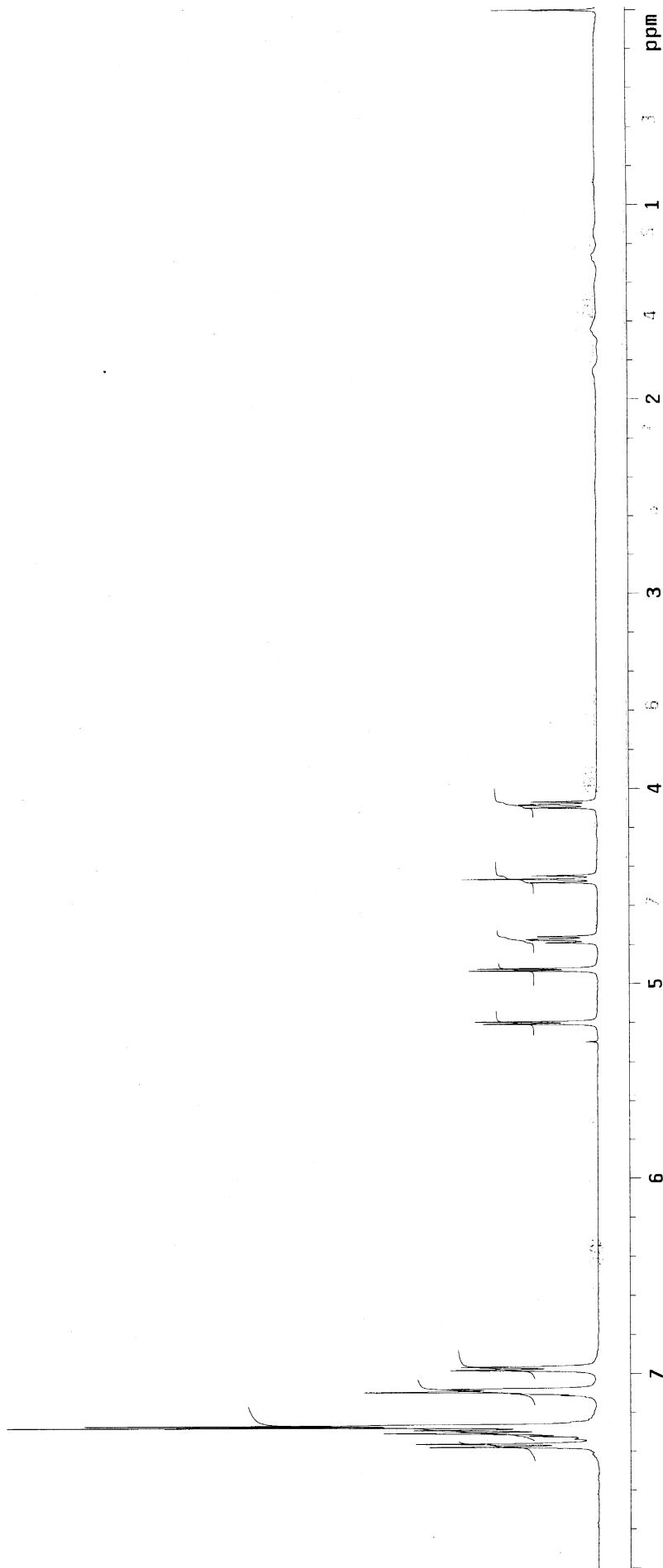
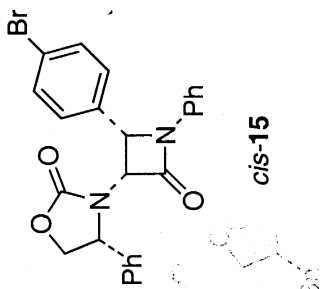
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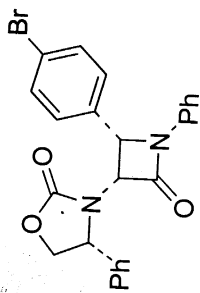
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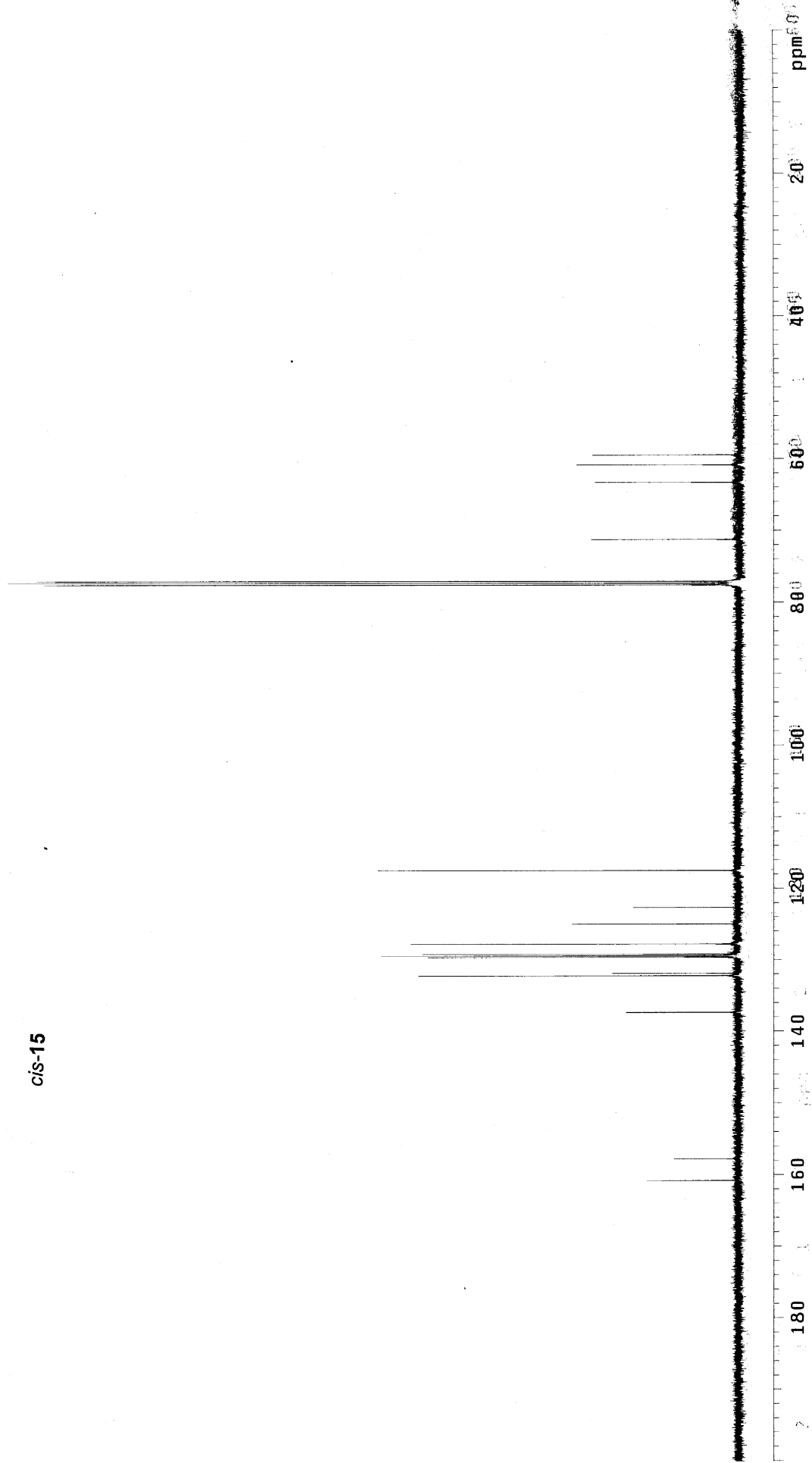
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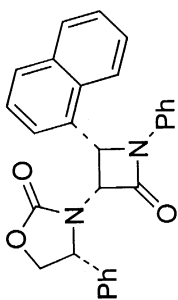
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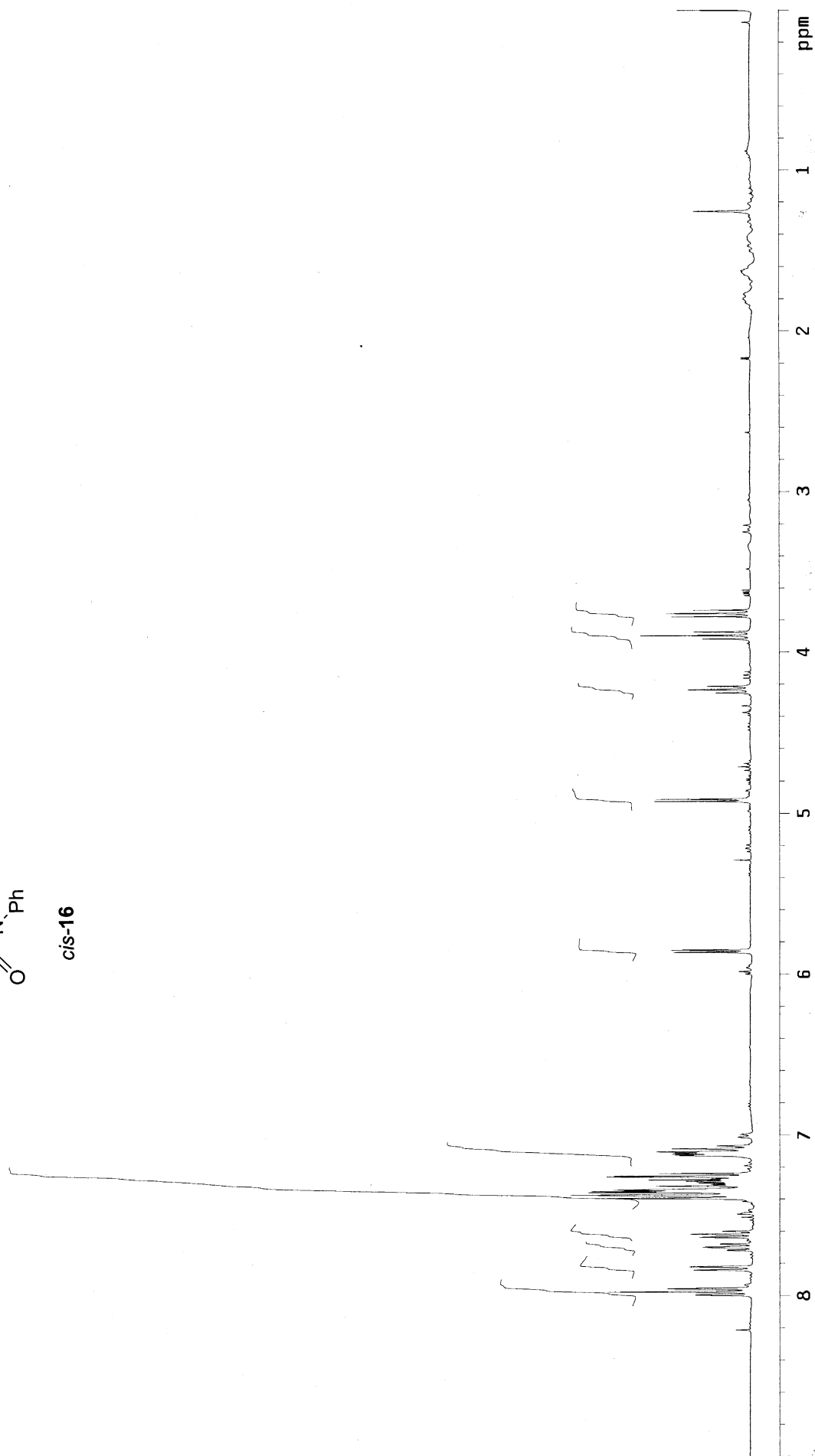
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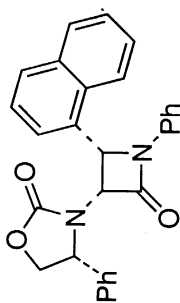


*cis*-16

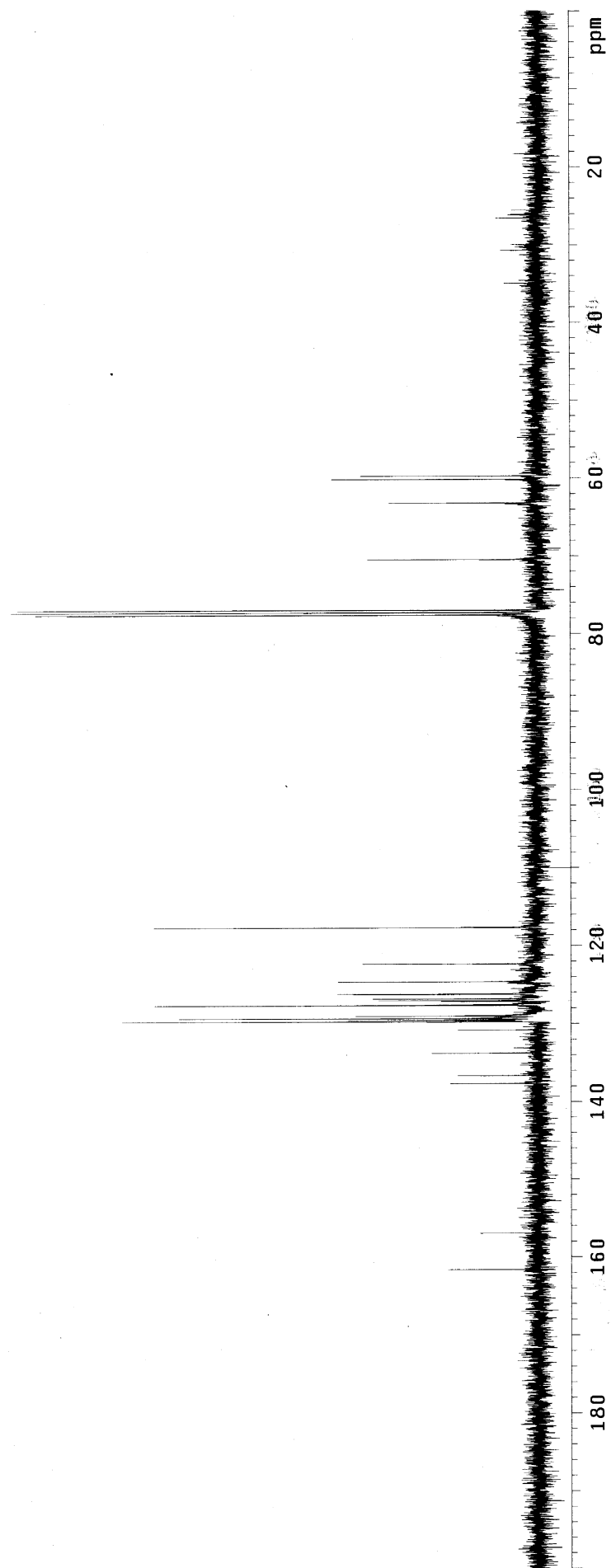




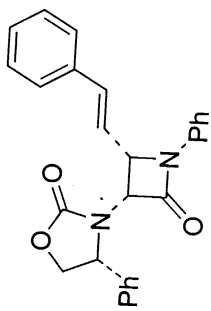
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100 MHz, CDCl<sub>3</sub>



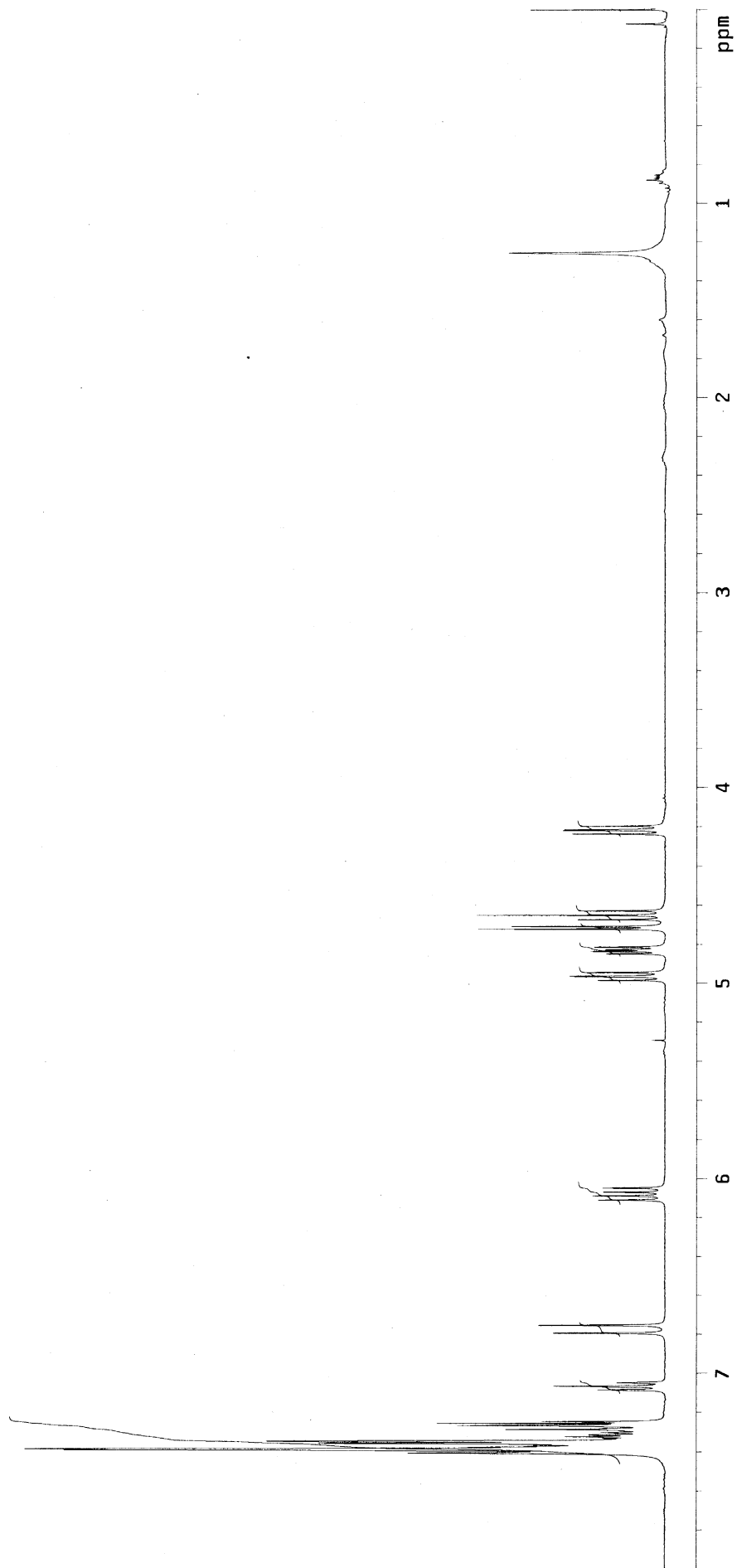
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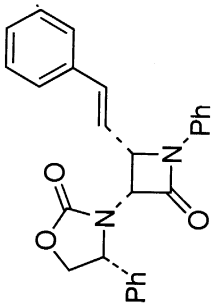
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**400 MHz, CDCl<sub>3</sub>**



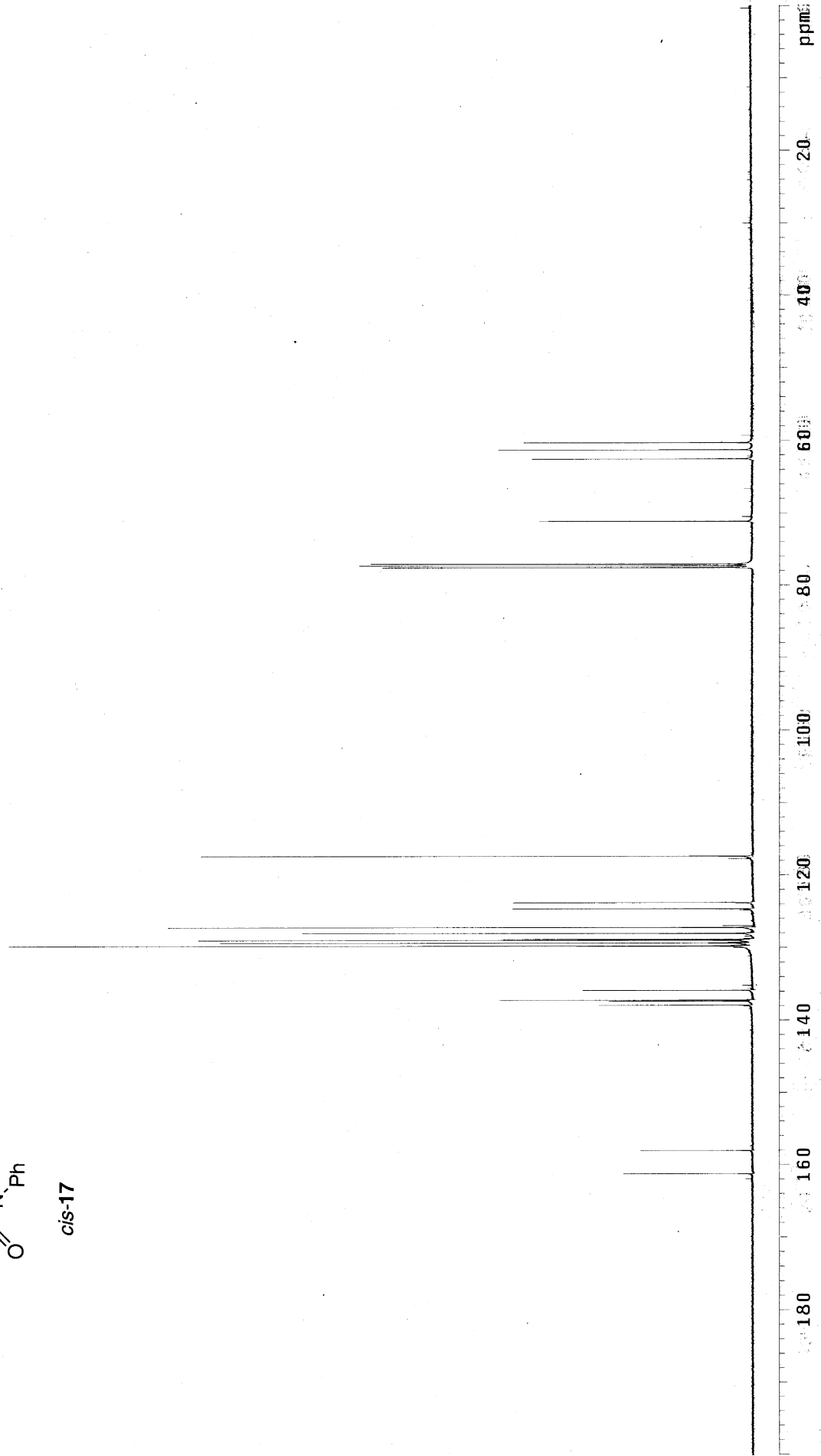
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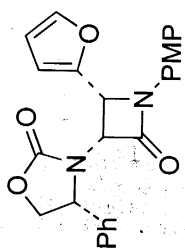
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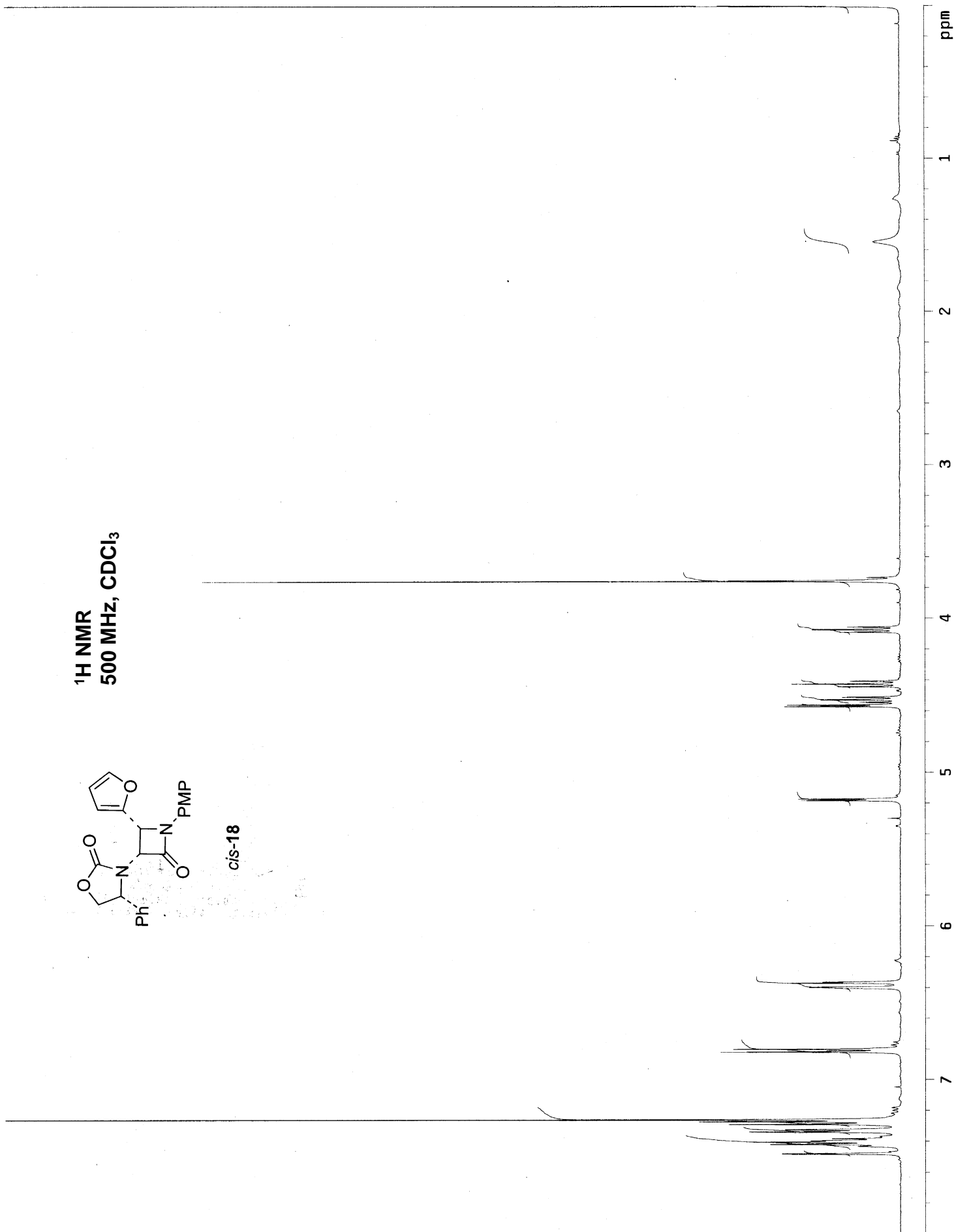
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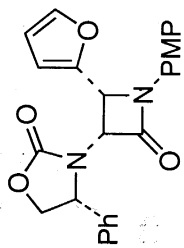


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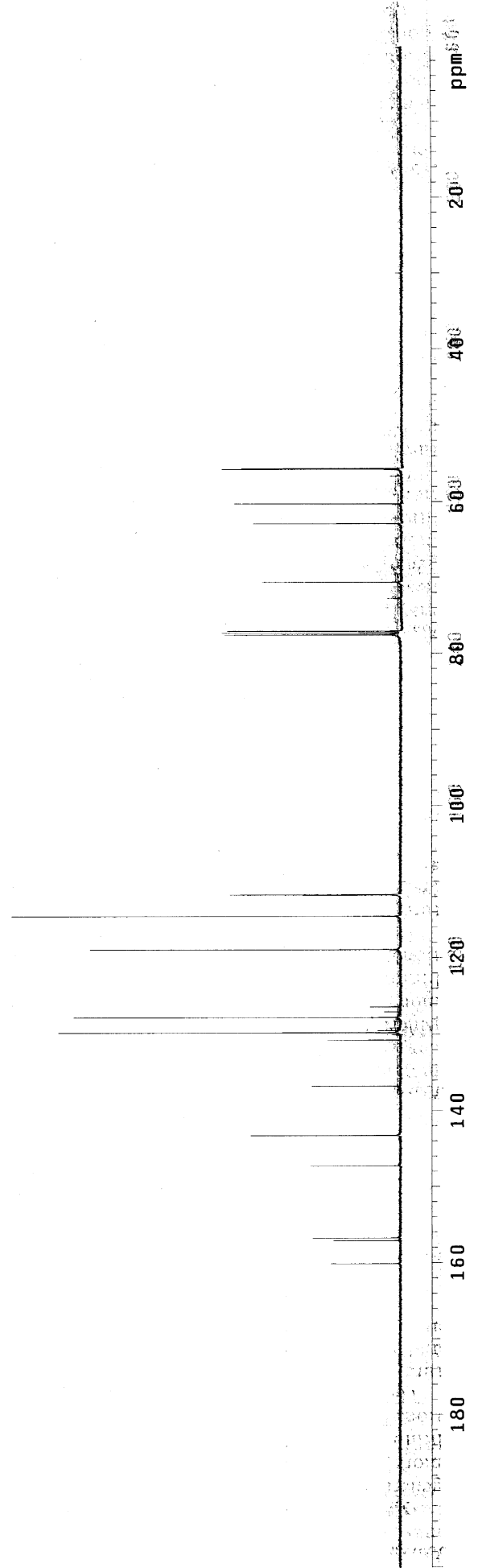
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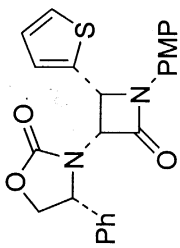


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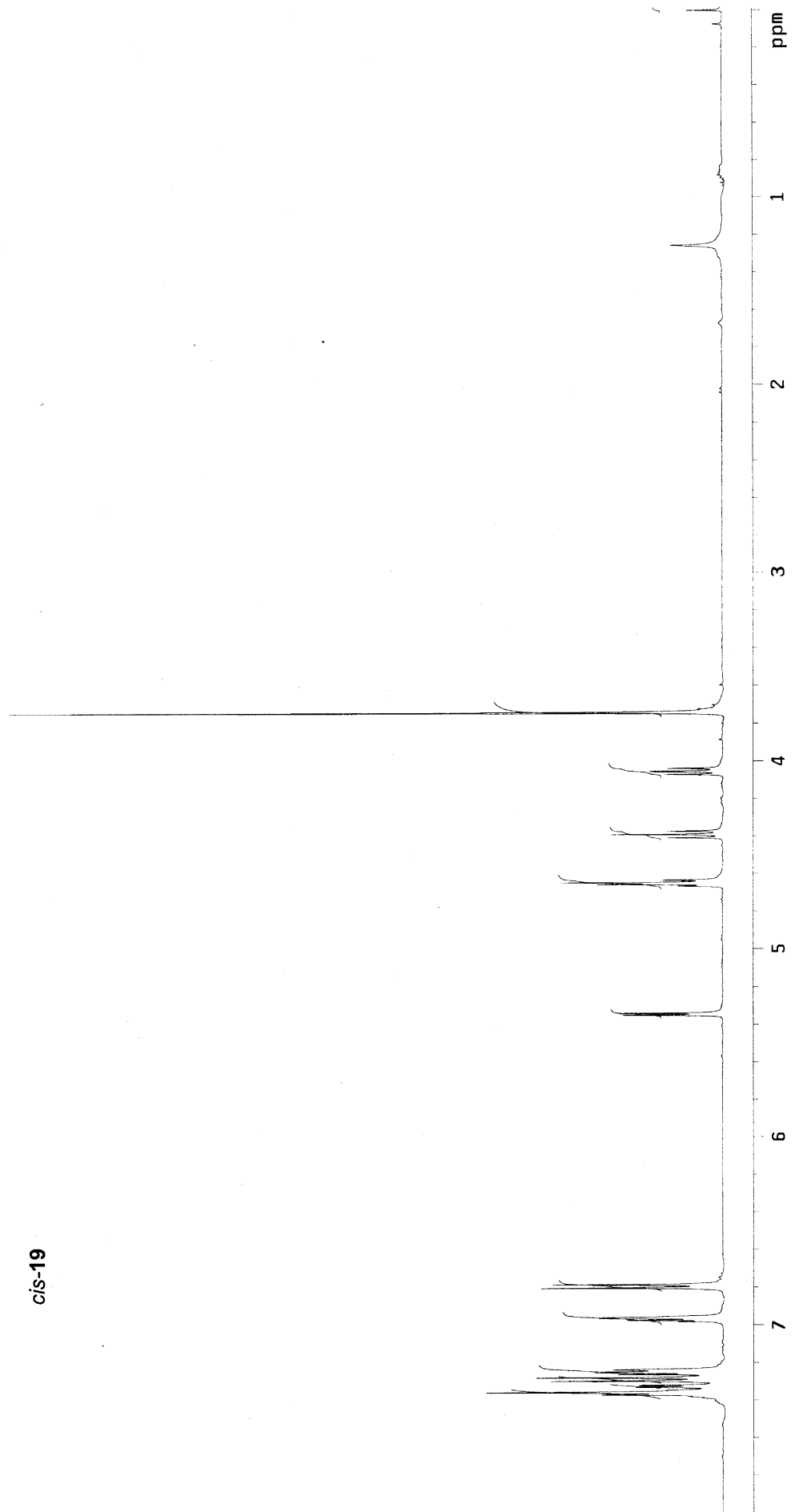
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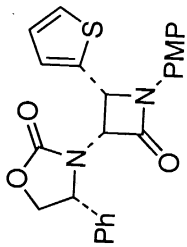
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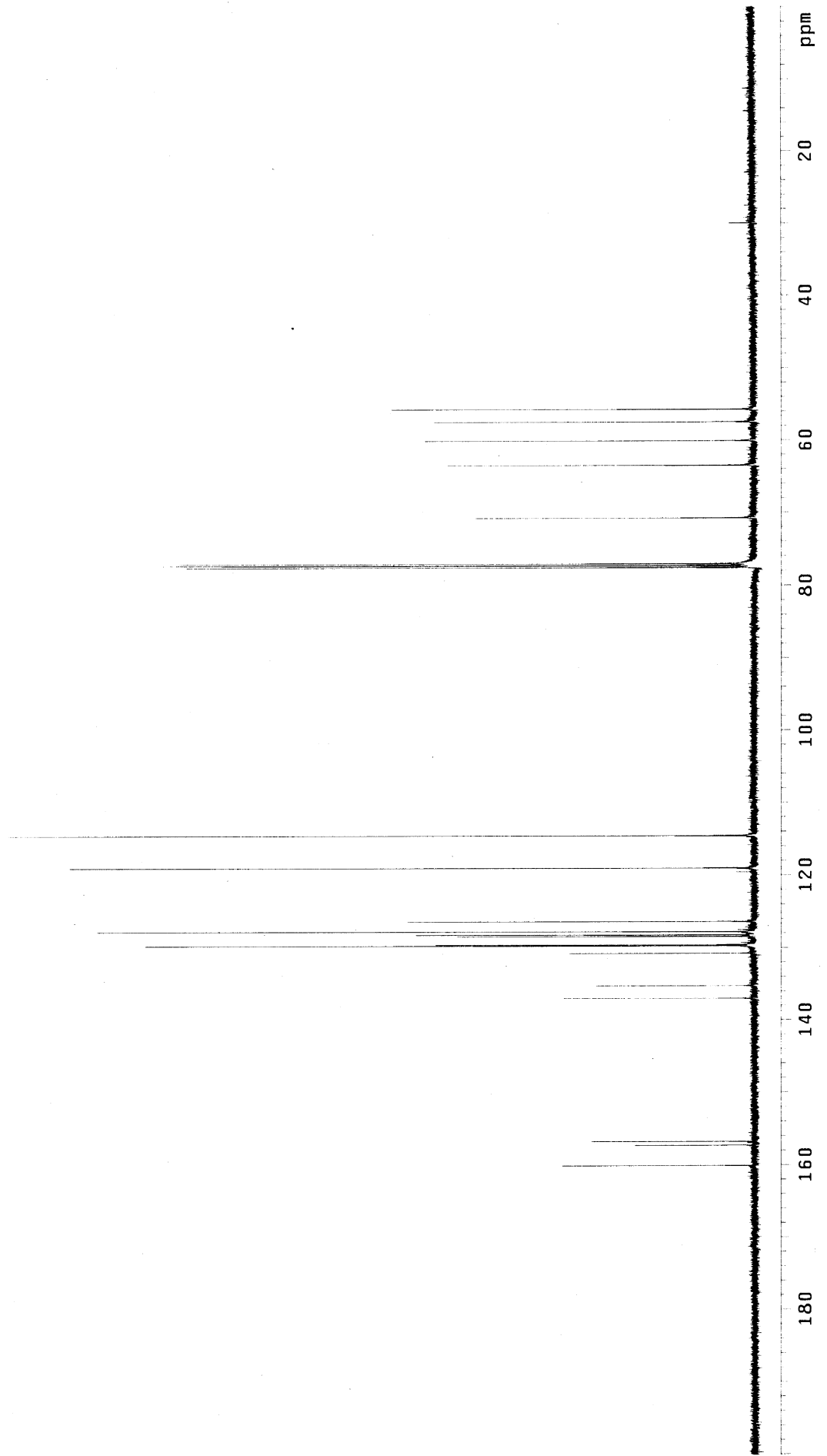
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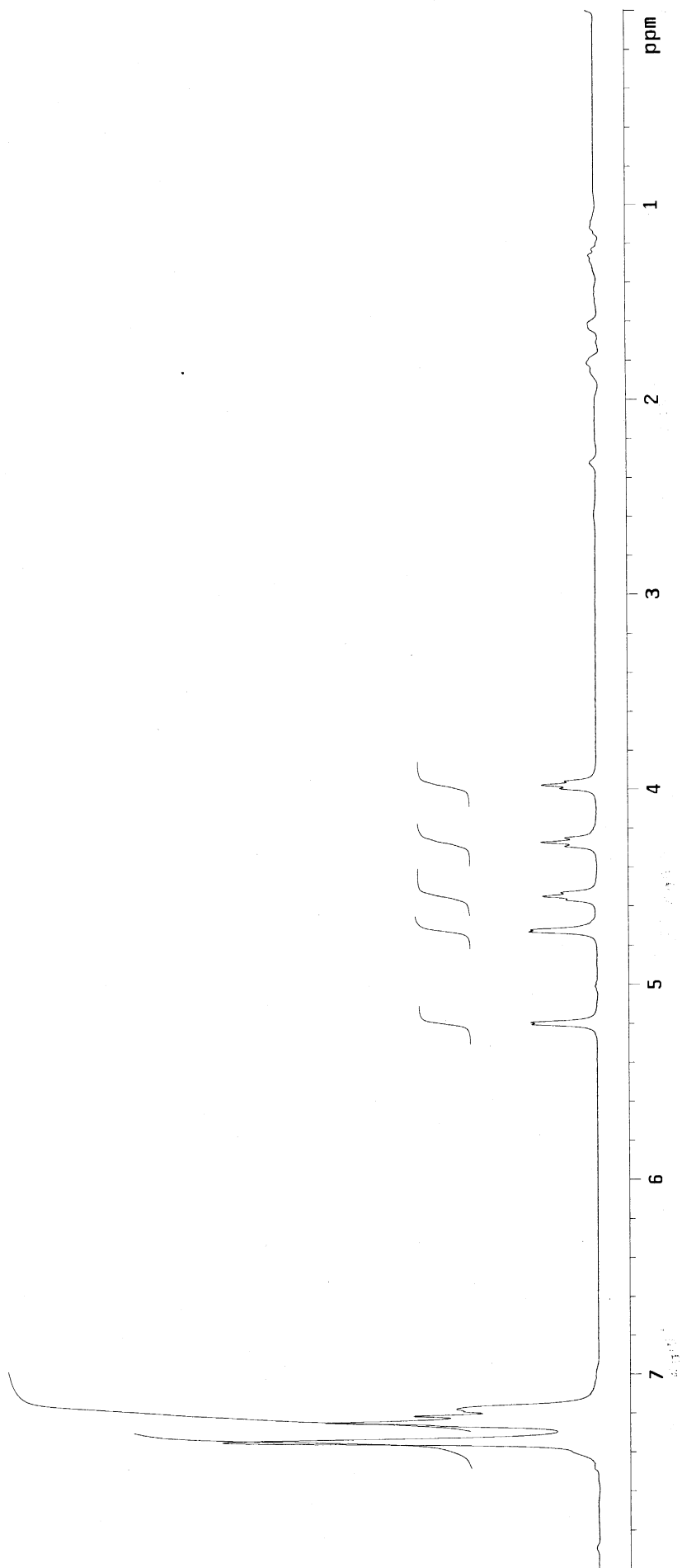
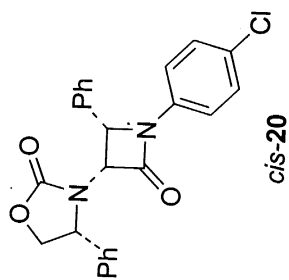
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*cis*-19

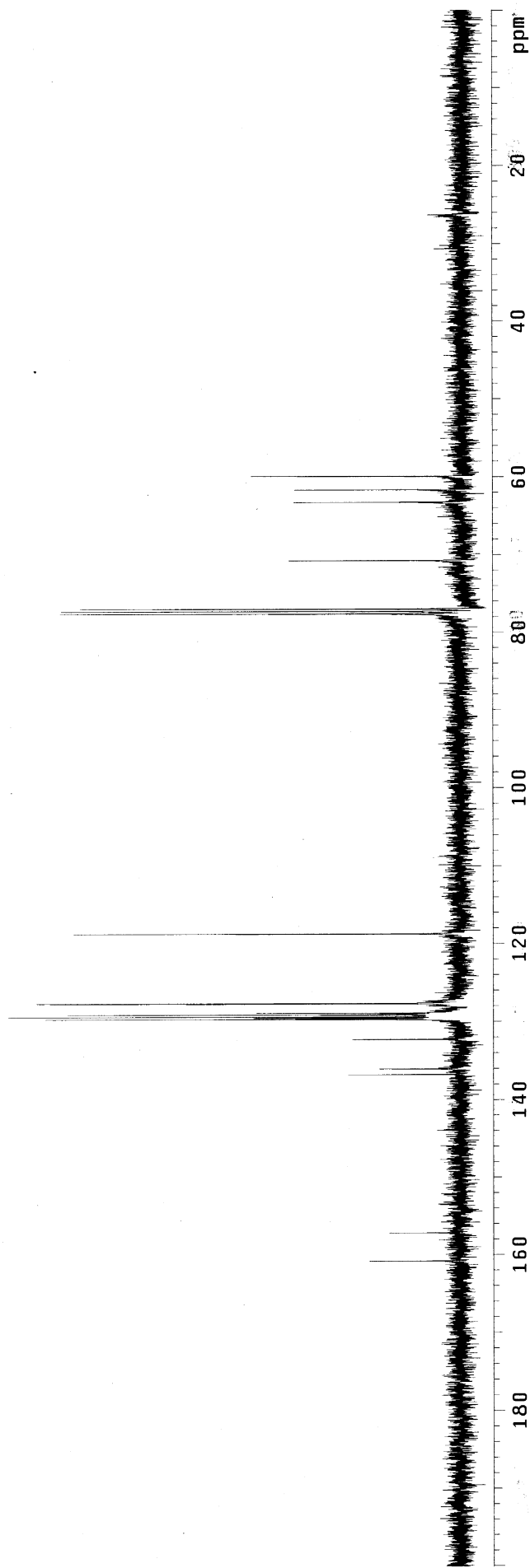
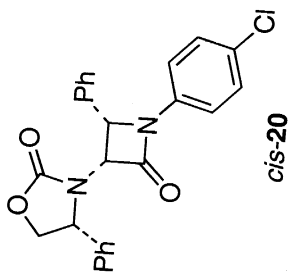


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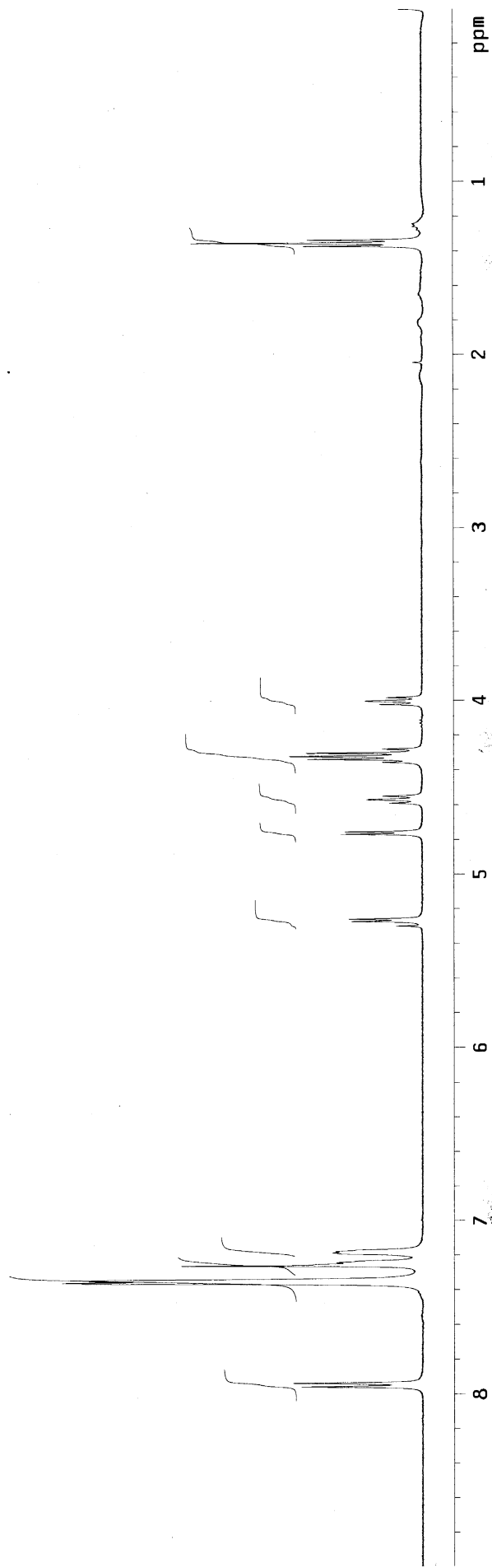
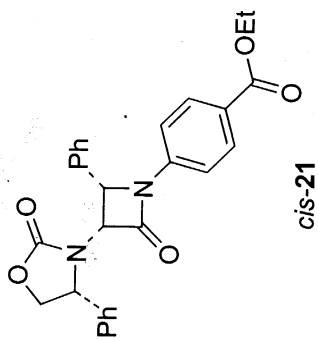




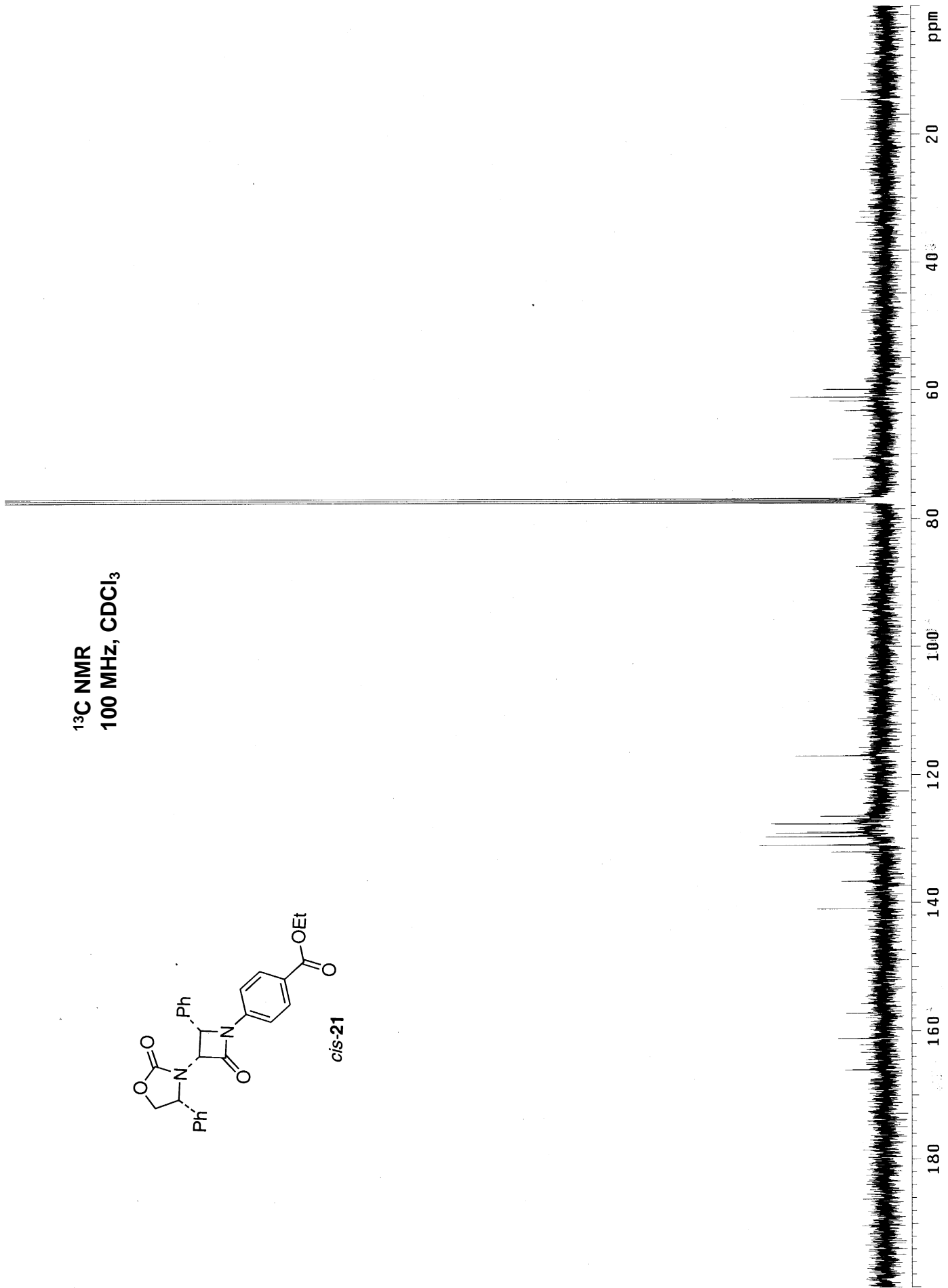
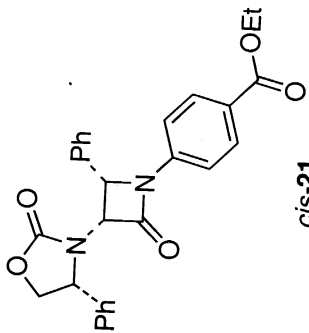
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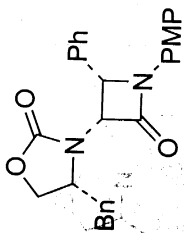
**<sup>1</sup>H NMR**  
**400 MHz, CDCl<sub>3</sub>**



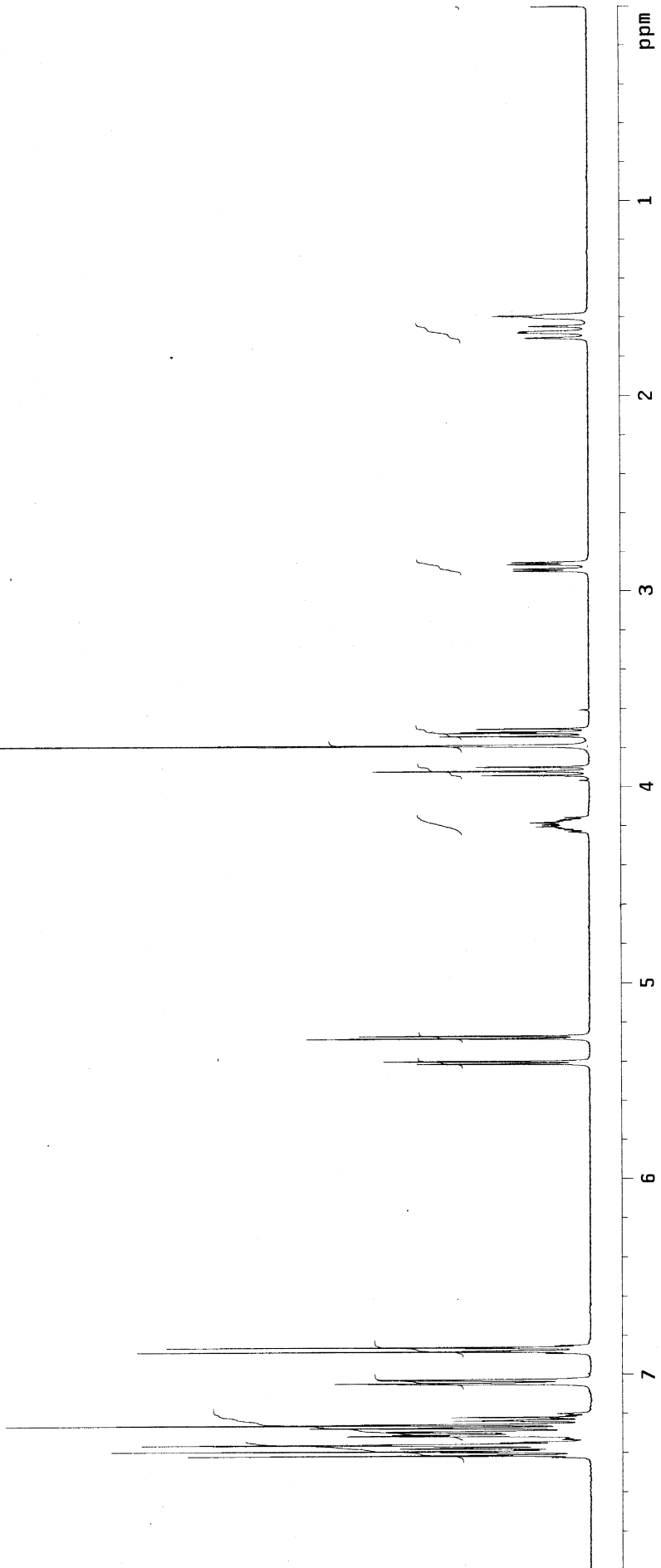
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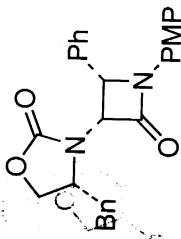
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400 MHz, CDCl<sub>3</sub>



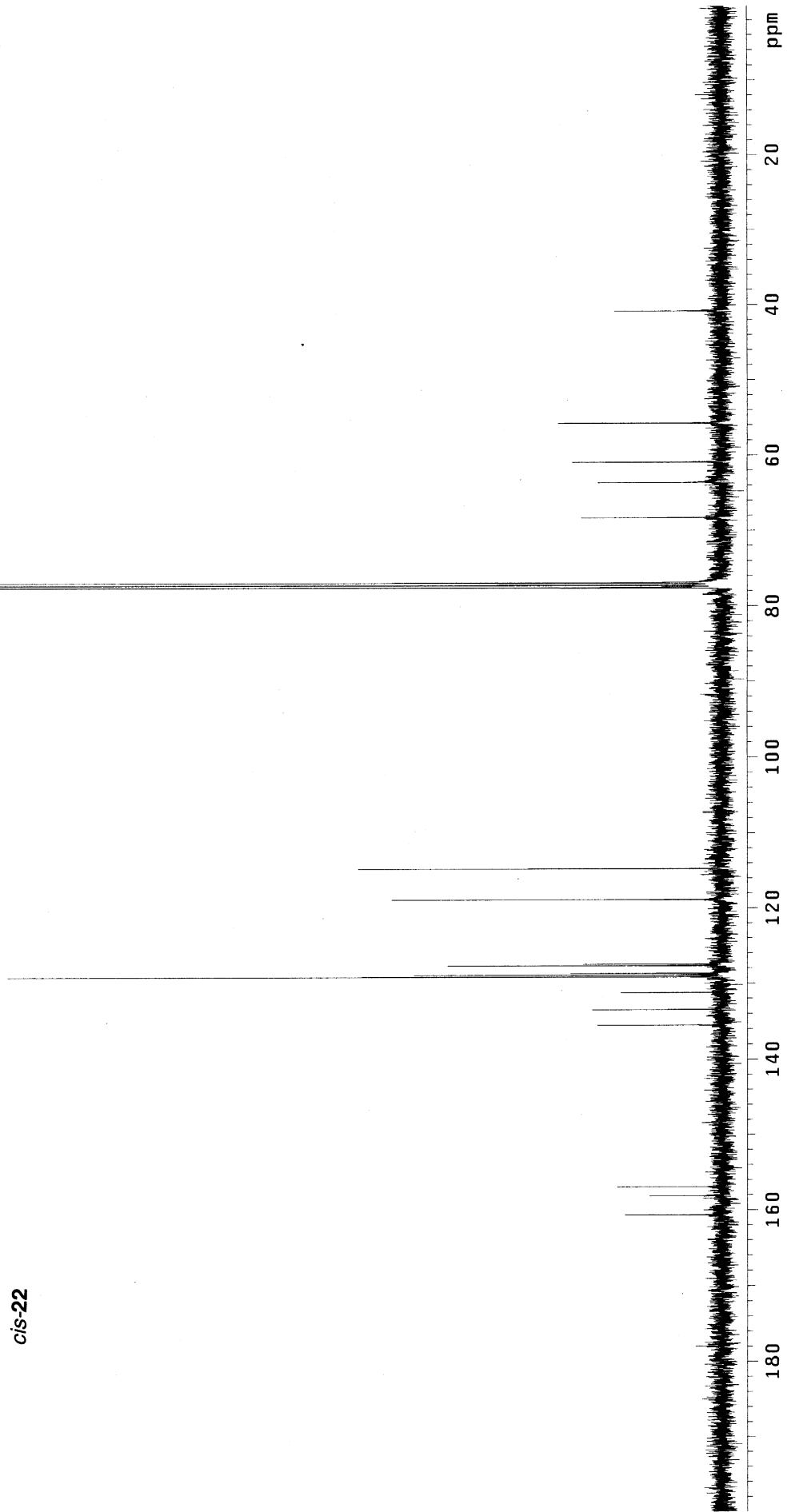
*cis*-22



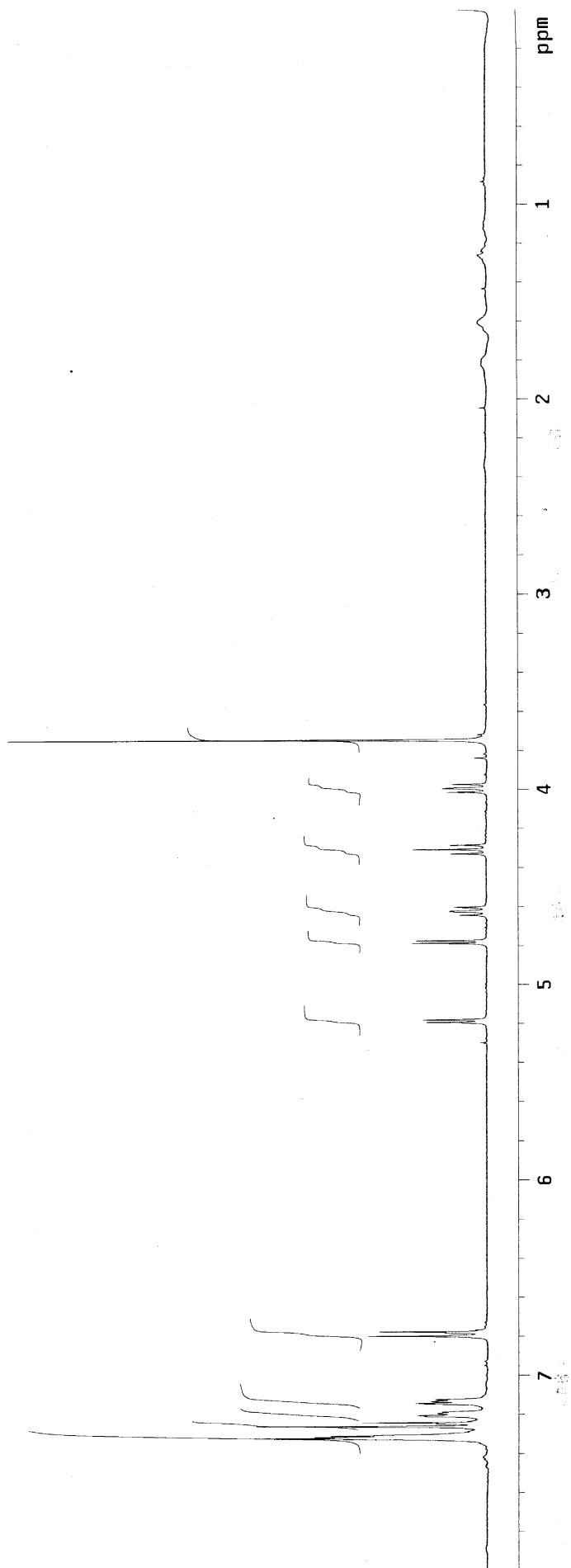
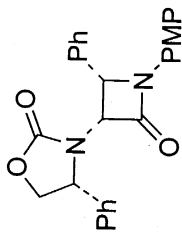
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100 MHz, CDCl<sub>3</sub>



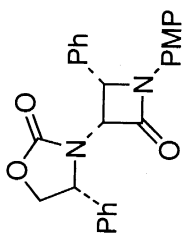
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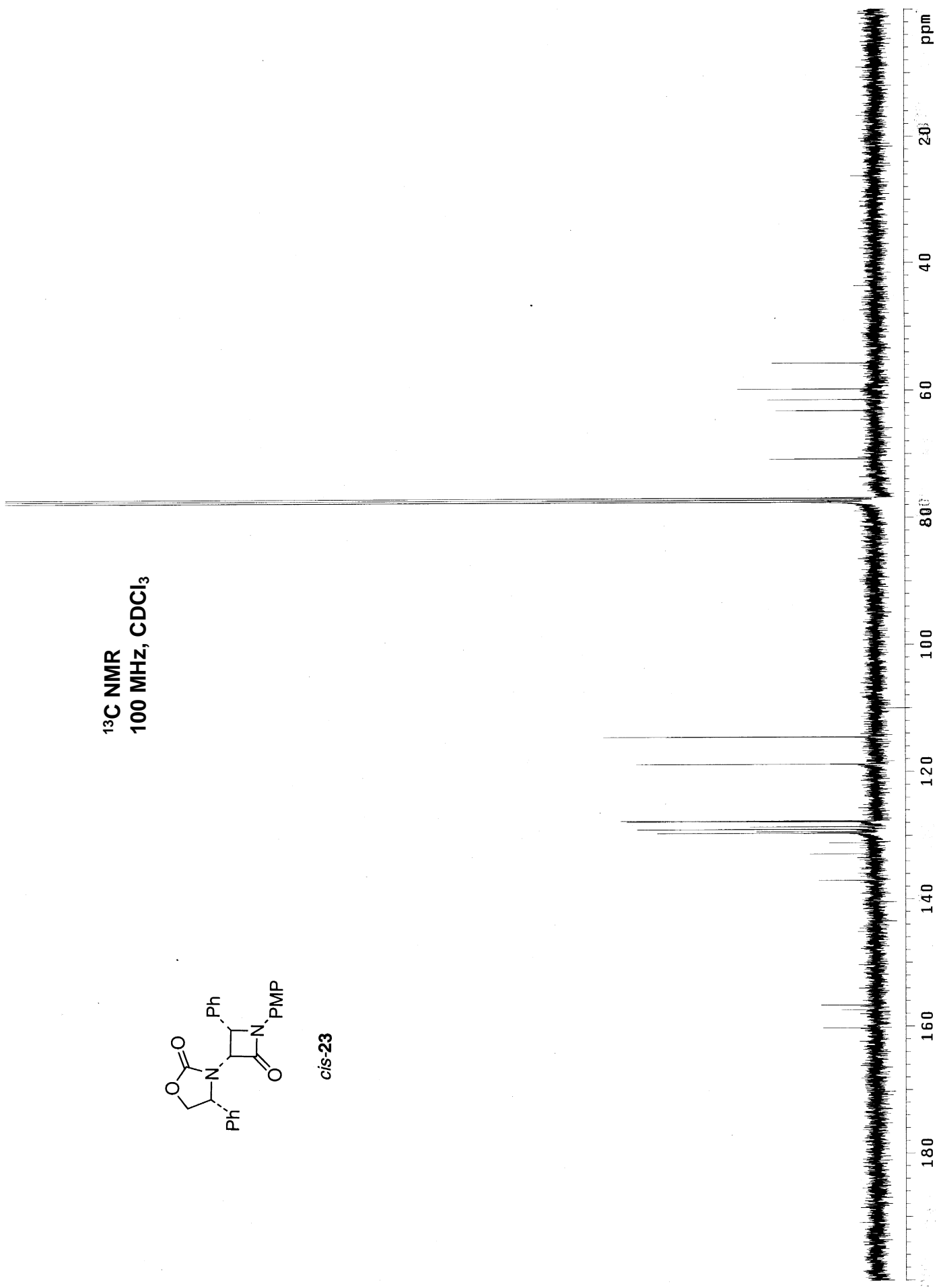
**<sup>1</sup>H NMR  
400 MHz, CDCl<sub>3</sub>**



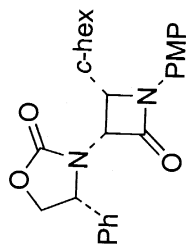
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100 MHz, CDCl<sub>3</sub>



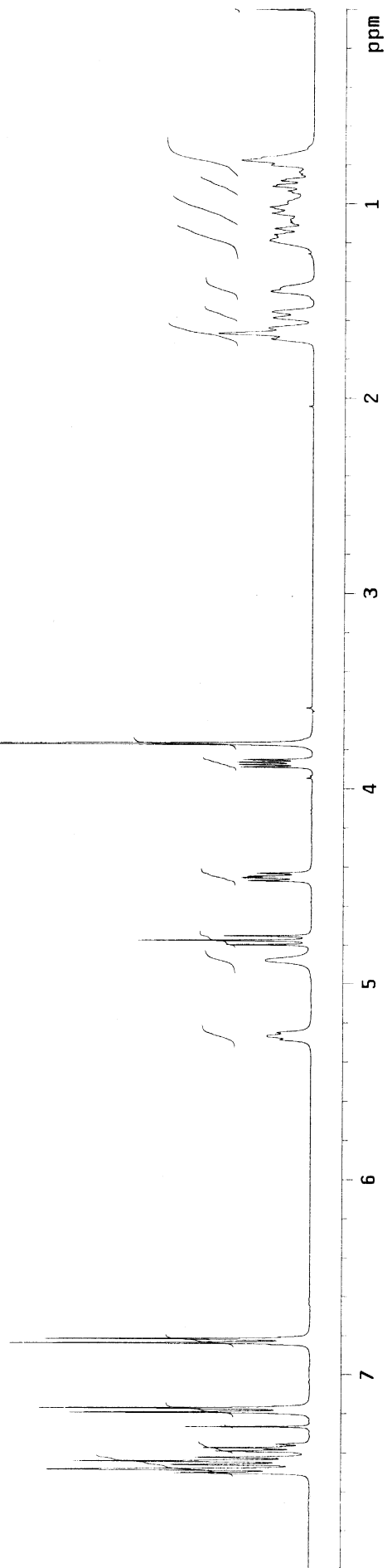
*cis*-23



**<sup>1</sup>H NMR**  
**400 MHz, CDCl<sub>3</sub>**

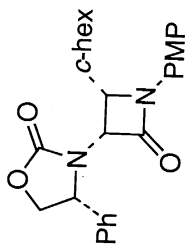


*cis*-24

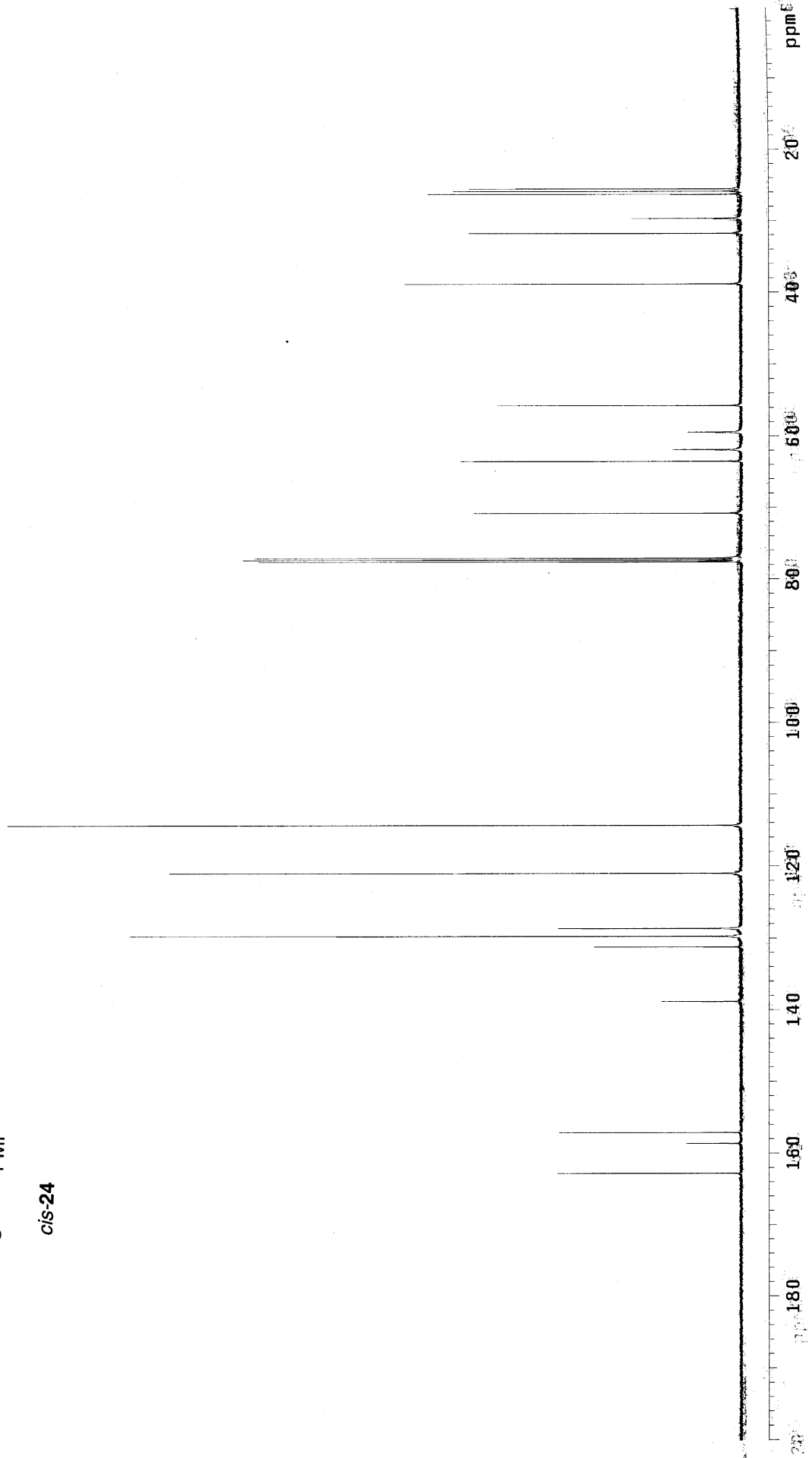




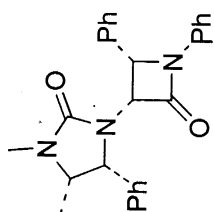
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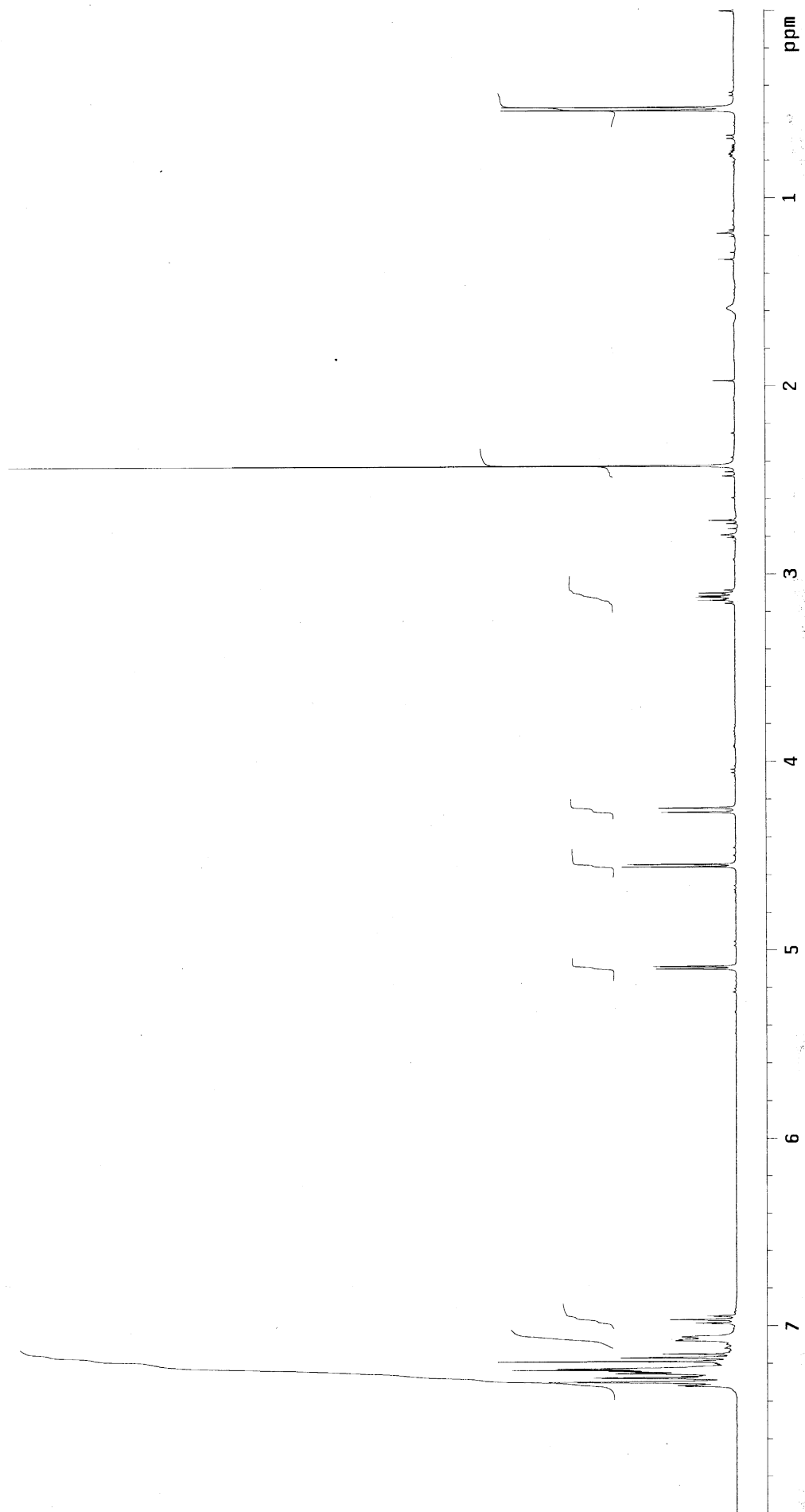
*cis*-24



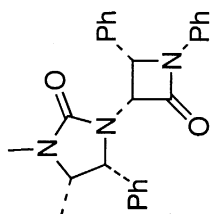
<sup>1</sup>H NMR  
400 MHz, CDCl<sub>3</sub>



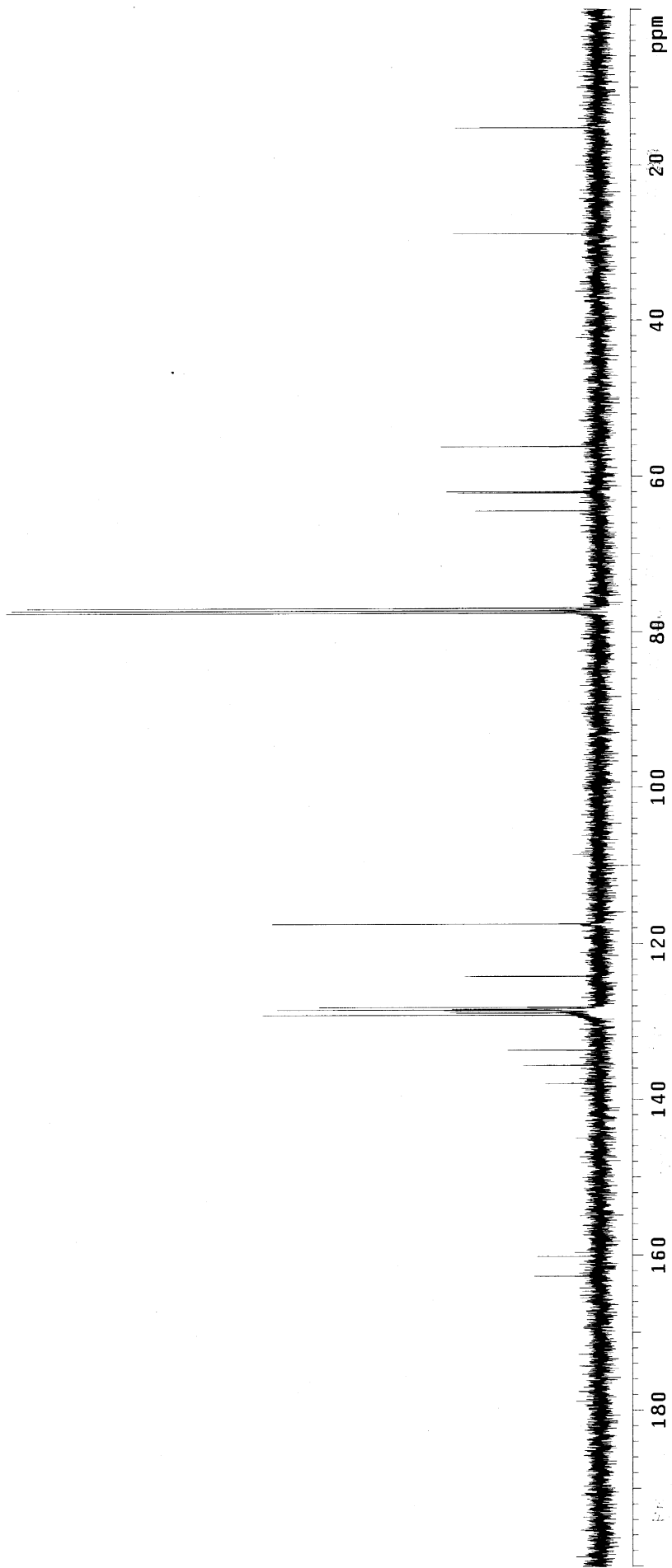
*cis*-25



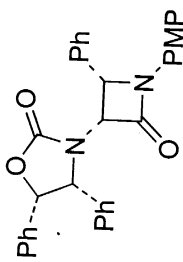
<sup>13</sup>C NMR  
100 MHz, CDCl<sub>3</sub>



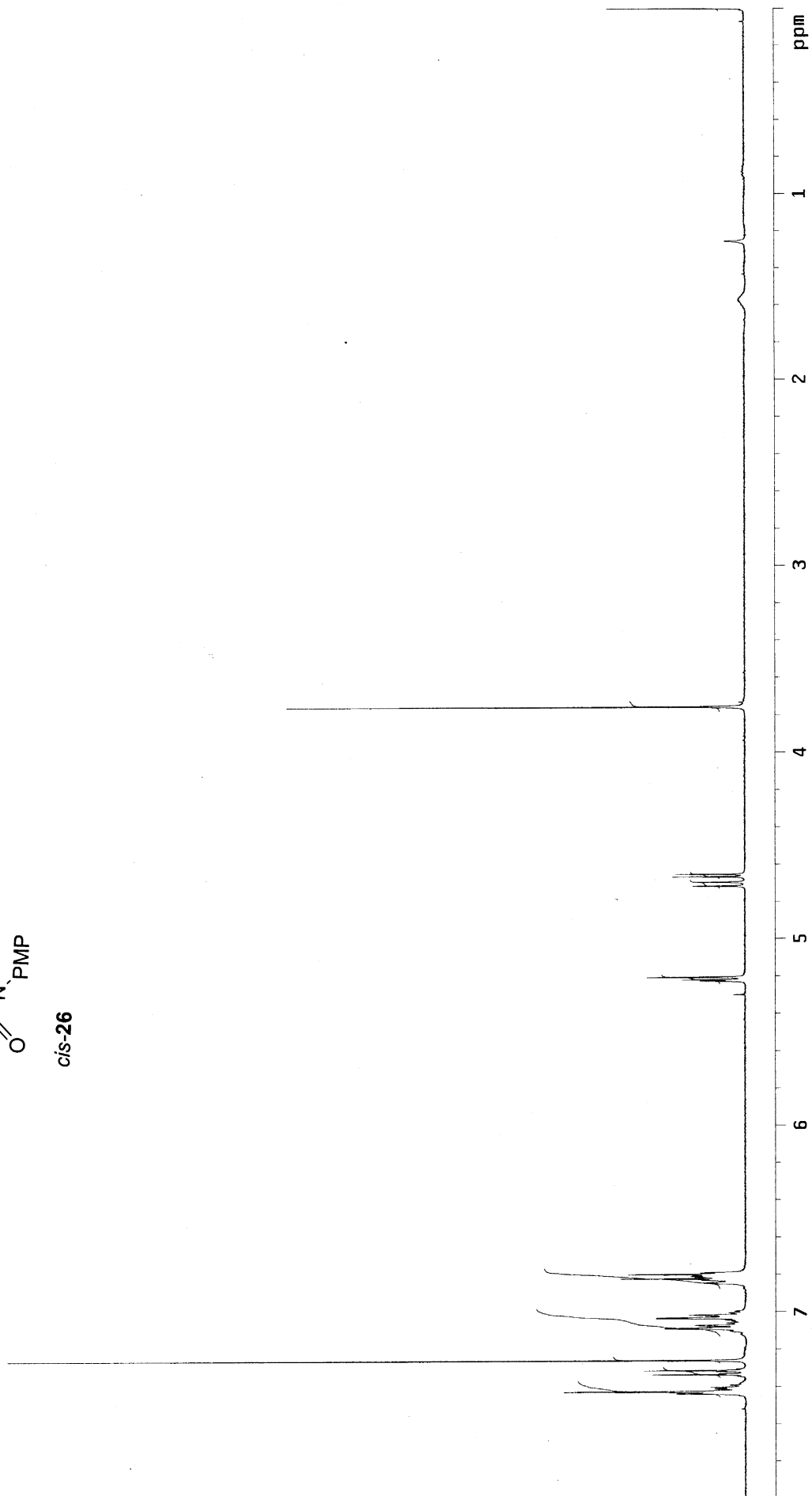
*cis*-25



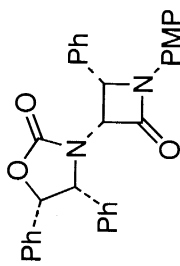
<sup>1</sup>H NMR  
400 MHz, CDCl<sub>3</sub>



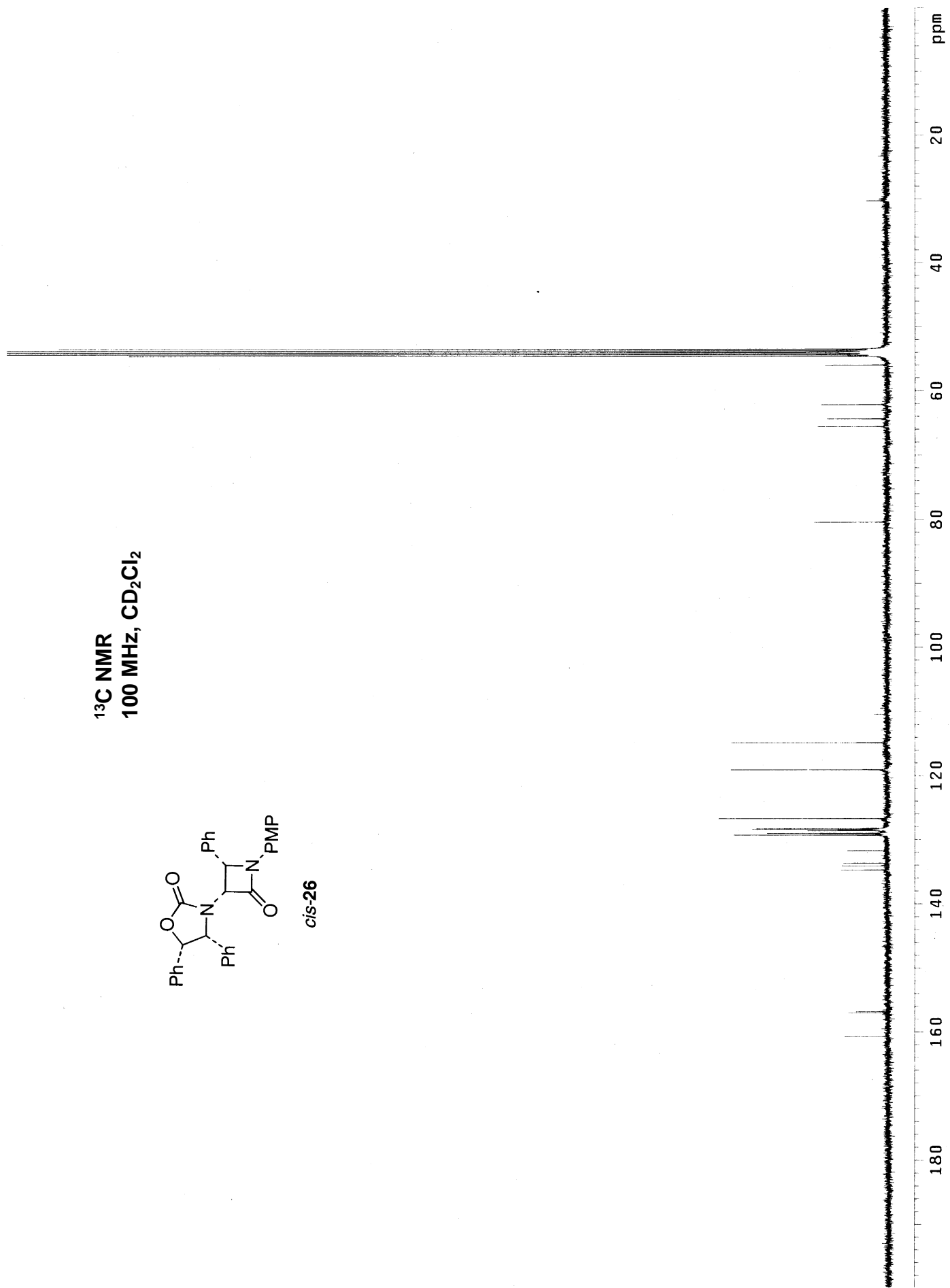
*cis*-26



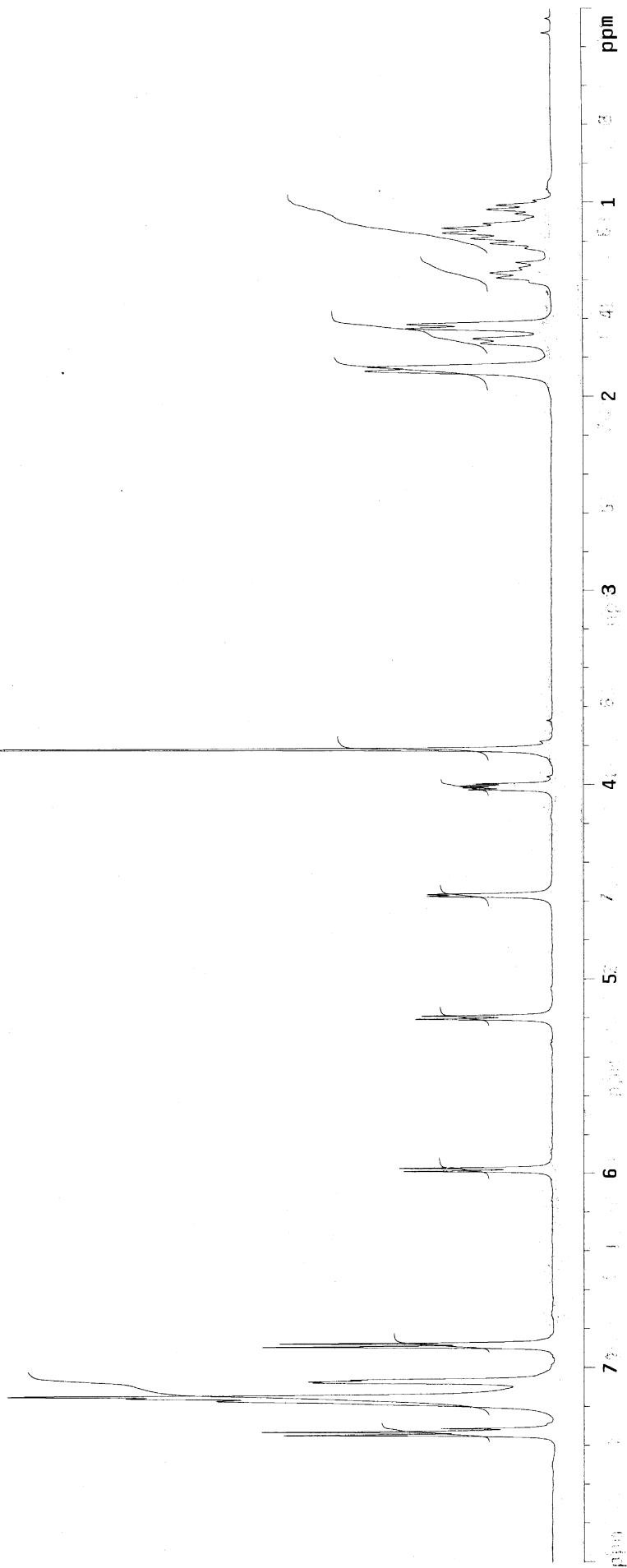
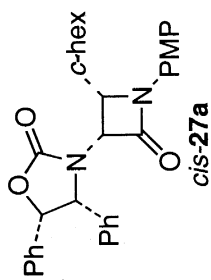
<sup>13</sup>C NMR  
100 MHz, CD<sub>2</sub>Cl<sub>2</sub>



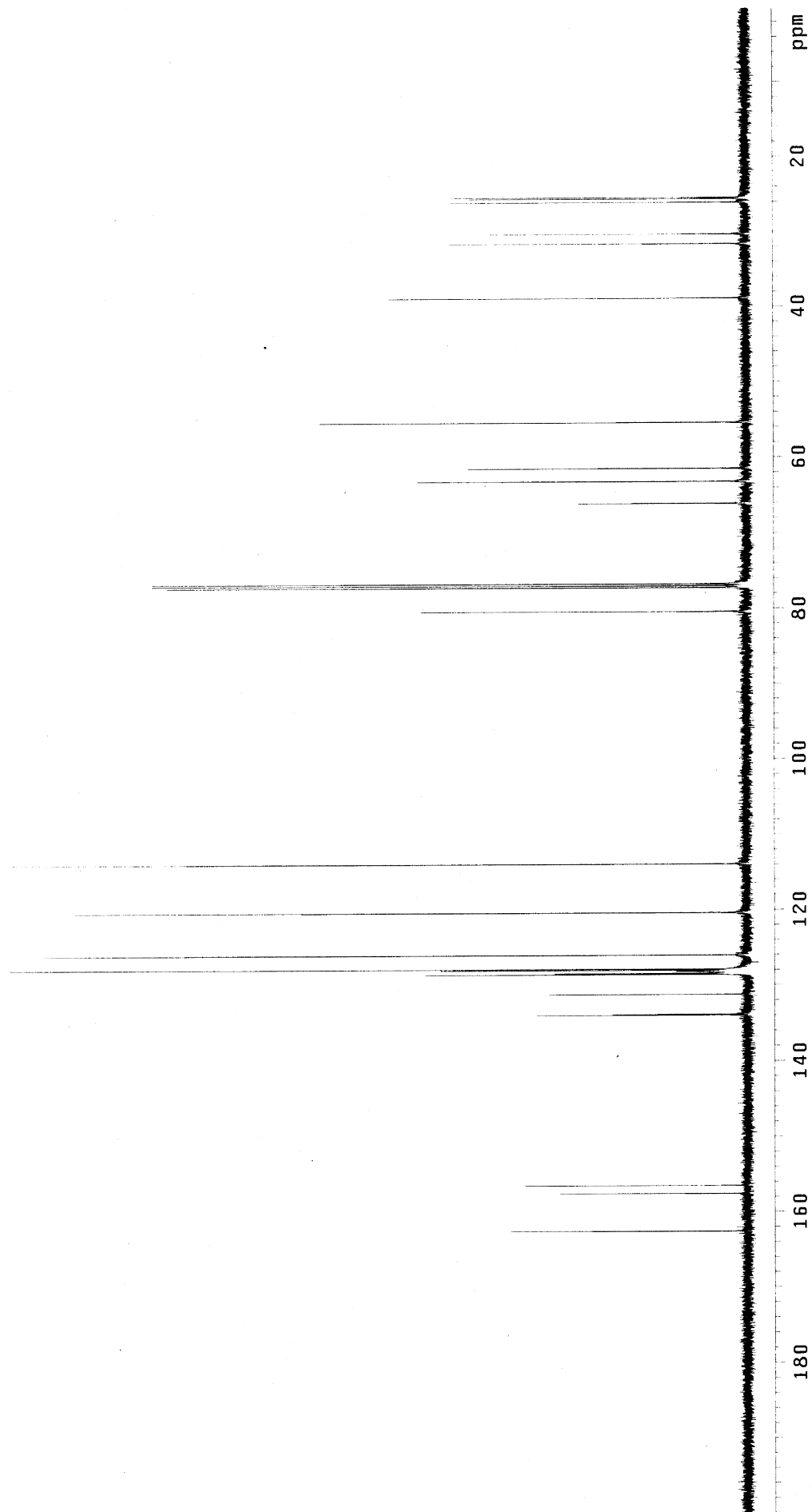
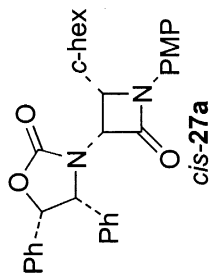
*cis*-26



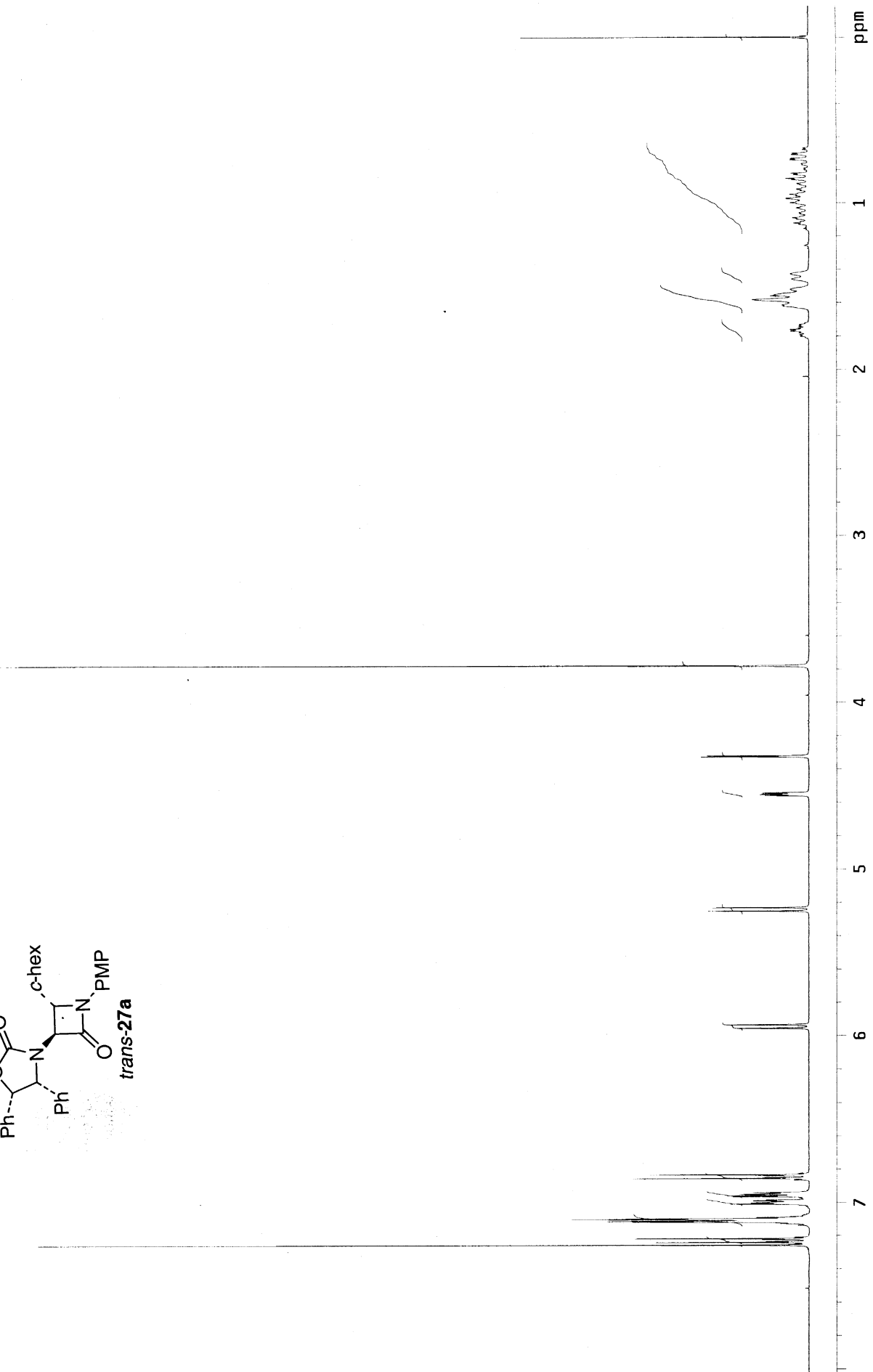
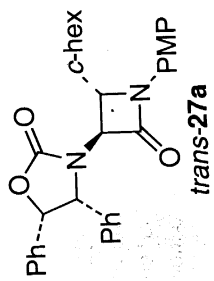
**<sup>1</sup>H NMR**  
**500 MHz, CDCl<sub>3</sub>**



<sup>13</sup>C NMR  
125 MHz, CDCl<sub>3</sub>

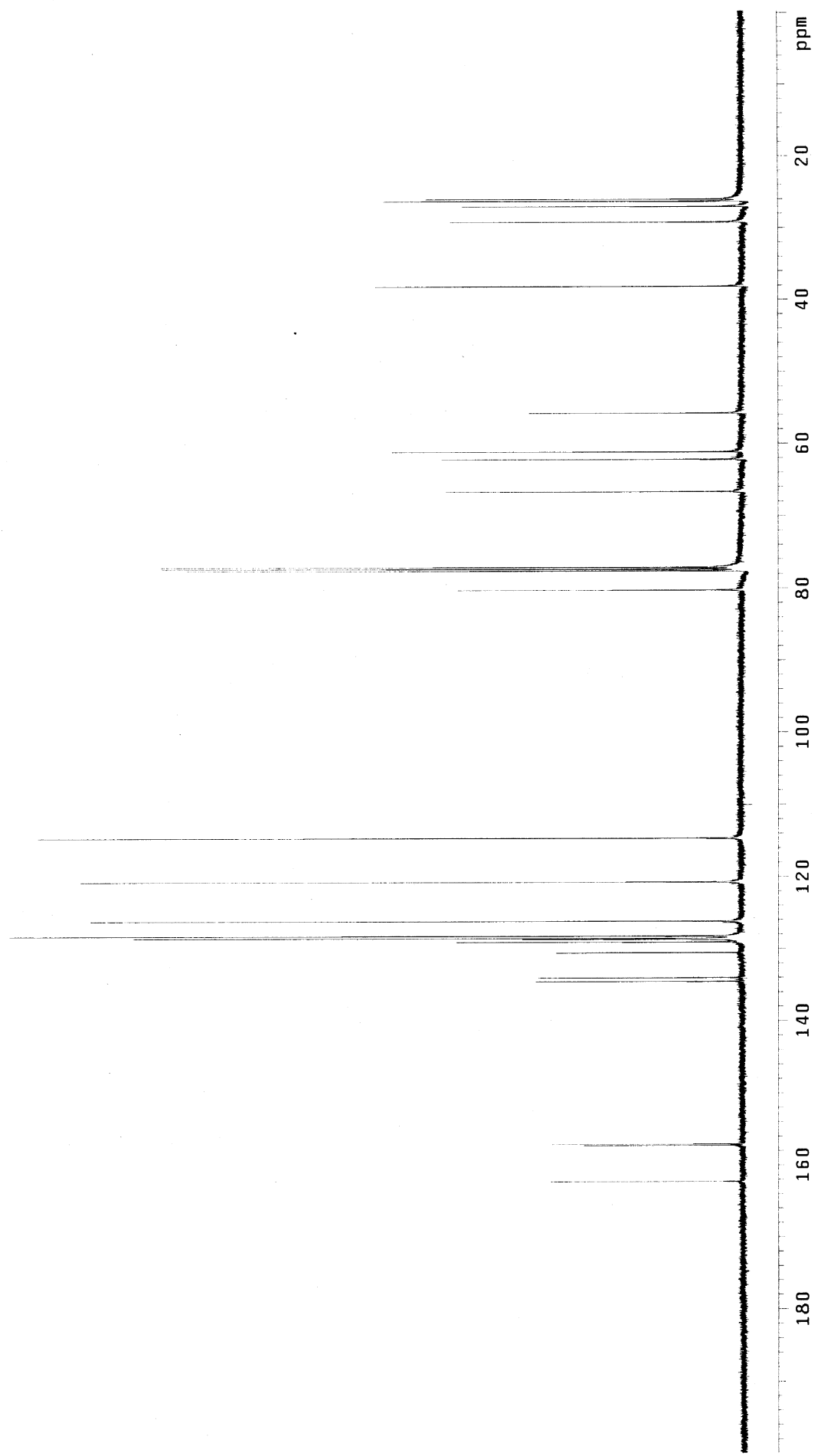
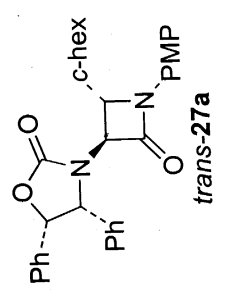


<sup>1</sup>H NMR  
400 MHz, CDCl<sub>3</sub>

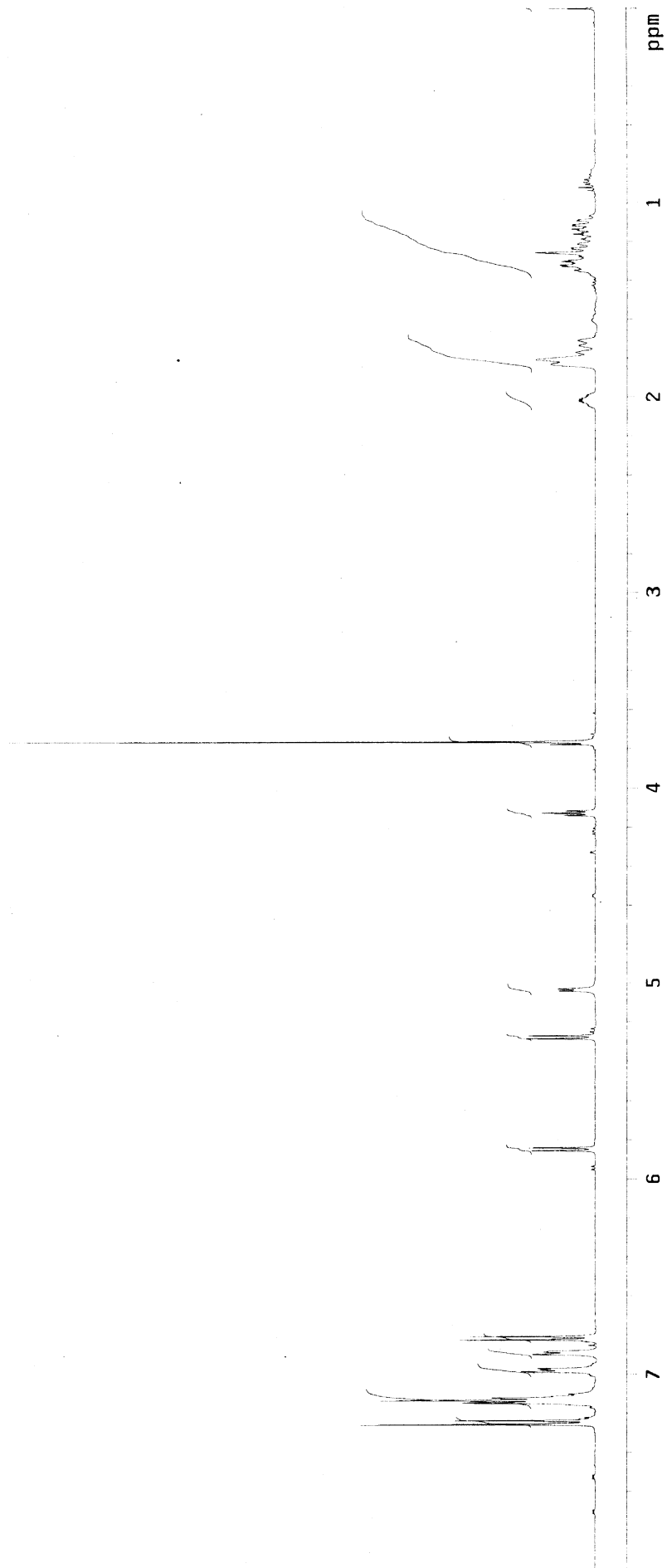
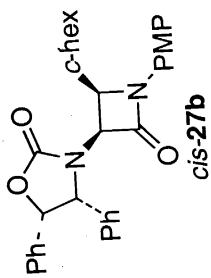




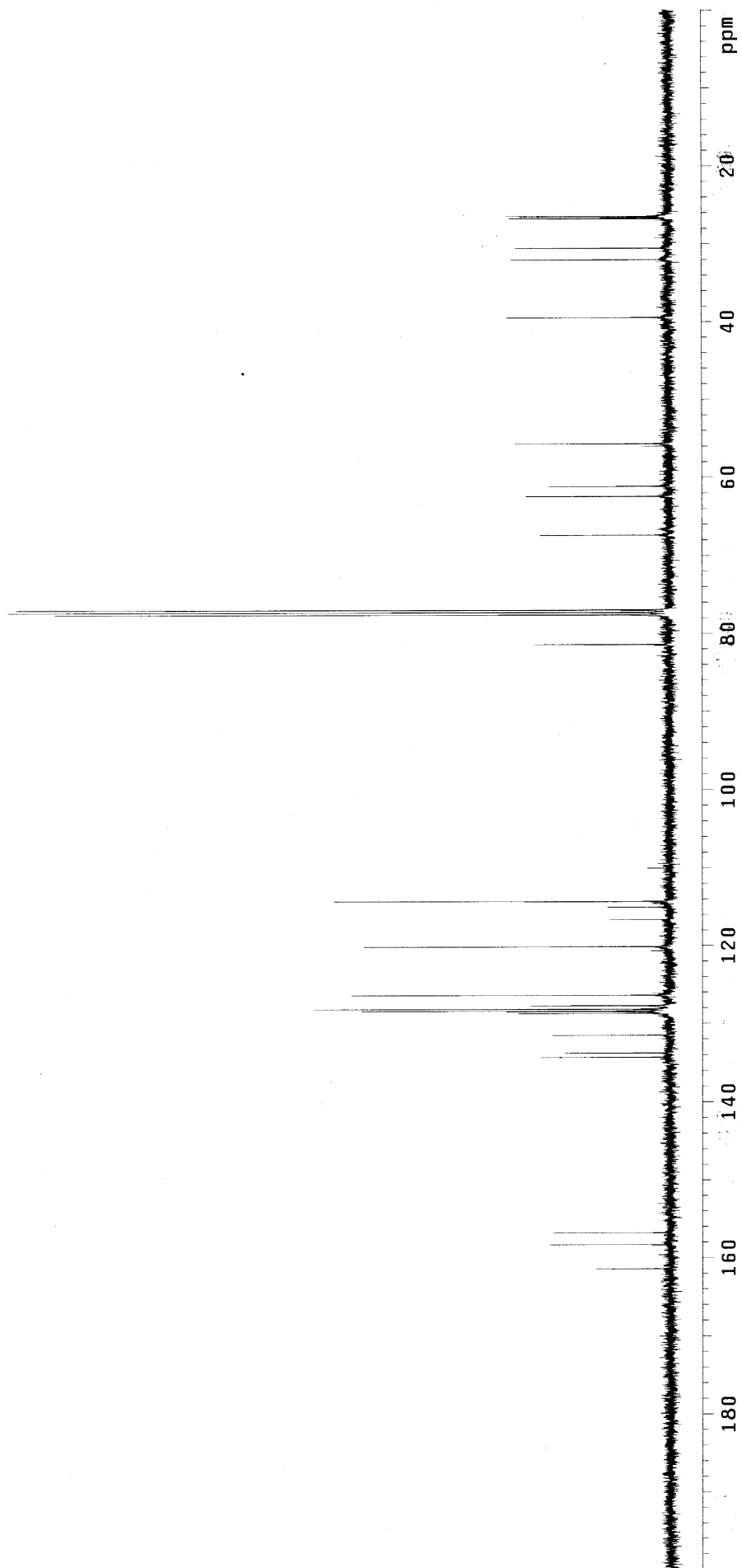
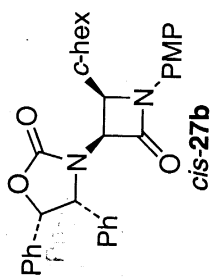
<sup>13</sup>C NMR  
125 MHz, CDCl<sub>3</sub>



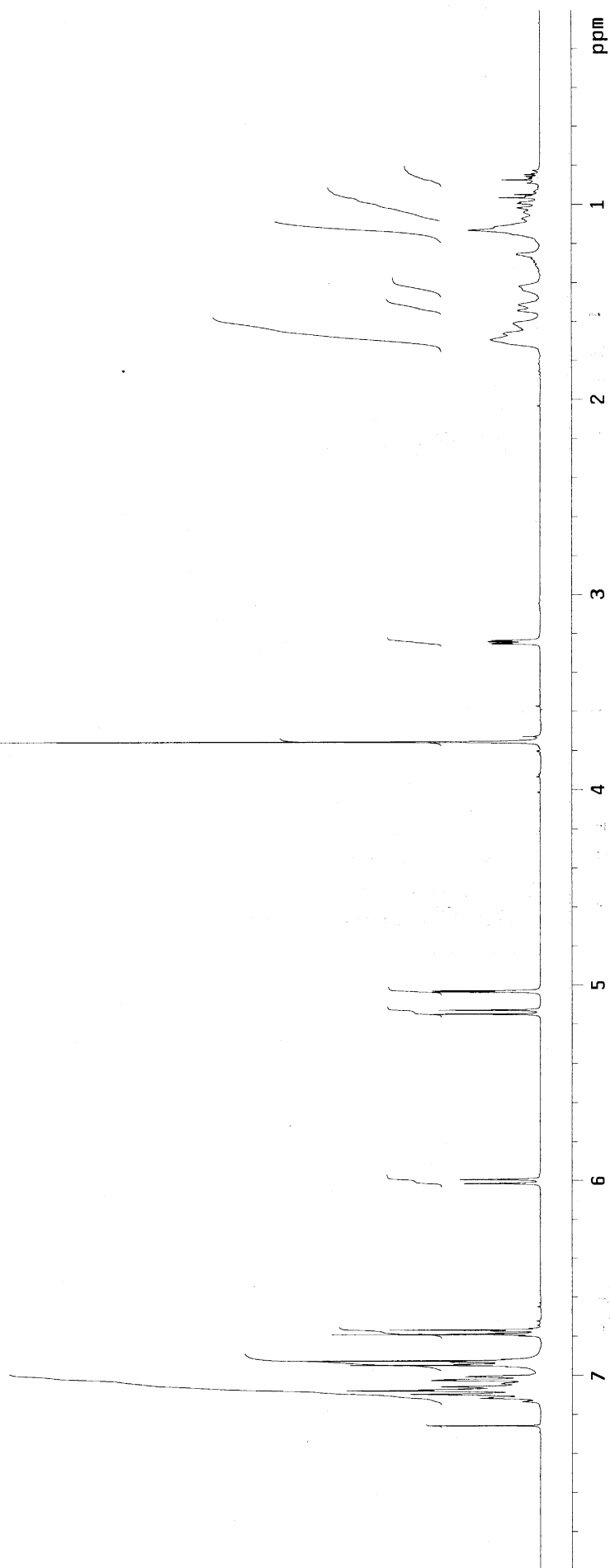
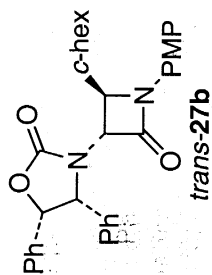
**<sup>1</sup>H NMR**  
**500 MHz, CDCl<sub>3</sub>**



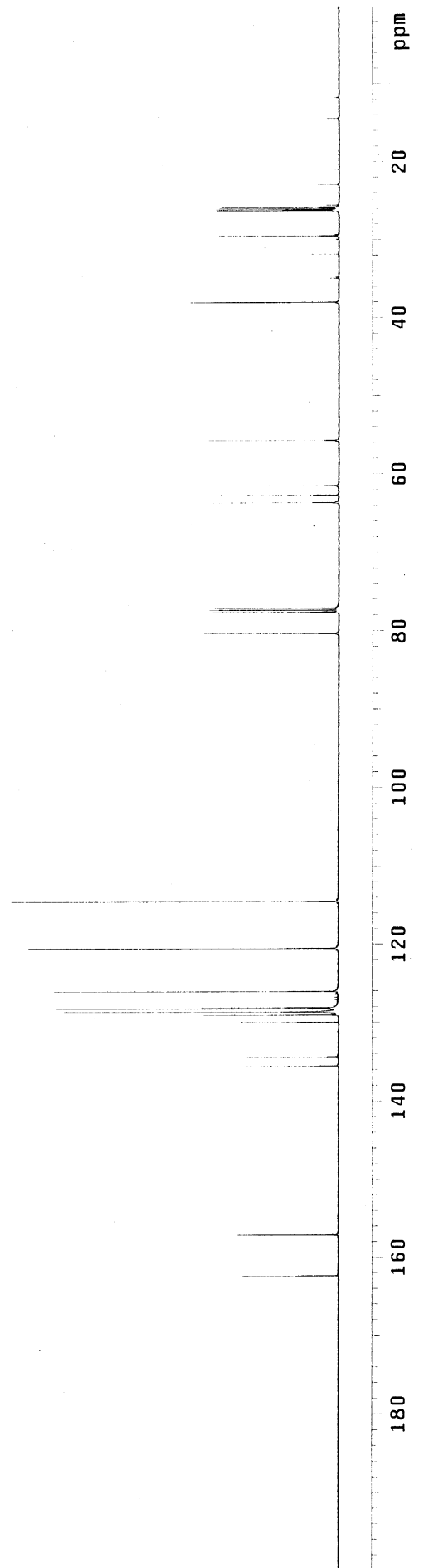
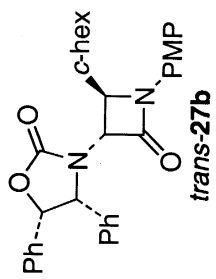
**<sup>13</sup>C NMR**  
**100 MHz, CDCl<sub>3</sub>**



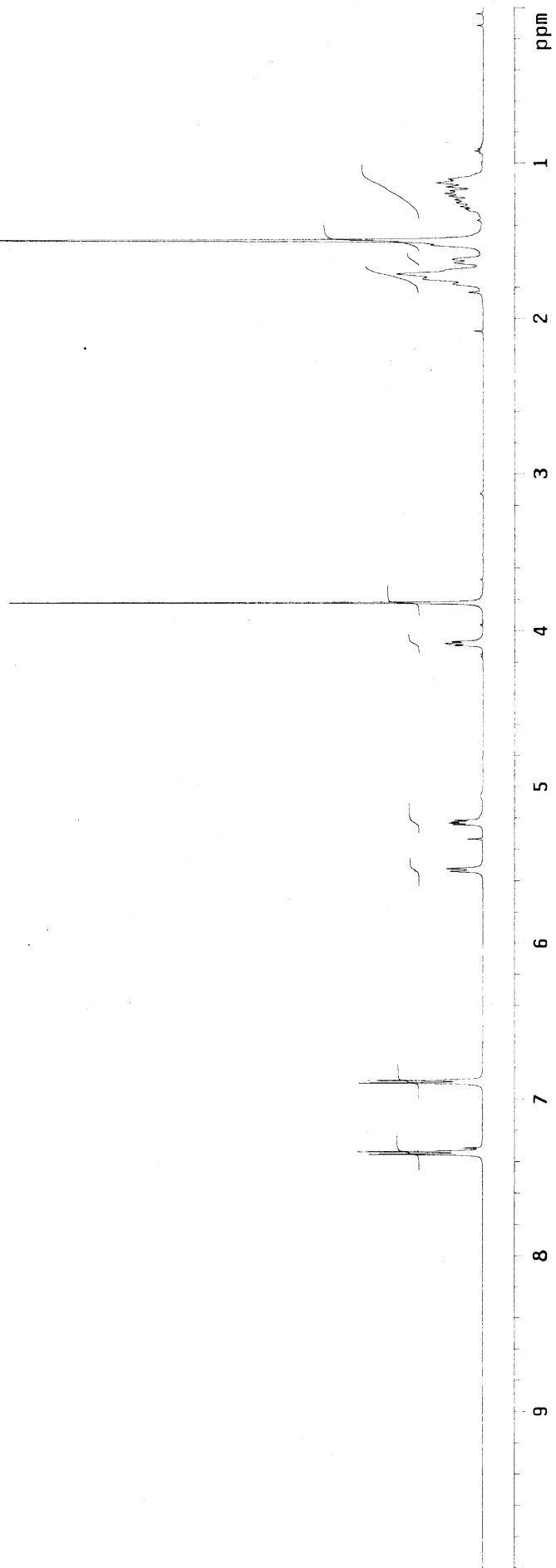
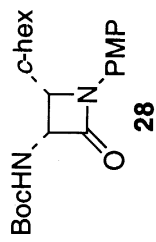
<sup>1</sup>H NMR  
400 MHz, CDCl<sub>3</sub>



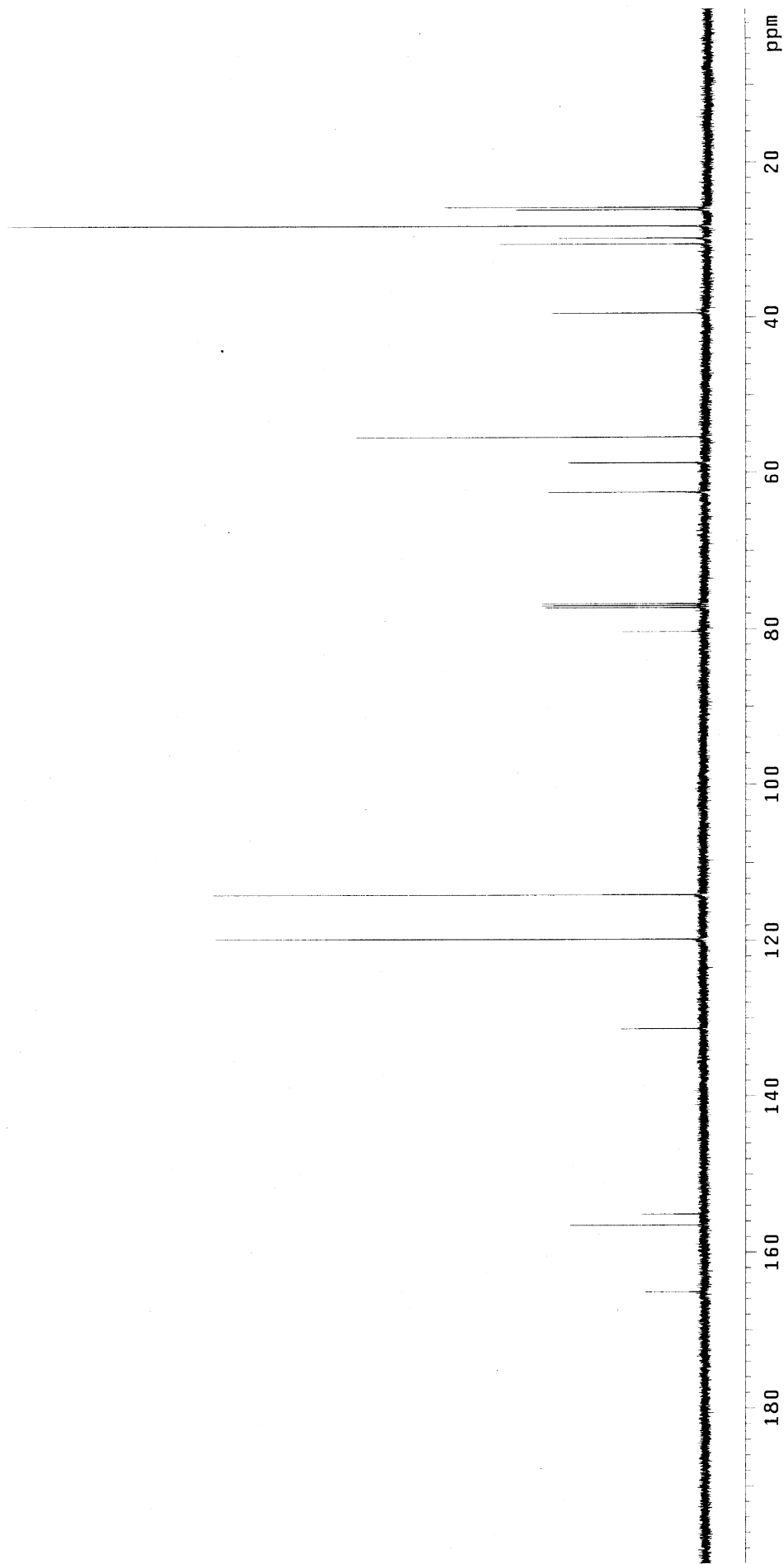
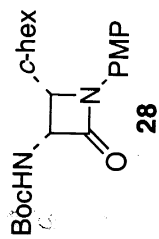
<sup>13</sup>C NMR  
125 MHz, CDCl<sub>3</sub>



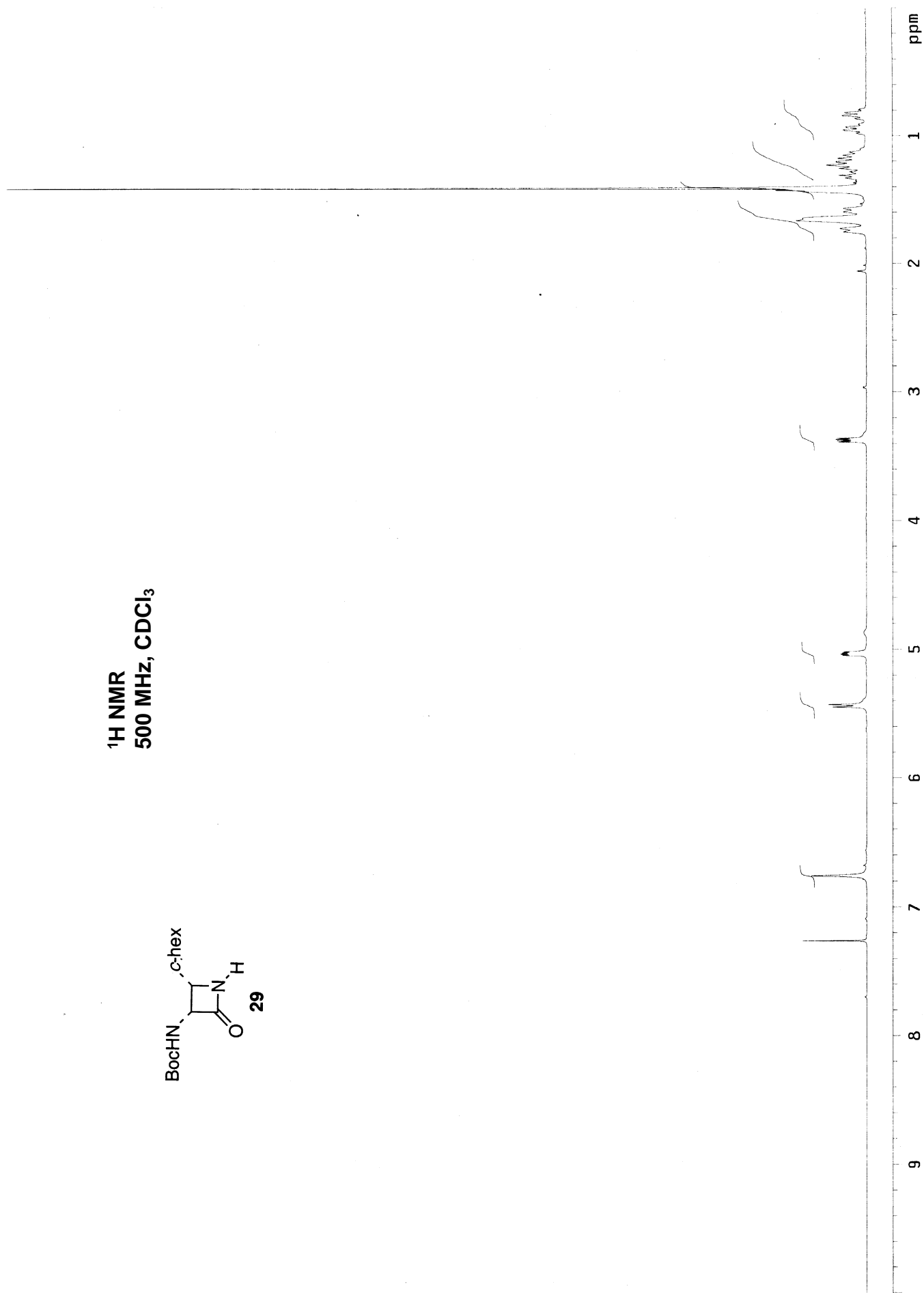
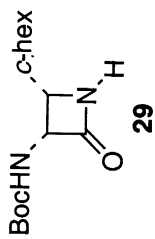
<sup>1</sup>H NMR  
500 MHz, CDCl<sub>3</sub>



<sup>13</sup>C NMR  
125 MHz, CDCl<sub>3</sub>

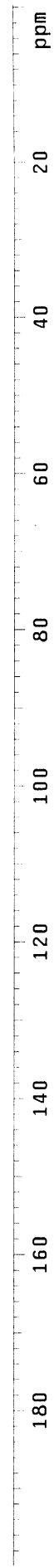
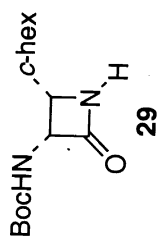


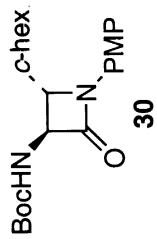
<sup>1</sup>H NMR  
500 MHz, CDCl<sub>3</sub>



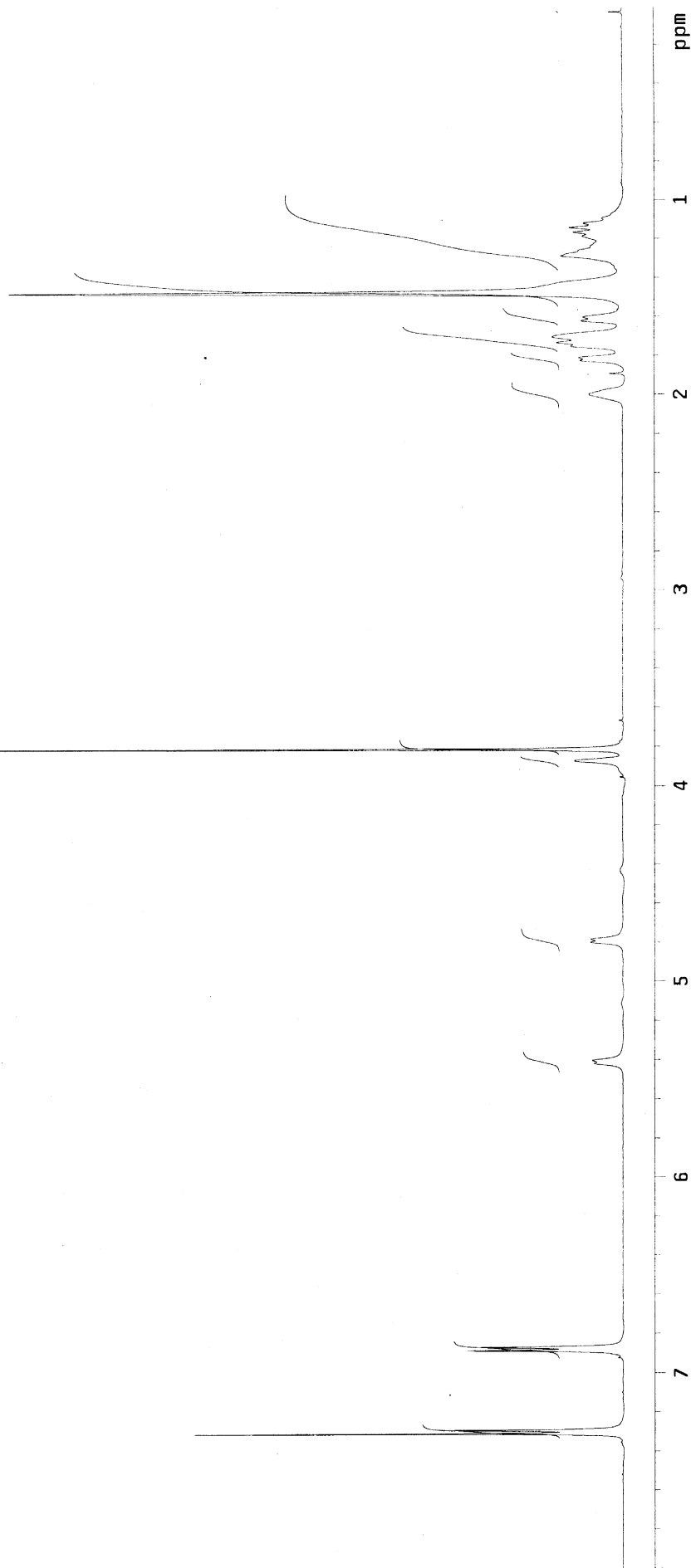


<sup>13</sup>C NMR  
125 MHz, CDCl<sub>3</sub>

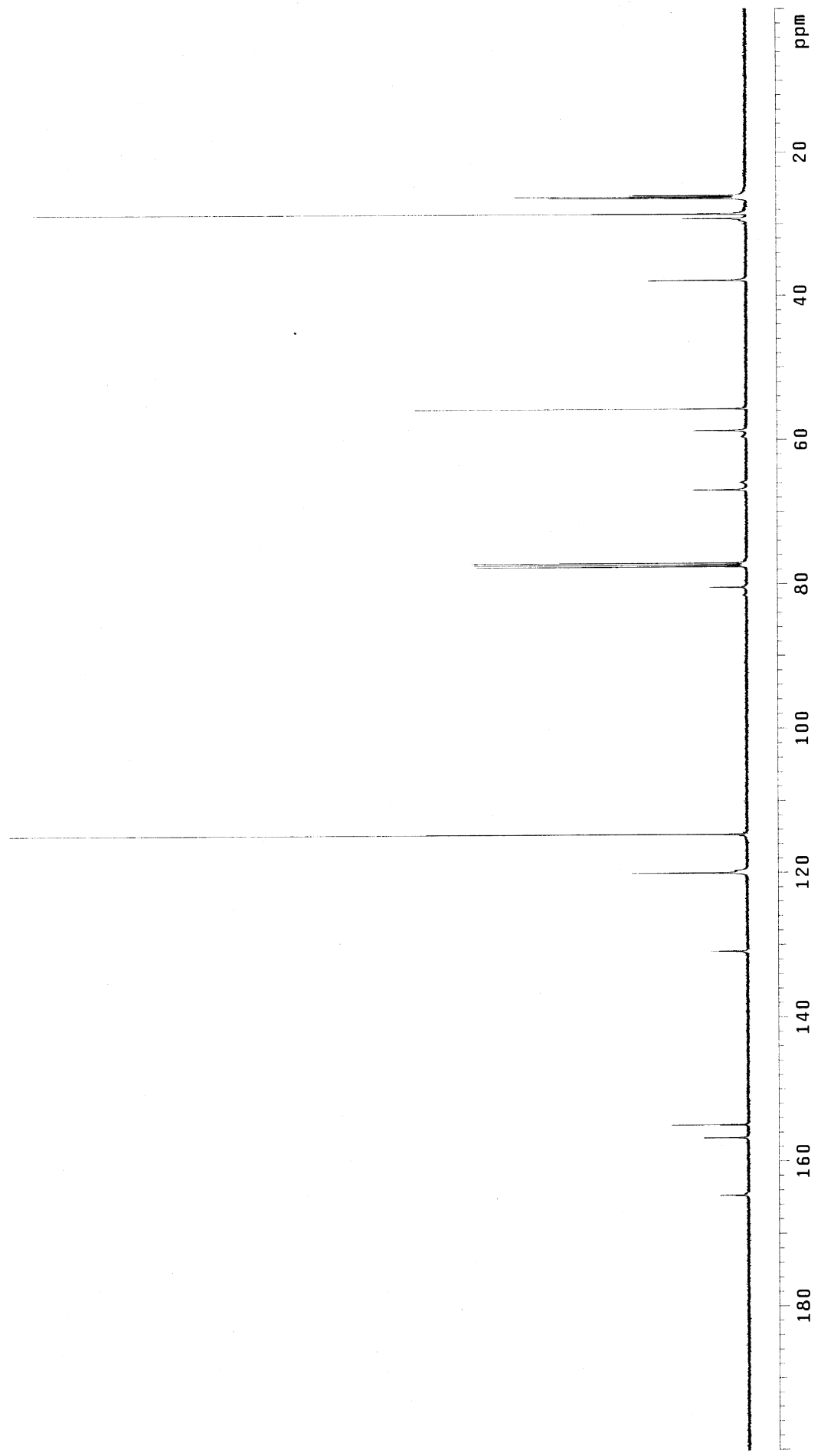
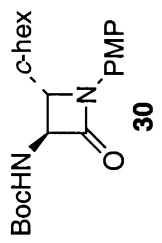




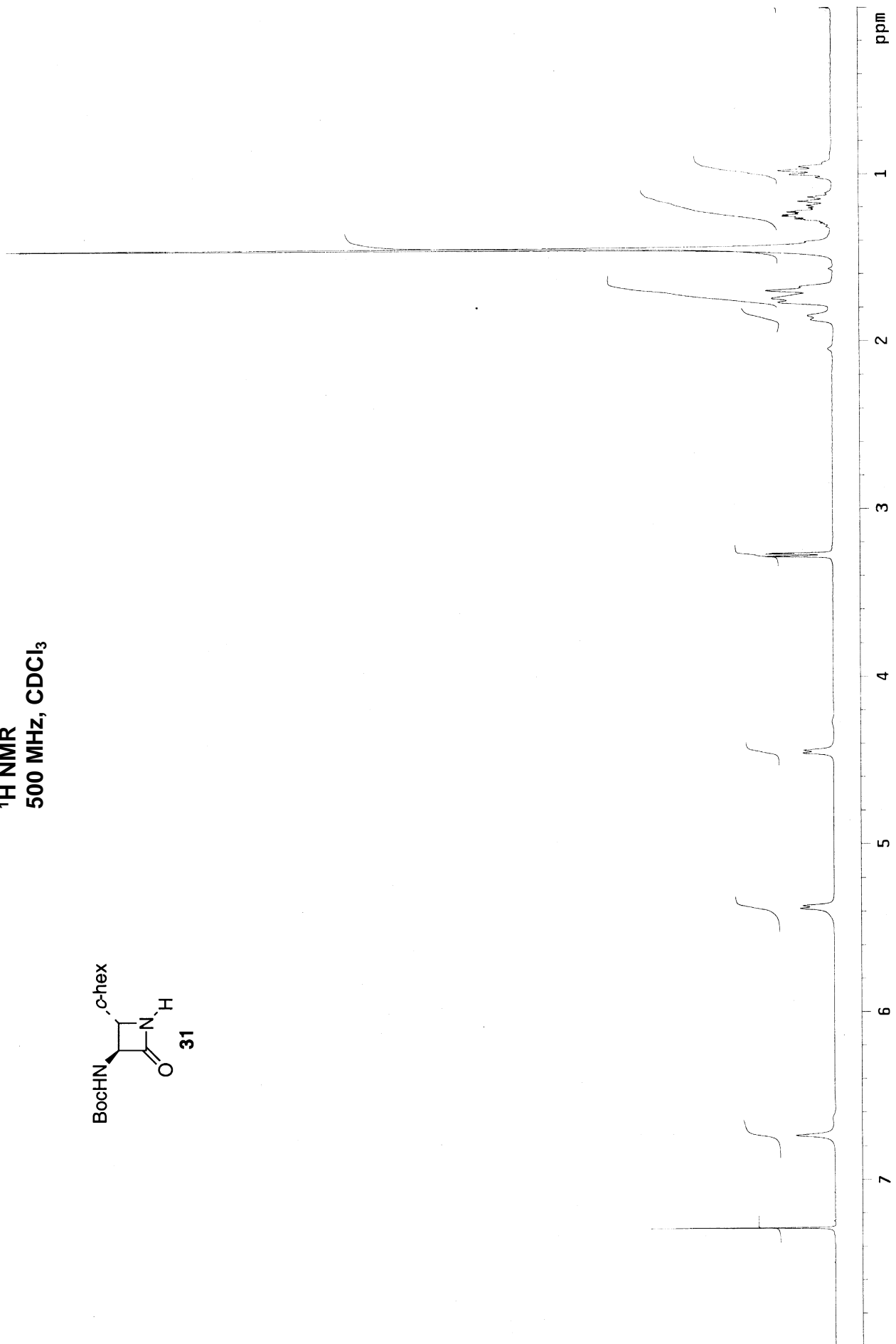
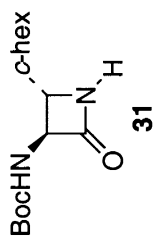
<sup>1</sup>H NMR  
500 MHz, CDCl<sub>3</sub>



<sup>13</sup>C NMR  
125 MHz, CDCl<sub>3</sub>



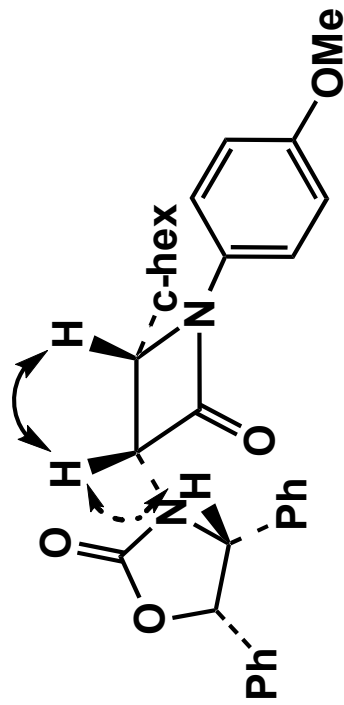
**<sup>1</sup>H NMR**  
**500 MHz, CDCl<sub>3</sub>**





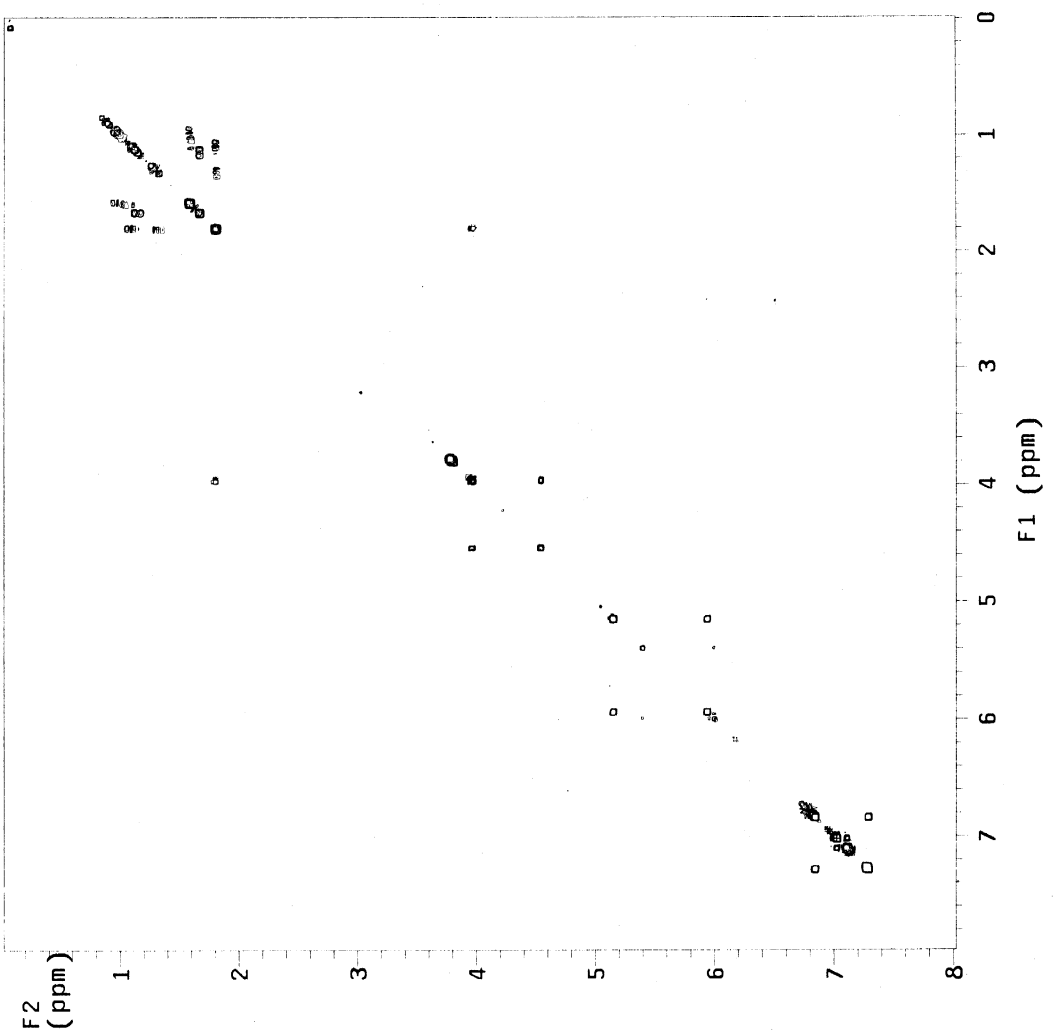
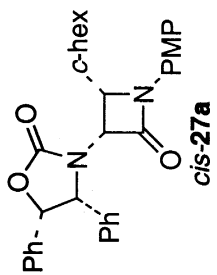
# Cosy and NOE Experiment of Compound

## *cis*-27a

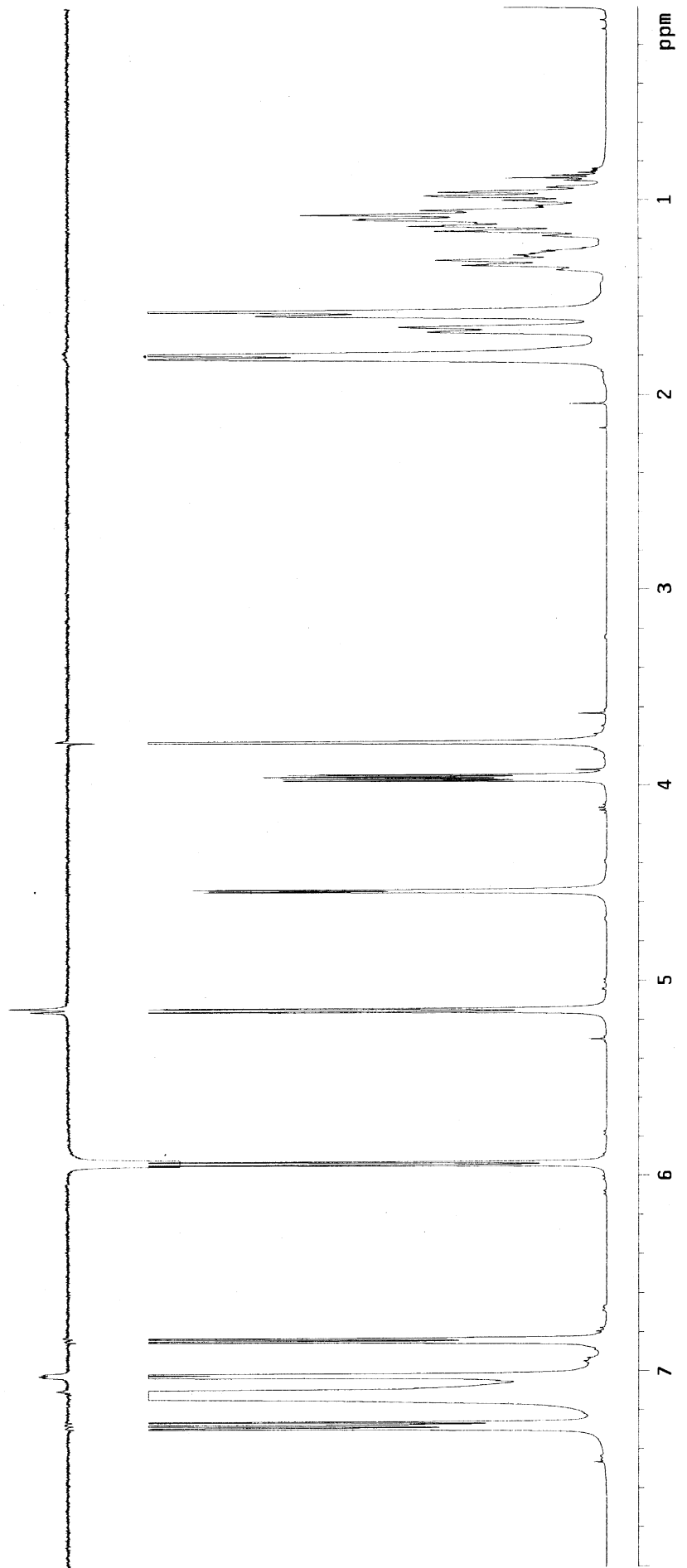
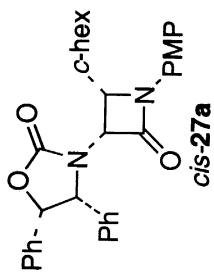


nOe of *cis*-27a

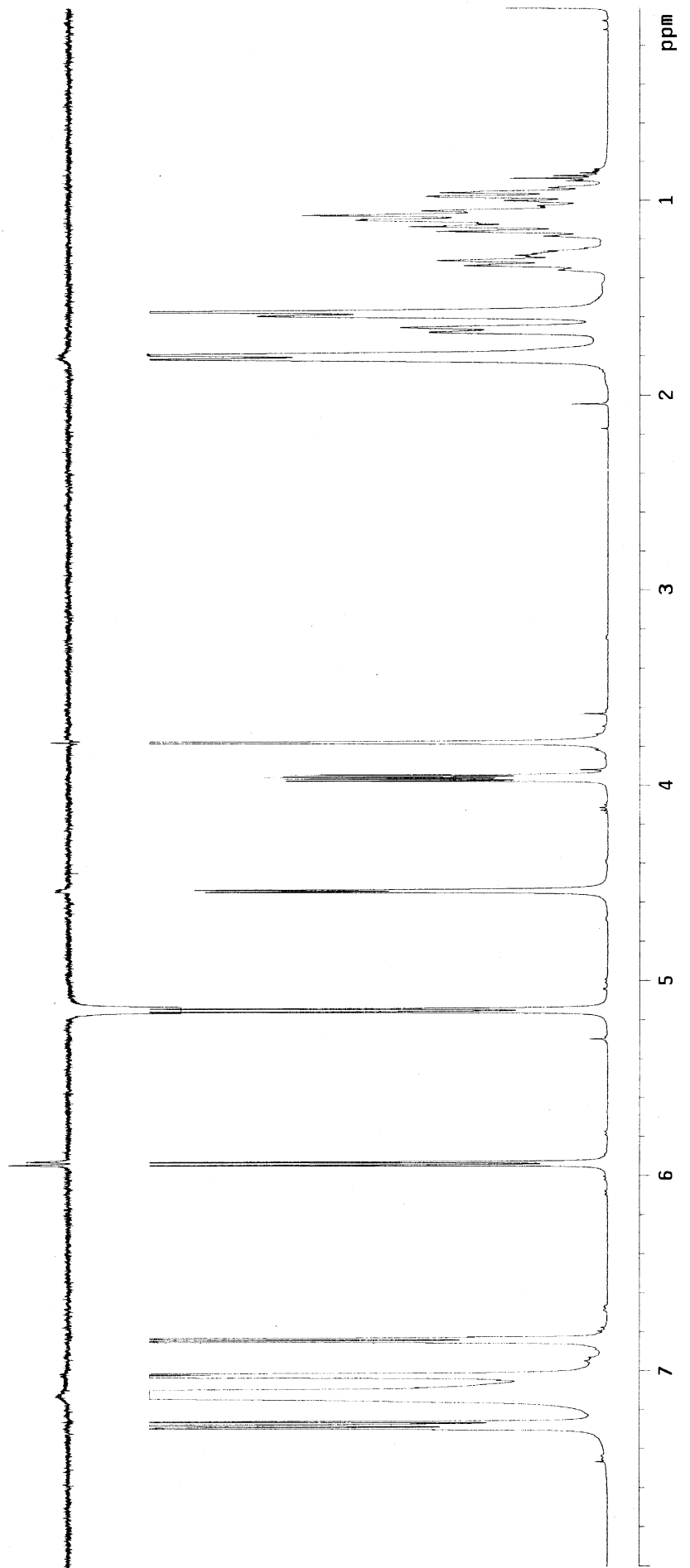
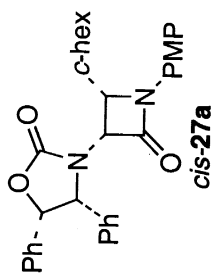
COSY  
500 MHz, CDCl<sub>3</sub>

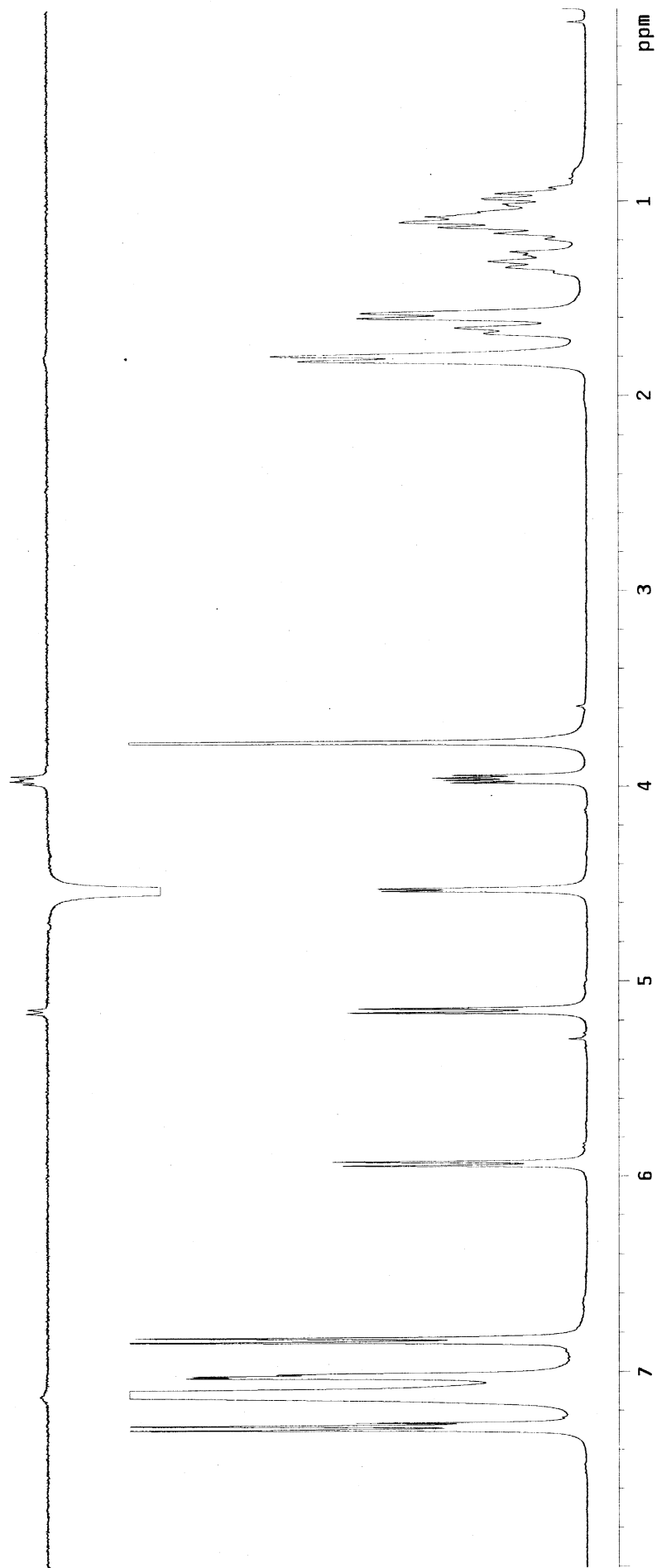
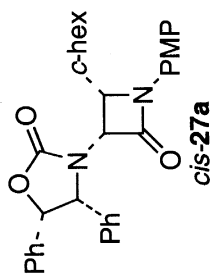


NOE  
500 MHz, CDCl<sub>3</sub>





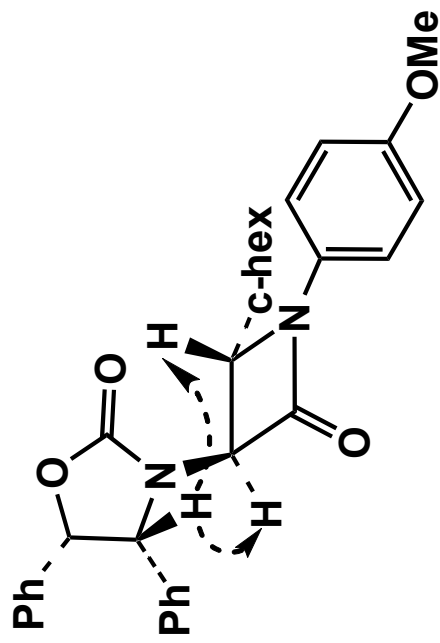






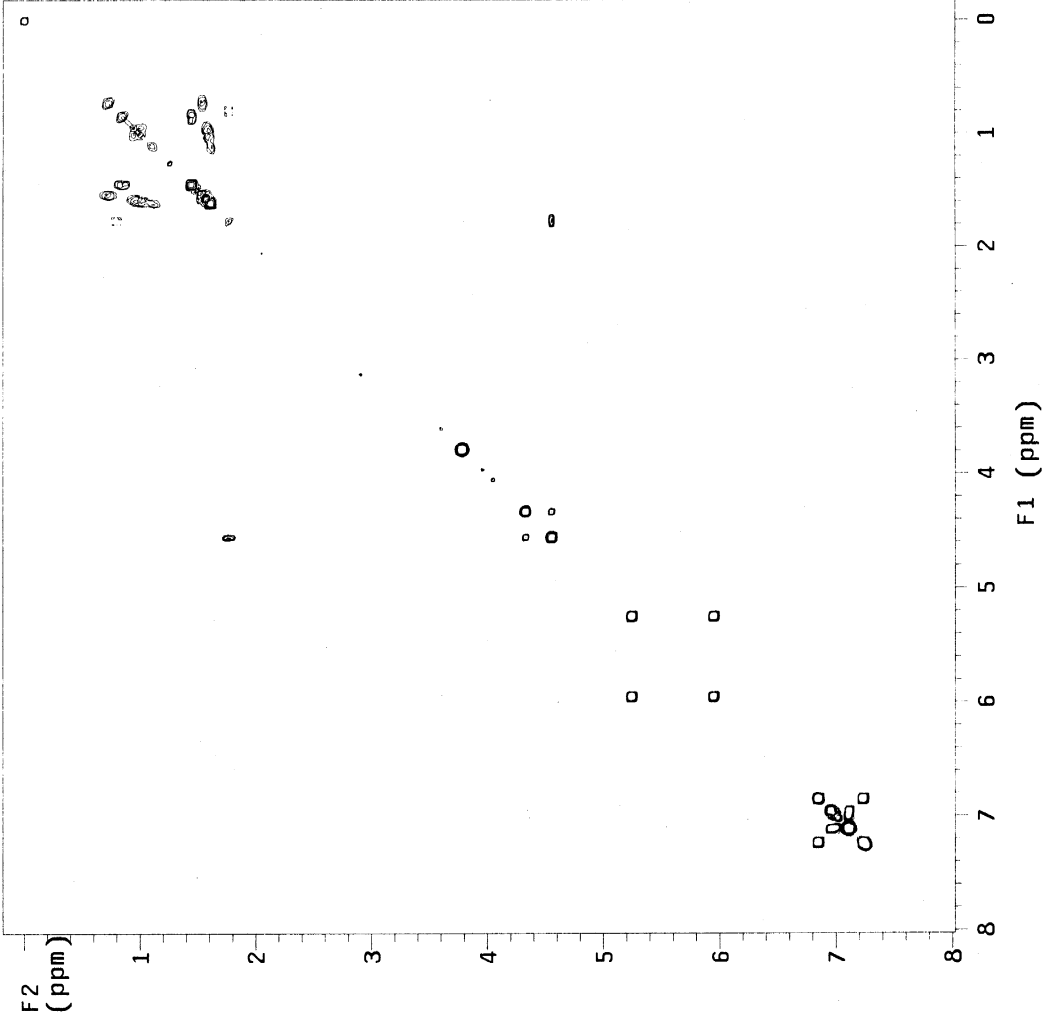
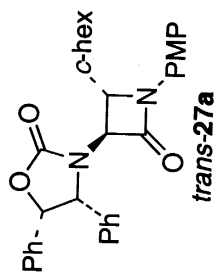
# Cosy and NOE Experiment of Compound

## *trans*-27a

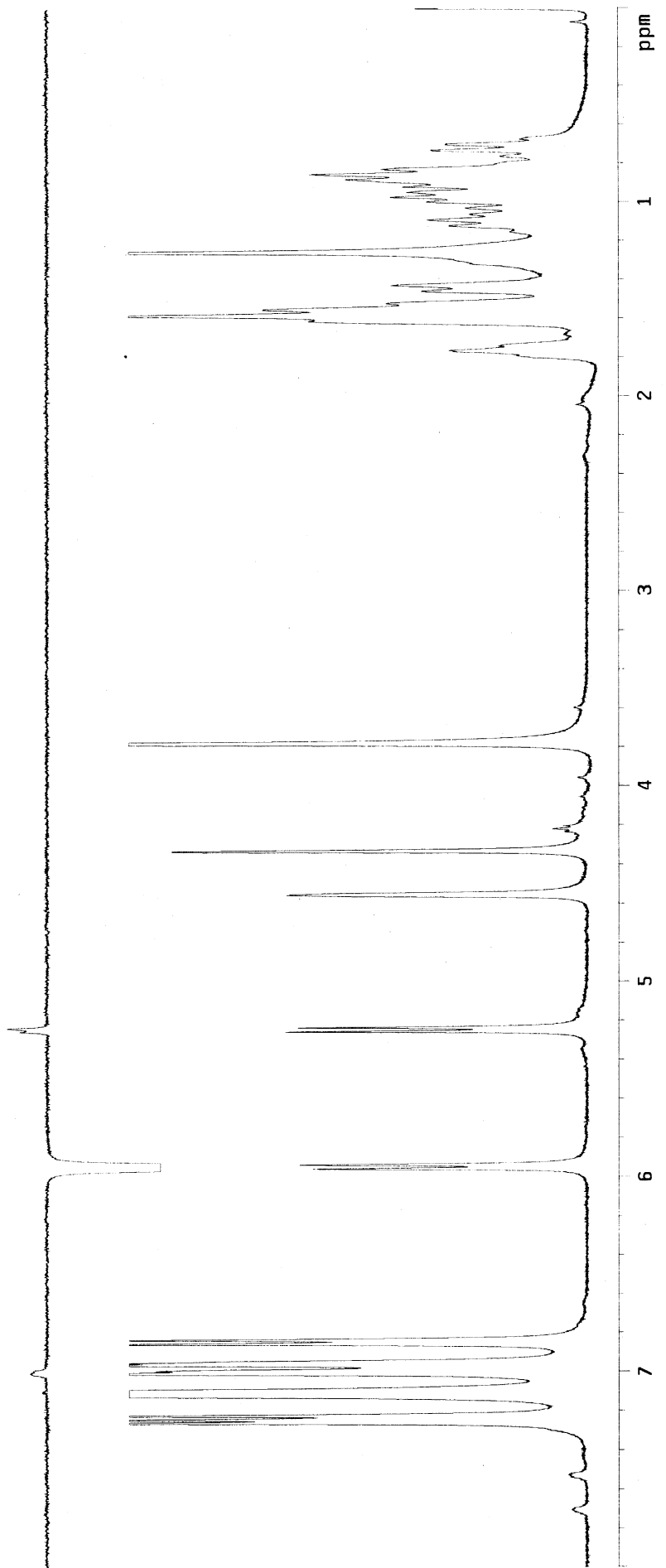
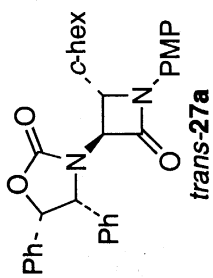


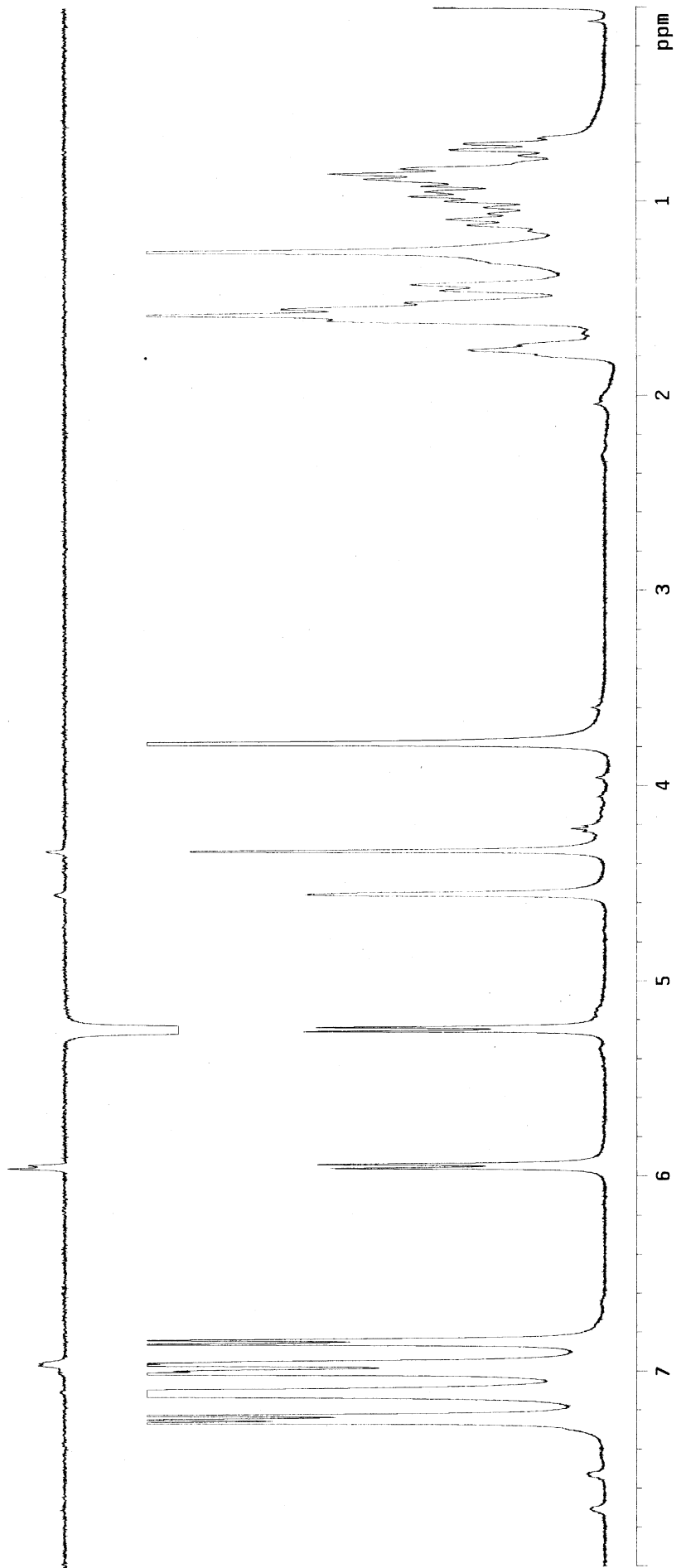
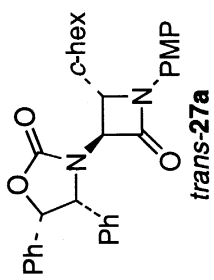
nOe of *trans*-27a

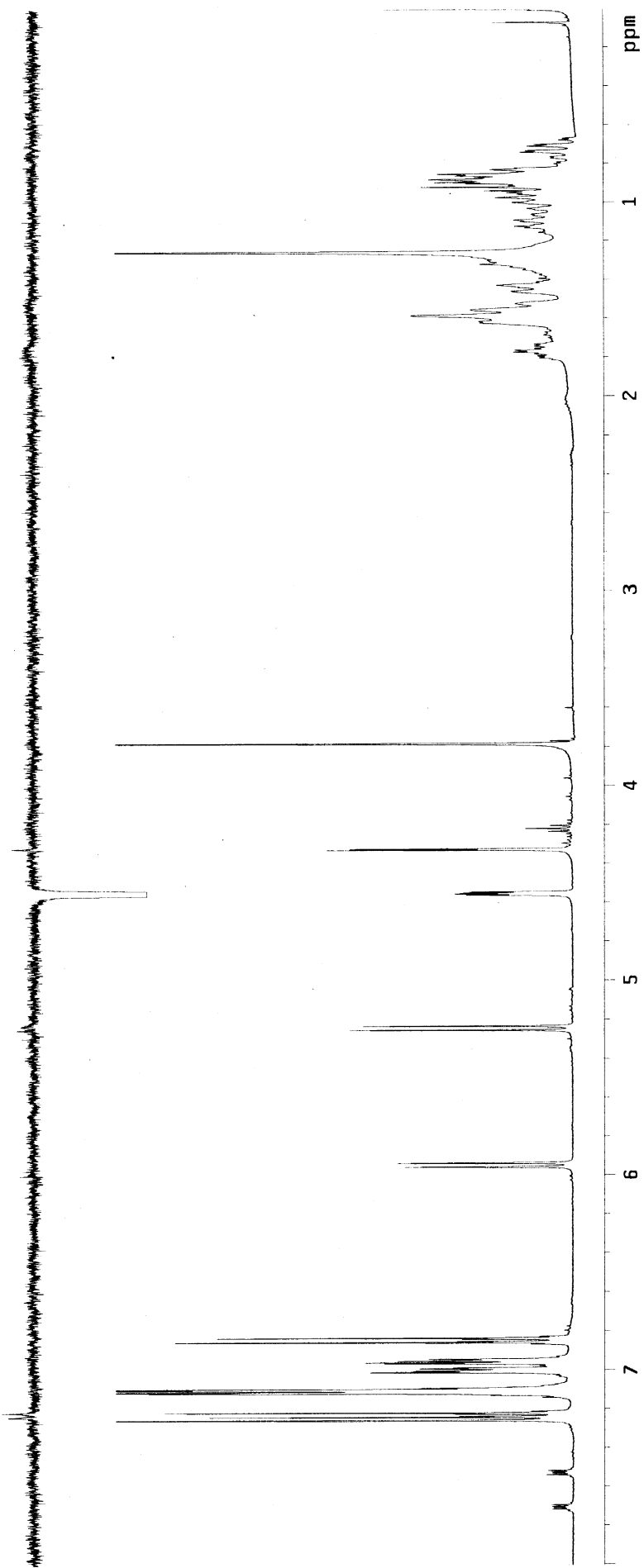
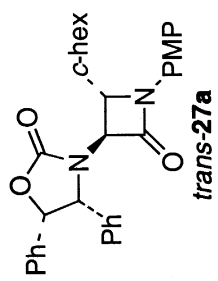
COSY  
400 MHz, CDCl<sub>3</sub>



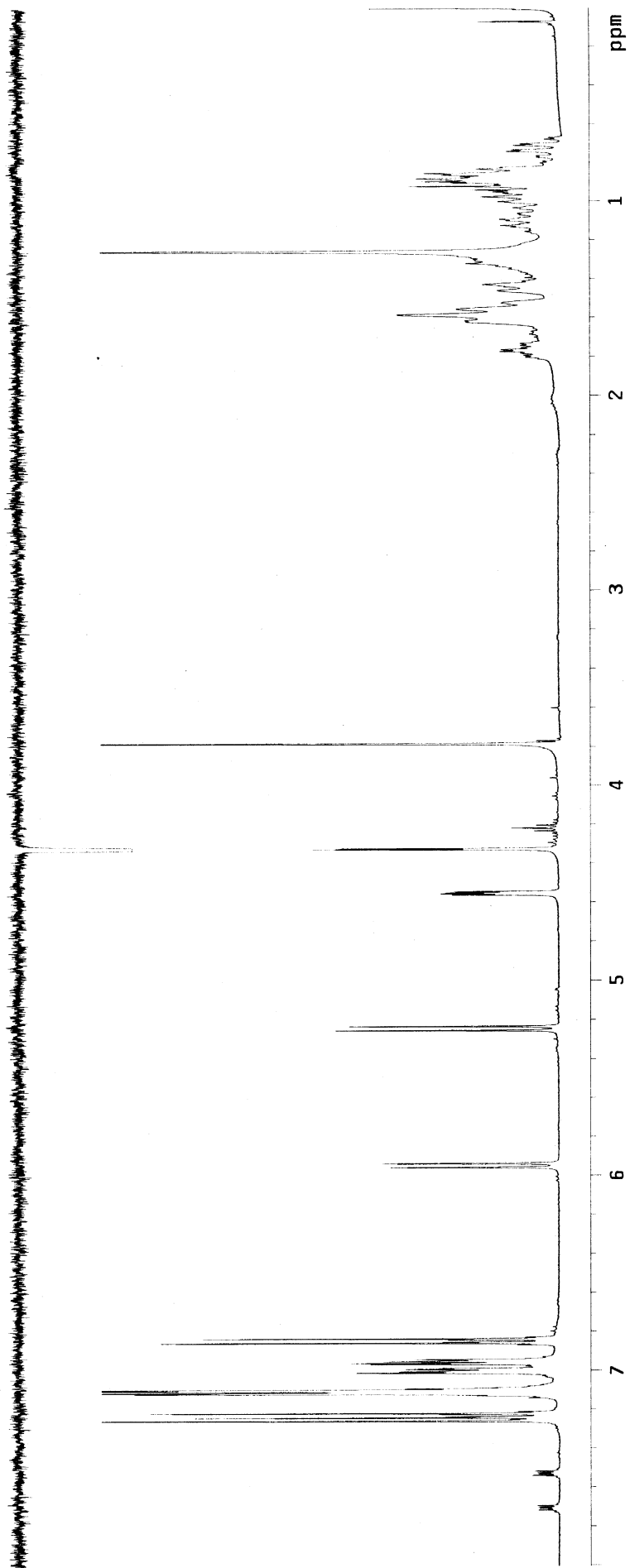
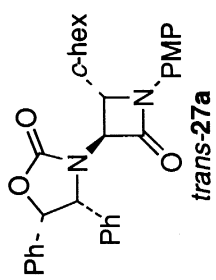
NOE  
400 MHz, CDCl<sub>3</sub>





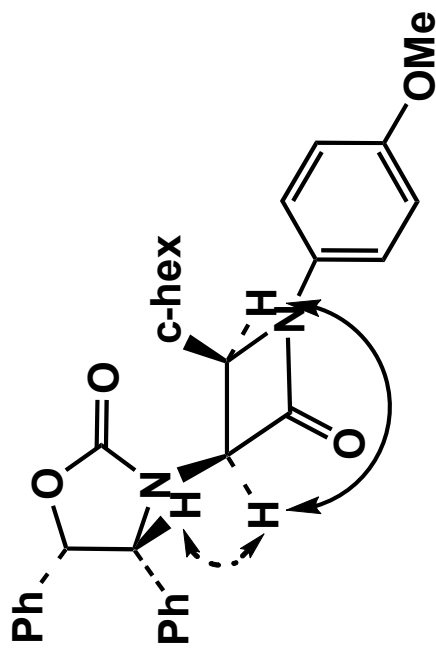






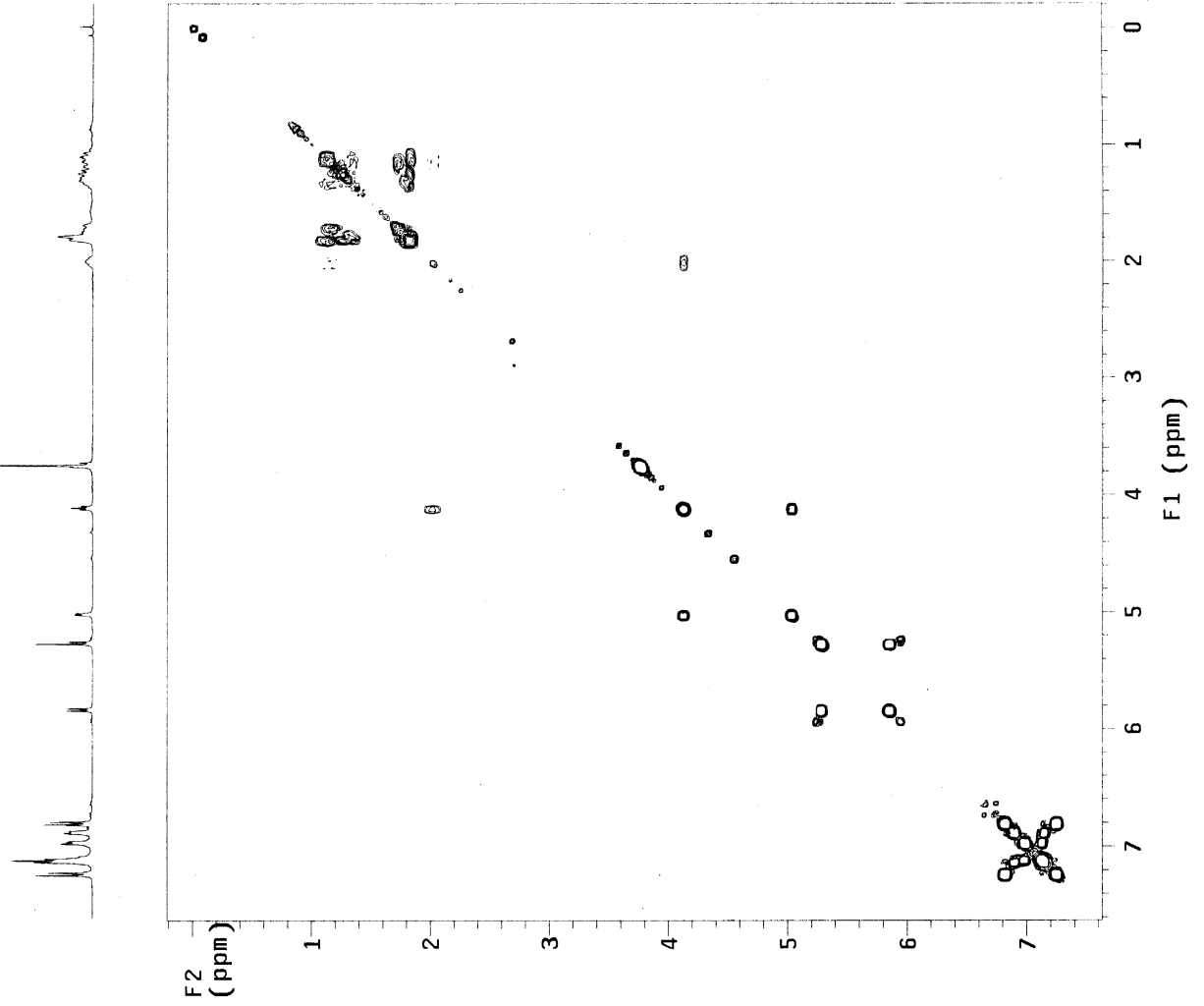
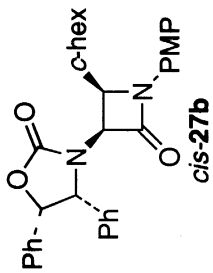
# Cosy and NOE Experiment of Compound

*cis*-27b

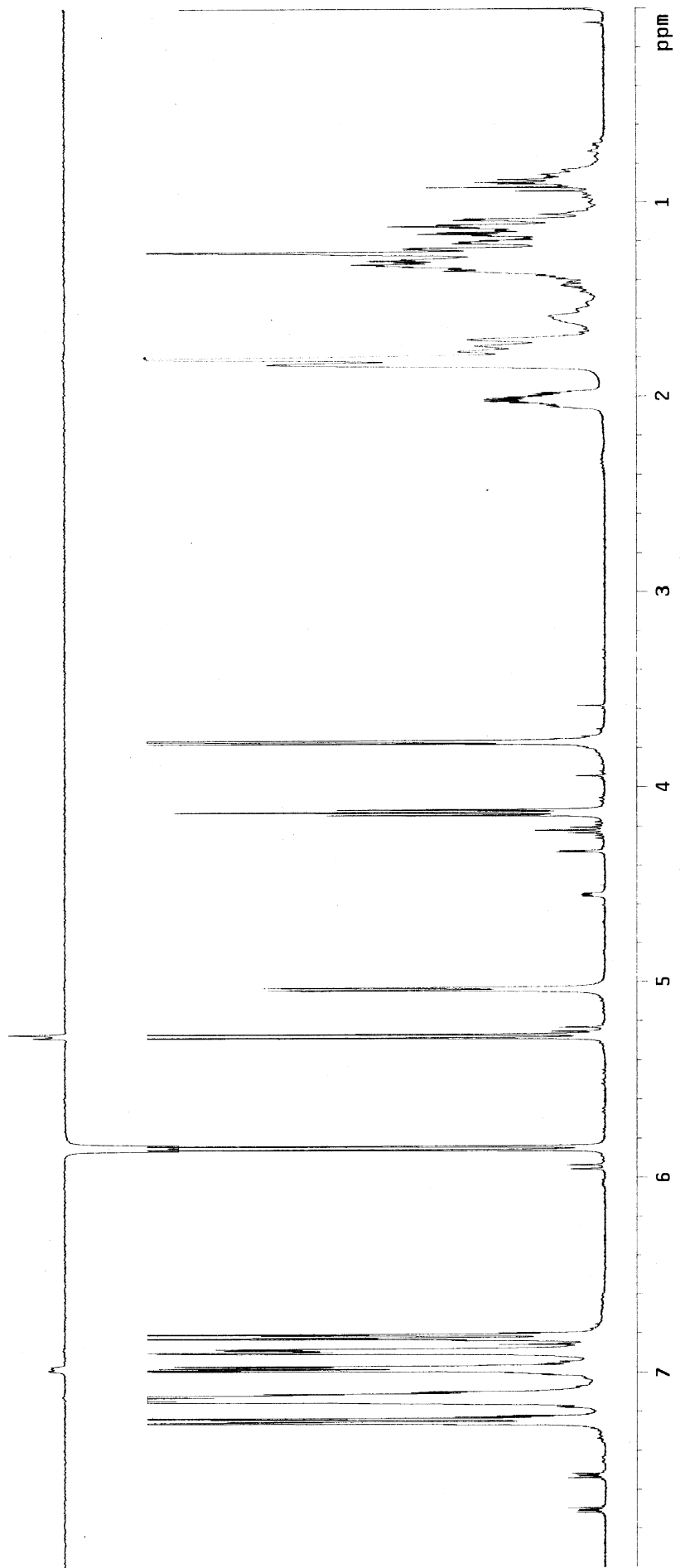
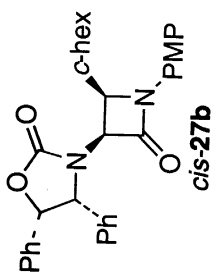


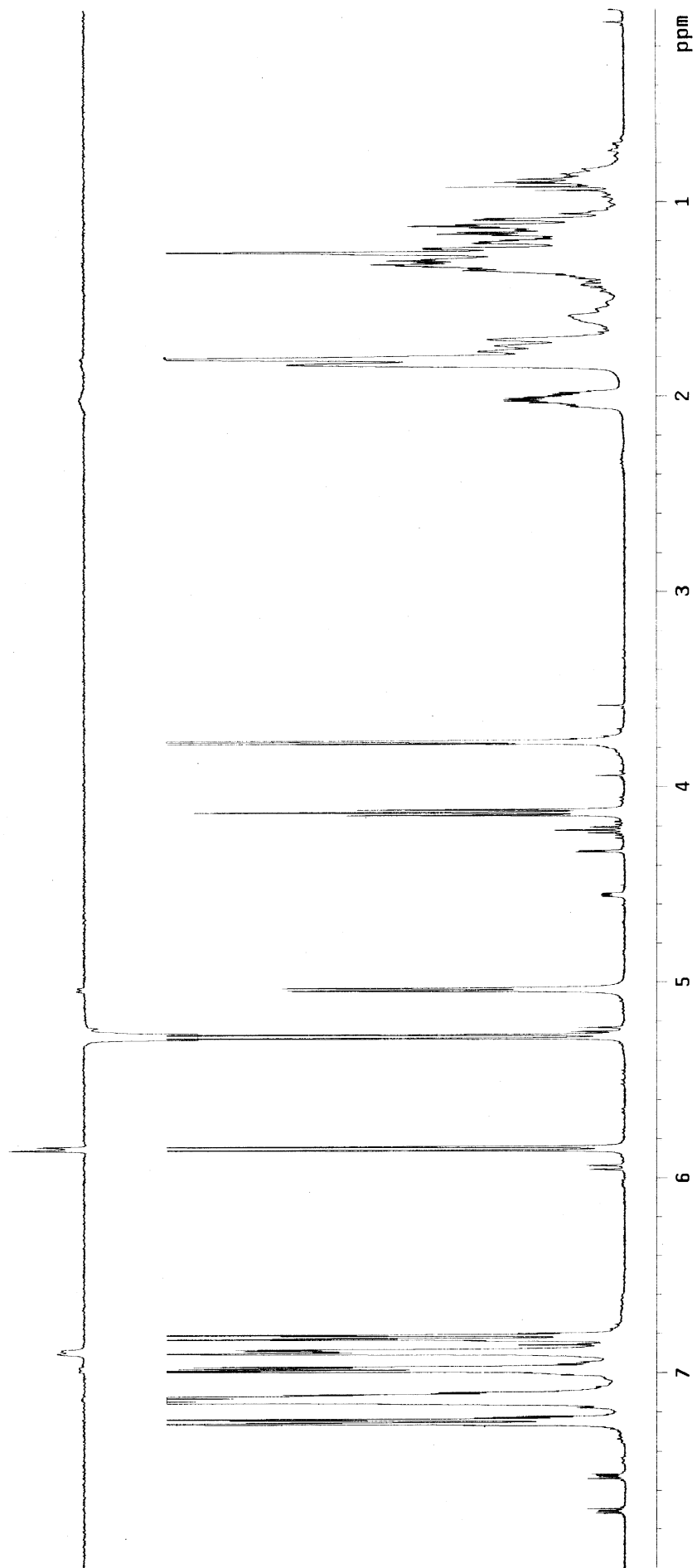
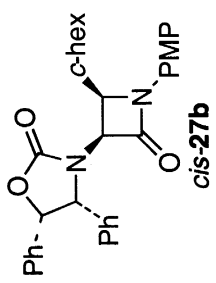
nOe of *cis*-27b

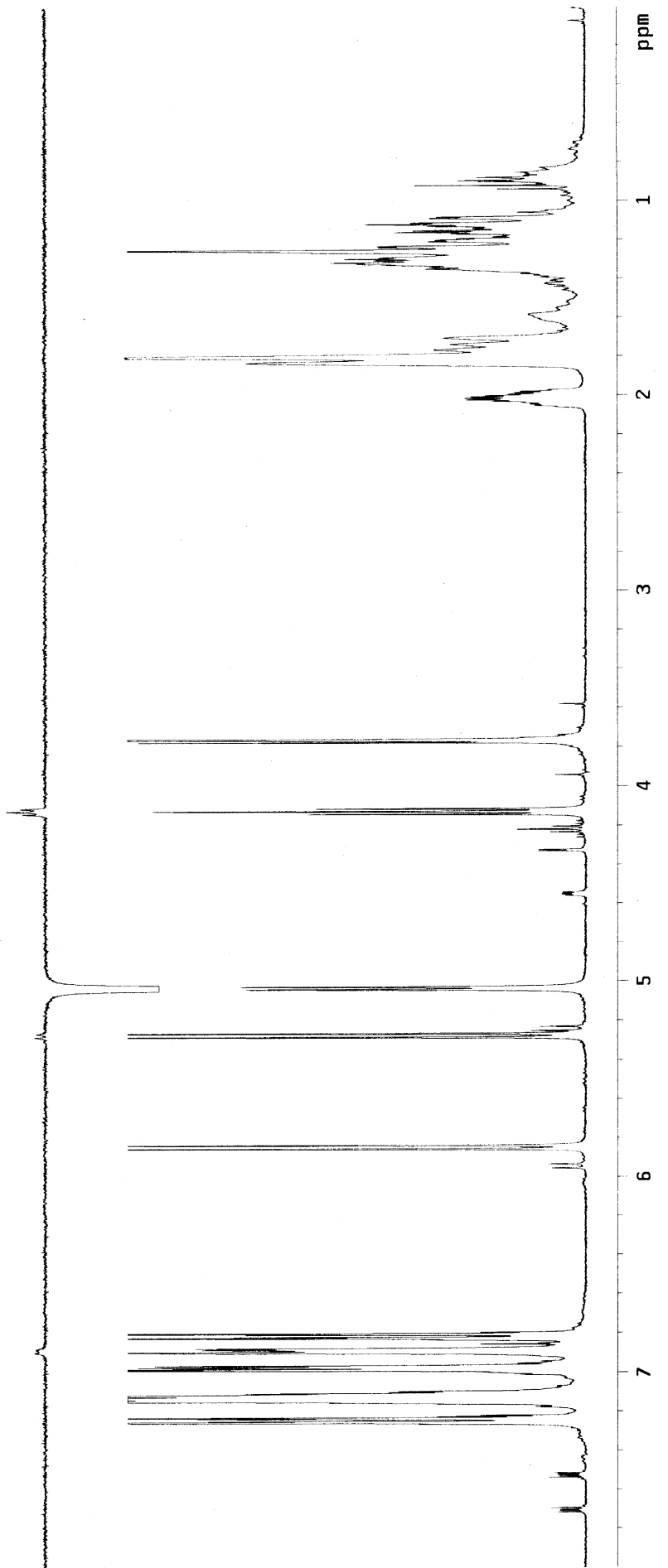
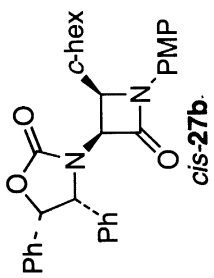
COSY  
400 MHz, CDCl<sub>3</sub>

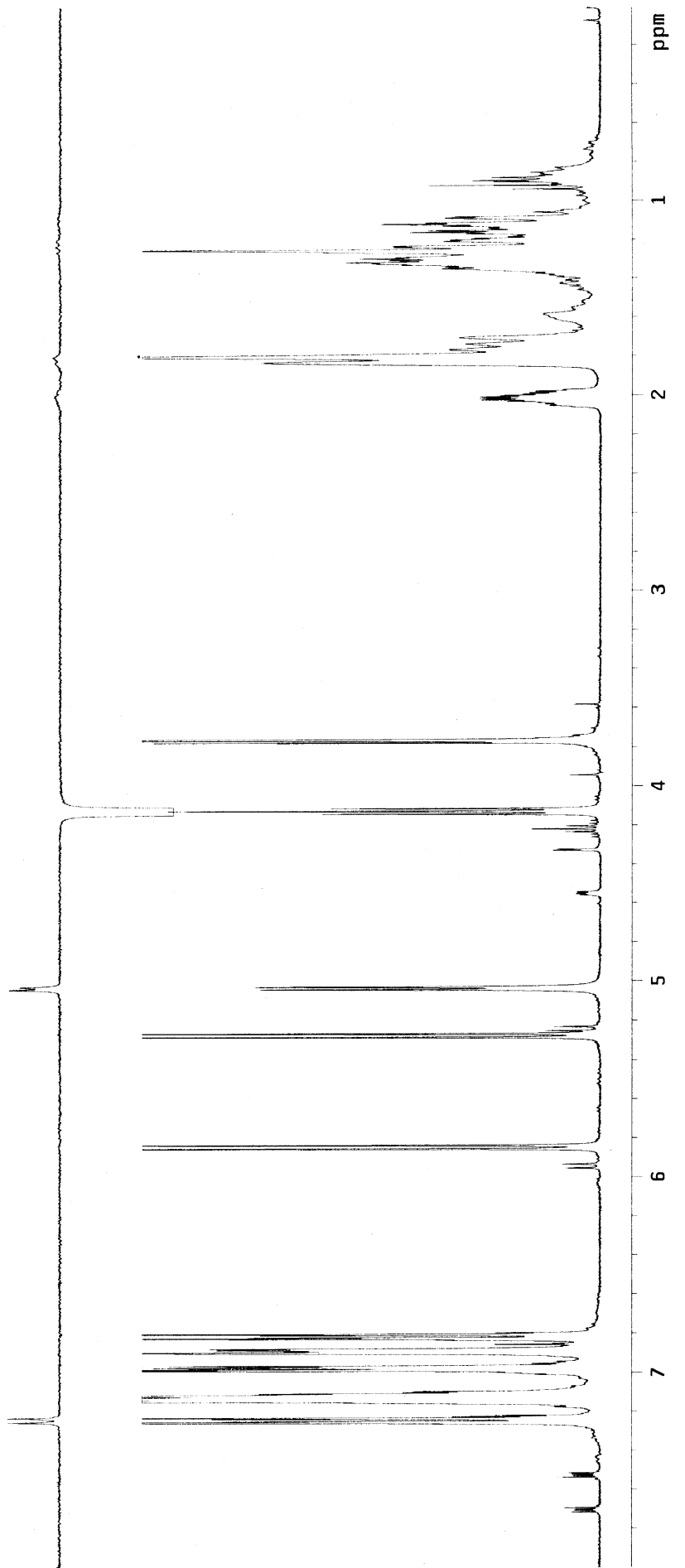
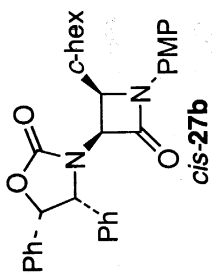


NOE  
400 MHz, CDCl<sub>3</sub>



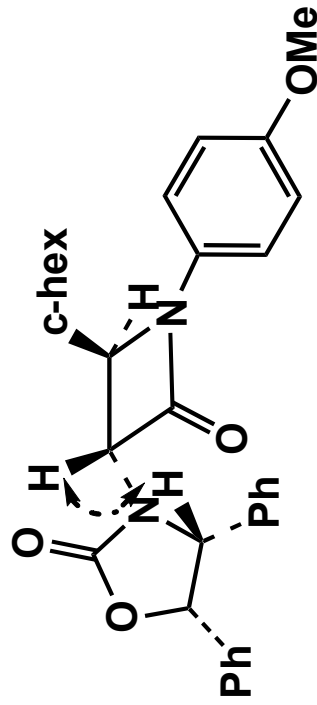






# Cosy and NOE Experiment of Compound

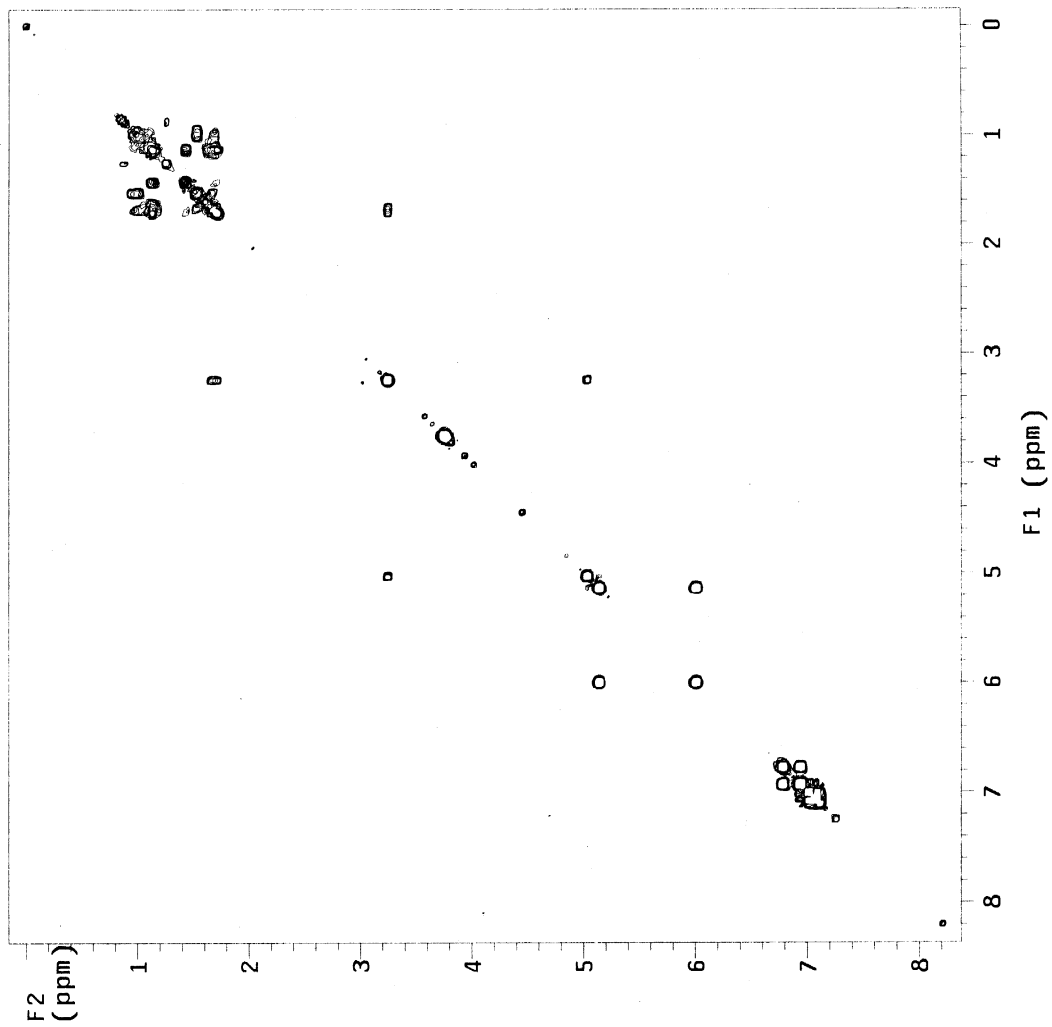
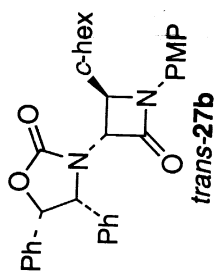
## *trans*-27b



nOe of *trans*-27b



COSY  
400 MHz, CDCl<sub>3</sub>



NOE  
500 MHz, CDCl<sub>3</sub>

