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APPENDICES

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APPENDIX A

ศูนย์วิทยทรัพยากร
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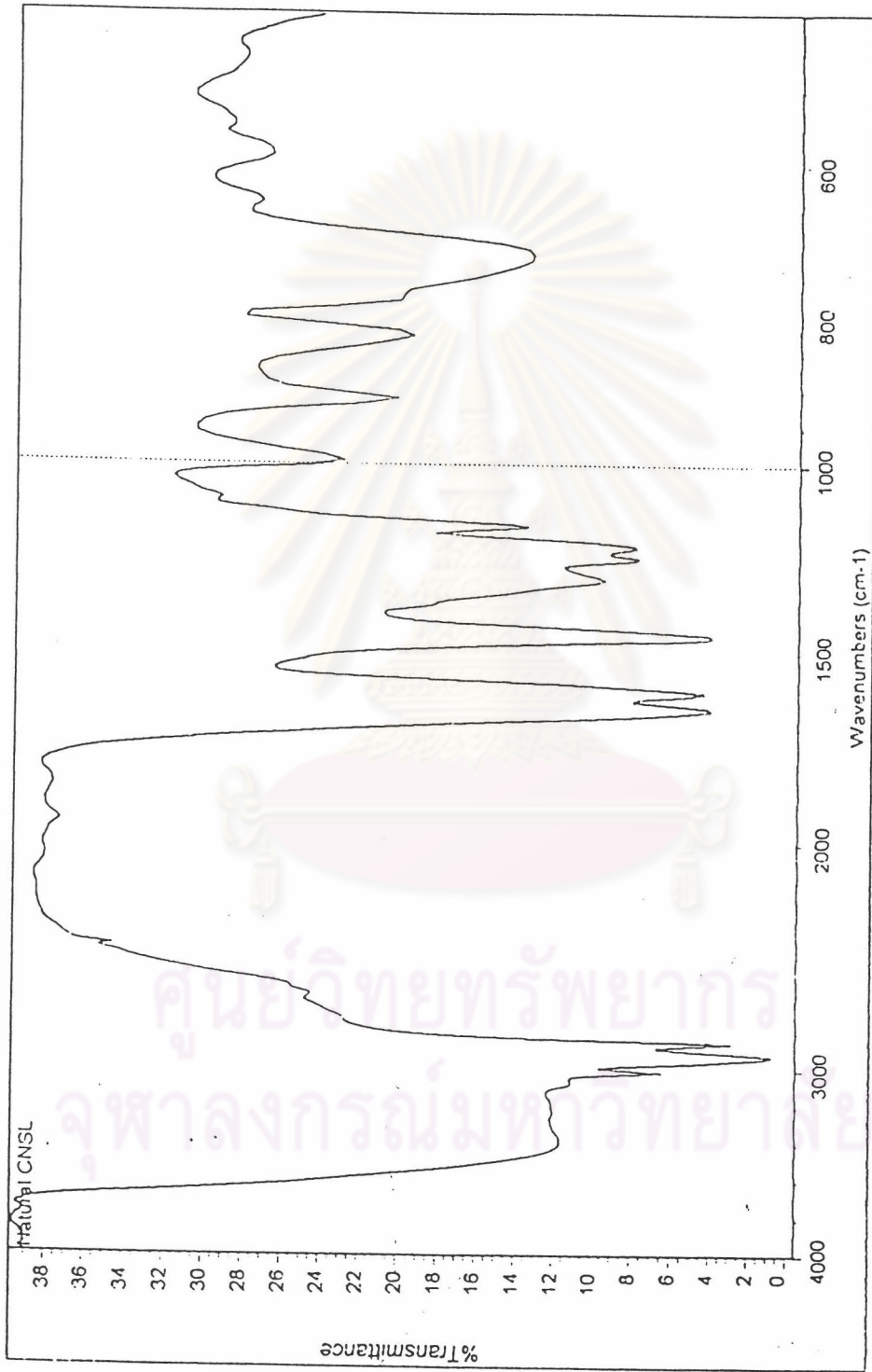


Figure A.1 Infrared spectrum of CNSL.

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Figure A.2 $^1\text{H-NMR}$ spectrum of CNSL.

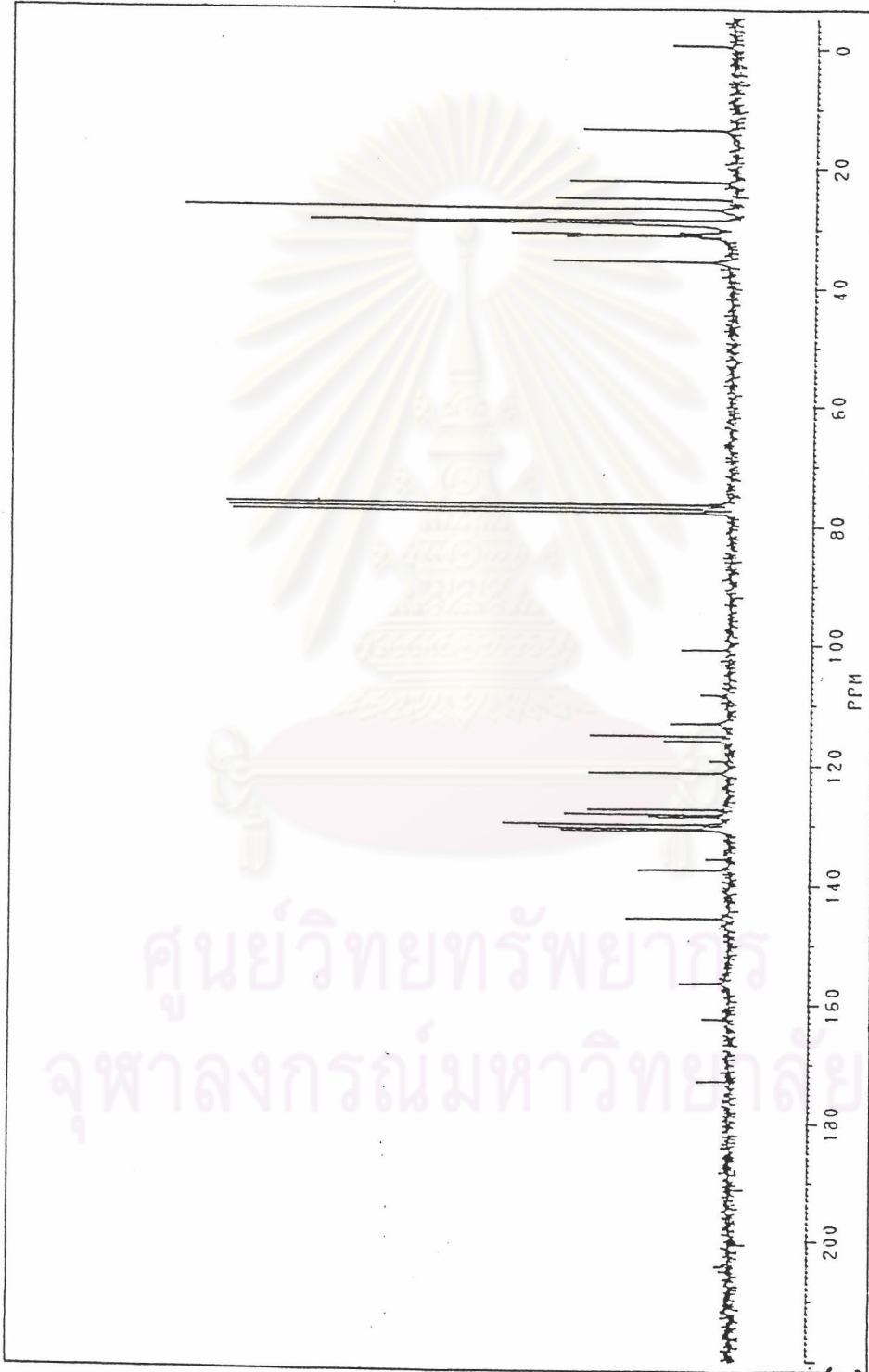


Figure A.3 ^{13}C -NMR spectrum of CNSL.

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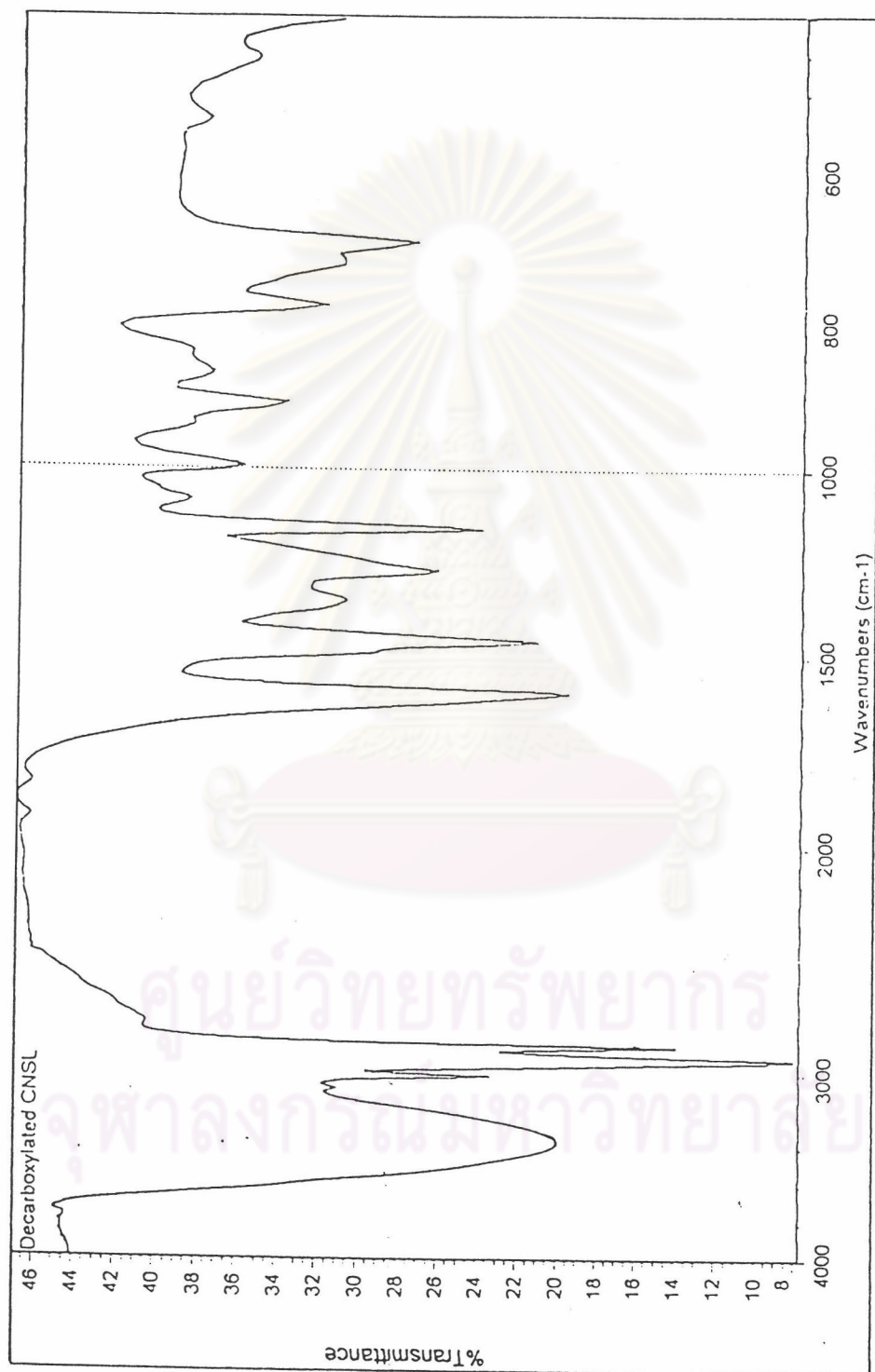


Figure A.4 Infrared spectrum of decarboxylated CNSL.

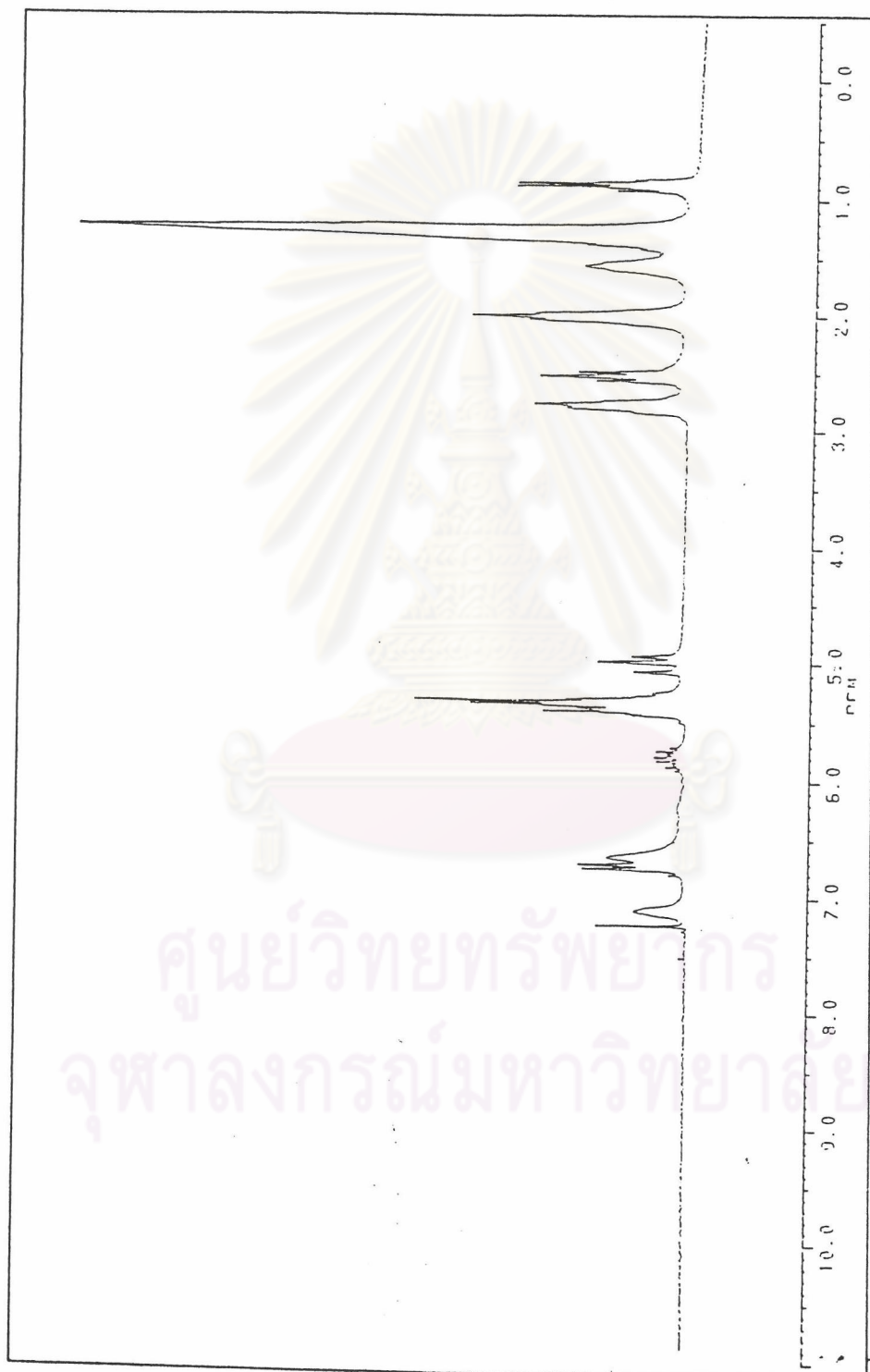


Figure A.5 $^1\text{H-NMR}$ spectrum of decarboxylated CNSL.

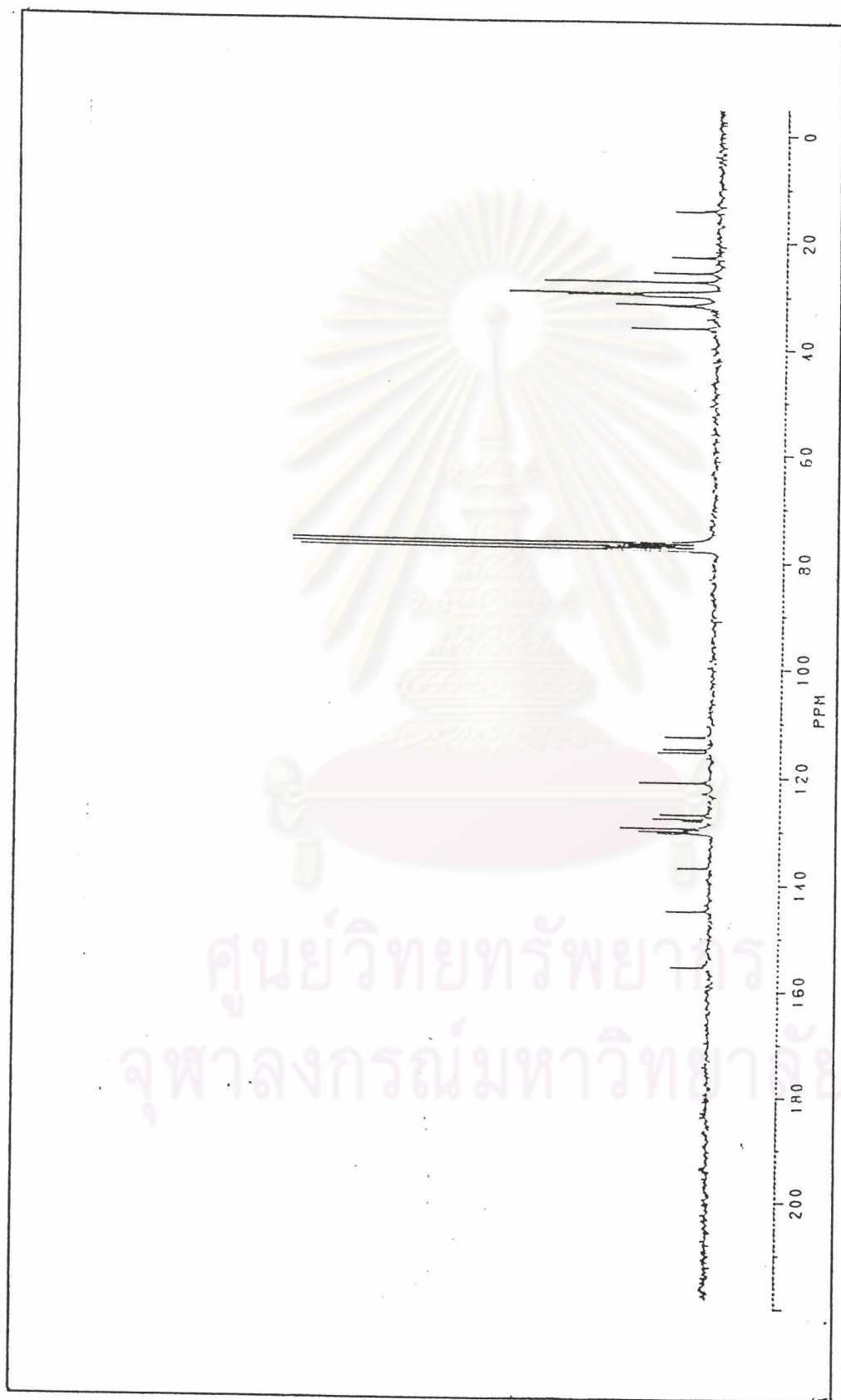


Figure A.6 ^{13}C -NMR spectrum of decarboxylated CNSL.

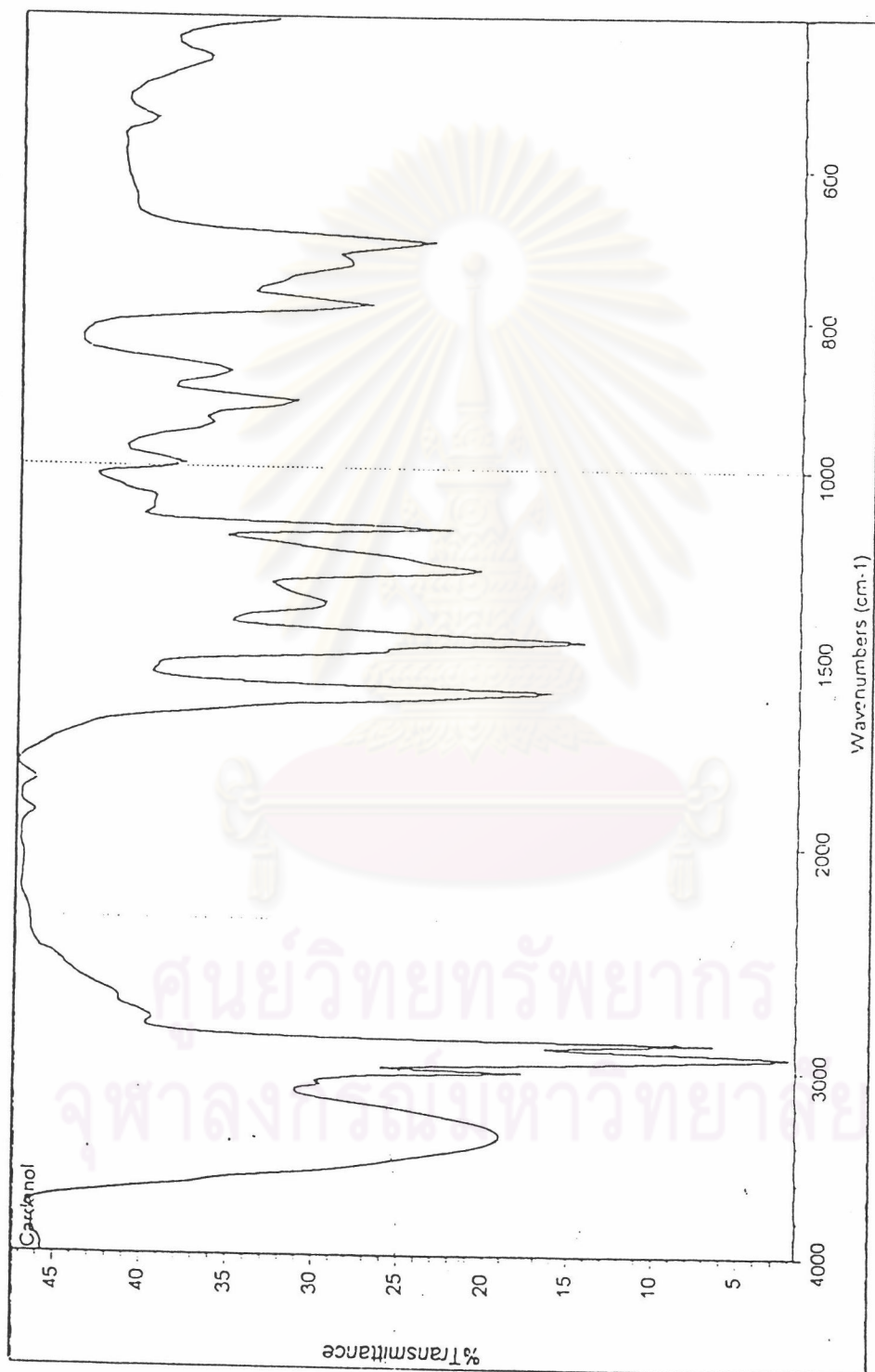


Figure A.7 Infrared spectrum of cardanol.

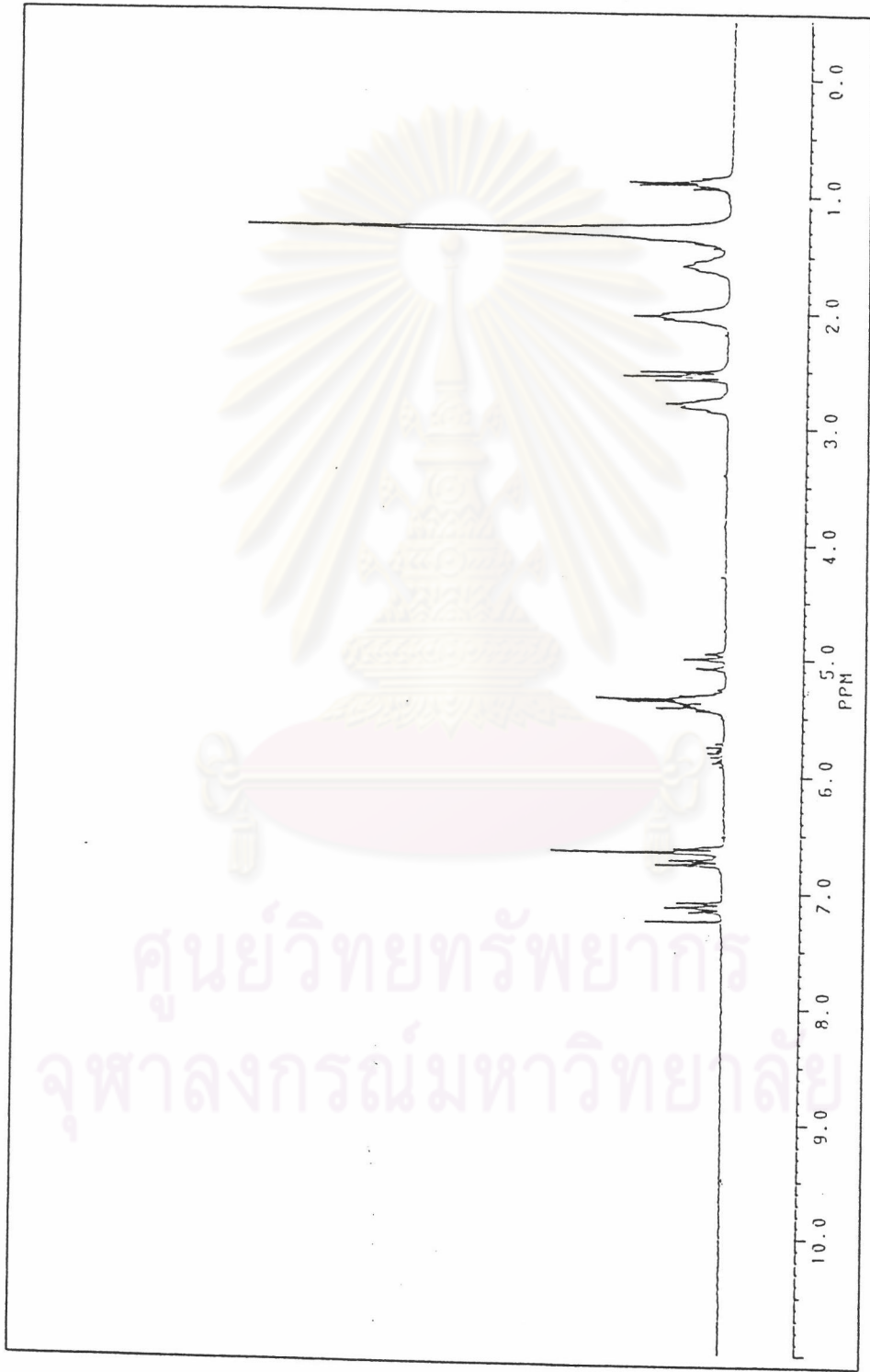


Figure A.8 $^1\text{H-NMR}$ spectrum of cardanol.

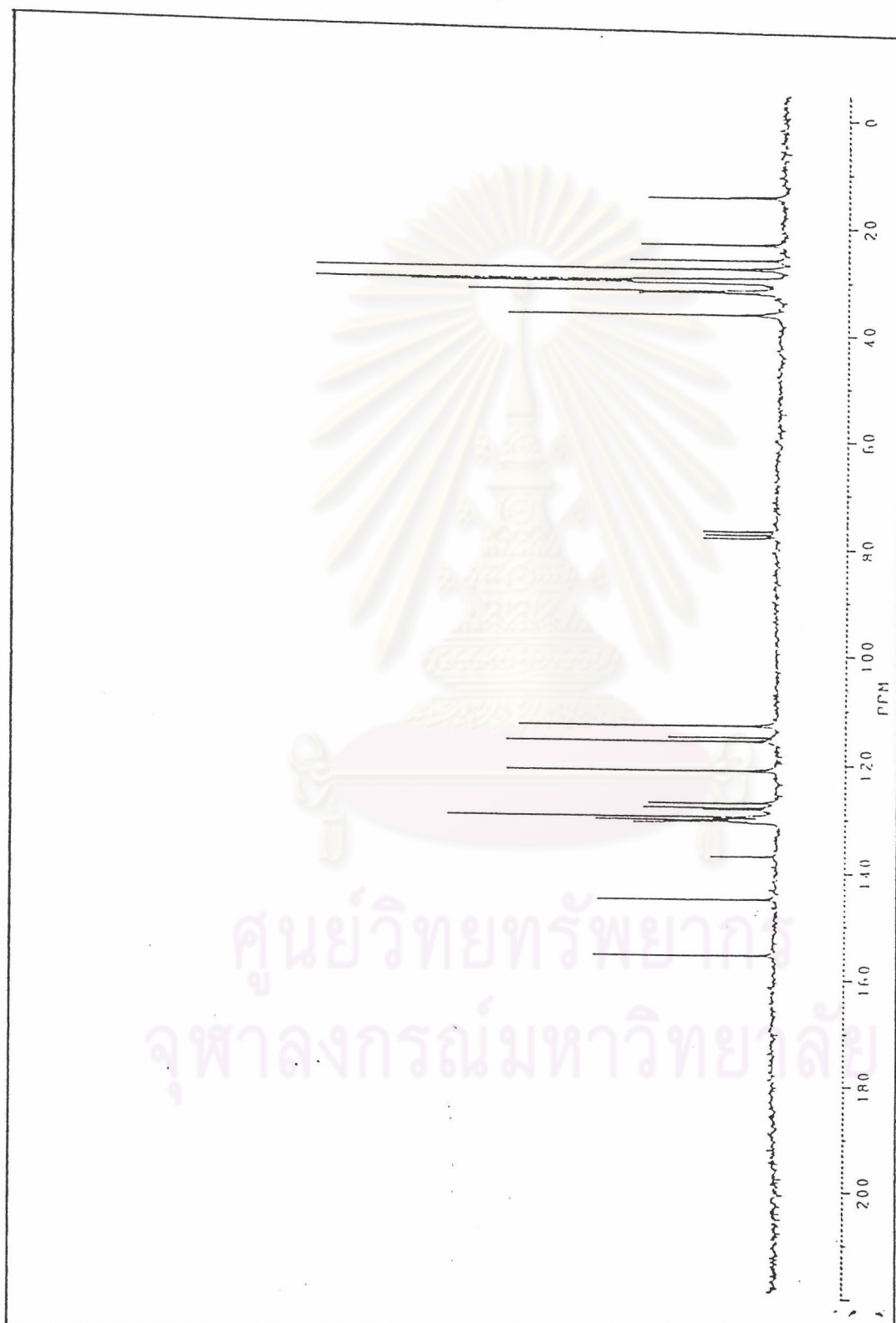


Figure A.9 ^{13}C -NMR spectrum of cardanol.

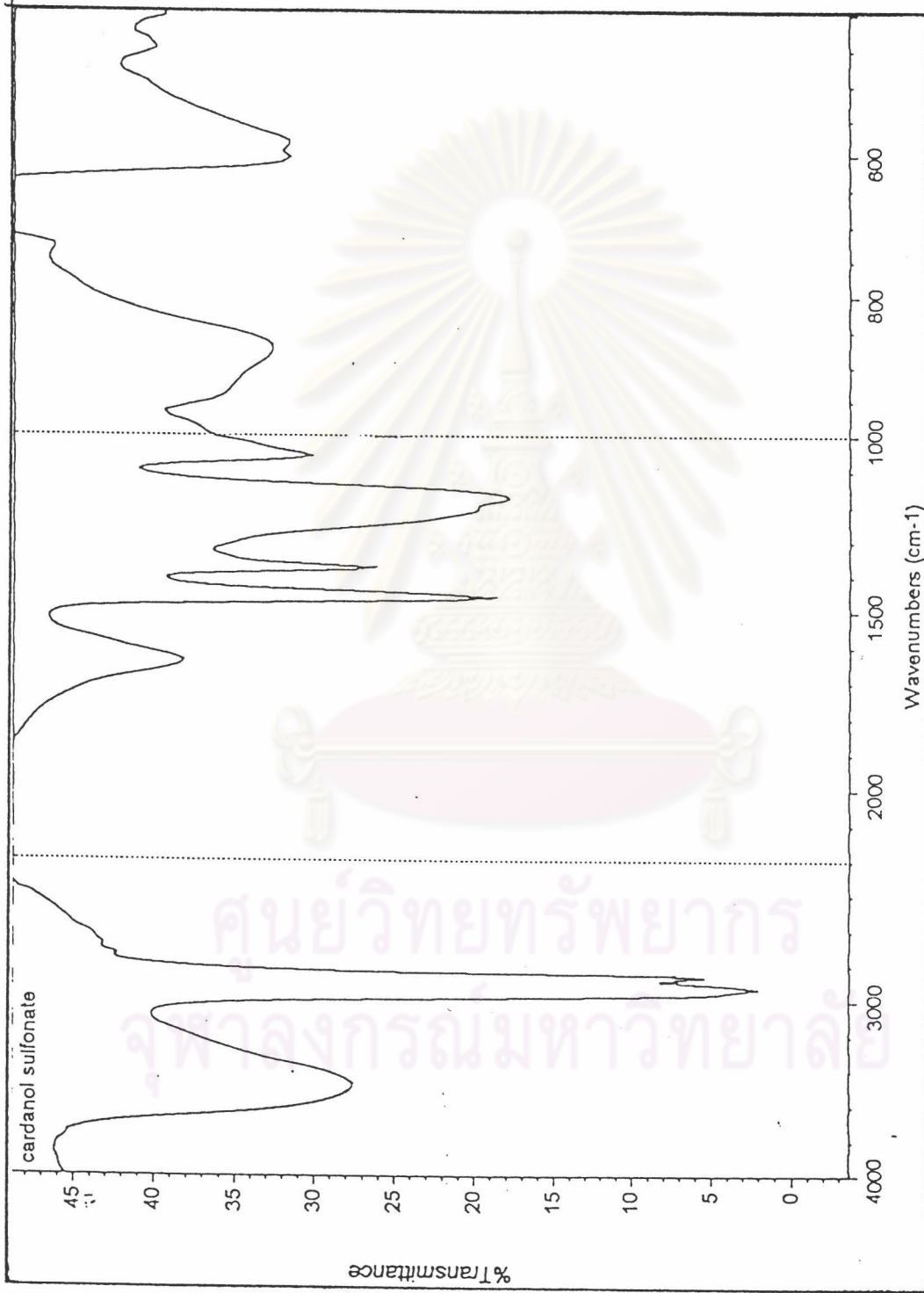


Figure A.10 Infrared spectrum of cardanol sulfonate.

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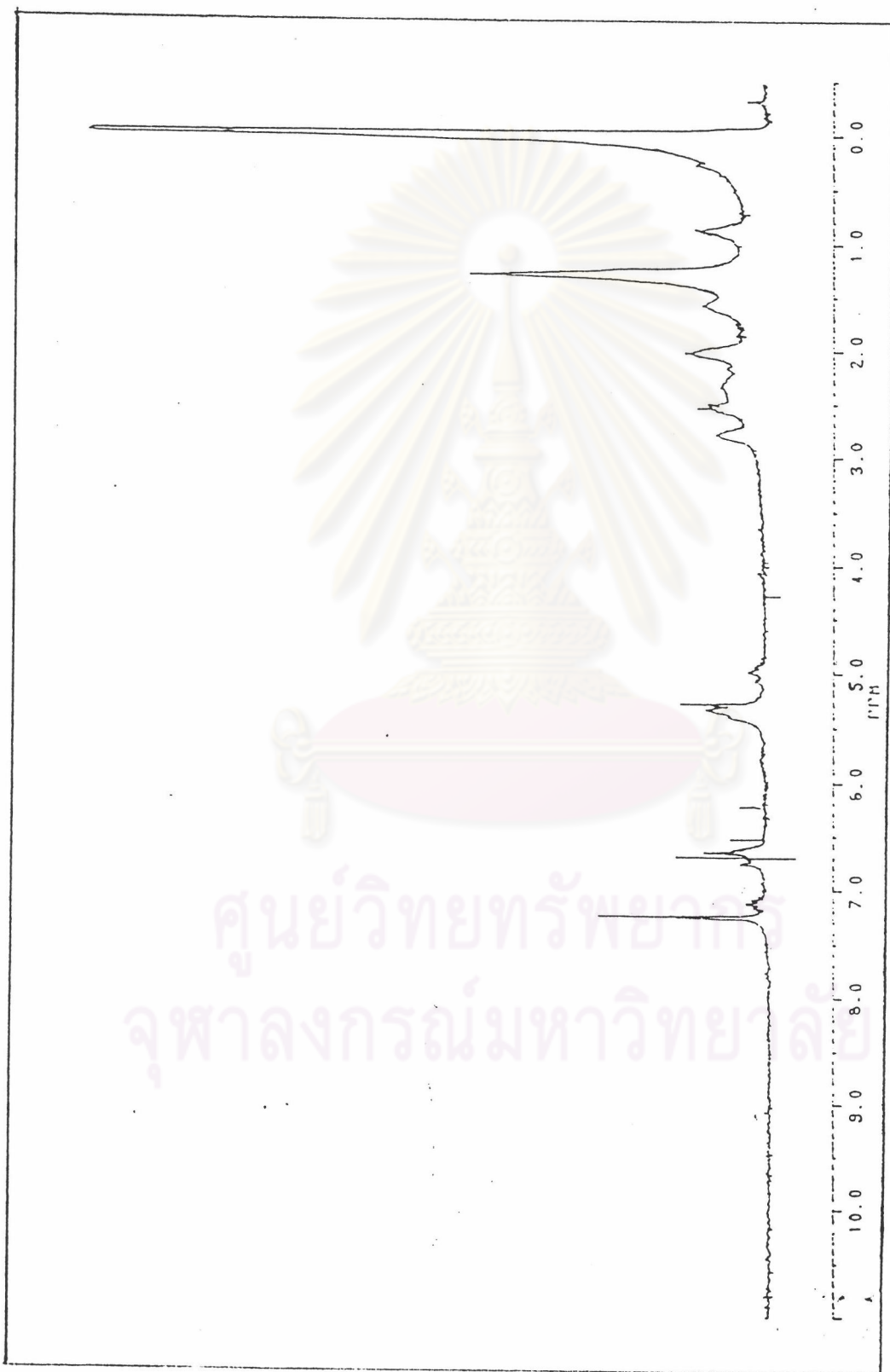


Figure A.11 $^1\text{H-NMR}$ spectrum of cardanol sulfonate.

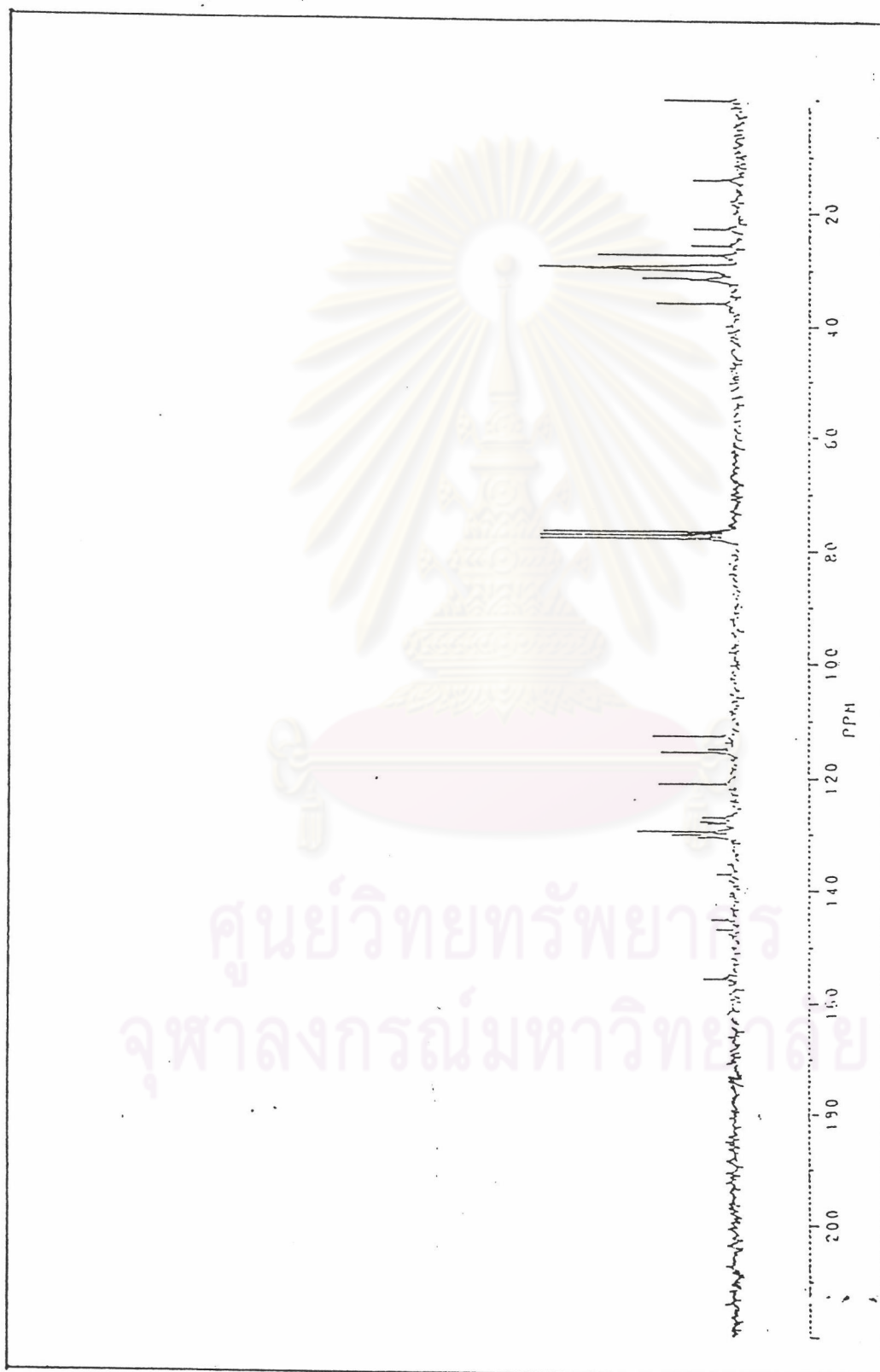


Figure A.12 ^{13}C -NMR spectrum of cardanol sulfonate.



APPENDIX B

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APPENDIX B

Table B.1 Surface tension of dodecylbenzene sulfonate

%w/v	Concentration(mol/L)	log C	Surface tension (mN/m)
0	0	-	72.80
0.5	0.014	-1.854	32.50
1.0	0.029	-1.537	32.00
2.0	0.058	-1.236	31.50
4.0	0.116	-0.935	30.50
6.0	0.174	-0.759	30.00
8.0	0.232	-0.634	29.50
10.0	0.290	-0.537	29.00
15.0	0.435	-0.361	28.00
20.0	0.580	-0.236	28.00
25.0	0.725	-0.139	28.00
30.0	0.870	-0.060	28.00

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Table B.2 Surface tension of cardanol sulfonate

%w/v	Concentration(mol/L)	log C	Surface tension (mN/m)
0	0	-	72.80
0.5	0.012	-1.921	43.00
1.0	0.025	-1.602	41.50
2.0	0.050	-1.301	37.50
4.0	0.099	-1.004	35.00
6.0	0.149	-0.827	34.00
8.0	0.199	-0.701	33.50
10.0	0.248	-0.605	33.00
15.0	0.372	-0.429	32.50
20.0	0.496	-0.304	32.25
25.0	0.620	-0.207	32.25
30.0	0.744	-0.128	32.25

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Table B.3 Reflectance

Before coating with clay soil

Reflectance = 88.03

Before washing	After washing with dodecylbenzene sulfonate	Before washing	After washing with cardanol sulfonate
34.095	76.400	34.000	72.775
34.225	74.480	33.540	72.850
34.260	77.060	33.600	71.740
34.280	76.190	33.675	72.260
33.960	74.070	33.835	72.690
34.390	78.375	34.280	75.120
34.165	76.975	34.295	74.820
34.580	75.995	34.240	73.775
34.015	77.850	34.380	74.835
34.320	75.295	34.225	74.405
Average:34.229	76.269	34.007	73.527

% Detergency(each detergent)

$$= \left\{ \frac{(\text{After washing} - \text{Before washing})}{(\text{Before coating with clay soil} - \text{Before washing})} \right\} \times 100$$

$$\% \text{ Detergency} = \left\{ \frac{\% \text{Detergency of synthesis detergent}}{\% \text{ Detergency of dodecylbenzene sulfonate}} \right\} \times 100$$

VITA

Miss Passapan Peungjitton was born on August 22, 1978 in Bangkok. She received her Bachelor's Degree of Science in Chemistry from the Department of Chemistry, Faculty of Science and Technology, Thammasart University in 2000. She began her Master study in the Program of the Petrochemical and Polymer Science, Faculty of Science, Chulalongkorn University in 2000 and completed the program in 2002.



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