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APPENDICES

Appendix A

The calculation of the percentage of hydrogenation

The percentage of hydrogenation was calculated as follows:

(For example, from Figure B-11 in Appendix B)

1	A(5.2ppm)	B(1ppm)
2	6.57	682.1
3	m	n
4	63.611	0.09615
5	%Hydrogenation	
6	90.63849	

Where :

A2 = Olefinic proton (5.2 ppm); peak area

B2 = Total proton of saturated and unsaturated proton (0-2 ppm)

****A4 = Saturated proton****

A4 = B2-(7xA2)/10 ; Unsaturated proton/unit polyisoprene = 7

Saturated proton/unit polyisoprene = 10

****B4 = Unsaturated proton****

B4 = A2/(A2+A4); [proton of unsaturate/(proton of unsaturate + proton of saturate)]

%Hydrogenation = (1-B4) x 100

APPENDIX B

^{1}H-NMR Spectra of Hydrogenated Natural Rubber

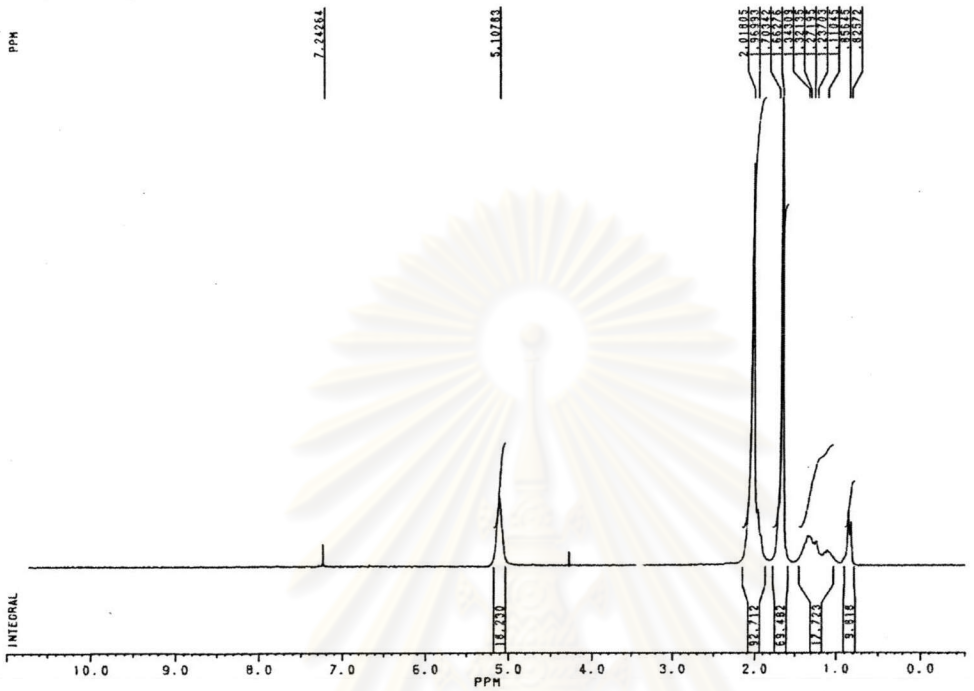


Figure B-1 ^{1}H-NMR Spectra of Hydrogenated Natural Rubber 22% ($CDCl_3$).

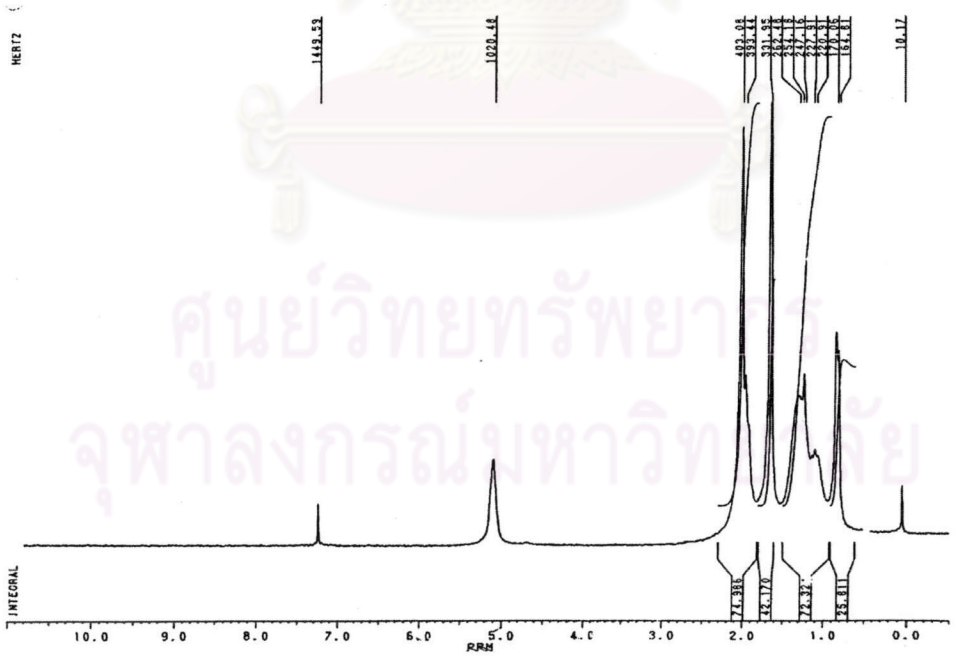


Figure B-2 ^{1}H-NMR Spectra of Hydrogenated Natural Rubber 28% ($CDCl_3$).

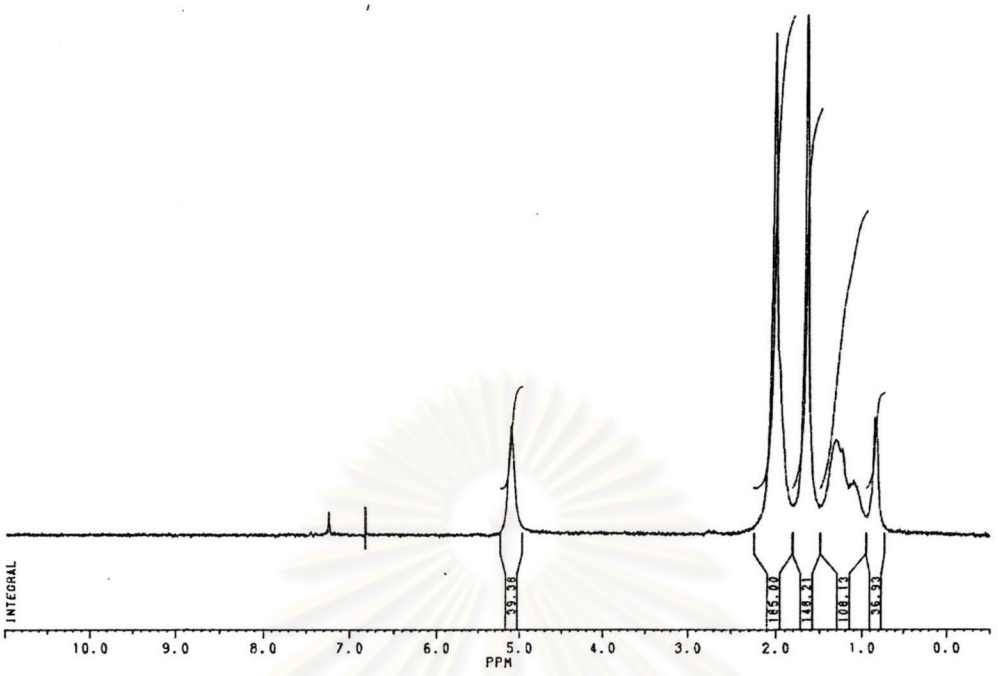


Figure B-3 ^{1}H-NMR Spectra of Hydrogenated Natural Rubber 31% ($CDCl_3$).

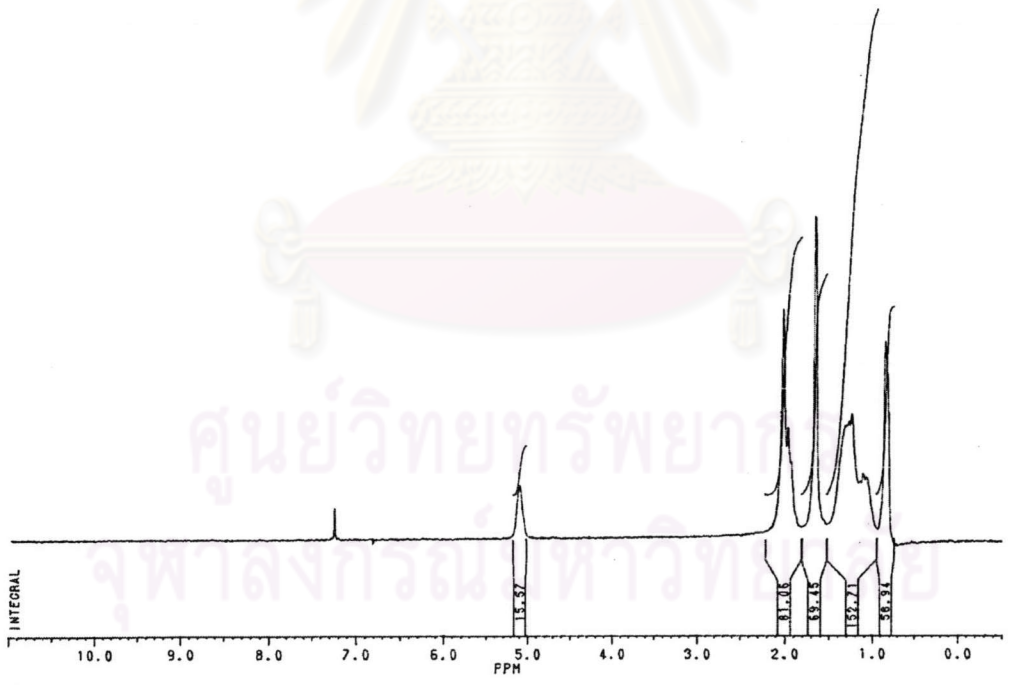


Figure B-4 ^{1}H-NMR Spectra of Hydrogenated Natural Rubber 38% ($CDCl_3$).

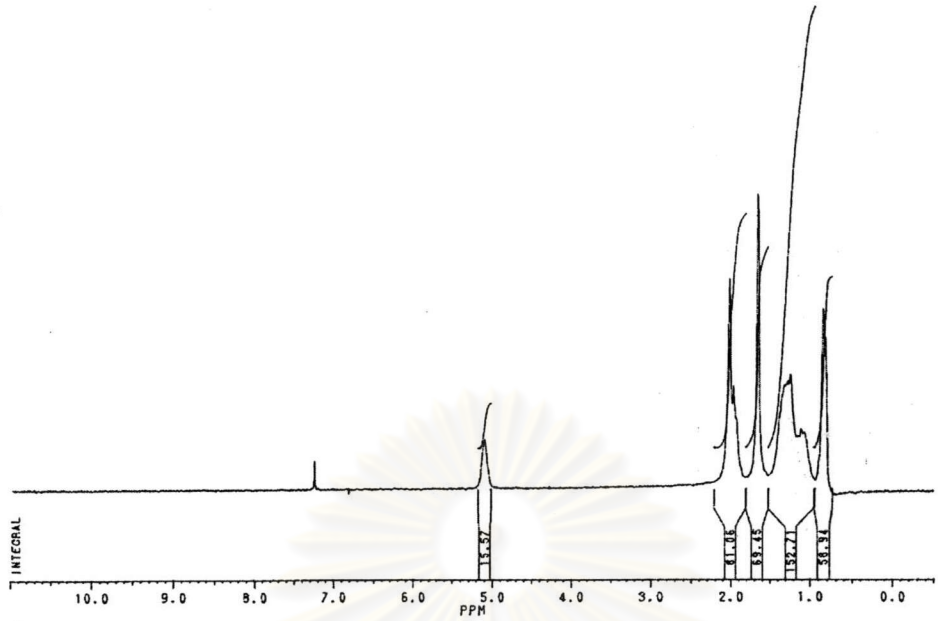


Figure B-5 ^{1}H-NMR Spectra of Hydrogenated Natural Rubber 55% ($CDCl_3$).

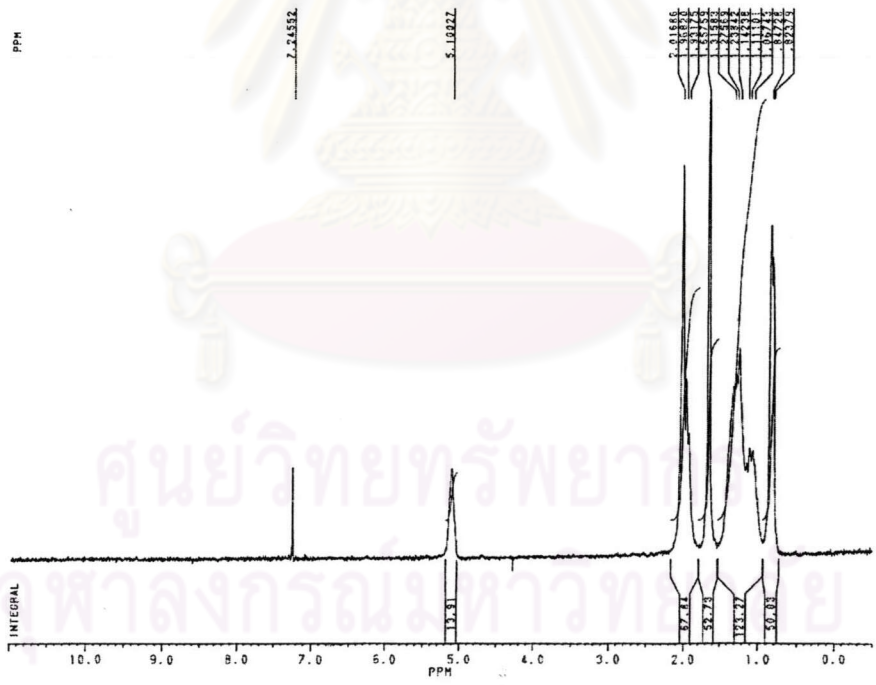


Figure B-6 ^{1}H-NMR Spectra of Hydrogenated Natural Rubber 59% ($CDCl_3$).

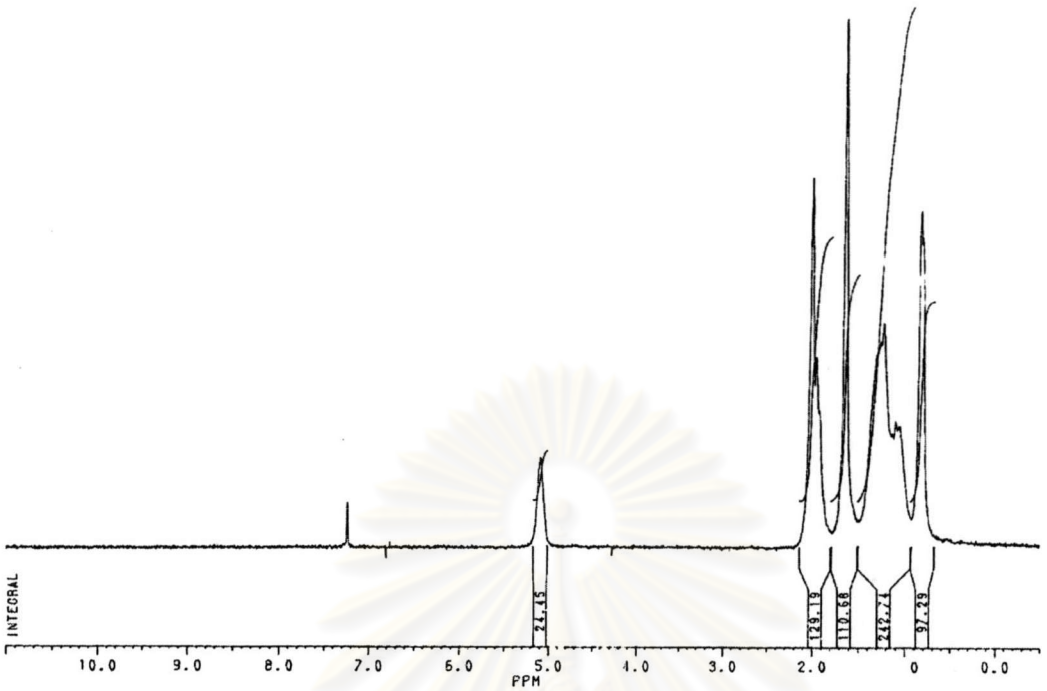


Figure B-7 ^{1}H-NMR Spectra of Hydrogenated Natural Rubber 63% ($CDCl_3$).

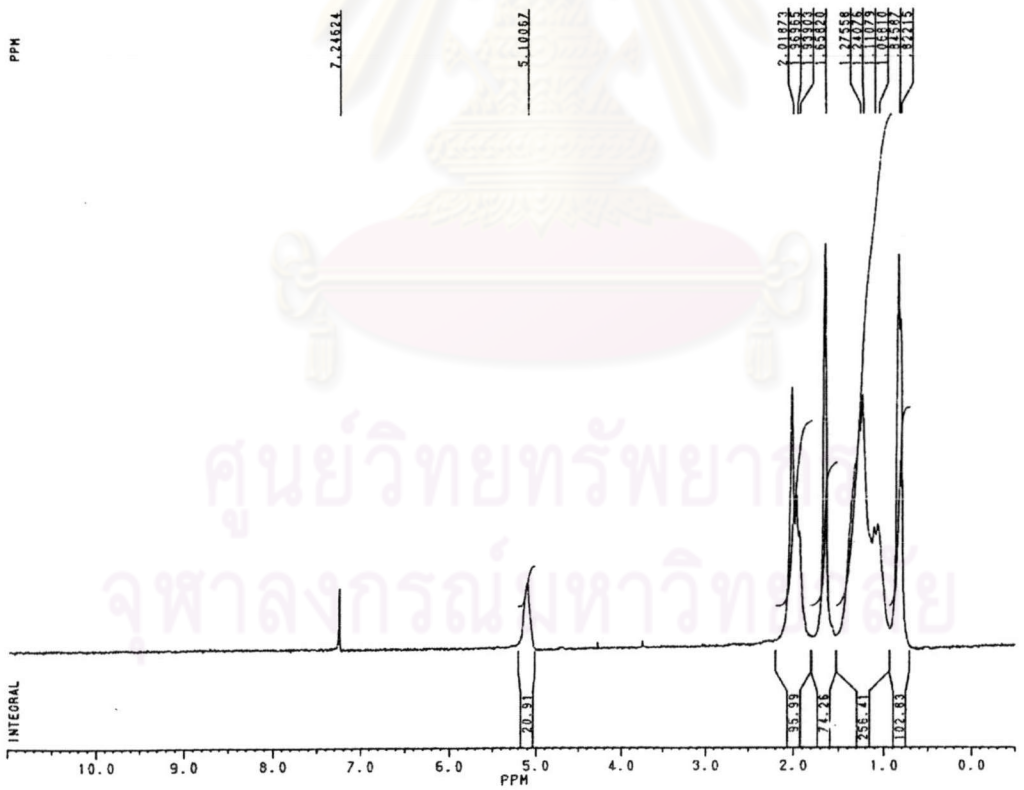


Figure B-8 ^{1}H-NMR Spectra of Hydrogenated Natural Rubber 68% ($CDCl_3$).

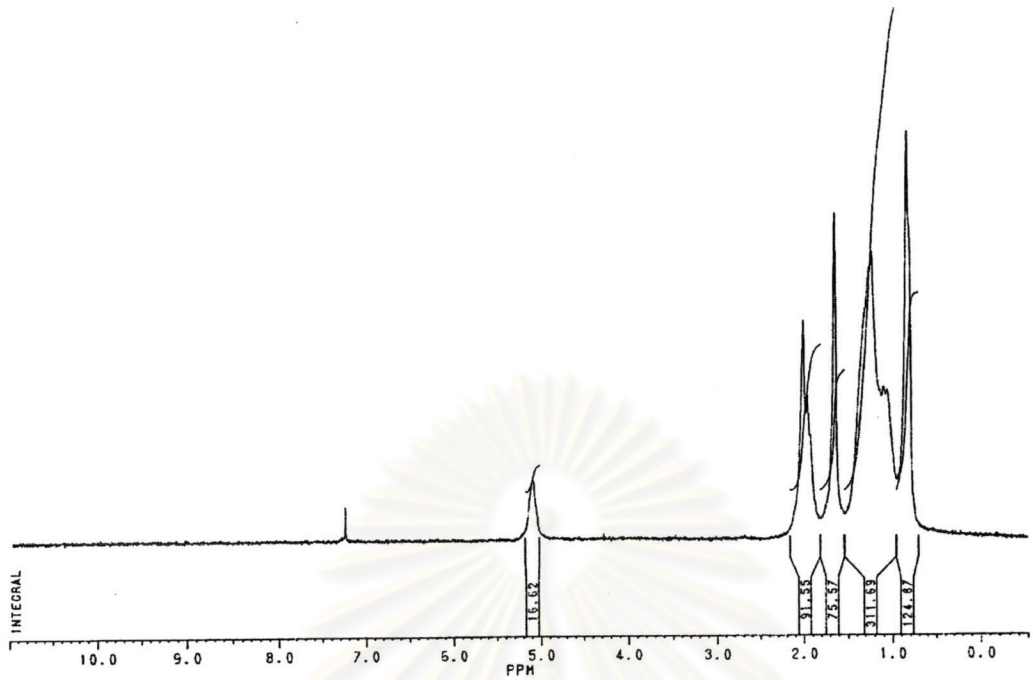


Figure B-9 ^{1}H-NMR Spectra of Hydrogenated Natural Rubber 75% ($CDCl_3$).

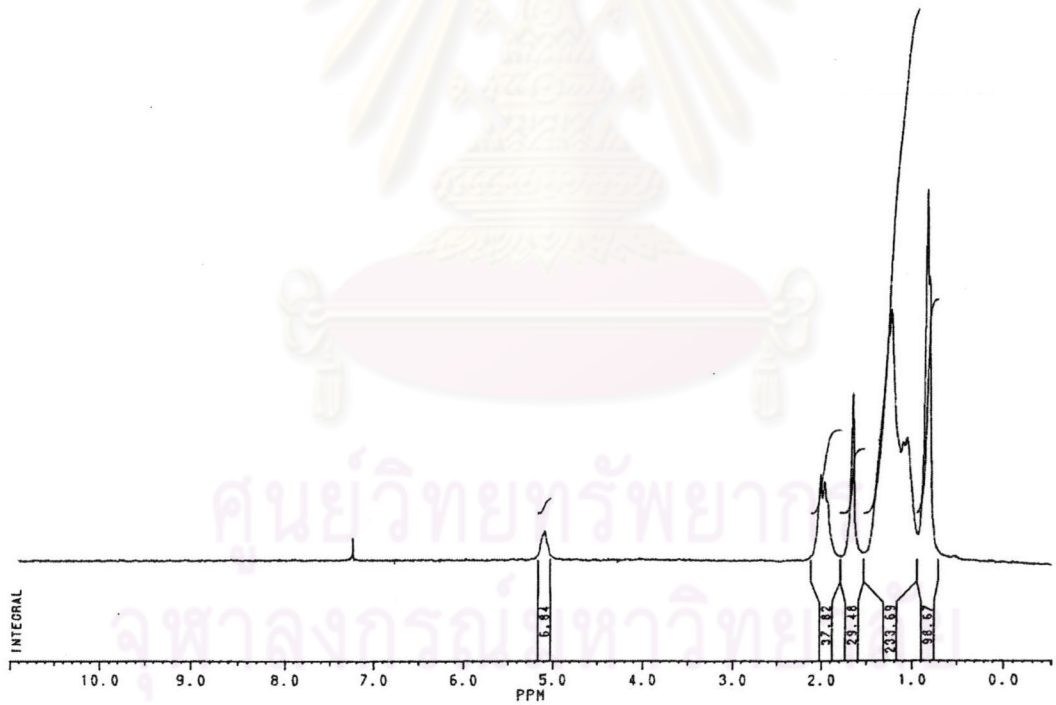


Figure B-10 ^{1}H-NMR Spectra of Hydrogenated Natural Rubber 84% ($CDCl_3$).

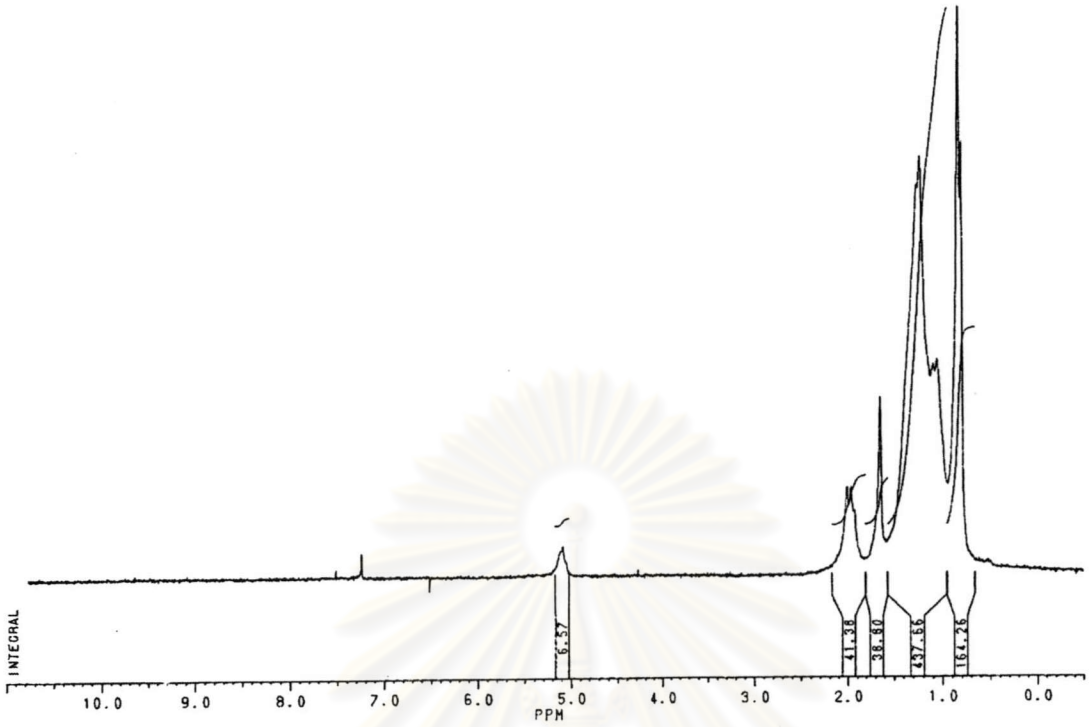
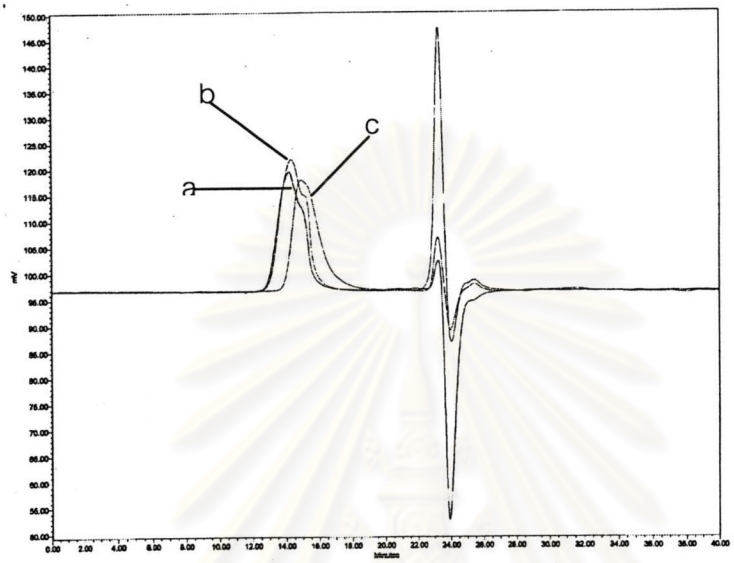


Figure B-11 ^{1}H-NMR Spectra of Hydrogenated Natural Rubber 91% ($CDCl_3$).

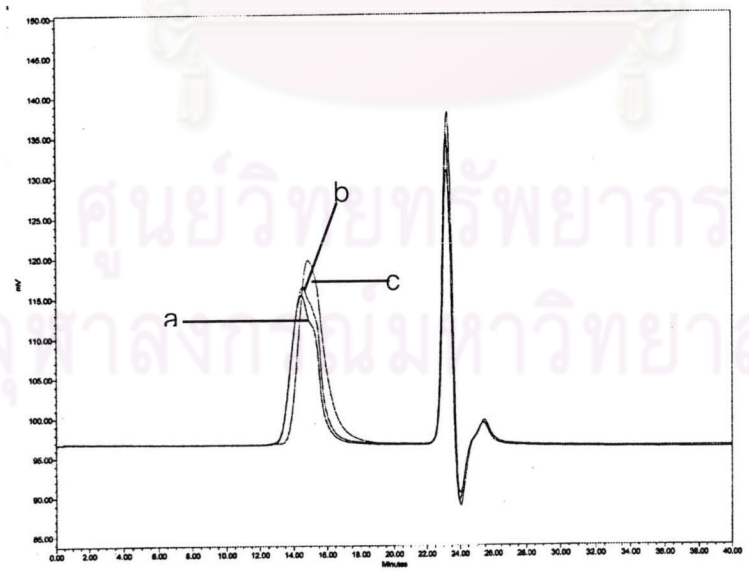
APPENDIX C

A plot of refractive index (RI) versus elution volume obtained from GPC

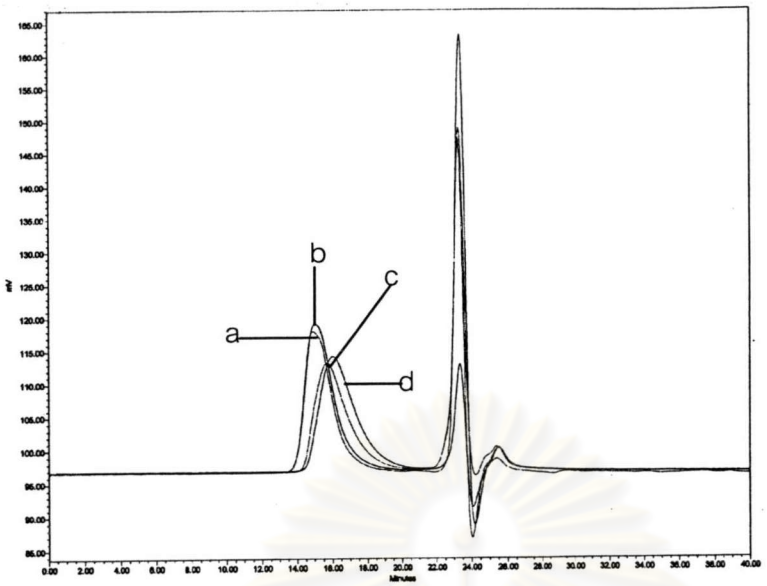
The Overlaid chromatogram of natural rubber and hydrogenated rubber



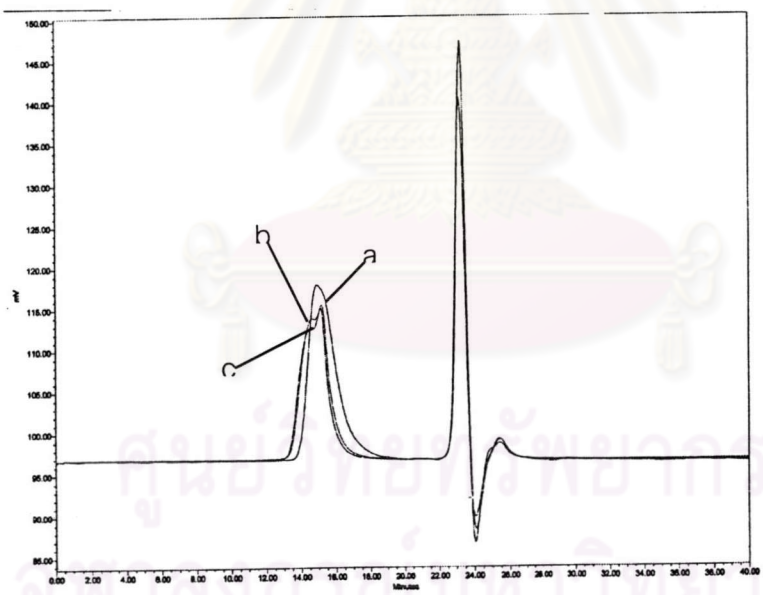
FigureC.1 The effect of catalyst on average molecular weight (a) Natural rubber (b) Non-catalyst (c) Hydrogenated natural rubber (Entry No. 4).



FigureC.2 The effect of hydrogen pressure on average molecular weight (a) P 30 bar (b) P 35 bar (c) P 40 bar.



FigureC.3 The effect of temperature on average molecular weight (a) T 100 °C (b) T 120 °C (c) T 130 °C (d) T 150 °C.



FigureC.4 The effect of catalyst amount on average molecular weight (a) catalyst 0.09 g (b) catalyst 0.13 g (c) catalyst 0.15 g .

VITA

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