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APPENDICES

APPENDIX A

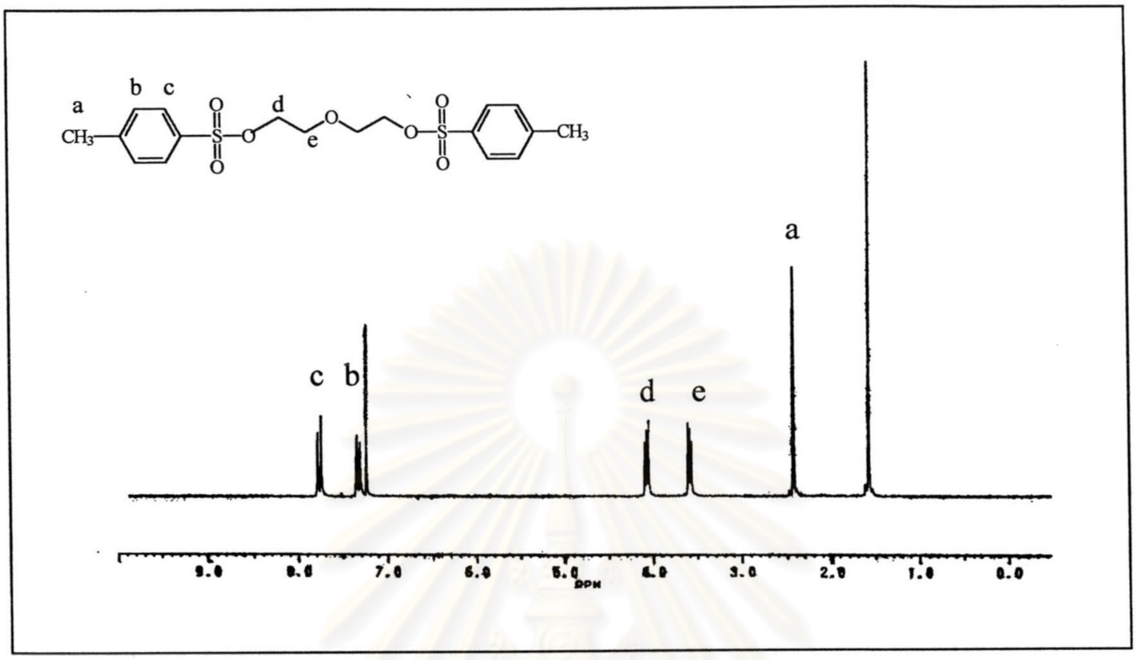


Figure A1 The ^{1}H-NMR spectrum of tosylate ester of diethyleneglycol, **1**

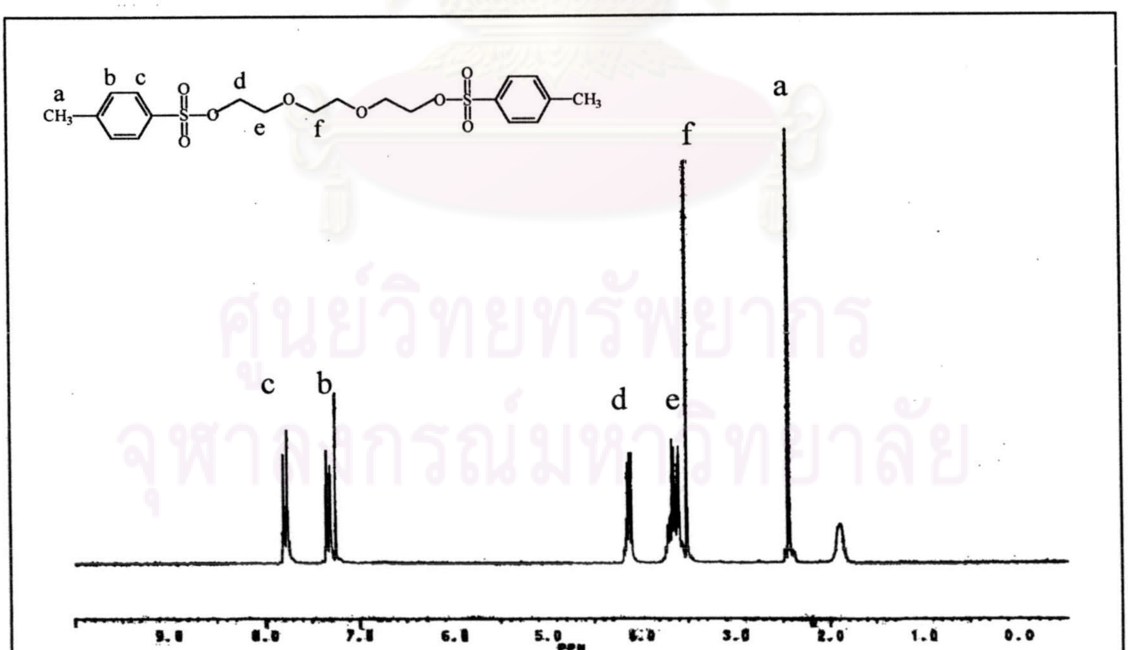


Figure A2 The ^{1}H-NMR spectrum of tosylate ester of triethyleneglycol, **2**

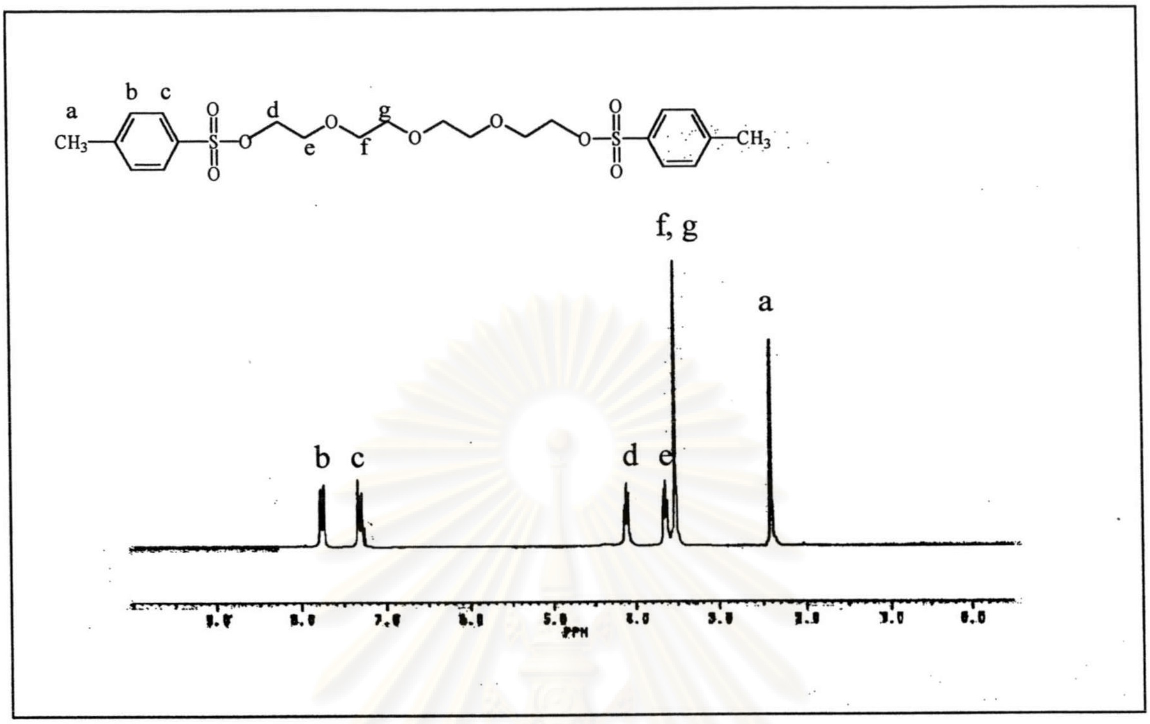


Figure A3 The ^{1}H-NMR spectrum of tosylate ester of tetraethyleneglycol, **3**

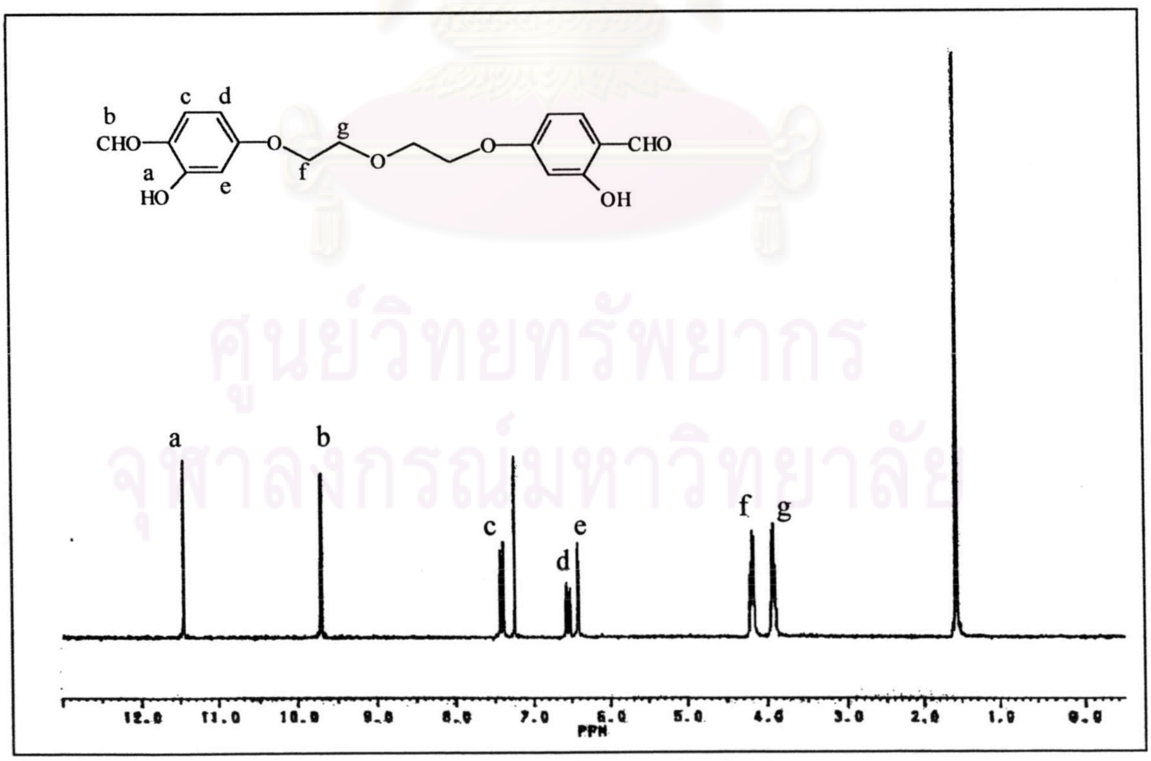


Figure A4 The ^{1}H-NMR spectrum of diethyleneglycol bis(4-salicyly)ether, **4**

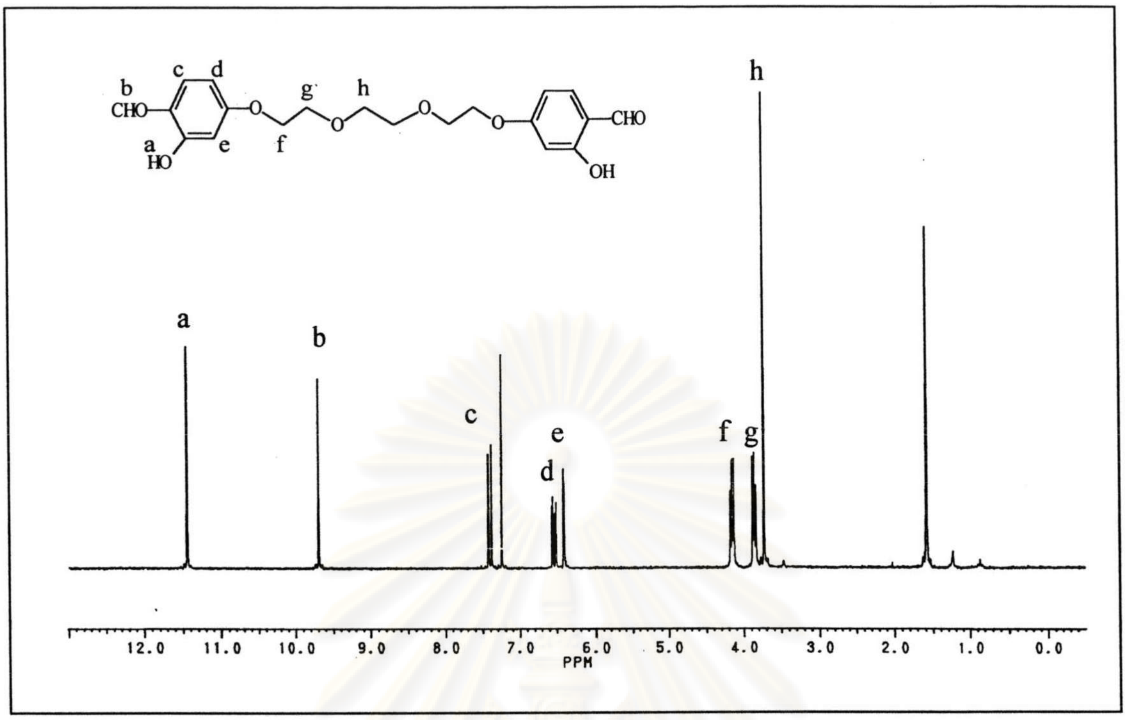


Figure A5 The ^{1}H-NMR spectrum of triethyleneglycol bis(4-salicylyl)ether, **5**

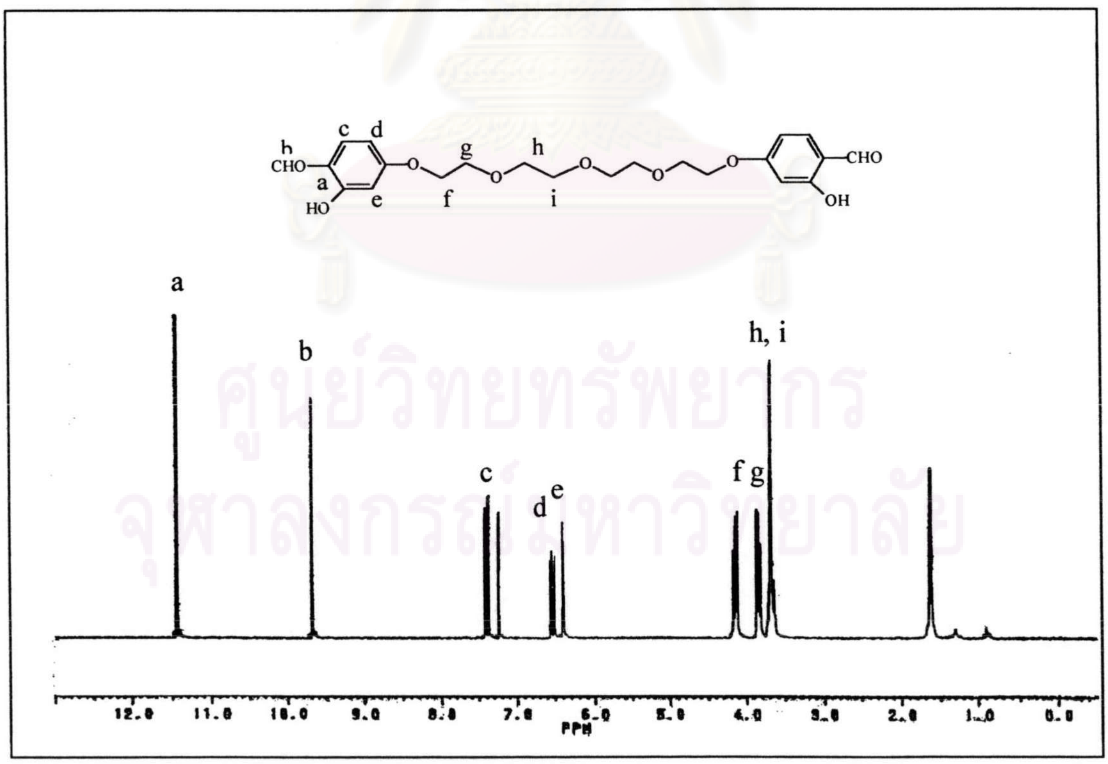


Figure A6 The ^{1}H-NMR spectrum of tetraethyleneglycol bis (4-salicylyl)ether, **6**

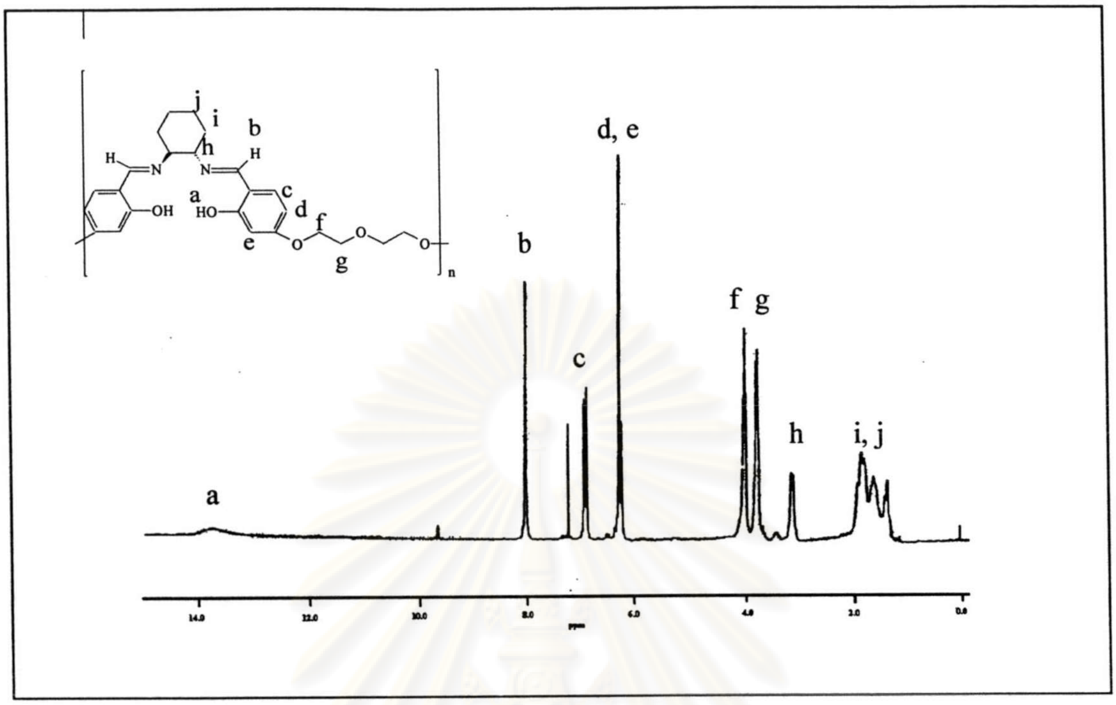


Figure A7 The ^{1}H-NMR spectrum of polymeric diethyleneglycol salen, 7

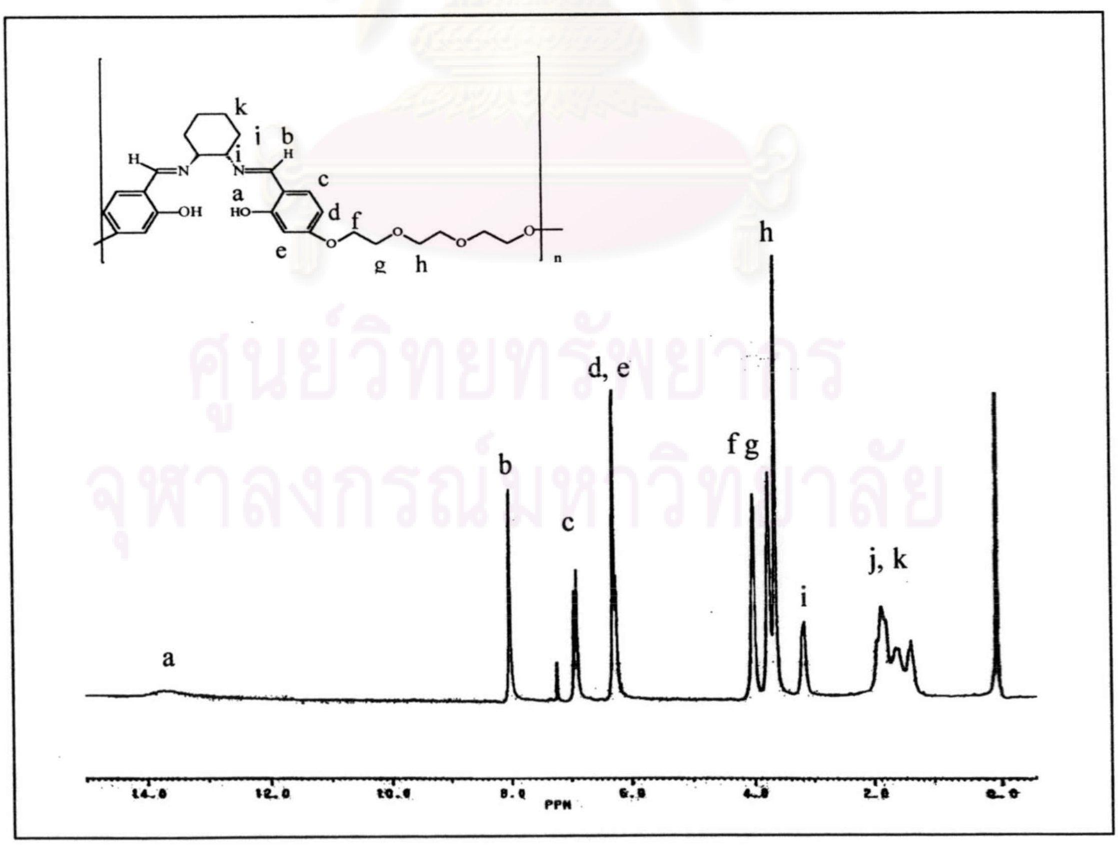


Figure A8 The ^{1}H-NMR spectrum of polymeric triethyleneglycolic salen, **8**

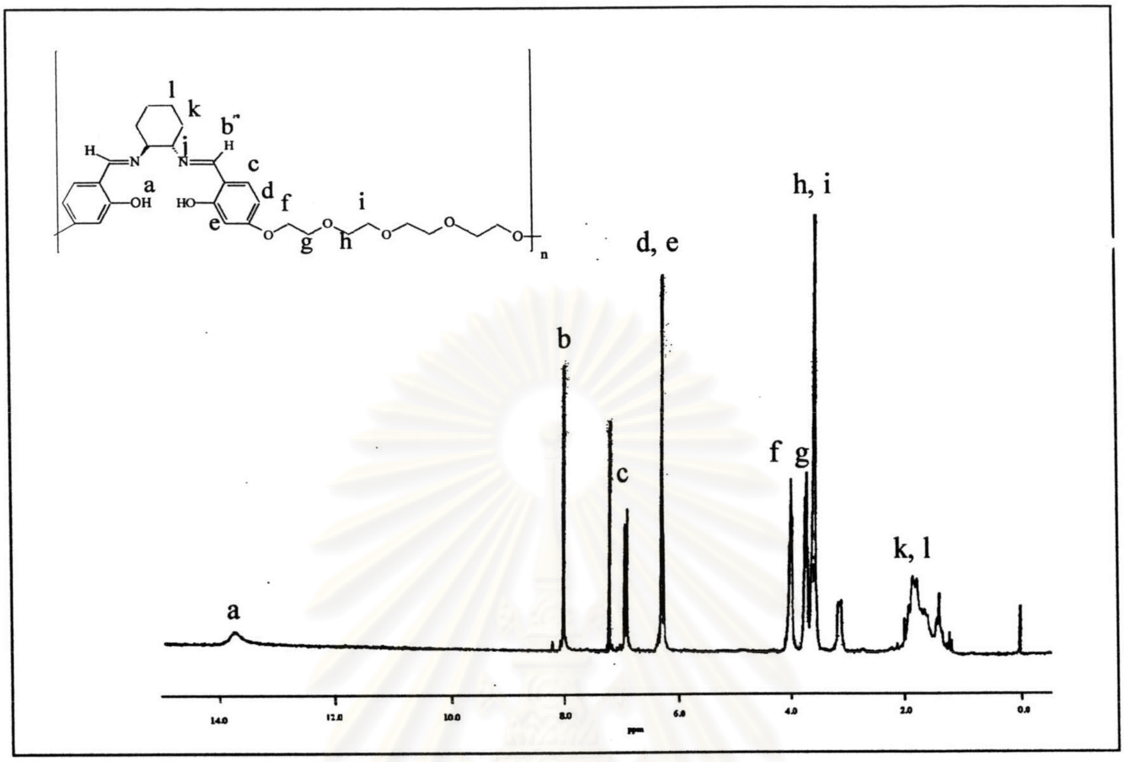


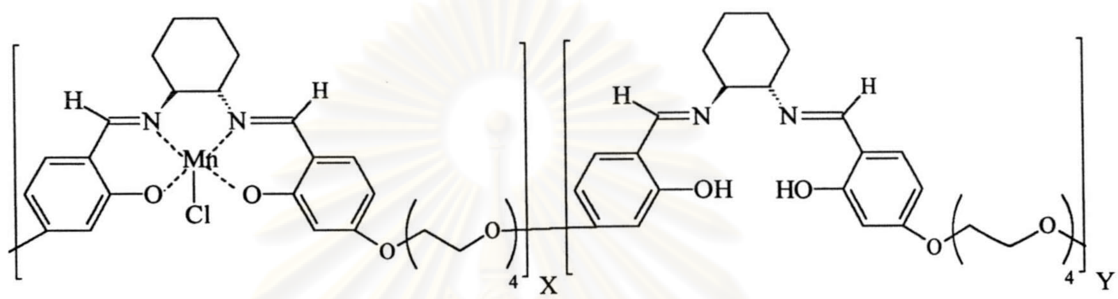
Figure A9 The ^{1}H-NMR spectrum of polymeric tetraethyleneglycolic salen, **9**

APPENDIX B

The calculation of the degree of complexation obtained from AAS

1. $(Mn\text{-}(EG)_4sal)_n$ complex

The molecular weight used in this calculation referred from the structure of repeating unit of polymeric complex as shown below.



MW_X = 600.5 **MW_Y = 512**

Calibration curve obtained from standard addition method was shown below;

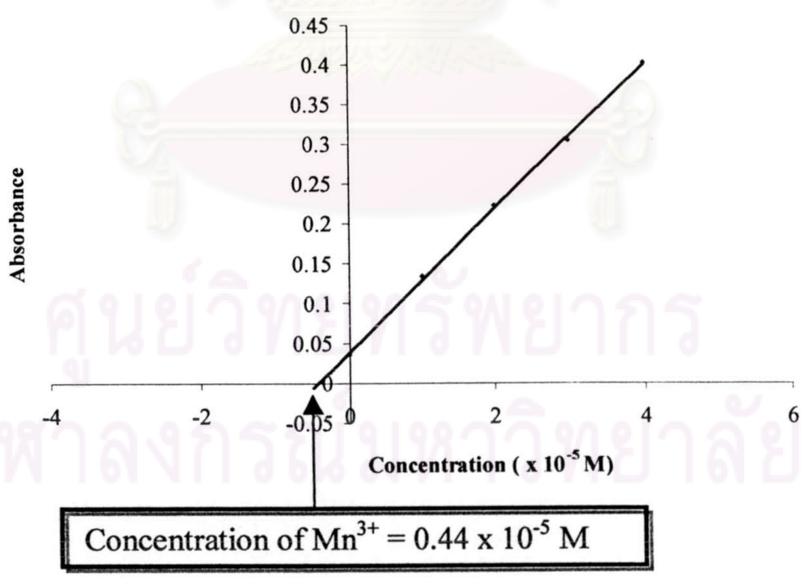


Figure B1 Calibration curve of $(Mn\text{-}(EG)_4sal)_n$ obtained from standard addition method.

The concentration of Mn^{3+} in sample $= 0.44 \times 10^{-5}$ M

$= 2.48 \times 10^{-4}$ grams

From the structure, the repeating units X and Y could be calculated from;

$$600.5X + 512Y = \text{weight of sample}$$

$$= 6.70 \times 10^{-3} \text{ grams} \qquad (1)$$

$$54.98X = \text{weight of } Mn^{3+}$$

$$= 2.48 \times 10^{-4} \text{ grams} \qquad (2)$$

thus $X = 4.51 \times 10^{-6}$ mole

Substituted X into equation (1)

$$600.5\,(4.51 \times 10^{-6}) + 512Y = 6.70 \times 10^{-3} \text{ grams}$$

$$Y = 7.80 \times 10^{-6} \text{ mole}$$

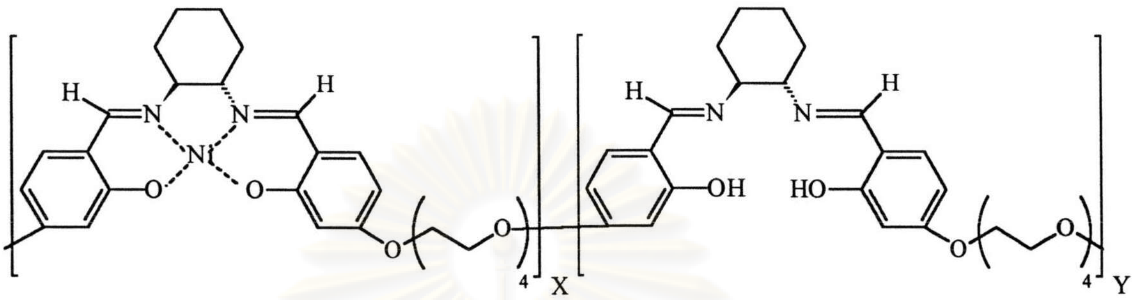
$$\%\ Mn^{3+} = \frac{X}{X+Y} \times 100$$

$$= \frac{4.51 \times 10^{-6}}{4.51 \times 10^{-6} + 7.80 \times 10^{-6}} \times 100$$

$$= 37\%$$

2. $(Ni\text{-}(EG)_4sal)_n$ complex

The molecular weight used in this calculation referred from the structure of repeating unit of polymeric complex as shown below.



MW_X = 569 **MW_Y = 512**

Calibration curve obtained from standard addition method was shown below;

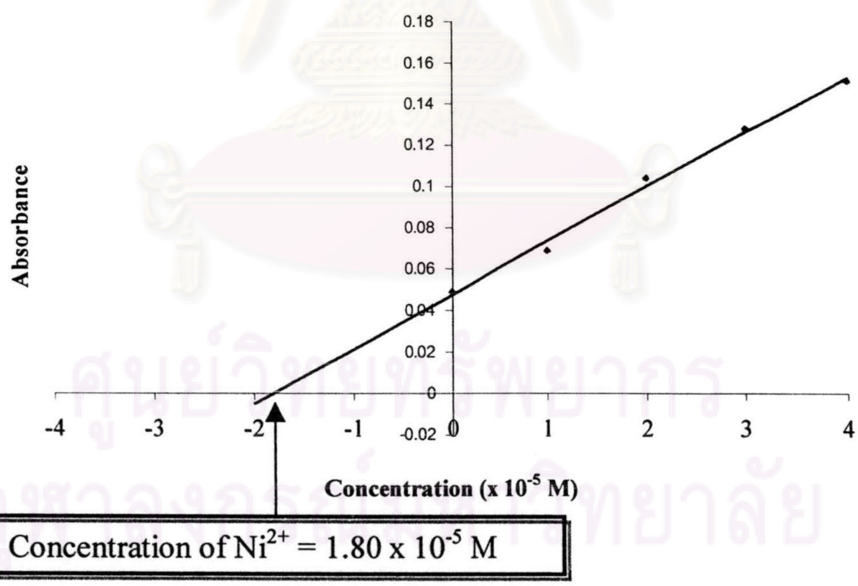


Figure B2 Calibration curve of $(Ni\text{-}(EG)_4sal)_n$ obtained from standard addition method.

The concentration of Ni^{2+} in sample = 1.80×10^{-5} M

= 1.05×10^{-3} grams

From the structure, the repeating units X and Y could be calculated from;

$569X + 512Y$ = weight of sample

= 9.20×10^{-3} grams (1)

$58.71X$ = weight of Ni^{2+}

= 1.05×10^{-3} grams (2)

thus X = 1.79×10^{-5} mole

Substituted X into equation (1)

$569 (1.79 \times 10^{-5}) + 512Y$ = 9.20×10^{-3} grams

Y = -1.90×10^{-6} mole

Since obtained Y value was negative, the $\%Ni^{2+}$ in the $(Ni\text{-}(EG)_4sal)_n$ was thus approximate 100%.

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