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APPENDICES

1. Calculation of percentage of grafting and total reaction efficiency

From FT-IR spectrometer: The integral area carbonyl (CO) peak (~1730 cm^{-1}) and CH bending peak (~1368 cm^{-1}) were obtained. The integral ratio was calculated by followed equation.

Integral ratio = Integral area of CO peak/integral area of CH bending peak

For example: The integral area of CO peak, integral area of C-H bending peak and integral ratio of HDPE modified with 5 % wt MMA and DCP:MMA = 1:60 equivalent mole were shown as followed:

	Crude	Purified
Integral area of CO peak	1.8452	1.2665
Integral area of C-H bending peak	0.6898	0.9411
Integral ratio	2.6749	1.3458

Percent weight of MMA in sample was calculated from the equation that obtained from calibration curve (Figure 3.1).

Integral ratio = 0.9387 x percent weight of MMA in sample or

Percent weight of MMA in sample = Integral ratio / 0.9387

Then:

Percent weight of MMA in crude sample = 2.6749/0.9387 = 2.87 %, and

Percent weight of MMA in purified sample = 1.3458/0.9387 = 1.44 %

Percentage of grafting and total reaction efficiency were calculated by used percent weight of MMA in purified sample and crude sample which are weight of MMA grafted on HDPE and weight of MMA converted respectively.

PG = Weight of MMA grafted on HDPE / Initial weight of MMA x 100

TE = Weight of MMA converted / Initial weight of MMA x 100

Then

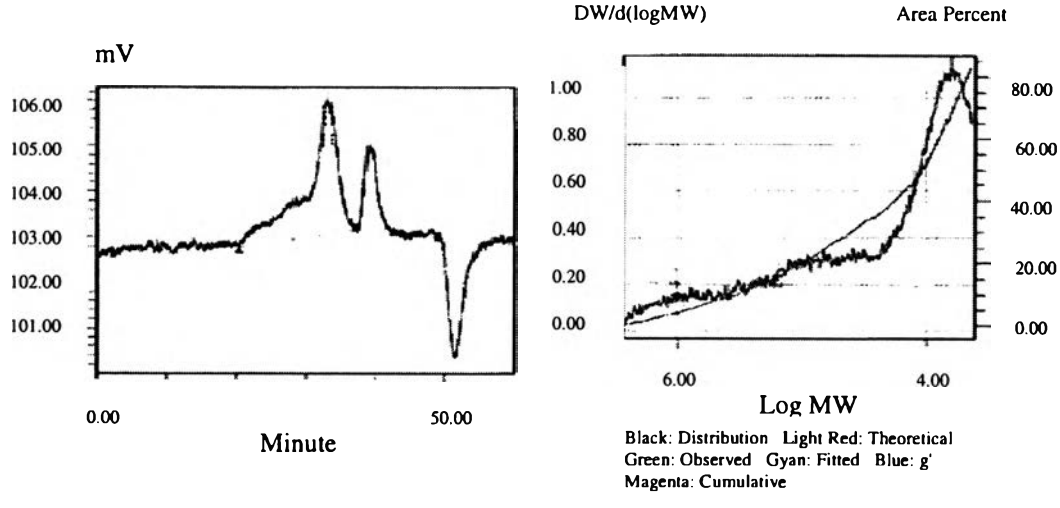
$$PG = 1.44/5 \times 100 = 28.8\ \%$$

$$TE = 2.87/5 \times 100 = 57.33\ \%$$

2. Example of raw data from GPC analysis

Millenium Sample Information

Project Name :	PE	Sample Type :	Broad Unknown
Sample Name :	HDPE H6240B	Volume :	100.00
Vial :	11	Run Time :	60.0 min
Injection :	1	Date Processed :	17/02/99 11:17:26
AM			
Channel :	SATIN	Dilution :	1.00000
Date Acquired :	28/01/99 02:04:05 PM		
Scale Factor :	1.00		
Acq Melt Set :	1.00		
Processing Method :	aun1		

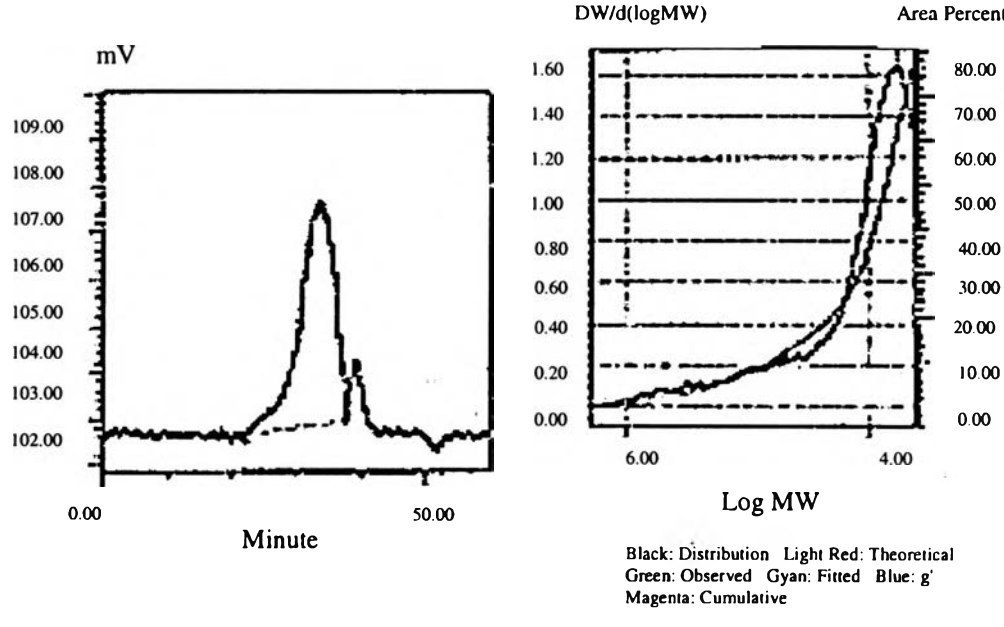


Peak Results

#	Name	Ret Time (min)	% Area	Mn (Daltons)	Mw (Daltons)	Polydispersity
1	HDPE H6240B	33.200	100.00	12750	154870	12.141468

Millenium Sample Information

Project Name :	PE	Sample Type :	Broad Unknown
Sample Name :	5 % MMA 1:60 DCP	Volume :	100.00
Vial :	12	Run Time :	60.0 min
Injection :	1	Date Processed :	17/02/99 11:16:58
AM			
Channel :	SATIN	Dilution :	1.00000
Date Acquired :	28/01/99 03:07:44 PM		
Scale Factor :	1.00		
Acq Melt Set :	1.00		
Processing Method :	aun1		



Peak Results

#	Name	Ret Time (min)	% Area	Mn (Daltons)	Mw (Daltons)	Polydispersity
1	5% MMA 1:60 DCP	31.437	100.00	7567	97259	12.85

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