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จุฬาลงกรณ์มหาวิทยาลัย



APPENDICES

ศูนย์วิทยทรัพยากร
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APPENDIX A

RAW DATA

A-1 Effect of Time for Synthesis Graft copolymer between EPDM and Styrene

time (hr)	BPO (g)	EPDM (g)	styrene (g)	weight(total) (g)	weight(hexane) (g)	weight(acetone) (g)
1	0.3635	3.321	18.12	21.8045	5.1902	5.01
2	0.5033	5.687	18.12	24.3103	8.5616	n.d.
3	0.5043	5.687	18.12	24.3113	10.3948	6.3672
4	0.5043	5.687	18.12	24.3113	16.2036	13.4145

Condition: Solvent Toluene and Polymerization Temperature 90 °C.

A-2 Effect of BPO concentration initiator for Synthesis Graft copolymer between EPDM and Styrene

time (hr)	BPO (g)	EPDM (g)	styrene (g)	weight(total) (g)	weight(hexane) (g)	weight(acetone) (g)
1	0.3635	3.321	18.12	21.8045	5.1902	5.01
2	0.5033	5.687	18.12	24.3103	8.5616	n.d.
3	0.5043	5.687	18.12	24.3113	10.3948	4.0415
3	1.1296	5.691	18.12	24.9406	17.5047	8.0262
3	1.5132	5.691	18.12	25.3242	16.3471	7.1334

Condition: Solvent Toluene and Polymerization Temperature 90 °C.

A-3 Effect of Oxygen for Synthesis Graft copolymer between EPDM and Styrene

Condition	BPO (g)	EPDM (g)	weight(total) (g)	weight(hexane) (g)	weight(acetone) (g)
no air	0.3637	4.0313	13.4550	0.8104	n.d.
air	0.3649	4.0313	13.4562	0.1634	n.d.

Condition: Solvent Toluene , Polymerization Temperature 90 °C, Polymerization Time 1 hr and Styrene monomer 9.06 g.

A-4 Effect of Solvents for Synthesis Graft copolymer between EPDM and Styrene

BPO (g)	EPDM (g)	weight(total) (g)	weight(hexane) (g)	Solvent	temp (°C)
0.3638	4.0313	13.4551	0.2222	toluene	60
0.3637	4.0209	13.4446	0.0321	hexane	60
0.4936	5.6581	15.2117	0.4126	heptane	60
0.3638	4.40315	13.4995	0.0041	THF	60
0.4936	5.6582	15.2118	3.889	heptane	90
0.4936	5.6413	15.1949	4.4517	toluene	90

Condition: Styrene monomer 9.06 g , Polymerization Time 1 hr and weight (hexane) not determine.

A-5 Effect of Temperature for Synthesis Graft copolymer between EPDM and Styrene

BPO (g)	EPDM (g)	weight(total) (g)	weight(hexane) (g)	temp (°C)
0.3638	4.0313	13.4551	0.2222	60
0.4936	5.6413	15.1949	4.4517	90

Condition: Styrene monomer 9.06 g , Polymerization Time 1 hr , weight (hexane) not determine and used Toluene as solvent.

A-6 Effect of Styrene concentration for Synthesis Graft copolymer between EPDM and Styrene

time (hr)	BPO (g)	EPDM (g)	styrene (g)	weight(total) (g)	weight(hexane) (g)
2	0.4936	5.6413	9.06	15.1949	4.4517
2	0.5033	5.687	18.12	24.3103	8.5616

Condition: Solvent Toluene , Polymerization Temperature 90 °C and weight acetone is not determine.

A-7 Effect of Aging for Synthesis Graft copolymer between EPDM and Styrene

Condition	BPO (g)	EPDM (g)	weight(total) (g)	weight(hexane) (g)	weight(acetone) (g)
no aging	0.3635	3.321	21.8045	5.1902	5.01
aging 5 min	0.5033	5.687	24.3103	8.5616	n.d.
aging 10 min	0.5033	5.687	24.3103	11.158	9.2703
aging 30 min	0.5033	5.687	24.3103	11.9907	5.4668
aging 60 min	0.5033	5.687	24.3103	3.7844	2.7254

Condition: Solvent Toluene , Polymerization Temperature 90 °C and Polymerization Time 2 hrs.

A-8 Example for calculation Yield of synthesis graft copolymer (%)

$$\text{Yield of synthesis graft copolymer (\%)} = \frac{\text{Weight of polymer after soxhlet hexane or acetone}}{\text{Weight of polymer total (BPO+EPDM+styrene)}} \times 100$$

Forexample : from table A-1: BPO = 0.3635 g, EPDM = 3.321 g , Styrene = 18.12 g

Weight total = 21.8045 , Weight (hexane) = 5.1905 ,

Weight (acetone) = 5.01

$$\text{Yield of synthesis graft copolymer (hexane)} = \frac{5.1905}{21.8045} \times 100$$

$$= 23.805 \%$$

$$\text{Yield of synthesis graft copolymer (acetone)} = \frac{5.01}{21.8045} \times 100$$

$$= 22.98 \%$$

APPENDIX B

DSC CURVE

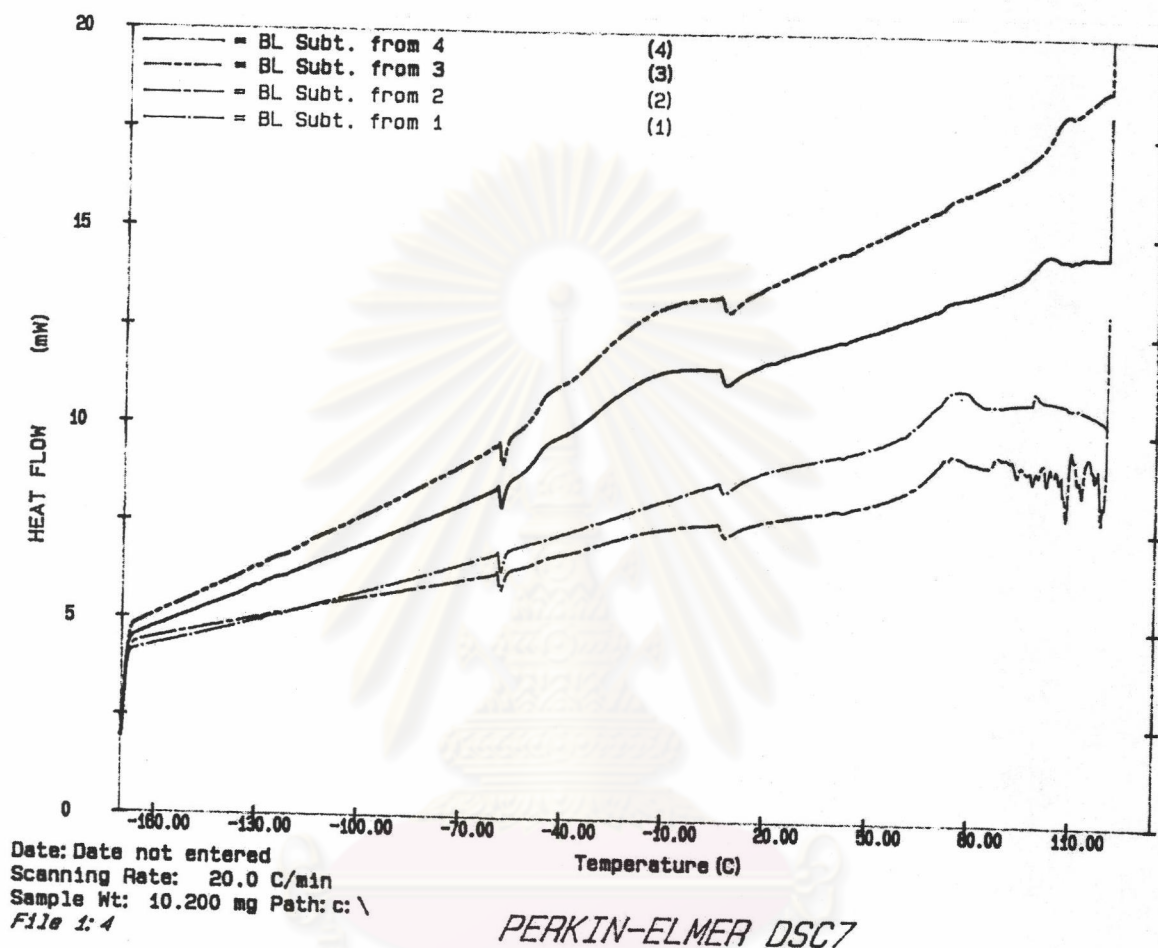


Figure B-1 DSC curve of polymer at second heat (1) pure PS (2) synthesis polymer after soxhlet hexane (3) synthesis polymer after soxhlet acetone (4) solvent hexane after soxhlet hexane

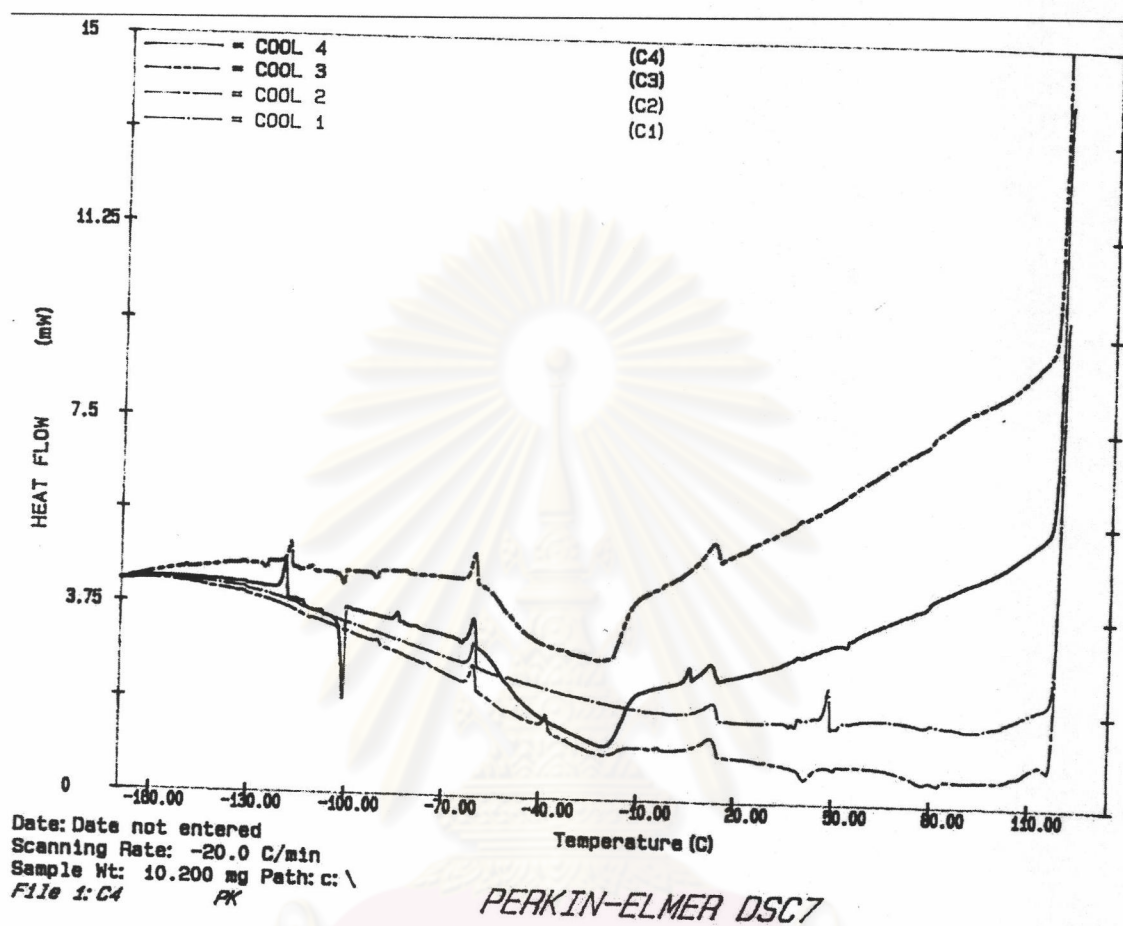


Figure B-2 DSC curve of polymer at first cool (1) pure PS (2) synthesis polymer
 after soxhlet hexane (3) synthesis polymer after soxhlet acetone
 (4) solvent hexane after soxhlet hexane

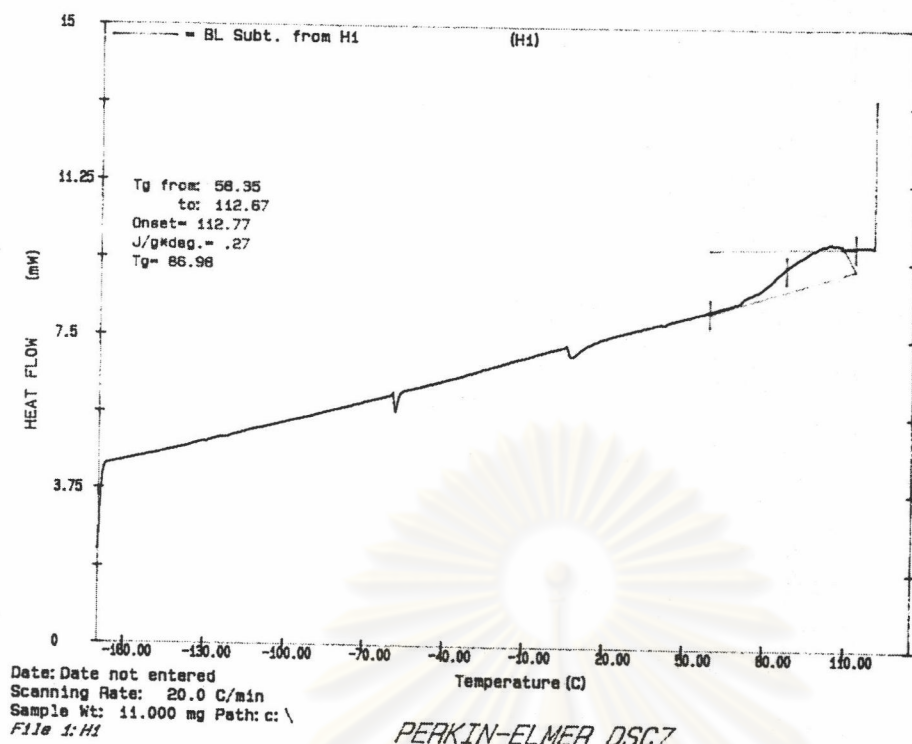


Figure B-3 DSC curve of polymer at first heat of pure PS

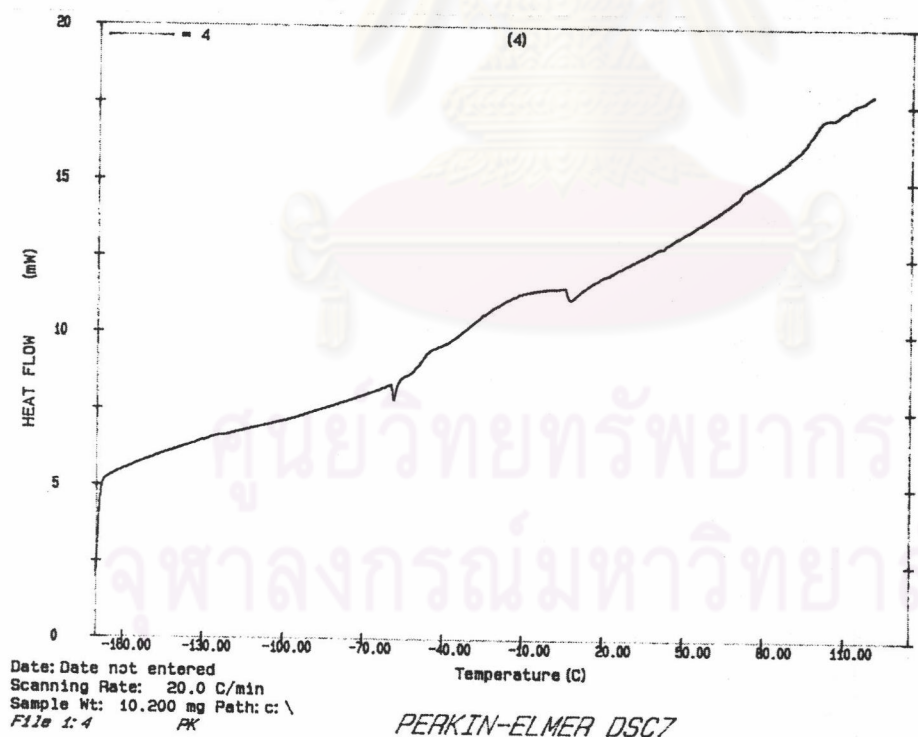


Figure B-4 DSC curve of polymer at first heat of solvent hexane after soxhlet hexane

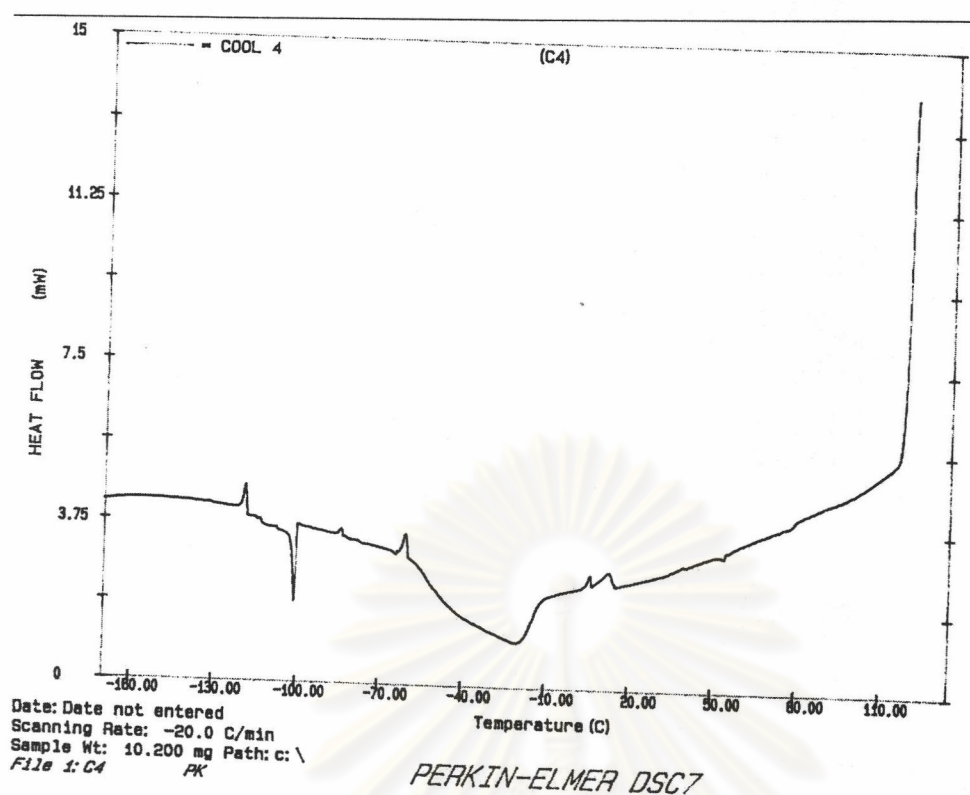


Figure B-5 DSC curve of polymer at first cool of solvent hexane after soxhlet hexane

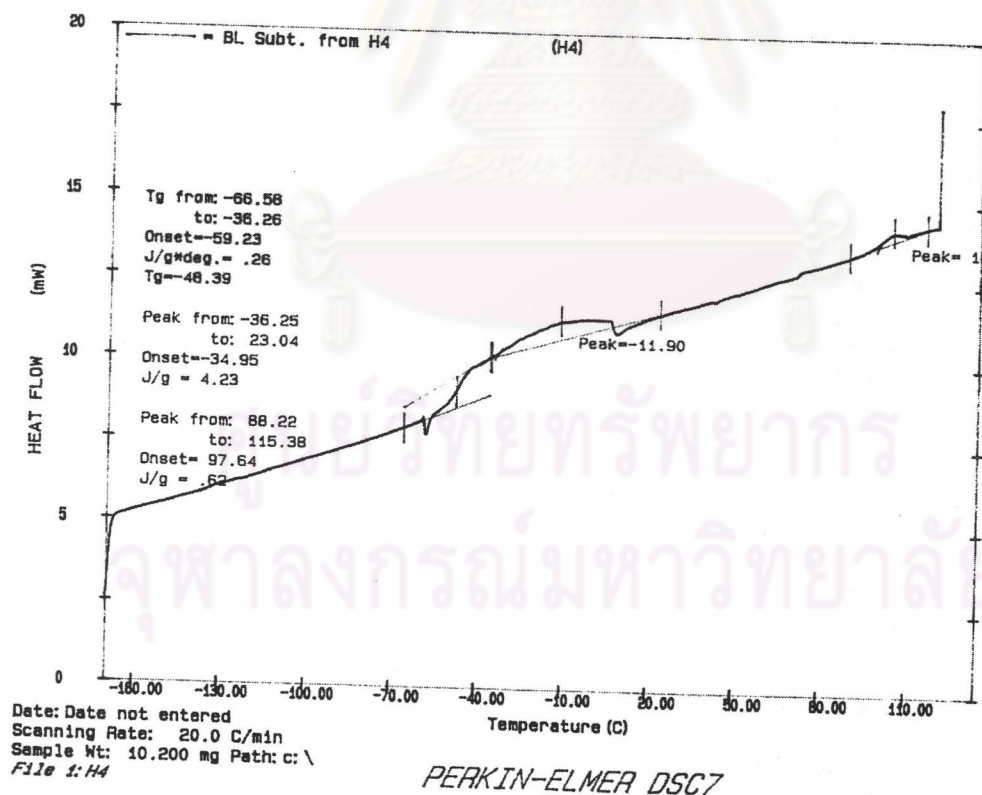


Figure B-6 DSC curve of polymer at second heat of solvent hexane after soxhlet hexane

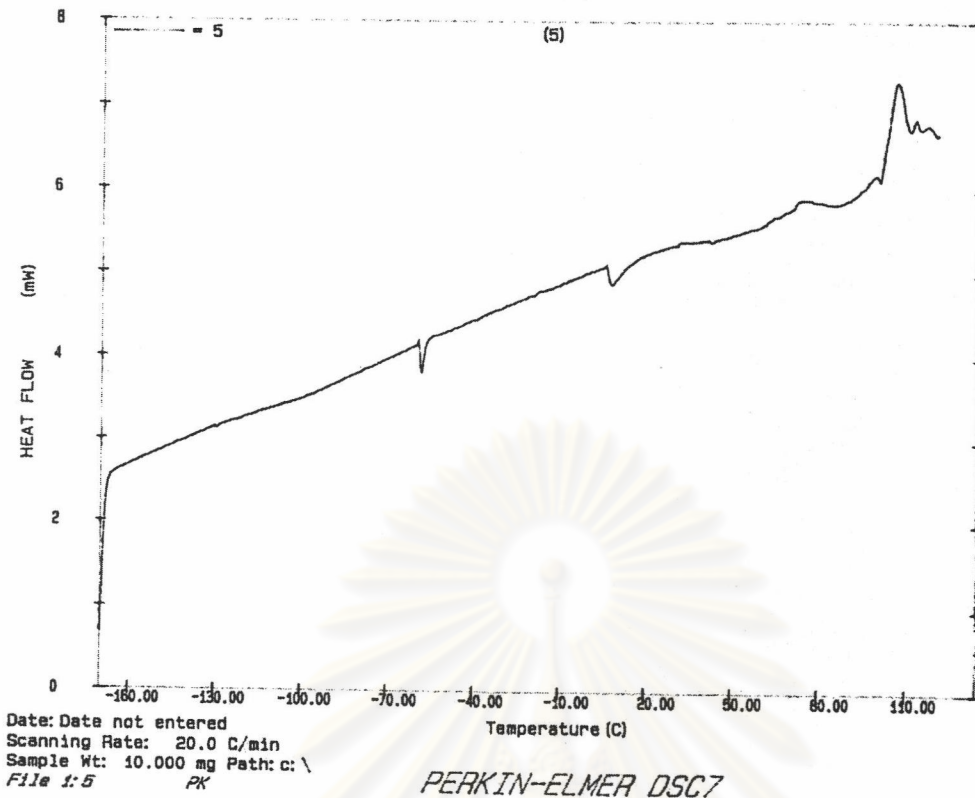


Figure B-7 DSC curve of polymer at first heat of solvent acetone after soxhlet acetone

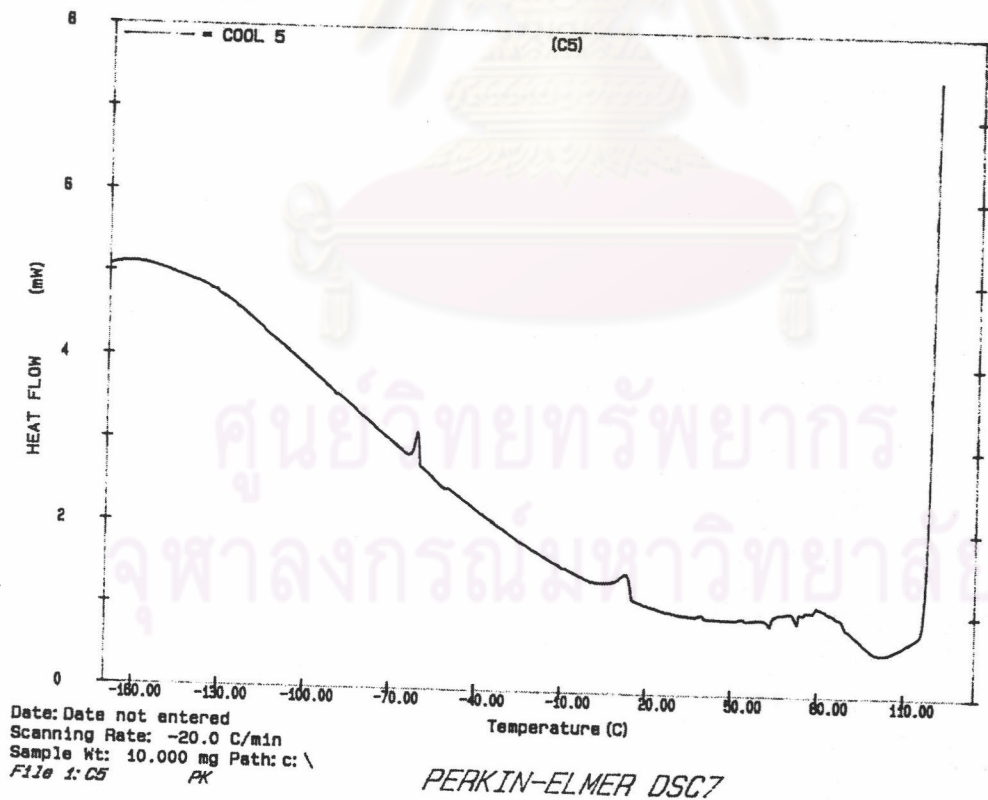


Figure B-8 DSC curve of polymer at first cool of solvent acetone after soxhlet acetone

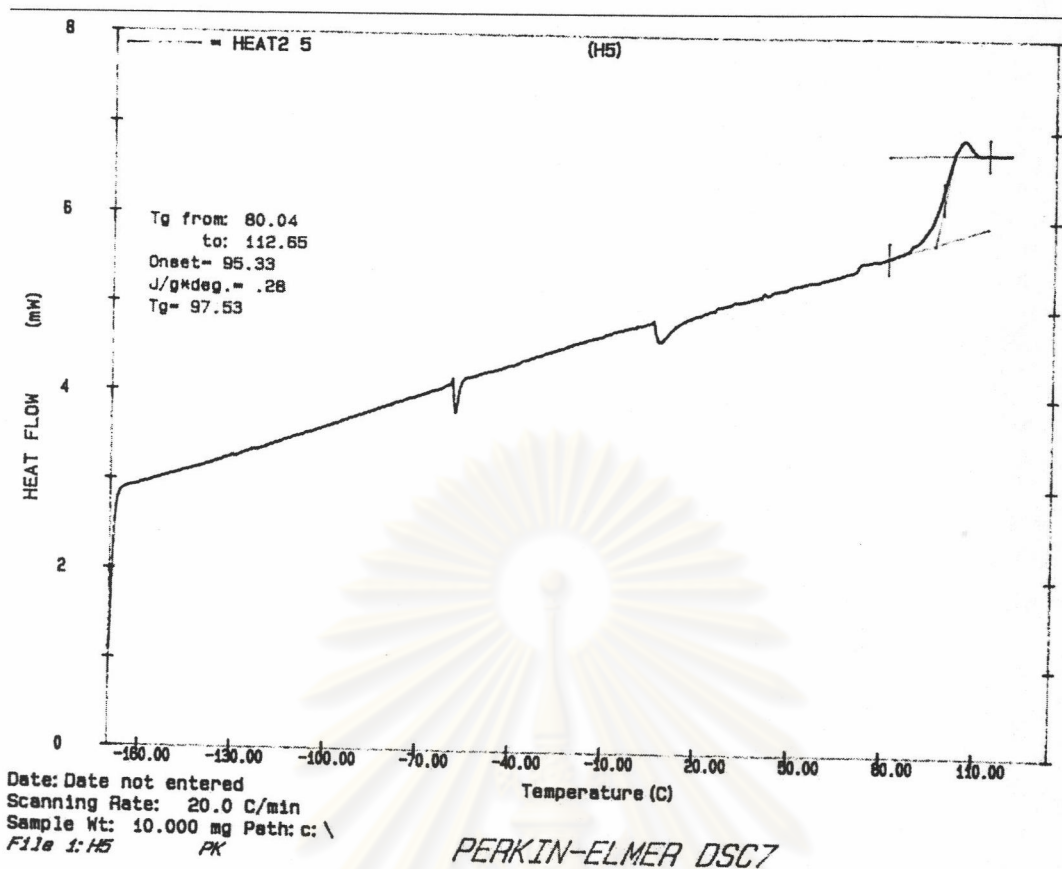


Figure B-9 DSC curve of polymer at second heat of solvent acetone after soxhlet acetone

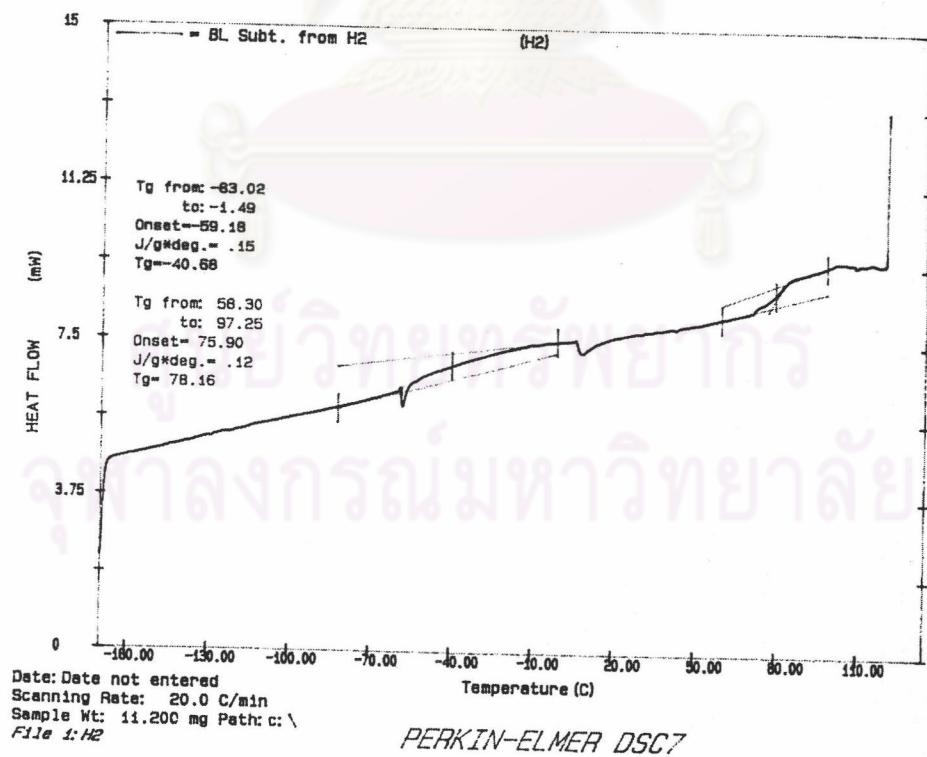


Figure B-10 DSC curve of synthesis polymer after soxhlet hexane

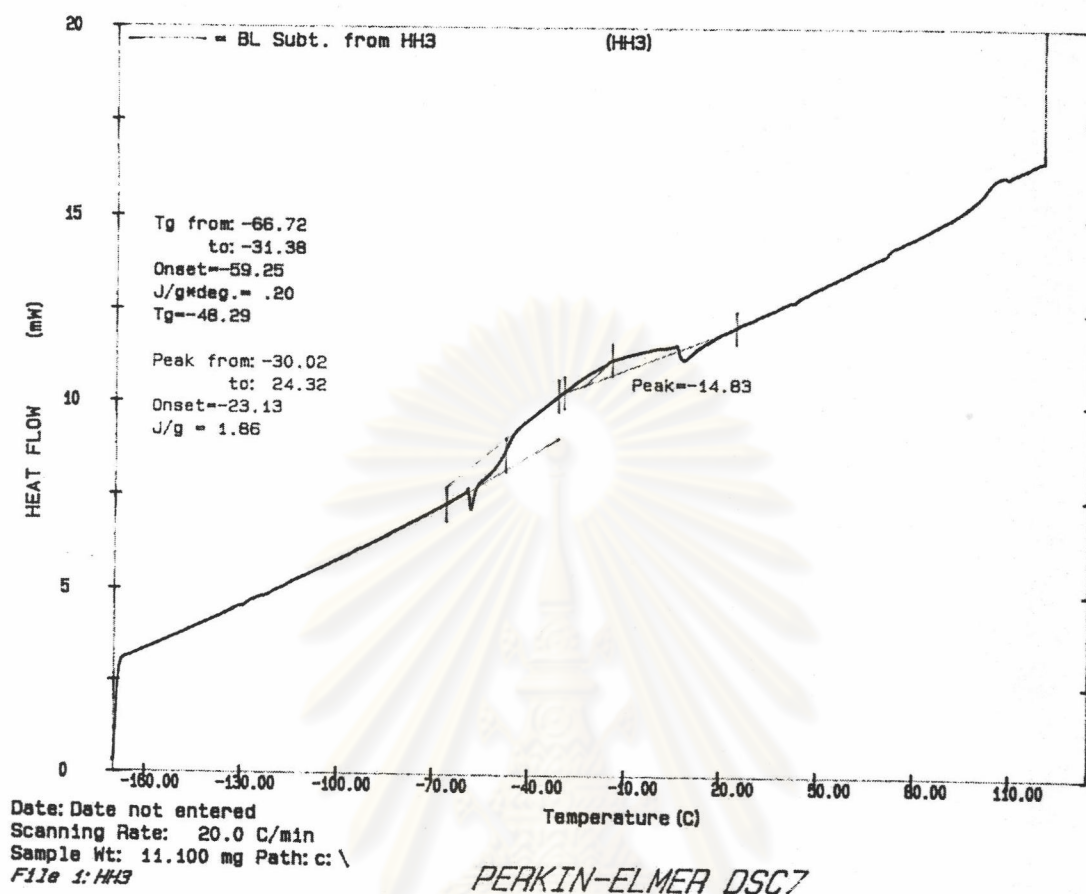


Figure B-11 DSC curve of synthesis polymer after soxhlet acetone

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