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APPENDICES

ศูนย์วิทยทรัพยากร
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APPENDIX A

NMR SPECTRUM

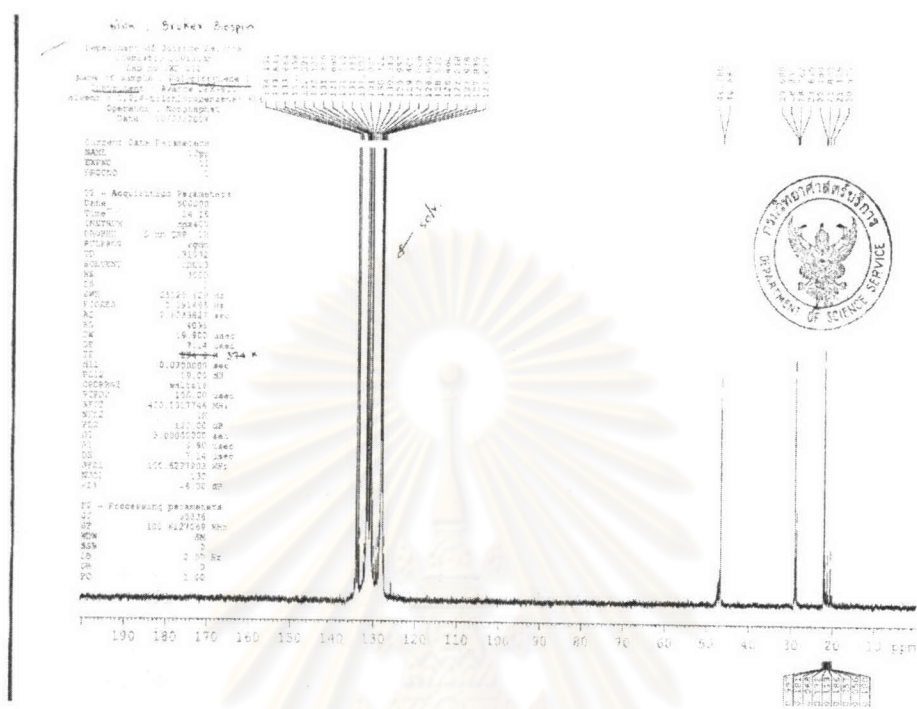


Figure A-1 ^{13}C -NMR spectrum of isotactic polypropylene preparing by Ziegler-Natta catalyst using hexane as solvent

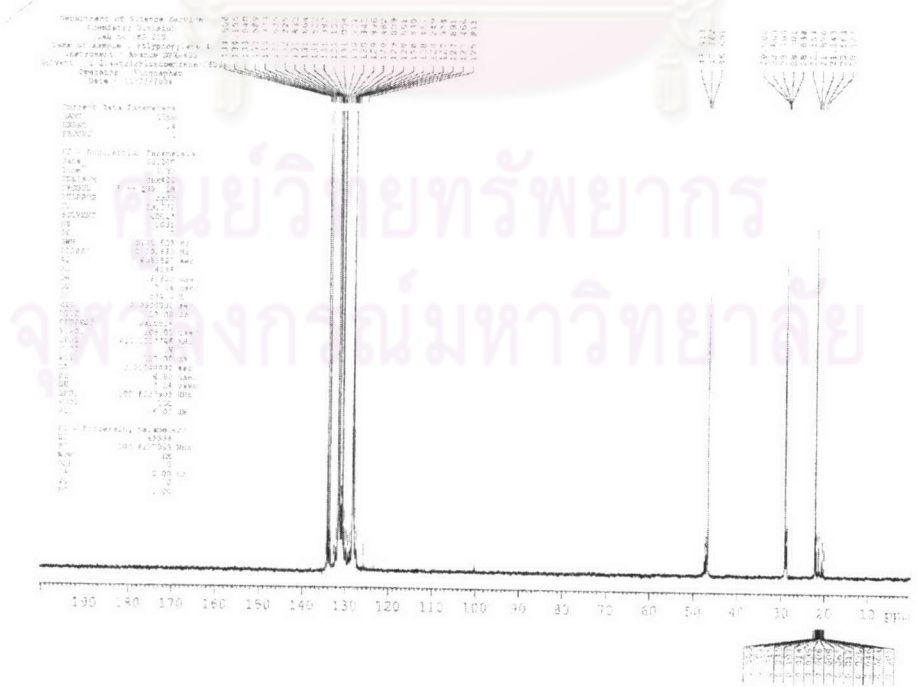


Figure A-2 ^{13}C -NMR spectrum of isotactic polypropylene preparing by Ziegler-Natta catalyst using toluene as solvent

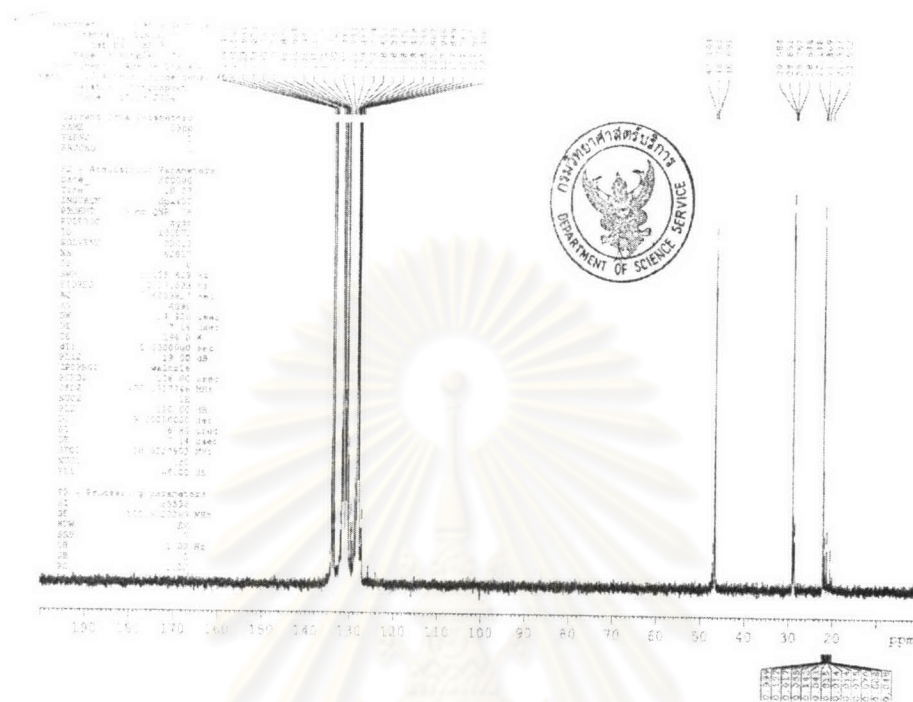


Figure A-5 ^{13}C -NMR spectrum of isotactic polypropylene preparing by Ziegler-Natta catalyst at polymerization temperature $50\text{ }^\circ\text{C}$

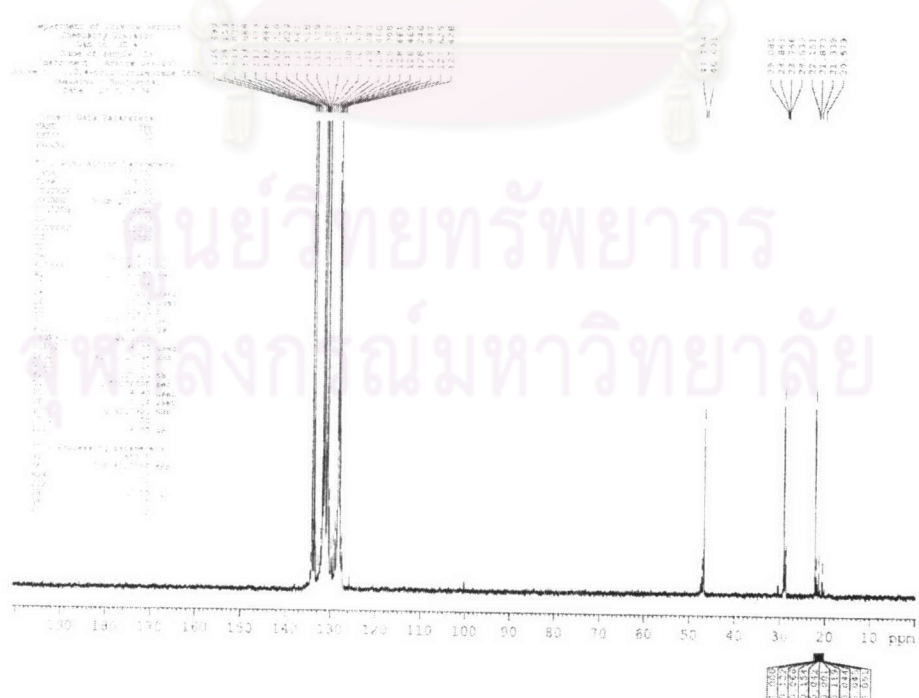


Figure A-6 ^{13}C -NMR spectrum of isotactic polypropylene preparing by Ziegler-Natta catalyst at polymerization temperature $60\text{ }^\circ\text{C}$

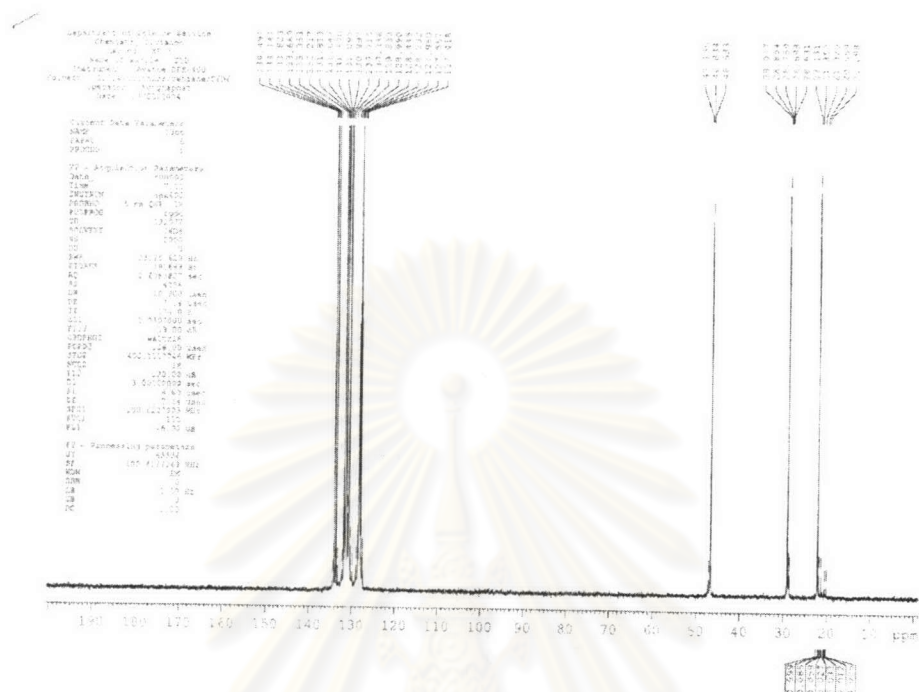


Figure A-7 ^{13}C -NMR spectrum of isotactic polypropylene preparing by Ziegler-Natta catalyst at polymerization temperature 70 °C

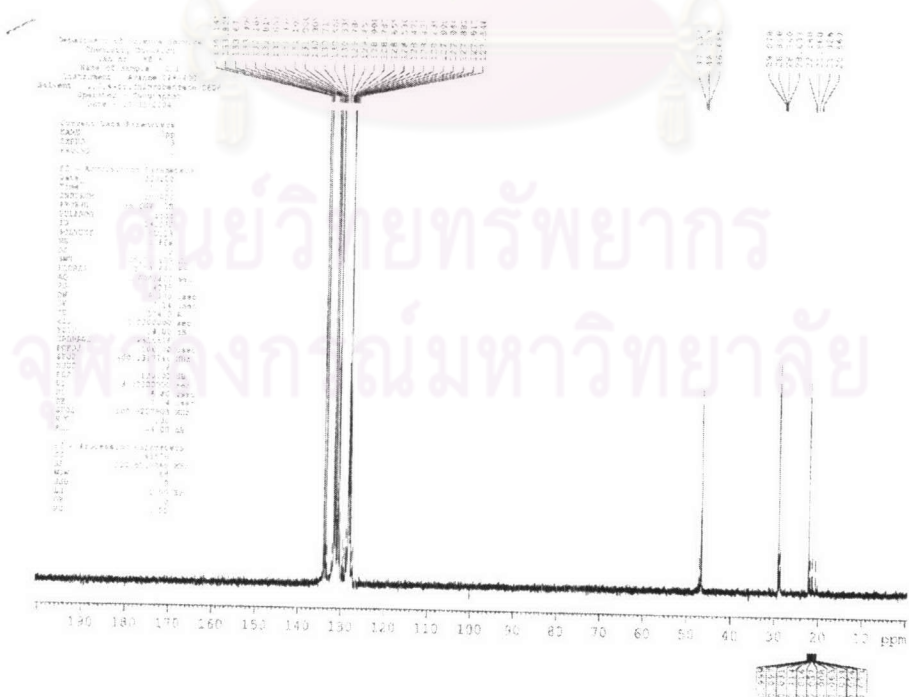


Figure A-8 ^{13}C -NMR spectrum of isotactic polypropylene preparing by Ziegler-Natta catalyst at propylene pressure 60 psi

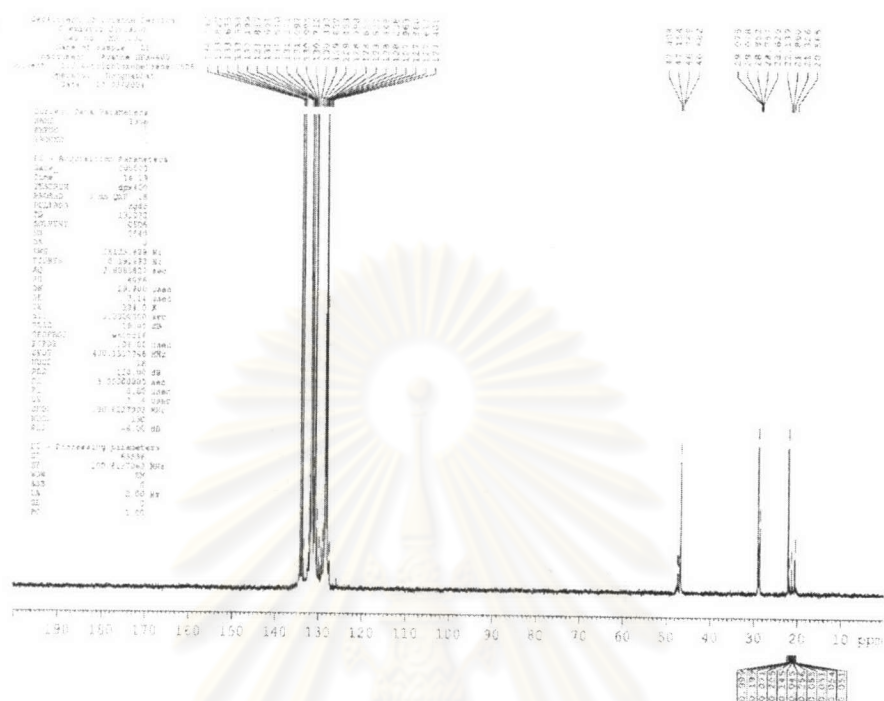


Figure A-11 ^{13}C -NMR spectrum of isotactic polypropylene preparing by Ziegler-Natta catalyst at catalyst concentration $6 \times 10^{-5} \text{ M}$

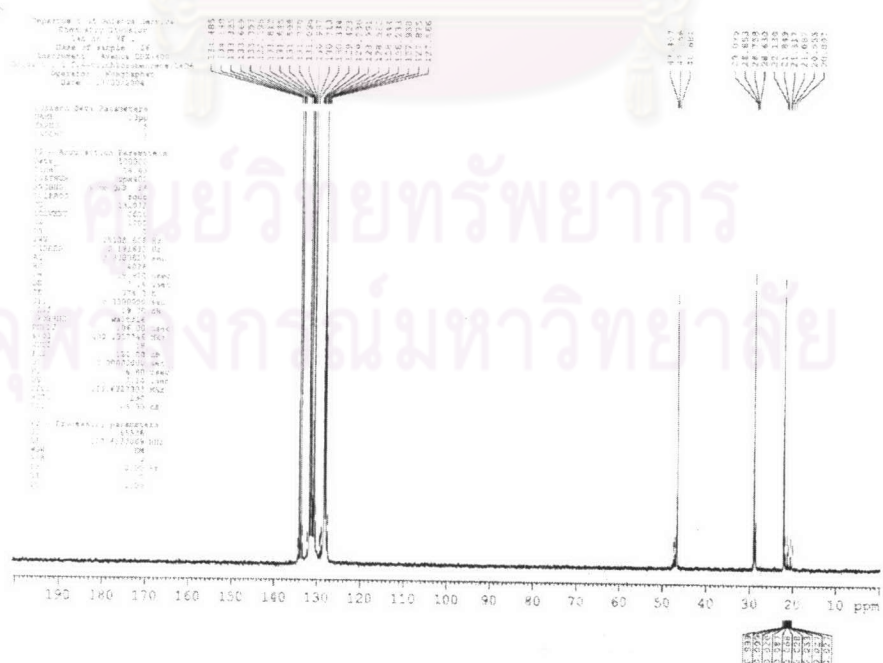


Figure A-12 ^{13}C -NMR spectrum of isotactic polypropylene preparing by Ziegler-Natta catalyst at catalyst concentration $8 \times 10^{-5} \text{ M}$

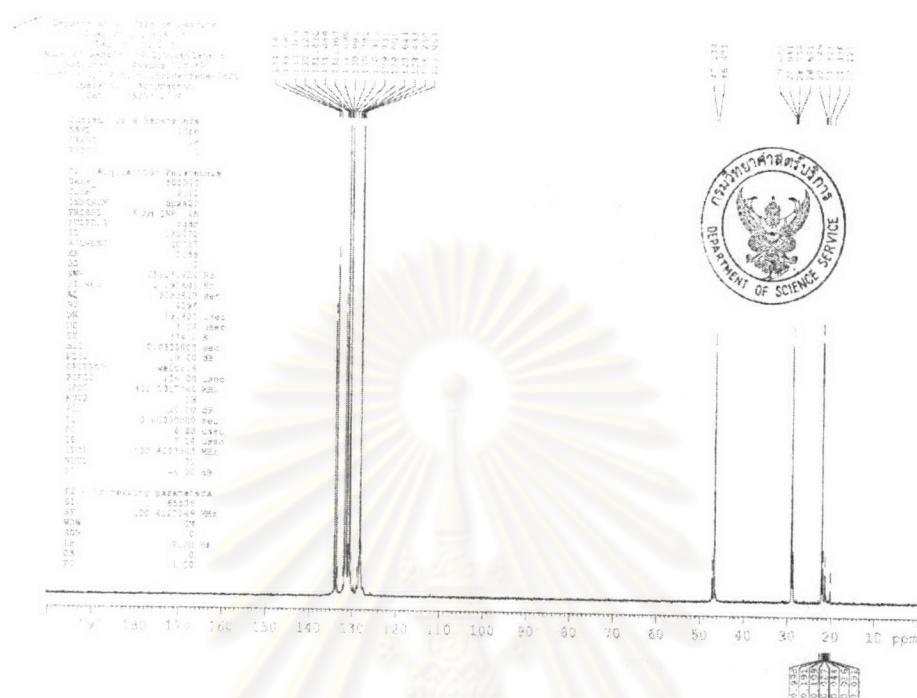


Figure A-13 ^{13}C -NMR spectrum of isotactic polypropylene preparing by metallocene catalyst using toluene as solvent

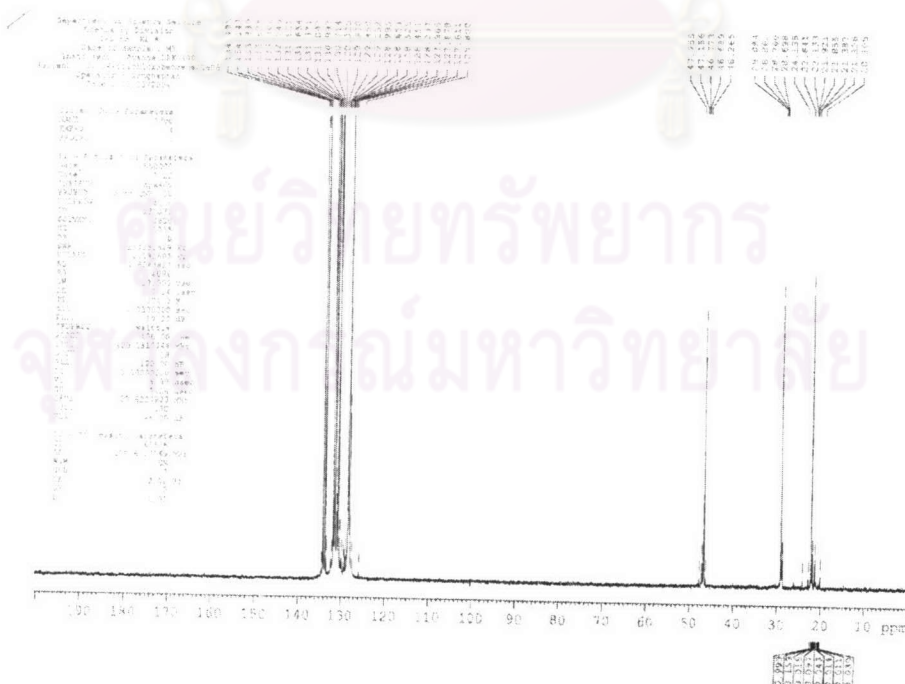


Figure A-14 ^{13}C -NMR spectrum of isotactic polypropylene preparing by metallocene catalyst using heptane as solvent

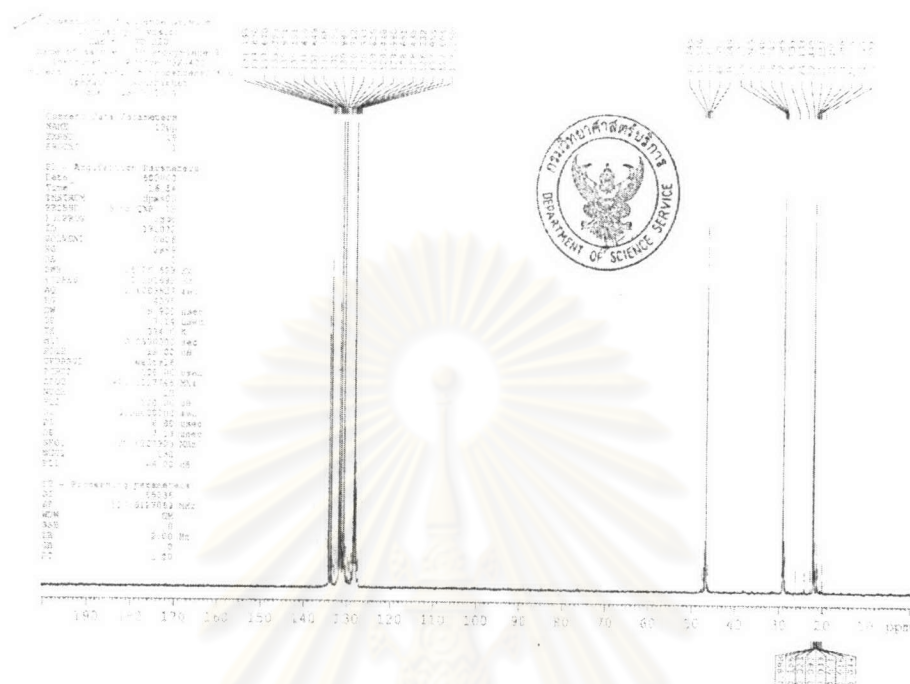


Figure A-17 ^{13}C -NMR spectrum of isotactic polypropylene preparing by metallocene catalyst at polymerization temperature $60\text{ }^\circ\text{C}$

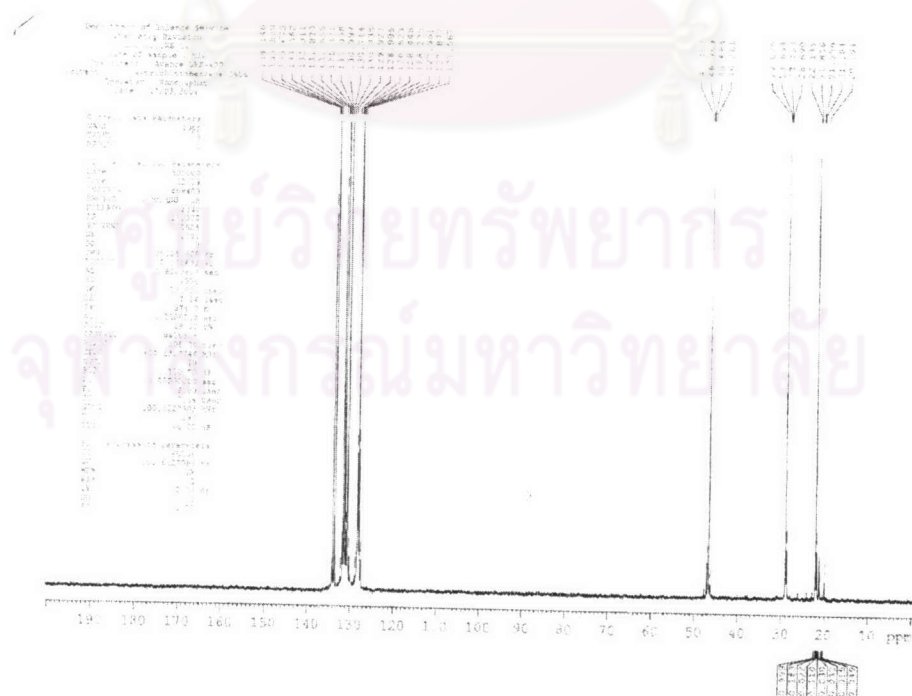


Figure A-18 ^{13}C -NMR spectrum of isotactic polypropylene preparing by metallocene catalyst at polymerization temperature $70\text{ }^\circ\text{C}$

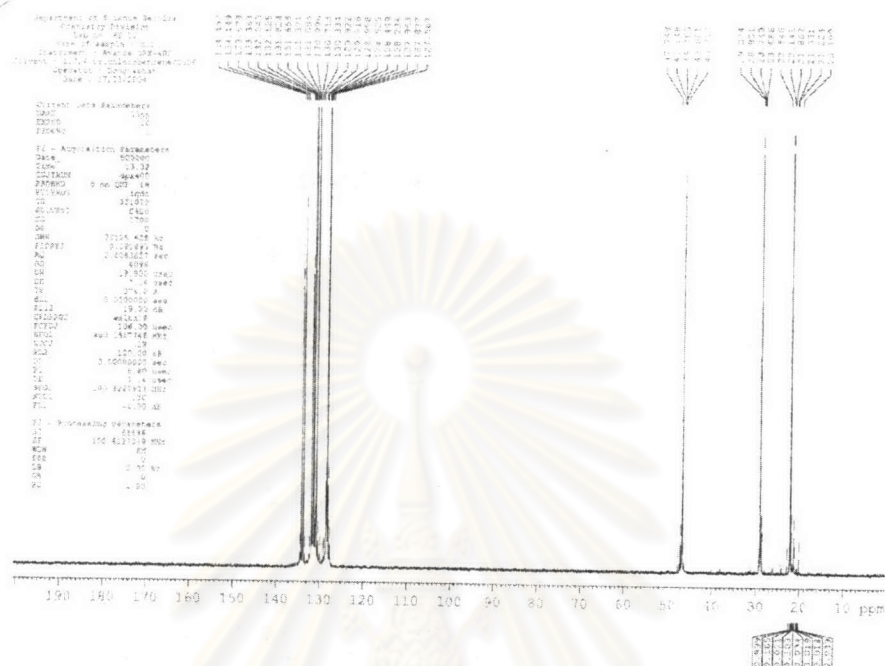


Figure A-19 ^{13}C -NMR spectrum of isotactic polypropylene prepared by metallocene catalyst at propylene pressure 60 psi

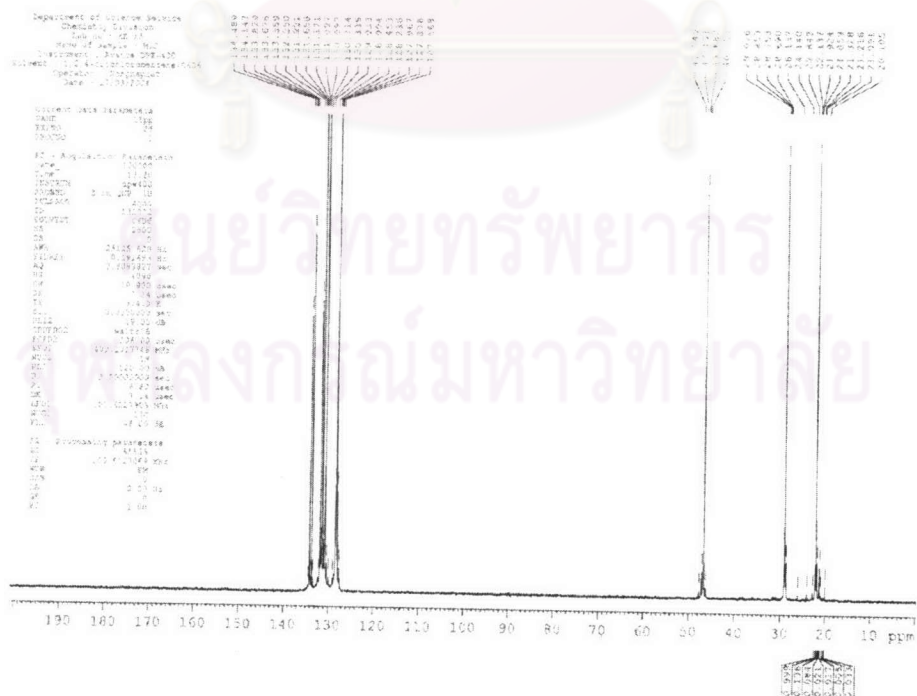


Figure A-20 ^{13}C -NMR spectrum of isotactic polypropylene prepared by metallocene catalyst at propylene pressure 100 psi

APPENDIX B DSC CURVE

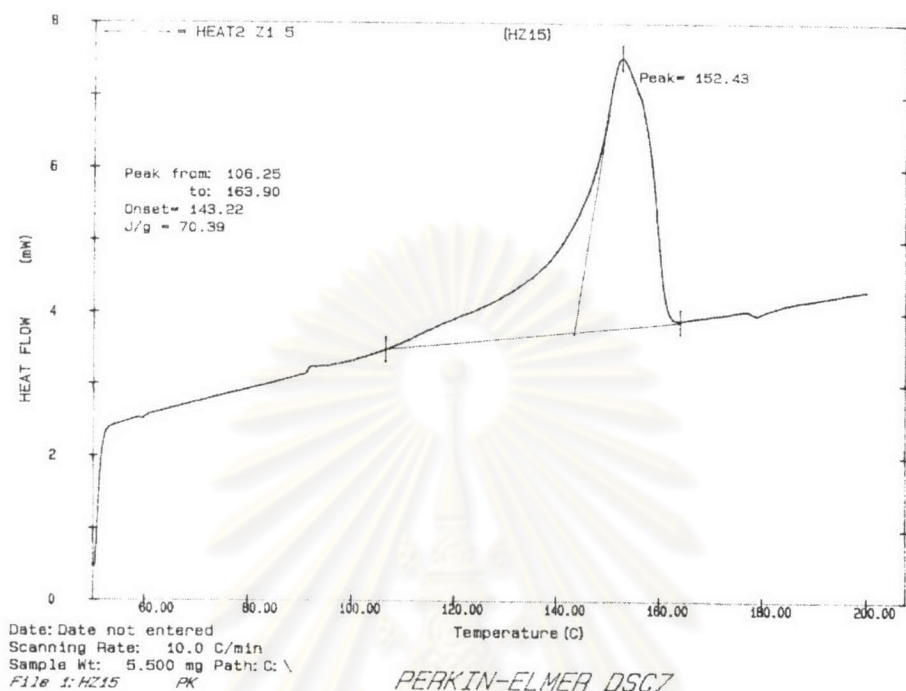


Figure B-1 DSC curve of isotactic polypropylene preparing by Ziegler-Natta catalyst using hexane as solvent

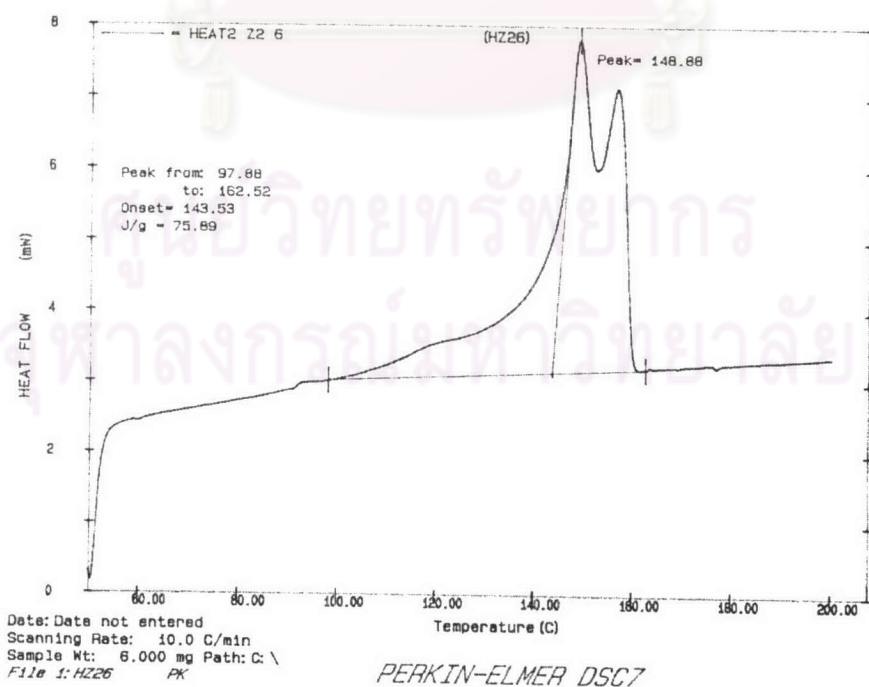


Figure B-2 DSC curve of isotactic polypropylene preparing by Ziegler-Natta catalyst using toluene as solvent

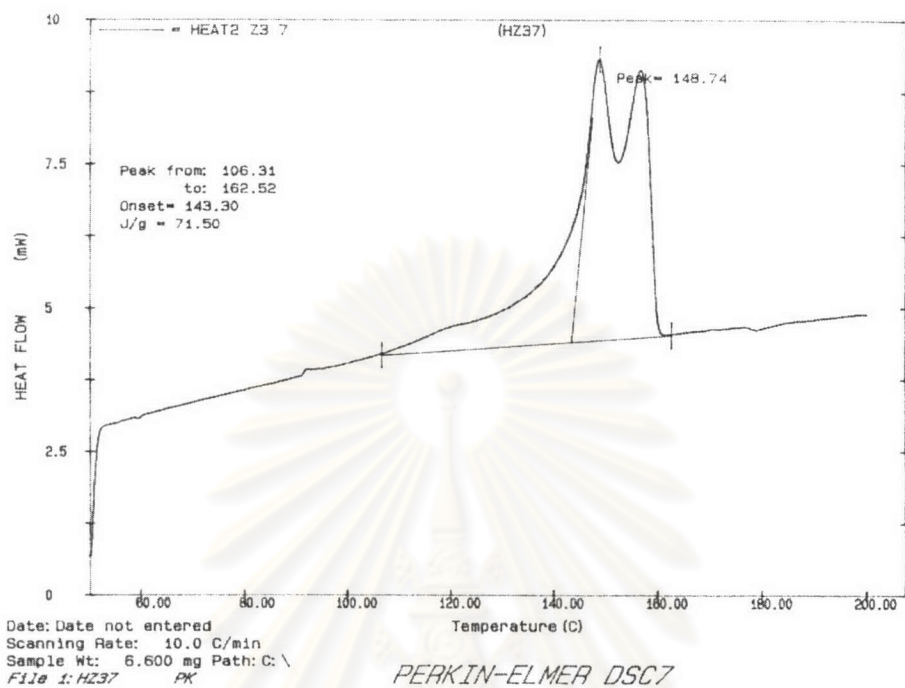


Figure B-3 DSC curve of isotactic polypropylene preparing by Ziegler-Natta catalyst using heptane as solvent

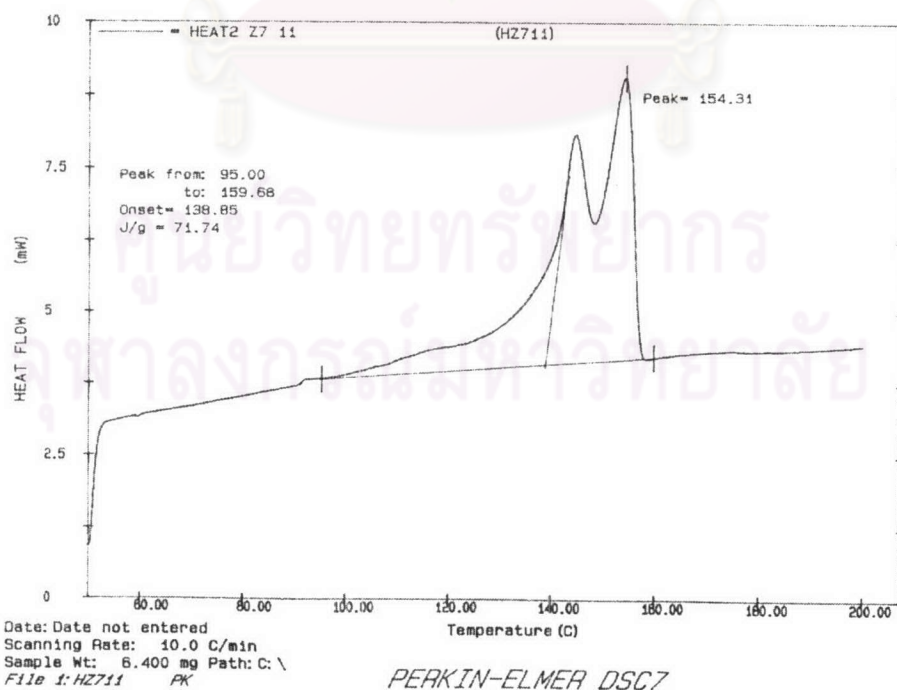


Figure B-4 DSC curve of isotactic polypropylene preparing by Ziegler-Natta catalyst at polymerization temperature 40 °C

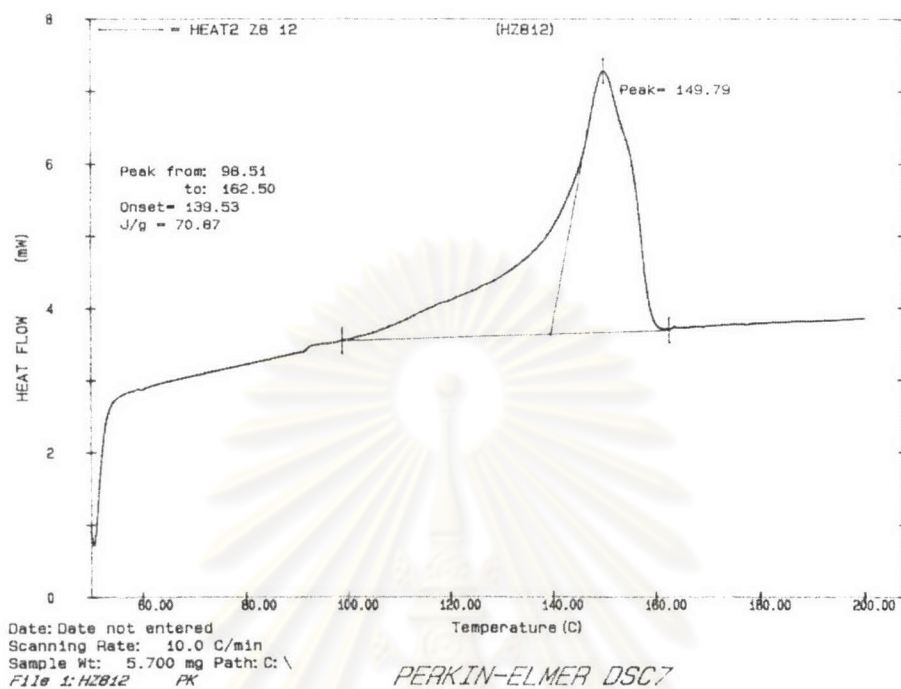


Figure B-5 DSC curve of isotactic polypropylene preparing by Ziegler-Natta catalyst at polymerization temperature 50 °C

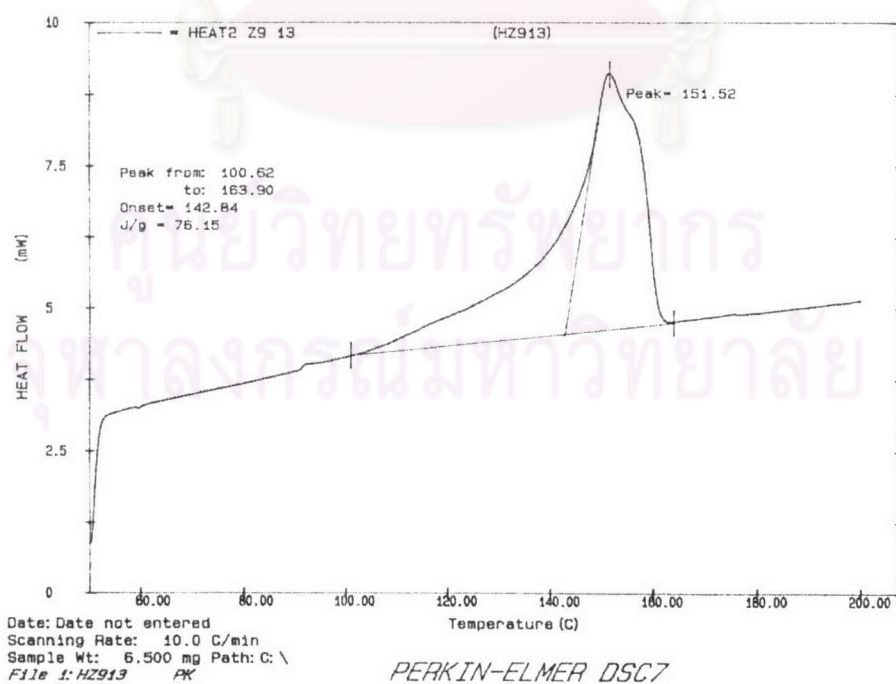


Figure B-6 DSC curve of isotactic polypropylene preparing by Ziegler-Natta catalyst at polymerization temperature 60 °C

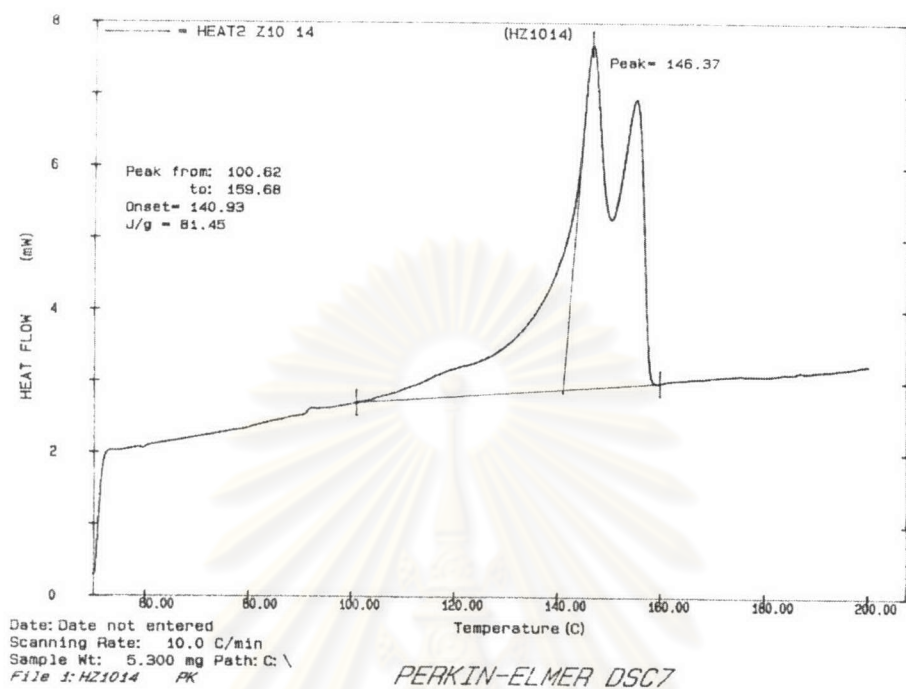


Figure B-7 DSC curve of isotactic polypropylene preparing by Ziegler-Natta catalyst at polymerization temperature 70 °C

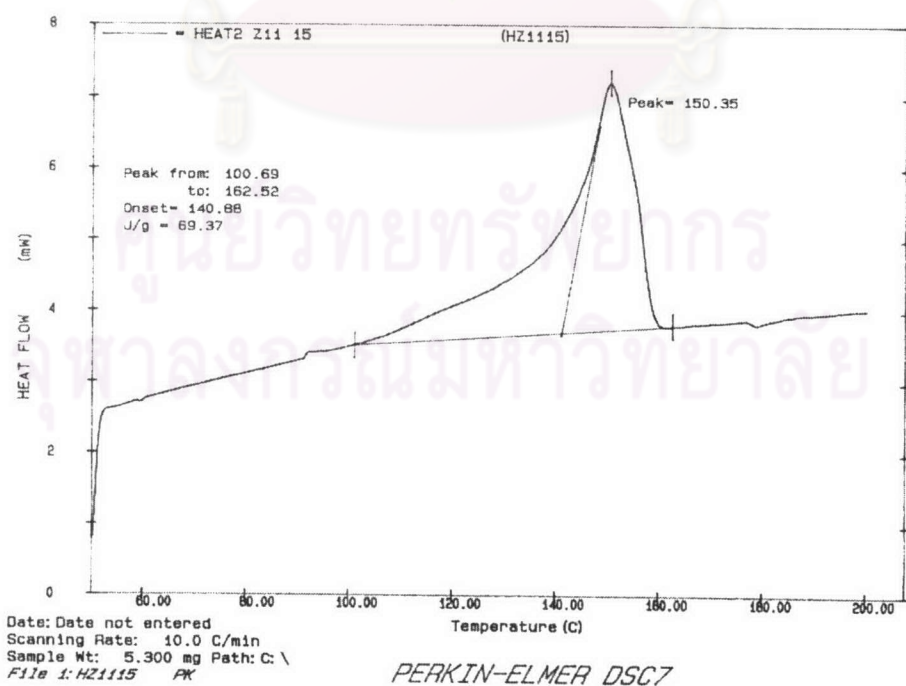


Figure B-8 DSC curve of isotactic polypropylene preparing by Ziegler-Natta catalyst at propylene pressure 60 psi

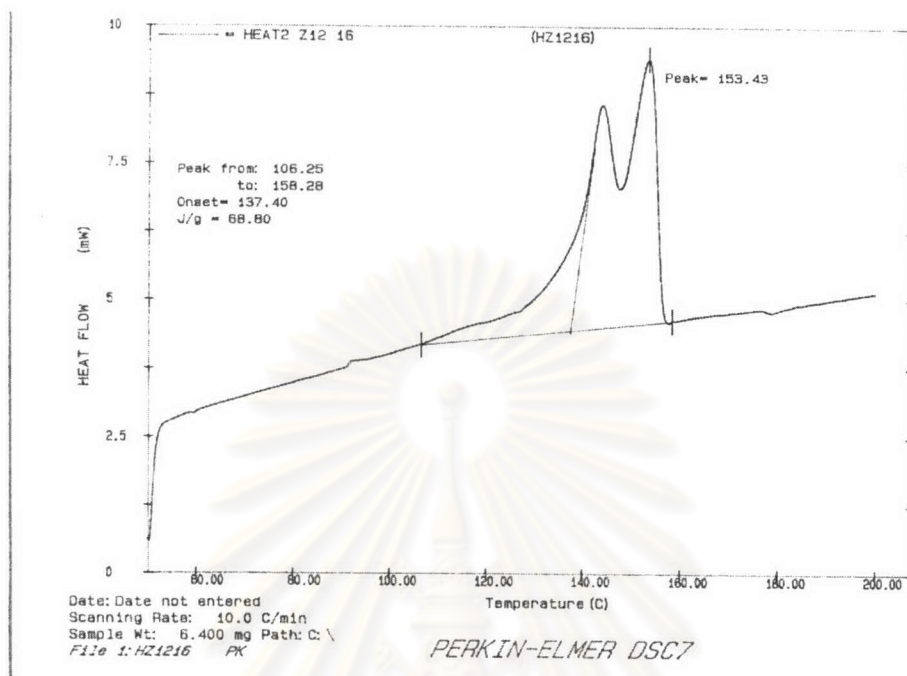


Figure B-9 DSC curve of isotactic polypropylene preparing by Ziegler-Natta catalyst at propylene pressure 100 psi

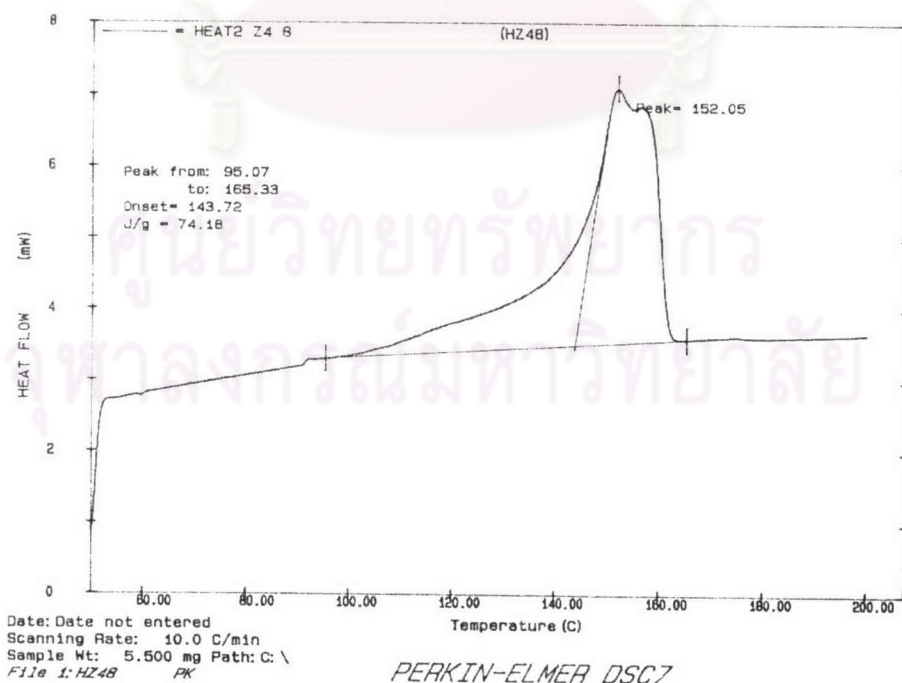


Figure B-10 DSC curve of isotactic polypropylene preparing by Ziegler-Natta catalyst at catalyst concentration 5×10^{-5} M

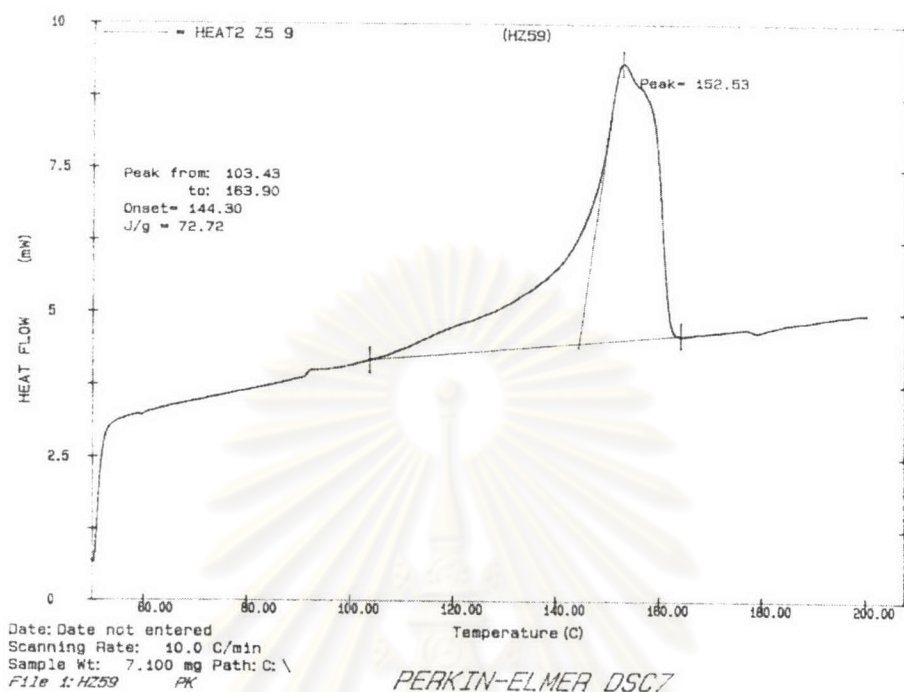


Figure B-11 DSC curve of isotactic polypropylene preparing by Ziegler-Natta catalyst at catalyst concentration 6×10^{-5} M

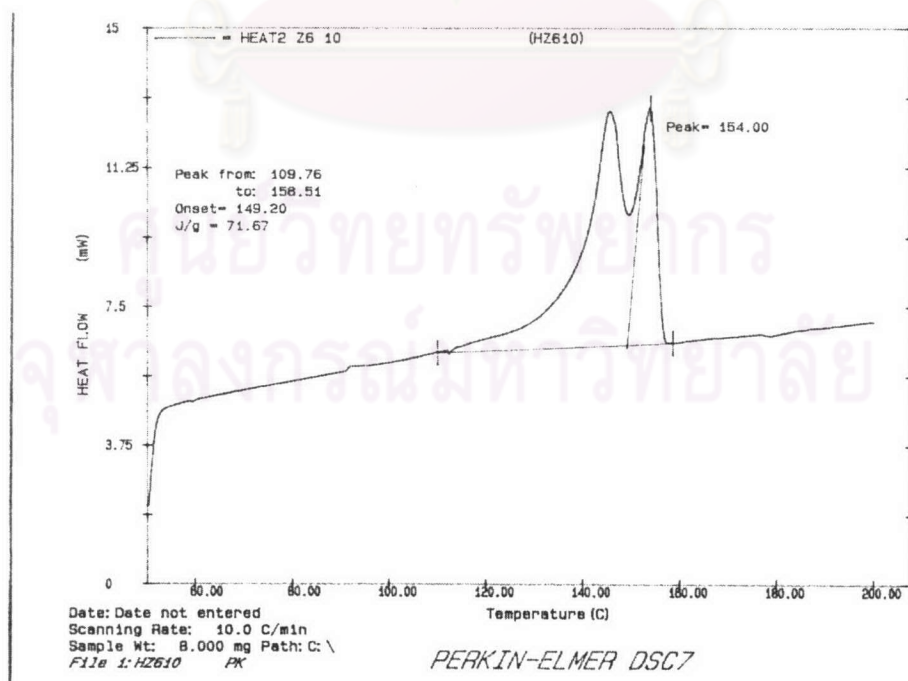


Figure B-12 DSC curve of isotactic polypropylene preparing by Ziegler-Natta catalyst at catalyst concentration 8×10^{-5} M

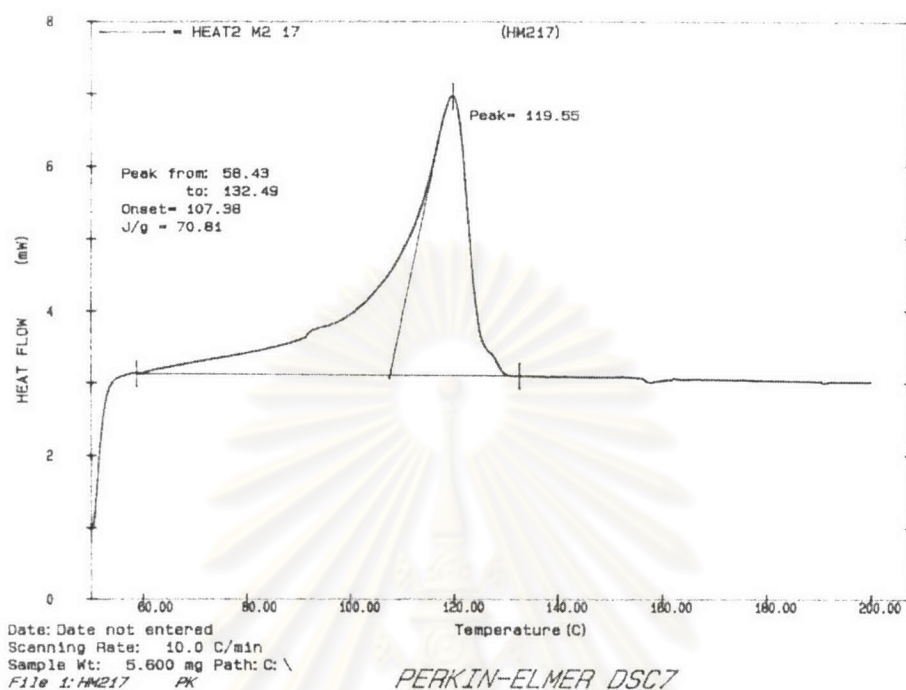


Figure B-13 DSC curve of isotactic polypropylene prepared by metallocene catalyst using toluene as solvent

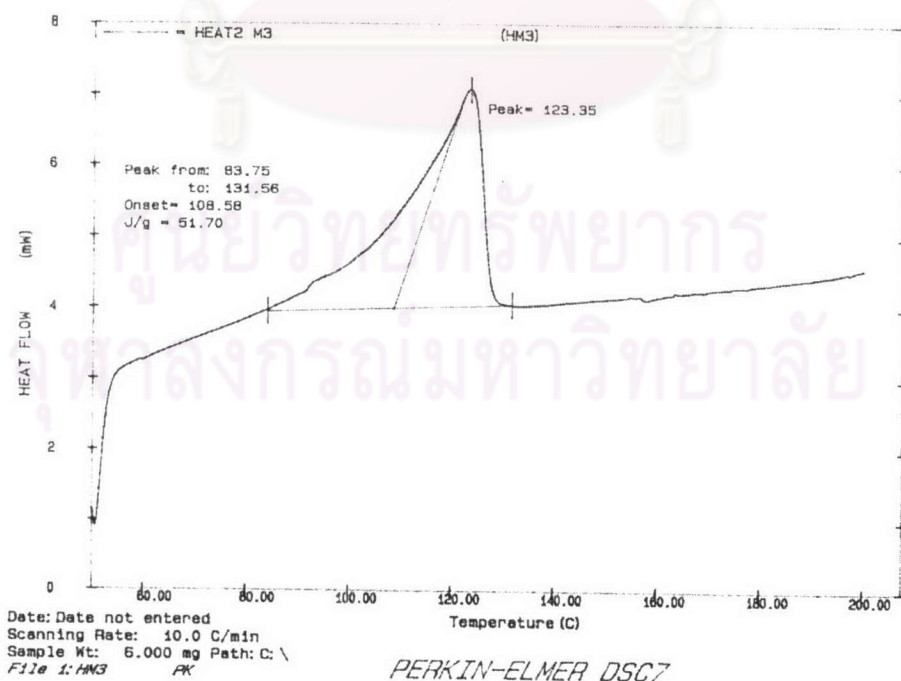


Figure B-14 DSC curve of isotactic polypropylene prepared by metallocene catalyst using heptane as solvent

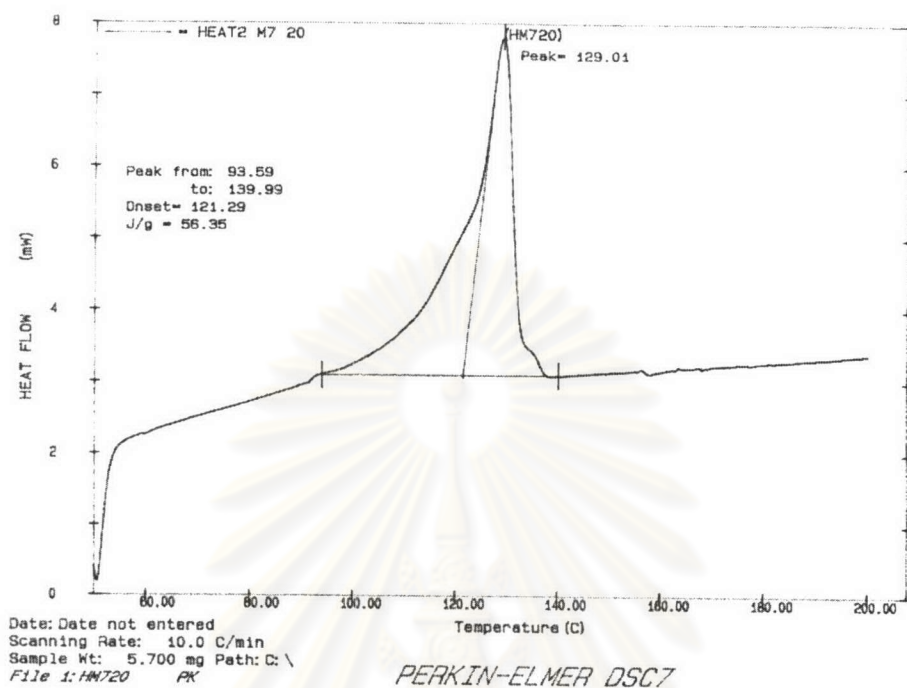


Figure B-15 DSC curve of isotactic polypropylene preparing by metallocene catalyst at polymerization temperature 40 °C

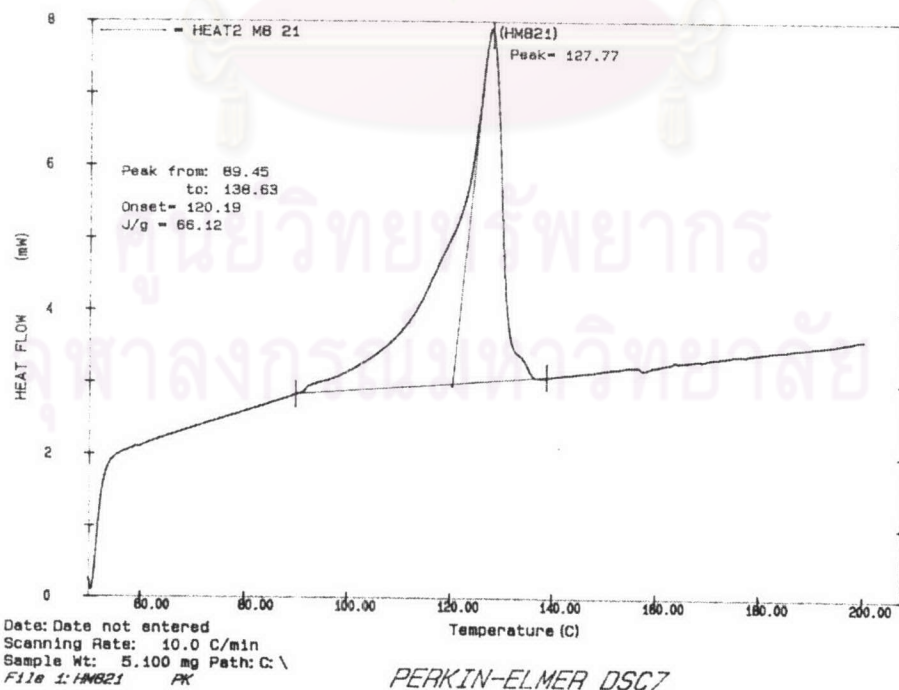


Figure B-16 DSC curve of isotactic polypropylene preparing by metallocene catalyst at polymerization temperature 50 °C

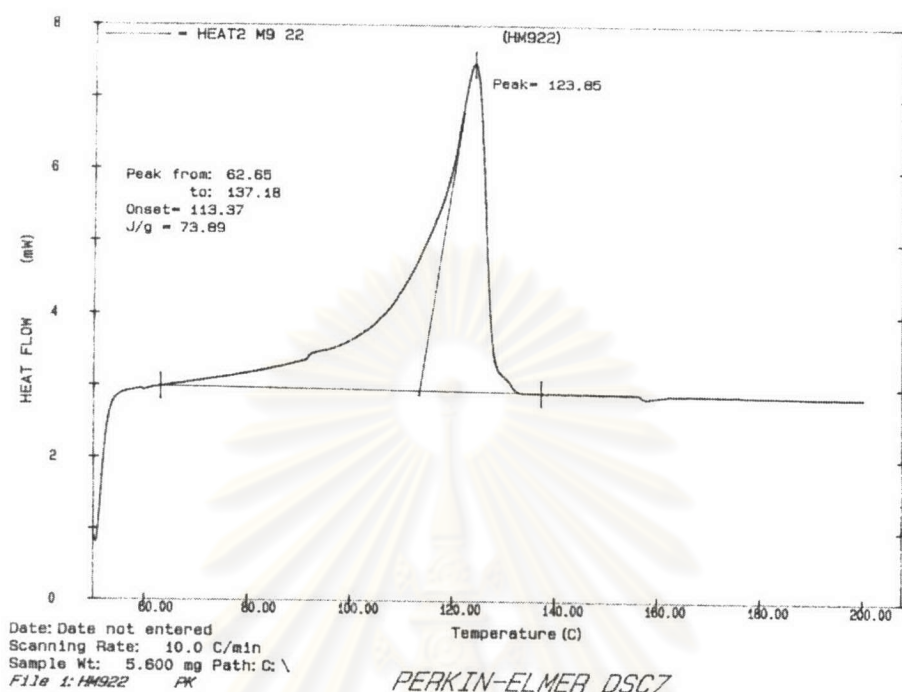


Figure B-17 DSC curve of isotactic polypropylene preparing by metallocene catalyst at polymerization temperature 60 °C

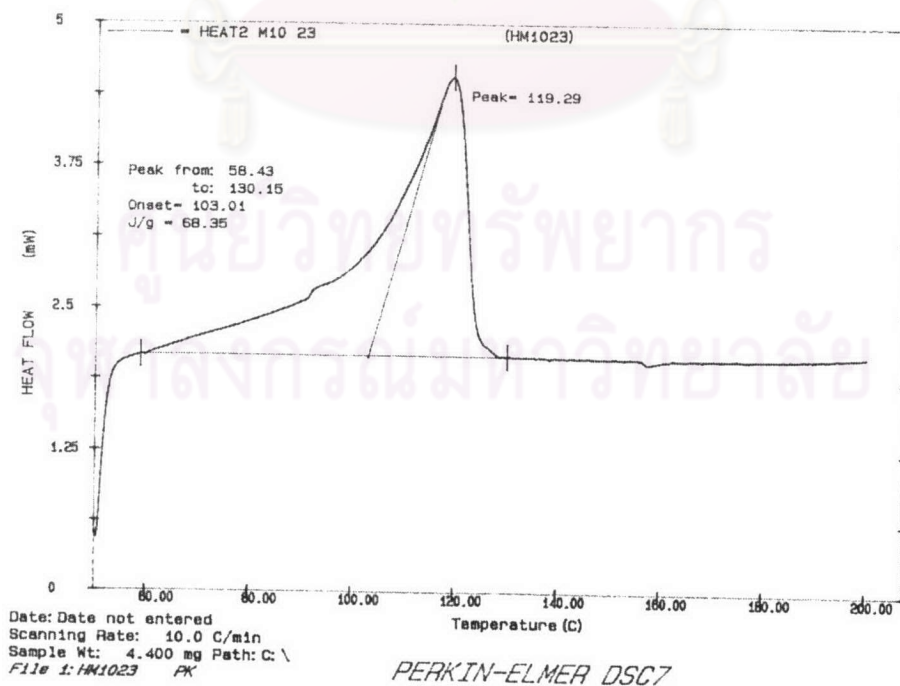


Figure B-18 DSC curve of isotactic polypropylene preparing by metallocene catalyst at polymerization temperature 70 °C

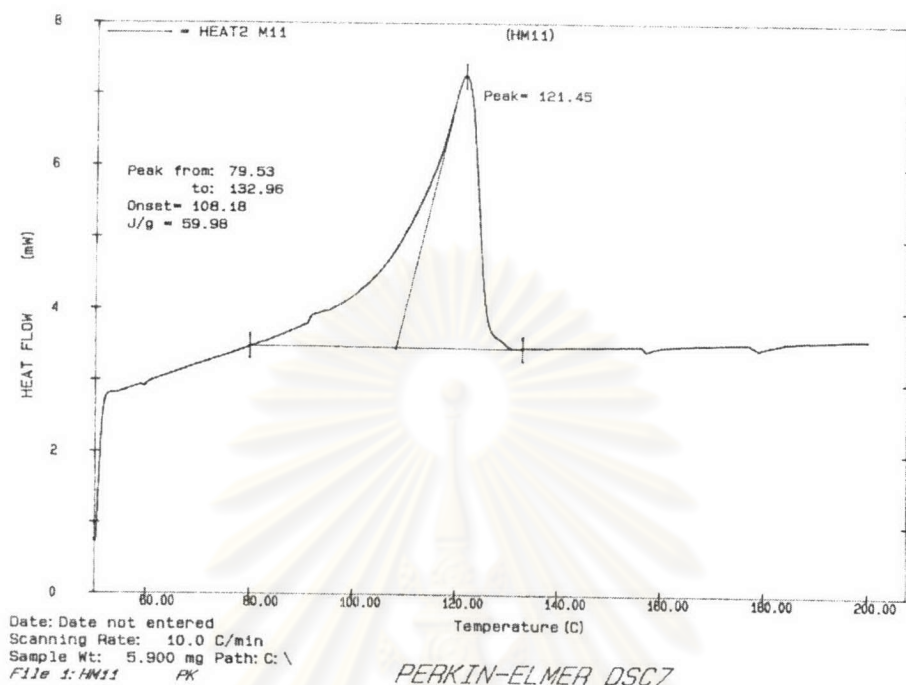


Figure B-19 DSC curve of isotactic polypropylene preparing by metallocene catalyst at propylene pressure 60 psi

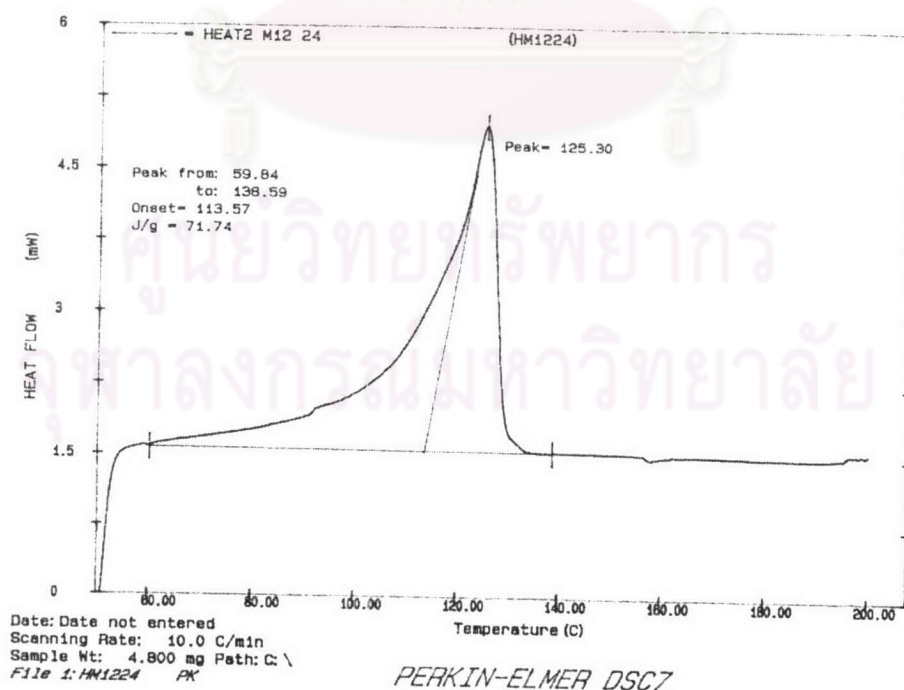


Figure B-20 DSC curve of isotactic polypropylene preparing by metallocene catalyst at propylene pressure 100 psi

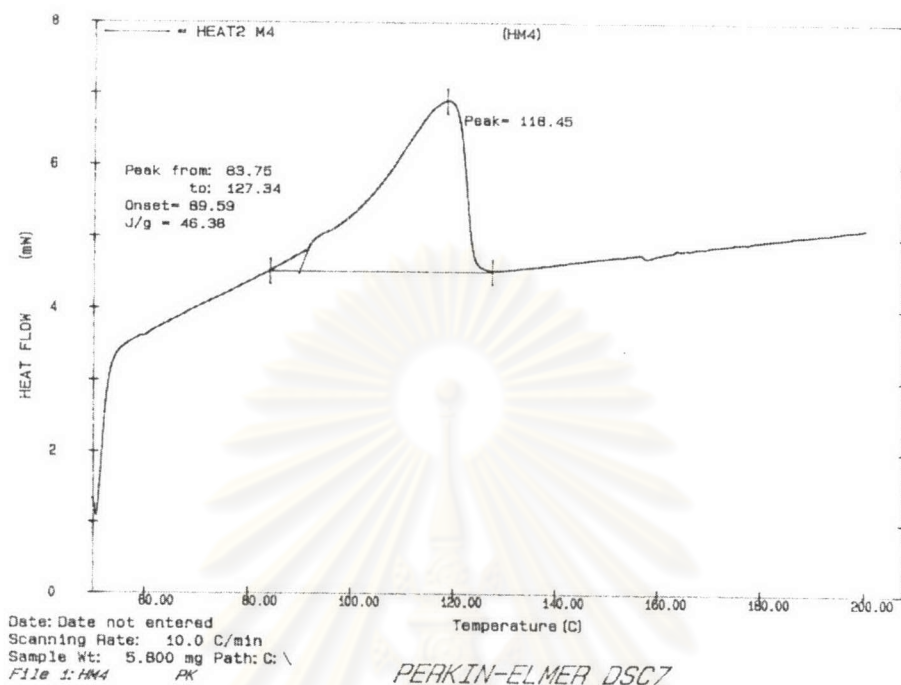


Figure B-21 DSC curve of isotactic polypropylene preparing by metallocene catalyst at catalyst concentration 6×10^{-5} M

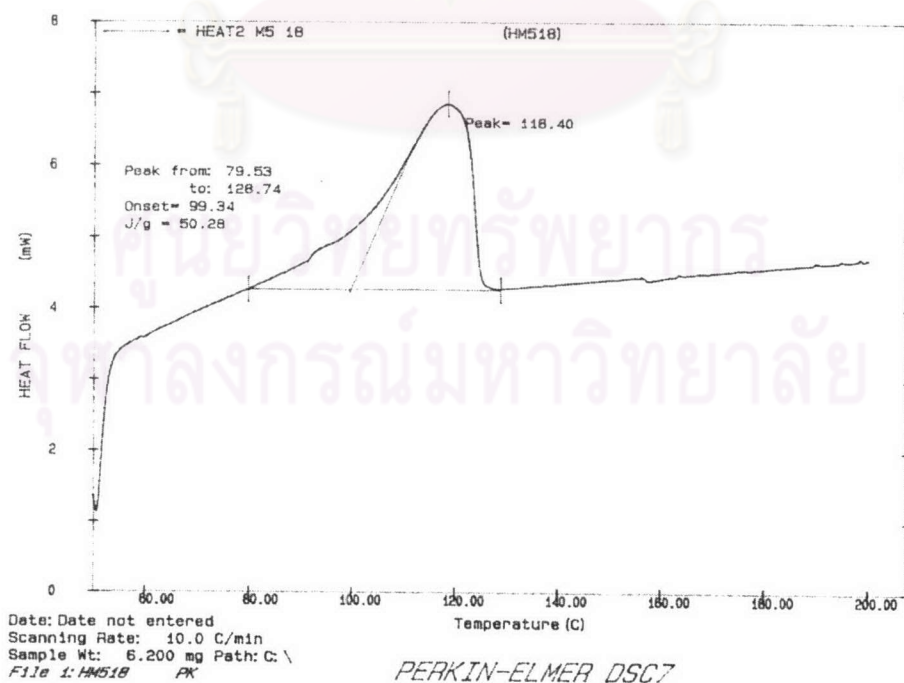


Figure B-22 DSC curve of isotactic polypropylene preparing by metallocene catalyst at catalyst concentration 7×10^{-5} M

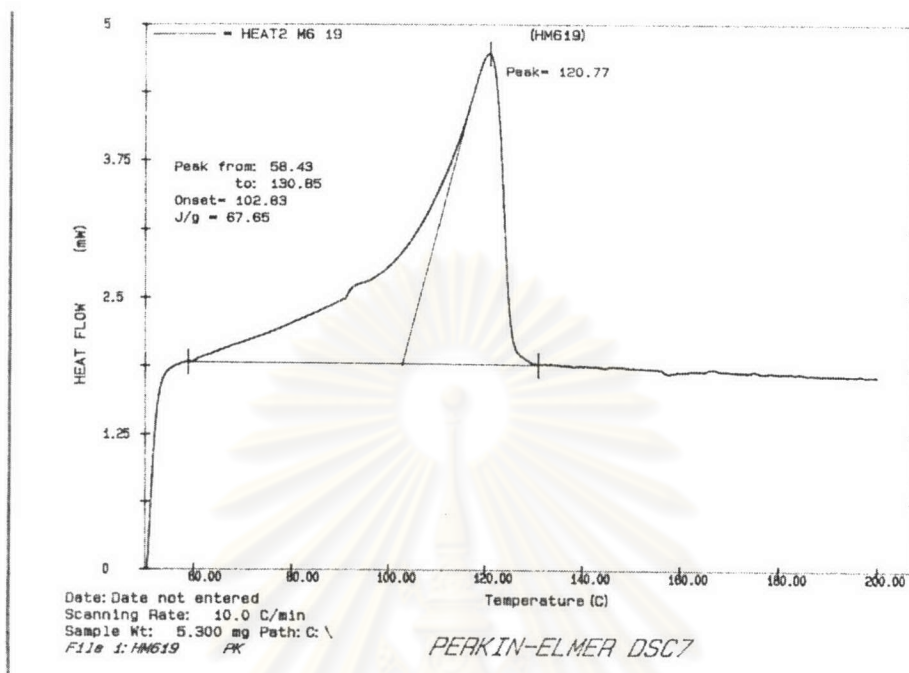


Figure B-23 DSC curve of isotactic polypropylene prepared by metallocene catalyst at catalyst concentration 8×10^{-5} M

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จุฬาลงกรณ์มหาวิทยาลัย

VITA

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