

KES

Poly Propylene Grading Method

KES T – K053

(EST.) 1994 – 09 – 01

Contents

1. Scope of Application
2. Analyzing Concept
3. Characteristics of Analysis
4. Summery of Analysis Result
5. Analysis Data

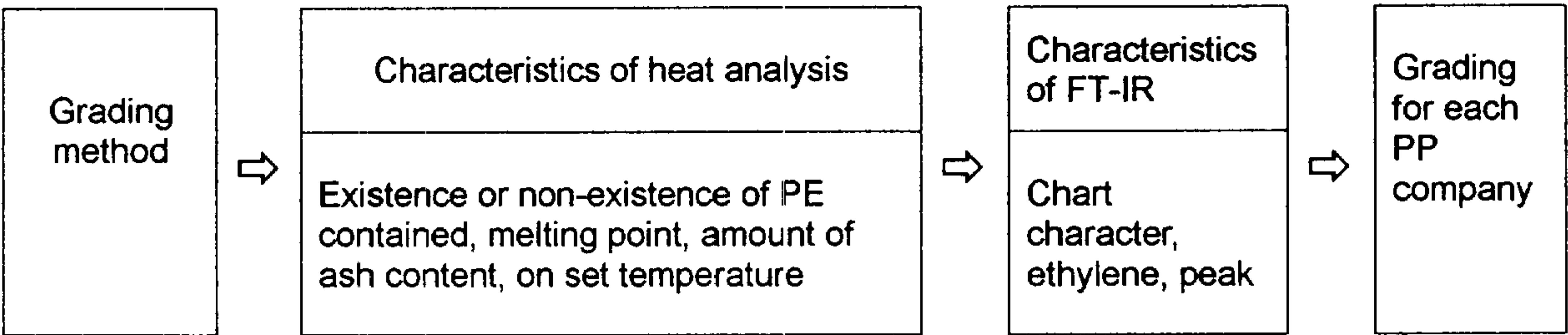


1. Scope of Application

This standard shall be applied for the method that analyzes the grade of poly propylene (PP from now on) manufacturer by FT-IR and TGA, DSC.

2. Analyzing Concept

By filmizing a PP resin that you want to analyze, have the IR suction graph by FT-IR, and measure the PP resin's melting point at constantly rising temperature by a heat analyzer, existence or non-existence as the melting point peak of poly ethylene (PE from now), and crystallization temperature, etc.



3. Characteristics of Analysis

3.1 Characteristics of Heat Analysis

3.1.1 Characteristics by PE added

For DSC analysis PE shows suction peak by melting at 125 °C. Therefore, when adding PE you shall see the PP melting Peak at 125 °C and 165 °C on the DSC Graph.

3.1.2 Characteristics by Rubber added

For DSC analysis, characteristics by rubber shall not be observed.

3.1.3 Heat Characteristics by PP Copolymer Total

Polymer Types and additions	Melting Point (Mp, °C)	Remark
Homo Polymer without PE	165 ~ 167	Standard : DSC rising temperature 10 °C / min
Block Polymer with PE	160 ~ 165	
Random Polymer	152 ~ 160	
Terpolymer	145 ~ 150	

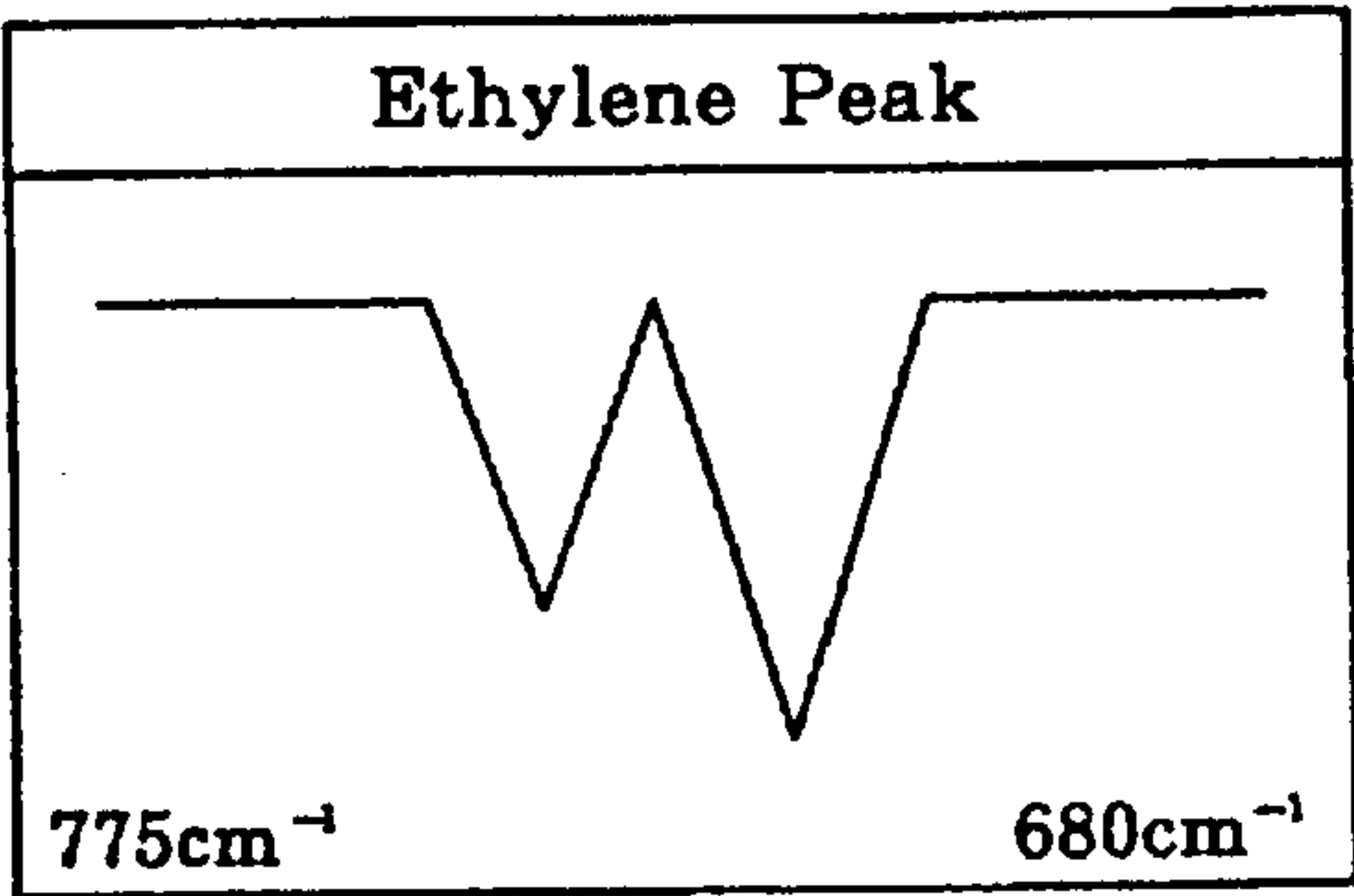
3.1.4 Amount of Pigment and inorganic material contained

Measure it with the residue after 900°C when TGA analyzing.

3.2 Characteristics on FT-IR Chart

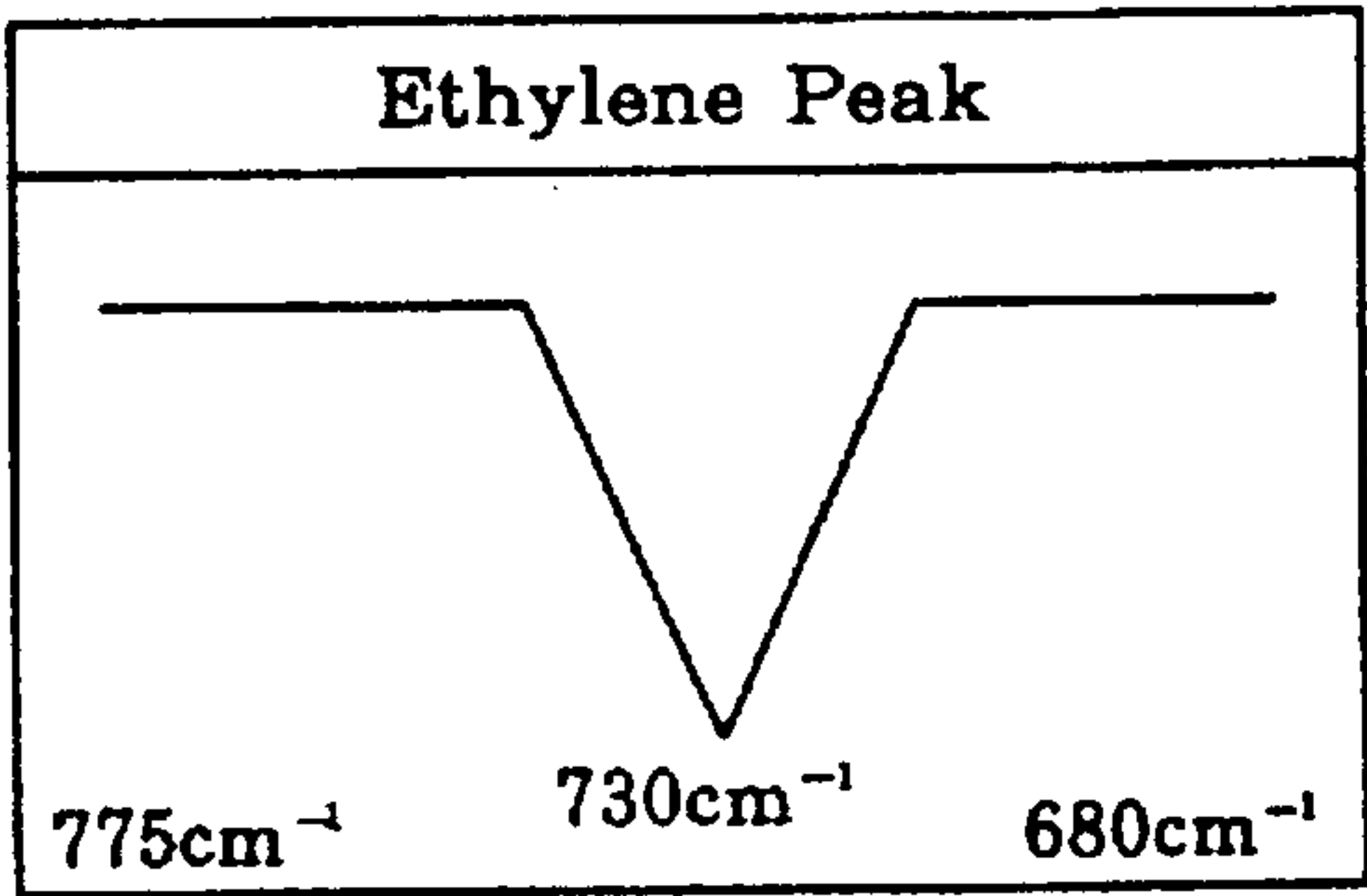
3.2.1

Double Peak shall be measured on the Ethylene Peak if PE is added.



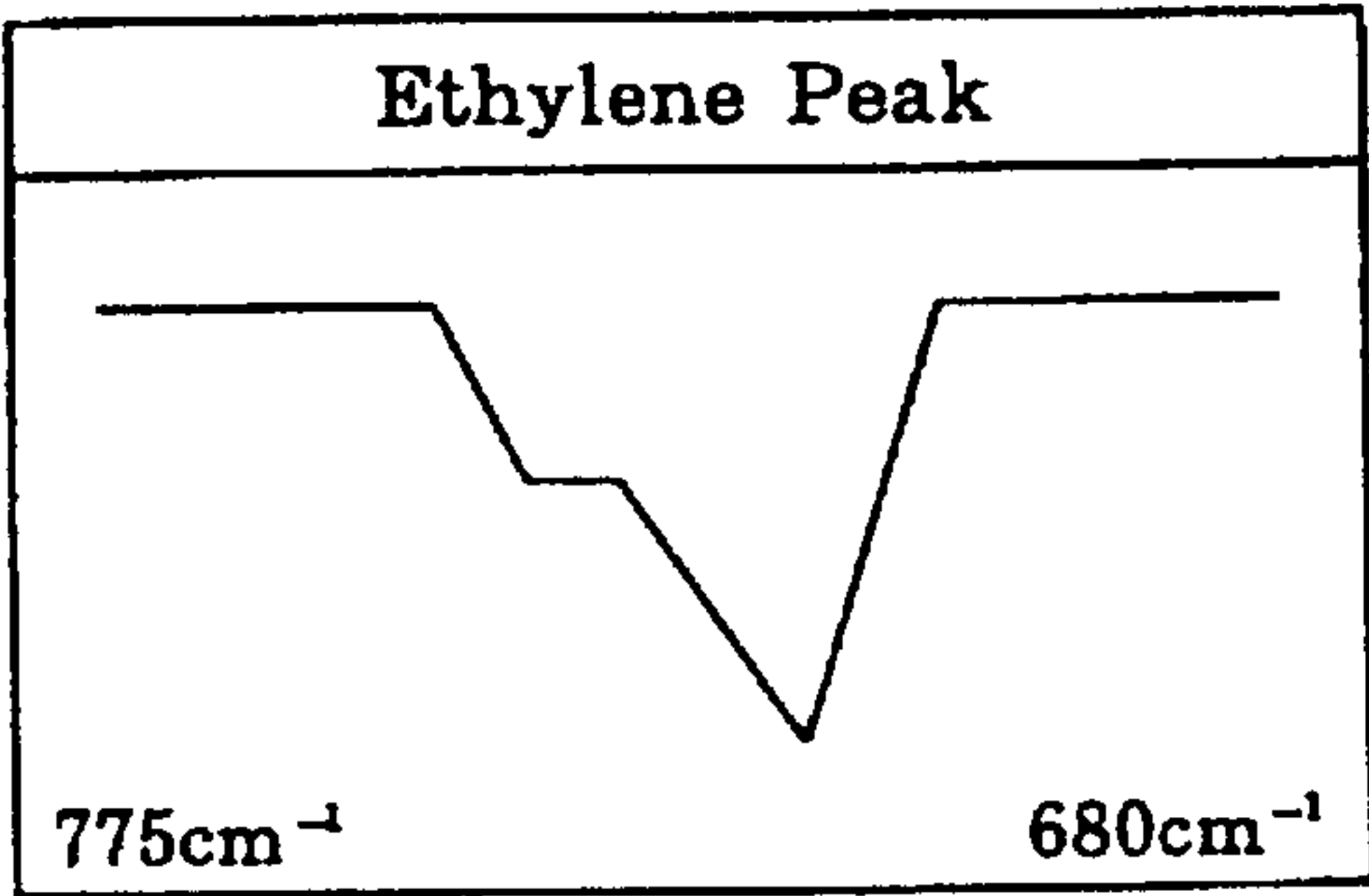
3.2.2

The case that rubber is added or it is random or Terpolymer(Buten observation).



3.2.3

The case that it is Block Polymer.



3.2.4 When DSC analyzing, there are many cases for block that rubber is added rather than PE melting point is detected.

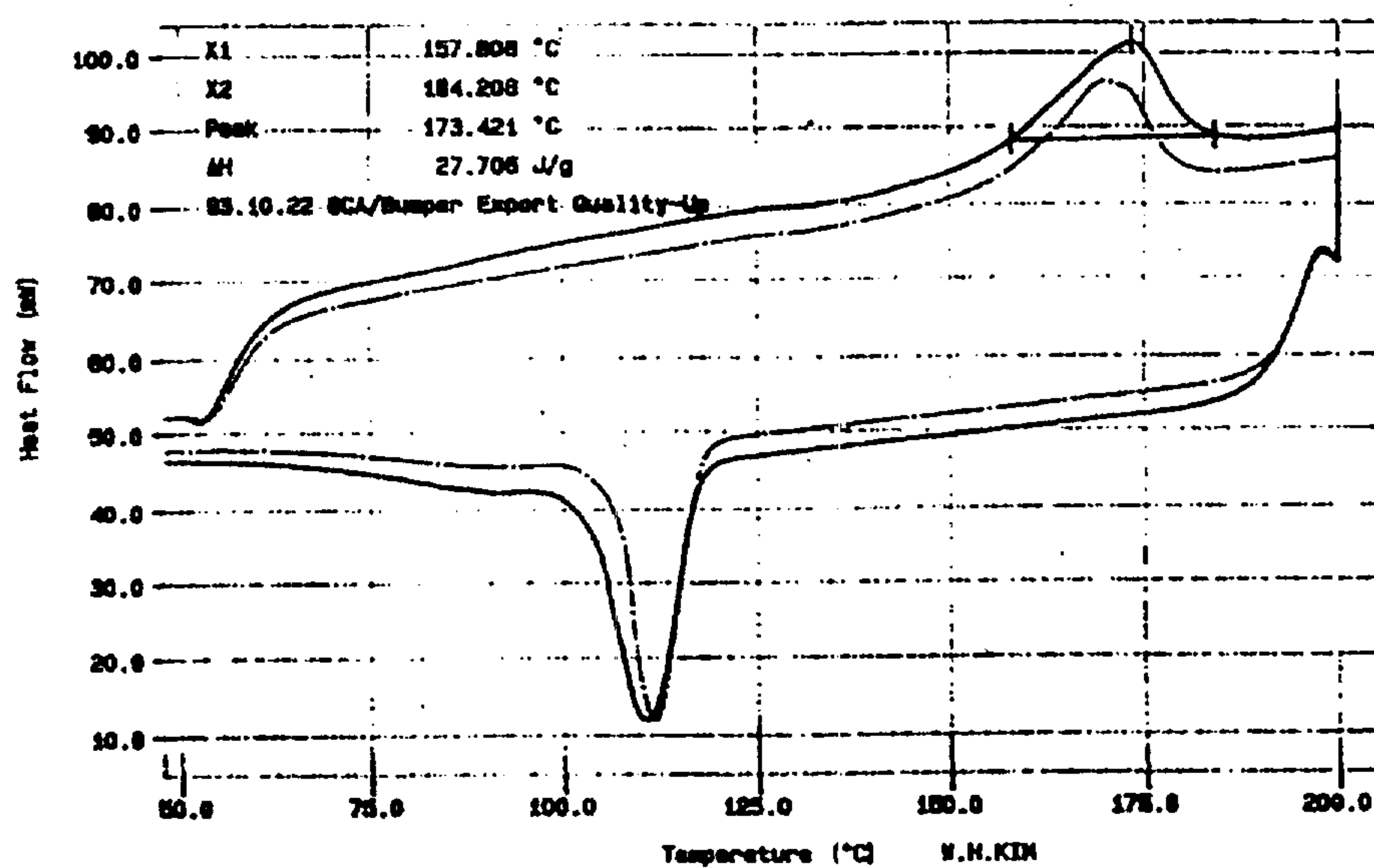
4. Summery of Analysis Result

No	Grade name	Results of heat analysis				FT-IR results
		DSC analysis		TGA analysis		
		PE melting point (°C)	PP melting point (°C)	On set temperature (°C)	Residue (%)	
1	TE5005K	—	173.4	515.6	—	Add homo, rubber
2	TE5005R	—	172.1	526.5	4.38	Add homo, rubber, inorganic material
3	TE5007K	131.32	165.9	507.4	—	Add block, PE
4	TE5006K	—	170.6	523.2	3.96	Add block, inorganic material
5	E373D	—	166.2	521.7	2.75	Add rubber, inorganic material
6	E373D	—	165.2	511.9	4.55	Add rubber, inorganic material
7	HCA352B	—	166.7	533.5	24.26	Add block, inorganic material
8	E353G	126.9	165.3	518.0	—	Add block, PE
9	EM4031	—	168.0	554.9	—	Add rubber
10	ETA3095	—	168.0	539.0	—	Add rubber
11	ETA3095	—	171.7	552.4	—	Add rubber
12	ETA3095	129.3	165.5	537.9	0.20	Add PE
13	EM4033	—	167.3	542.9	0.98	Add rubber, inorganic material
14	5212MHI	—	167.4	546.9	21.33	Add inorganic material, 36cm, peak

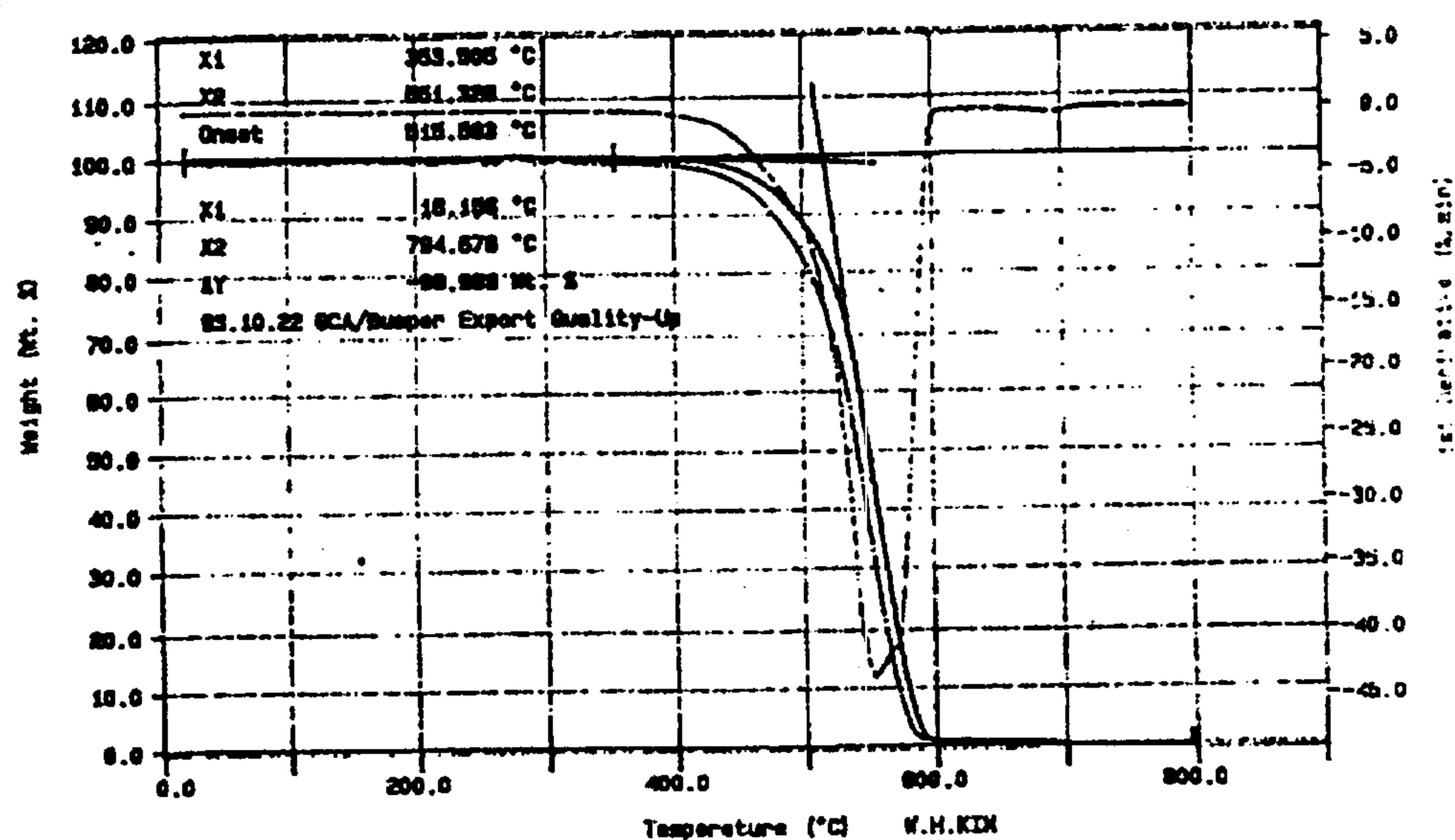
5. Analysis Data

5.1 TE5005K

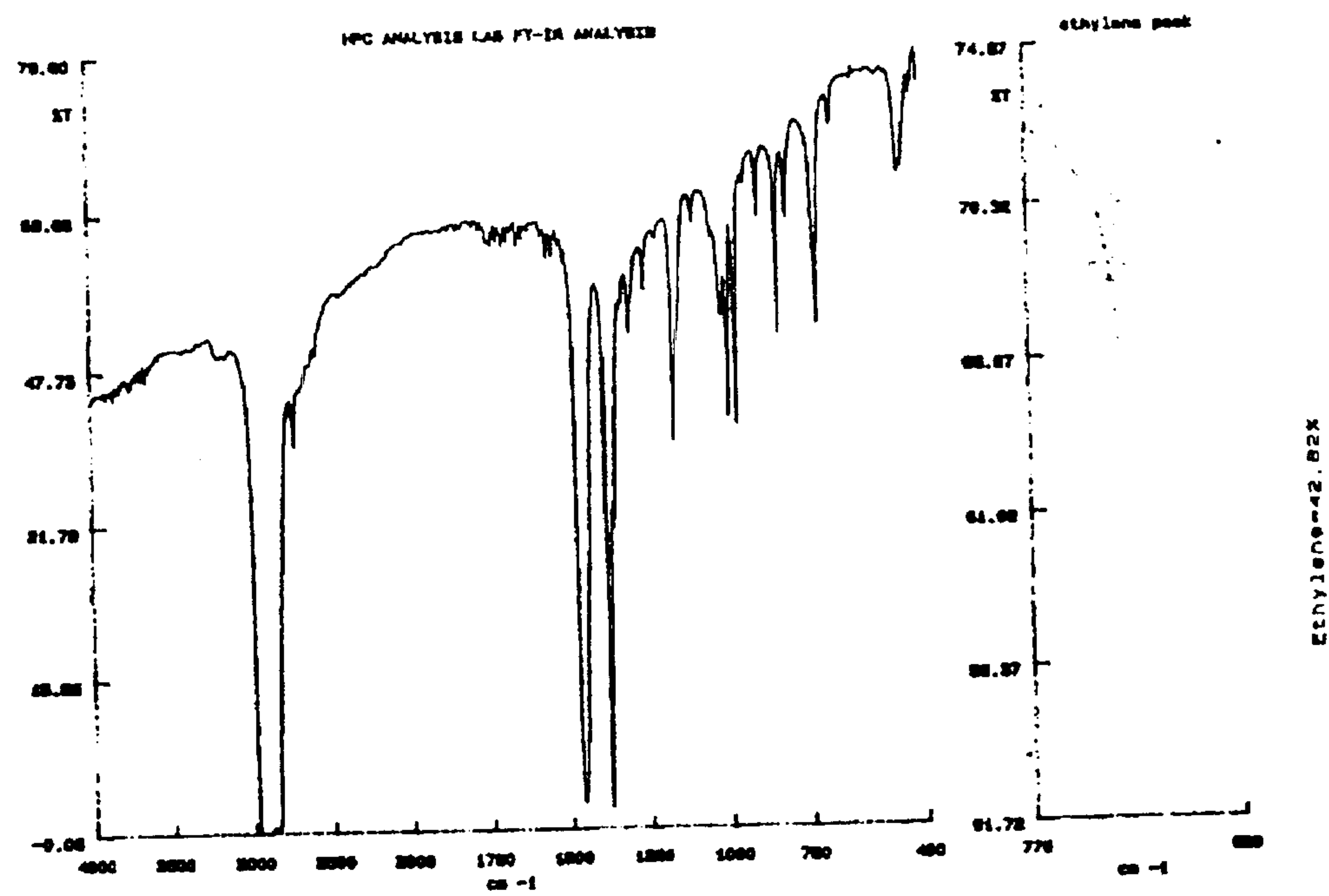
5.1.1 DSC Graph



5.1.2 TGA Graph

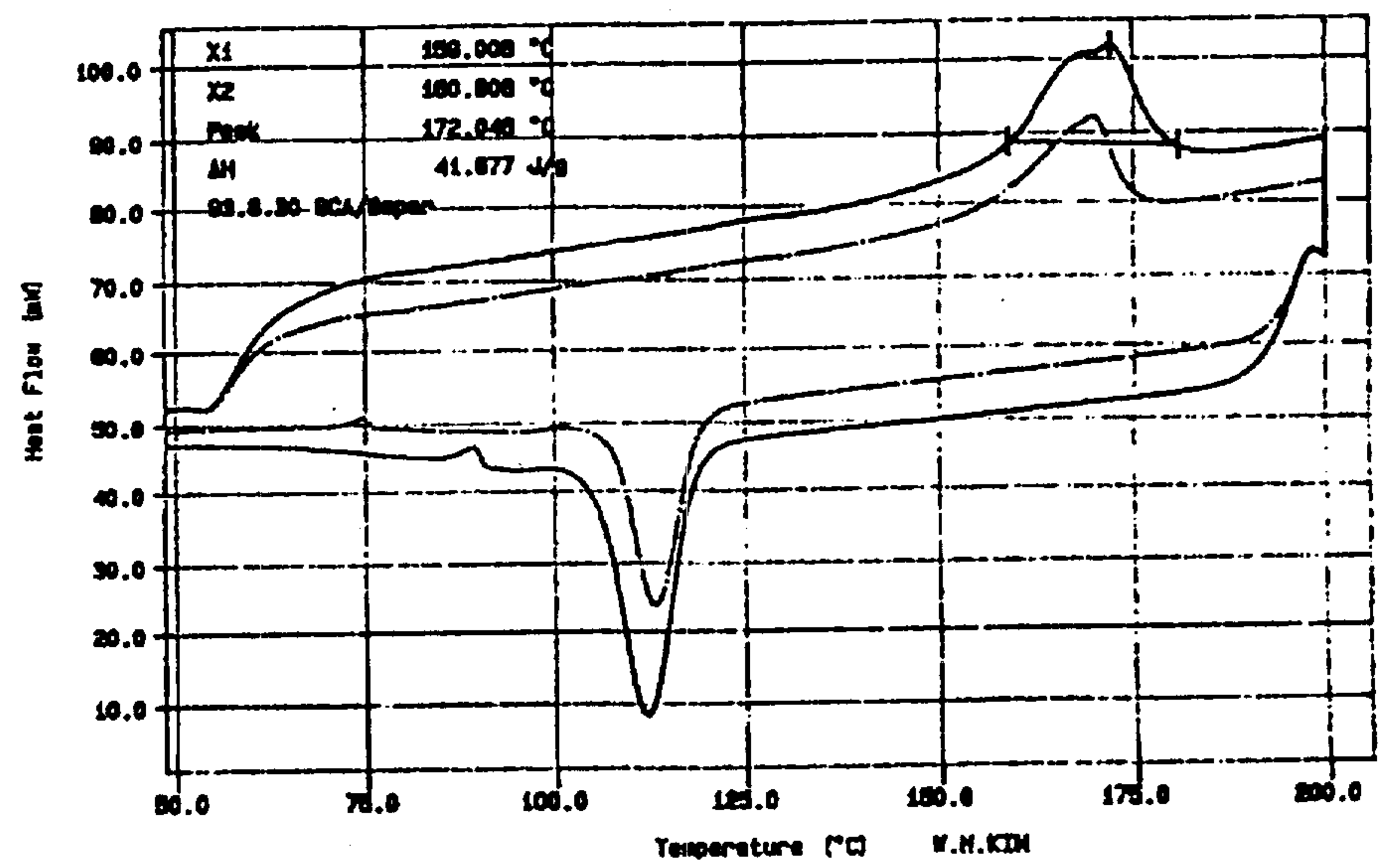


5.1.3 FT – IR Chart

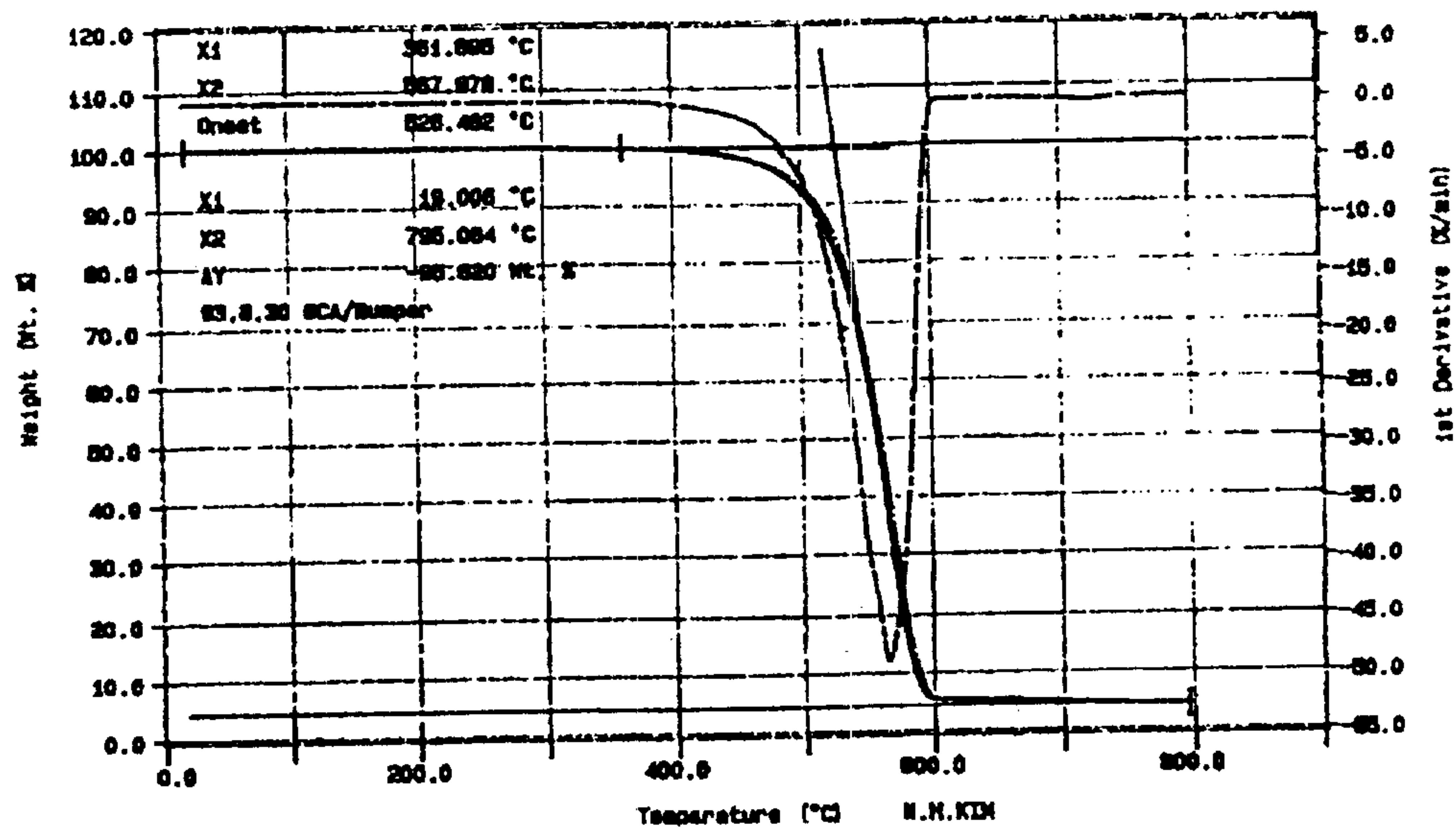


5.2 TE5005R

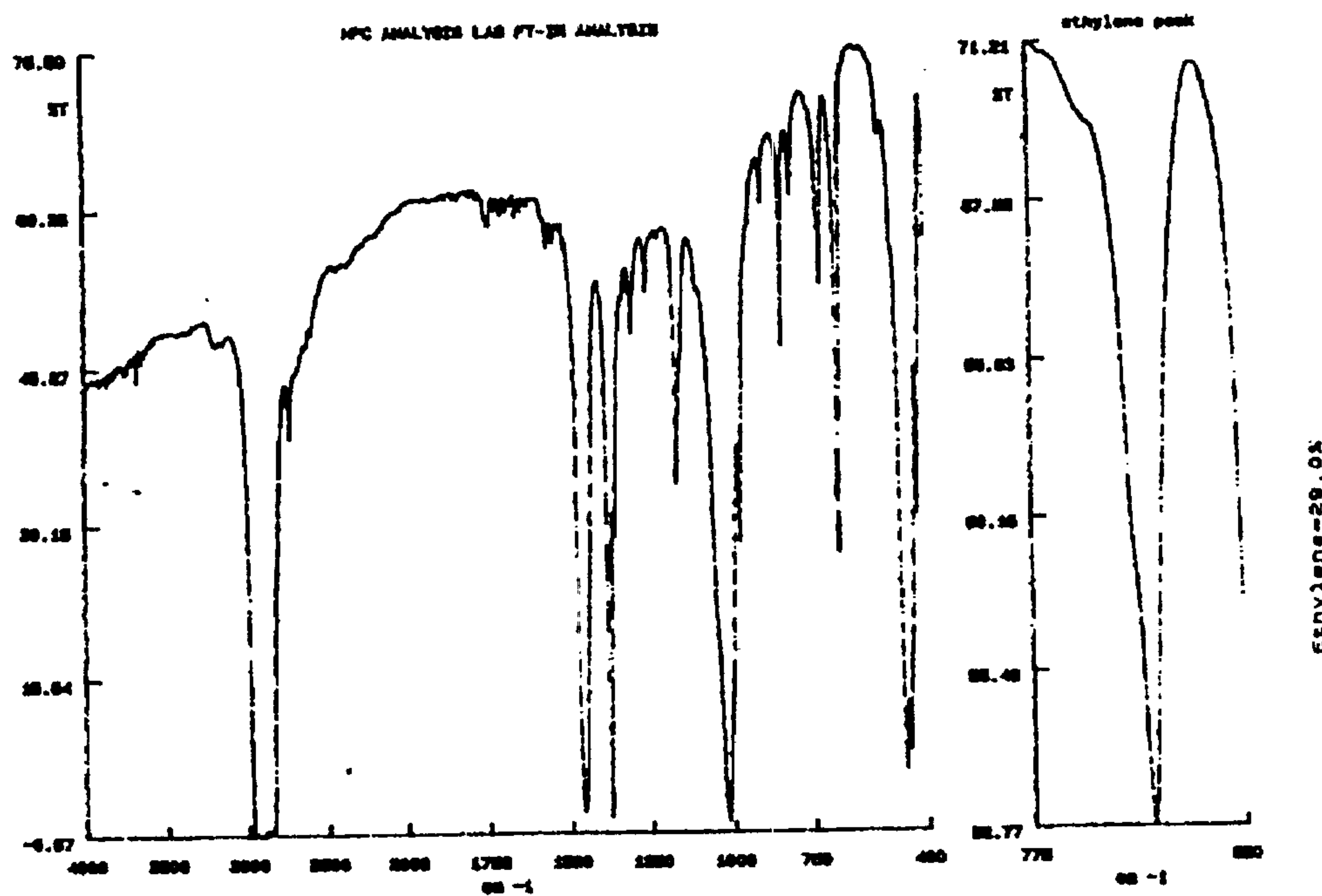
5.2.1 DSC Graph



5.2.2 TGA Graph

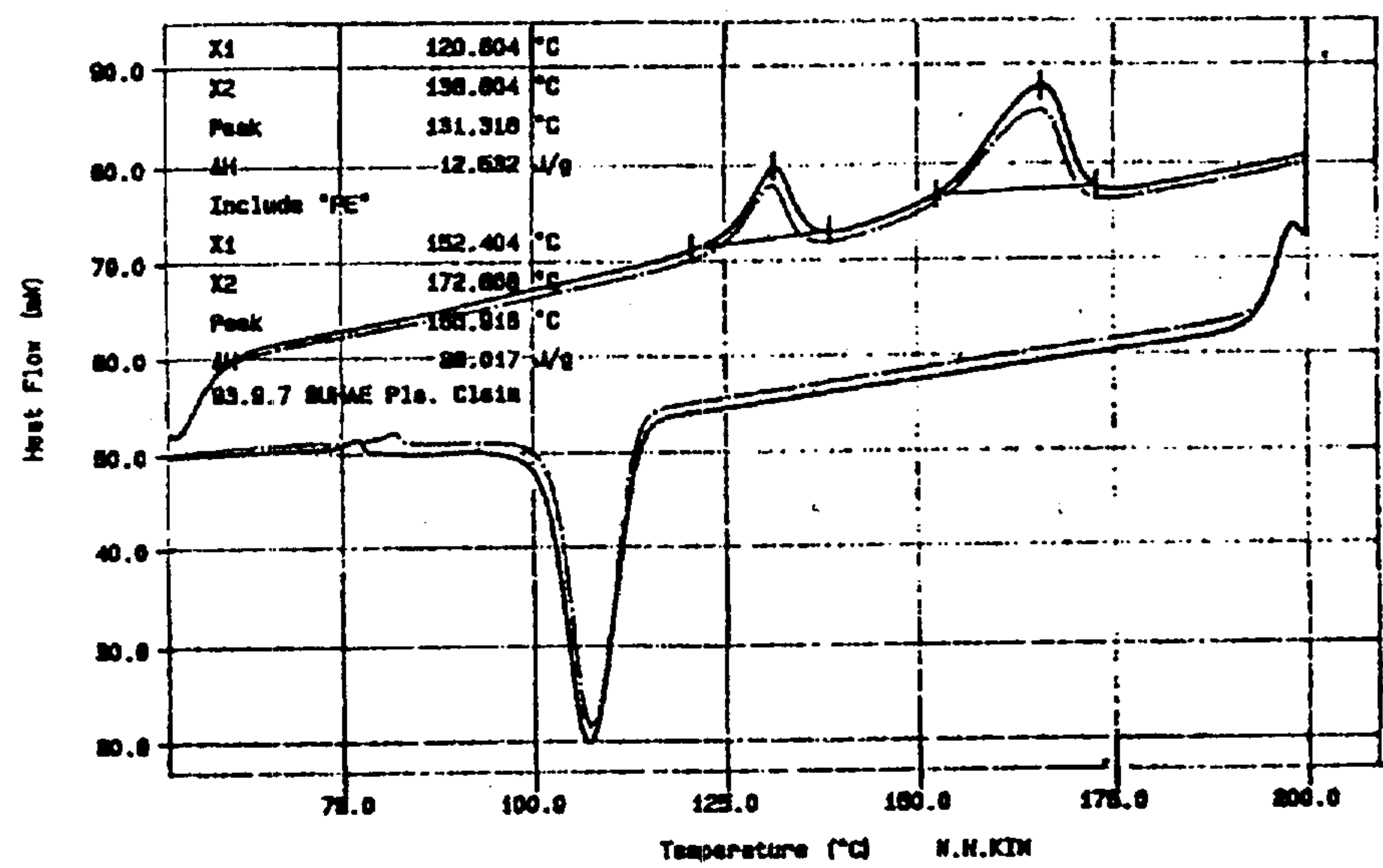


5.2.3 FT – IR Chart



5.3 TE5007K

5.3.1 DSC Graph



5.3.2 TGA Graph

