Application Brief

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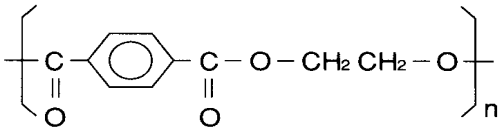
DMA NO. 9

Dynamic Viscoelastic Data of Polyethyleneterephthalate

1. Sample Polyethyleneterephthalate : PET
(Brand Name : S-Type film, biaxially oriented)

2. Chemical Structure



3. Thermal History Annealed at 130℃ for 1 hour.

4. Instruments SDM5600 Rheol. Station
DMS200 Dynamic Mechanical Spectrometer

5. Conditions

Deformation mode :	Tensile mode
Sample Size :	10.00(ℓ)×10.00(w)×0.01(t)mm
Temperature Range :	-150℃ ～ 220℃
Heating Rate :	1K/min
Atmosphere :	N_2
Frequency :	0.5,1,2,5,10Hz

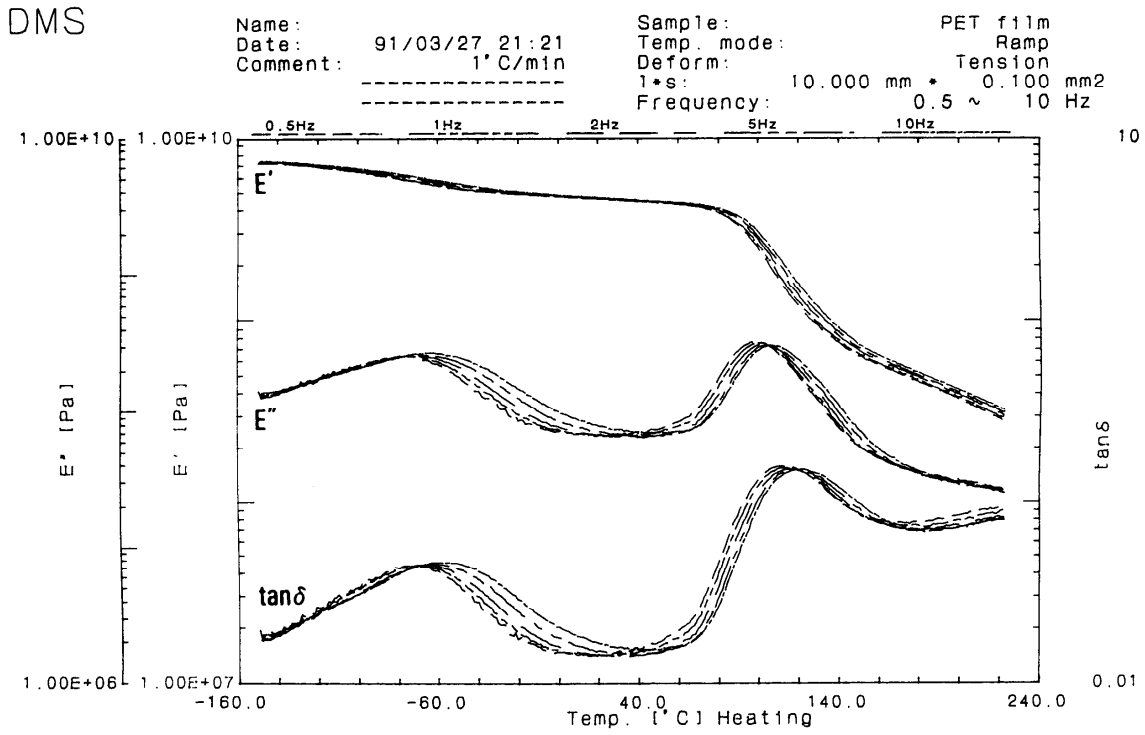
6. Transition temperature and activation energy based on tanδ

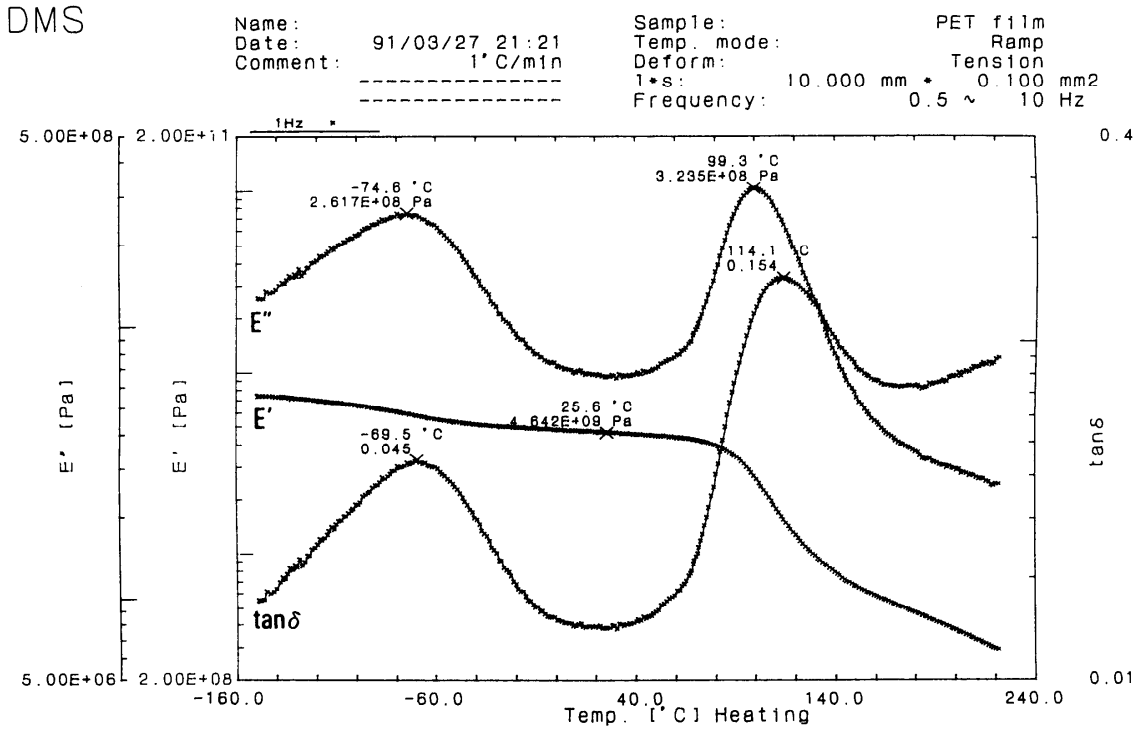
	Transition Temperature (℃)	ΔEa (kJ/mol)	Comments
α Transition	114 (1Hz)	398	Glass Transition
β Transition	-70 (1Hz)	76	Local mode relaxation

7. Thermal Analysis Data

Annealed Sample (1st run)	Tm : 257.7℃, ΔHm : 61.0 J/g
Quenched Sample (2nd run)	Tg : 76.5℃, ΔCp : 0.377 J/deg･g
	Tc : 134.0℃, ΔHc : 37.9 J/g
	Tm : 257.5℃, ΔHm : 51.3 J/g

DSC 10K/min


DMS
Name:
Date: 91/03/27 21:21
Comment: 1°C/min
Sample: PET film
Temp. mode: Ramp
Deform: Tension
1*s: 10.000 mm * 0.100 mm2
Frequency: 0.5 ~ 10 Hz
0.5Hz
1Hz
2Hz
5Hz
10Hz
1.00E+10
1.00E+10
10
E' [Pa]
E' [Pa]
E'
E"
tanδ
tanδ
1.00E+06
1.00E+07
0.01
-160.0
-60.0
40.0
140.0
240.0
Temp. [°C] Heating


DMS
Name:
Date: 91/03/27 21:21
Comment: 1°C/min
Sample: PET film
Temp. mode: Ramp
Deform: Tension
1*s: 10.000 mm * 0.100 mm2
Frequency: 0.5 ~ 10 Hz
1Hz
5.00E+08
2.00E+11
0.4
-74.6 °C
2.617E+08 Pa
99.3 °C
3.235E+08 Pa
114.1 °C
0.154
E"
E'
25.6 °C
4.642E+08 Pa
-69.5 °C
0.045
tanδ
E' [Pa]
E' [Pa]
tanδ
5.00E+06
2.00E+08
0.01
-160.0
-60.0
40.0
140.0
240.0
Temp. [°C] Heating