

.

理想彈性

純粘性流動

가

가

粘彈性體

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가

19

Maxwell, Kelvin, Voigt

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緩和現象

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가

가

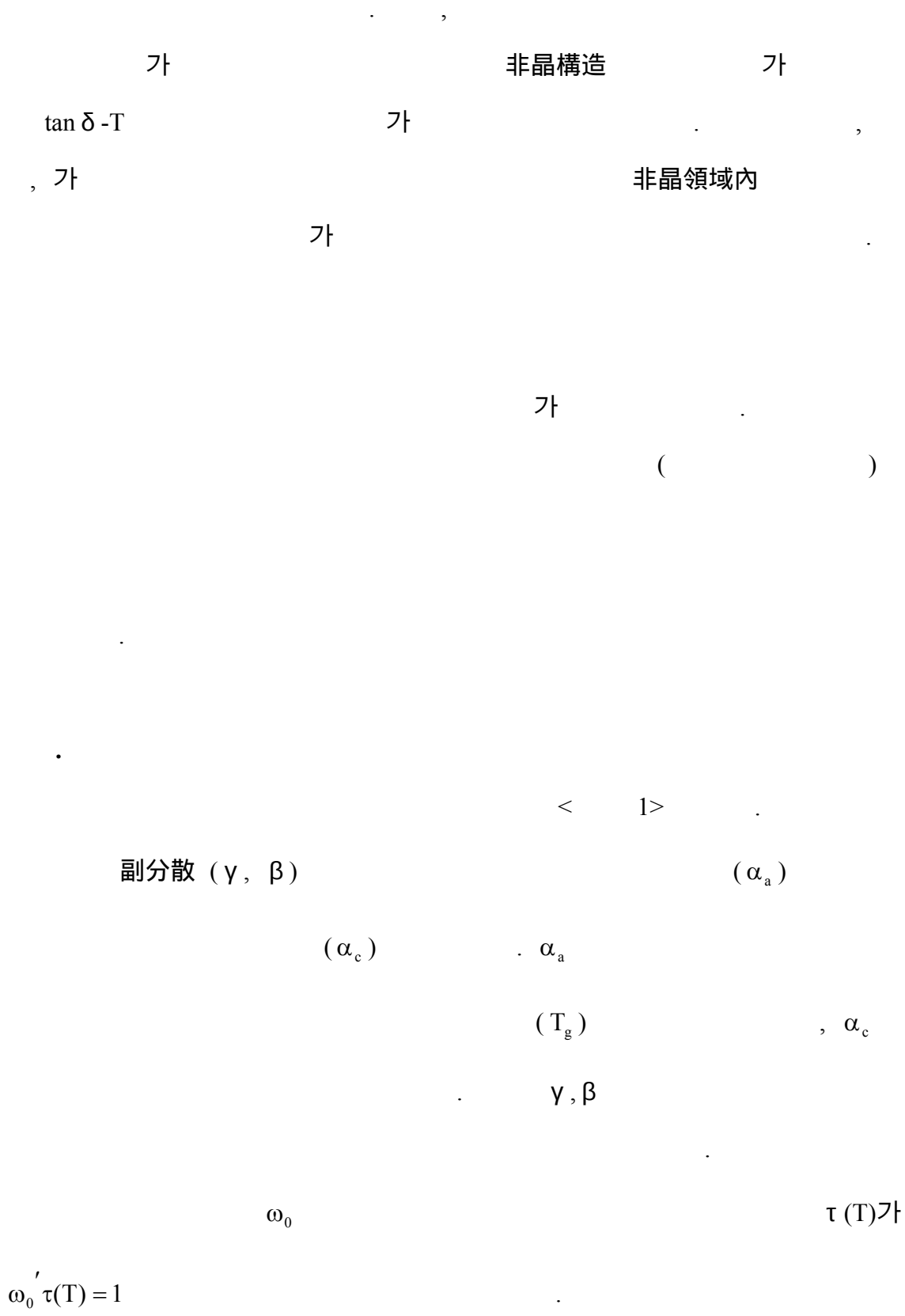
가

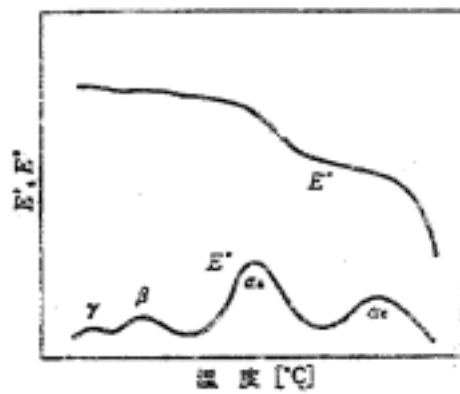
.

가

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가





< 1>

< 2>

6,

(PET),

(PAN)

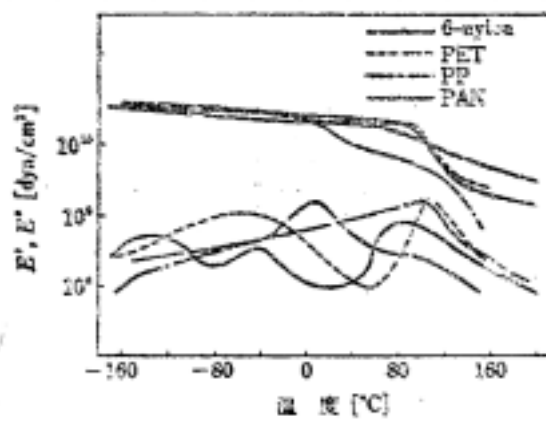
(PP)

E' ,

, E''

110Hz,

1 /min



< 2>

6 -40

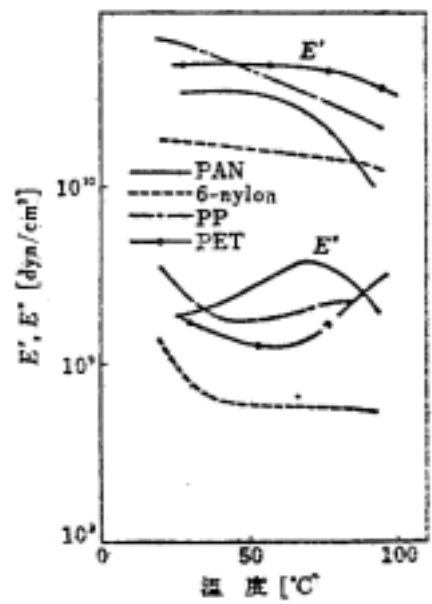
,-130

γ

. PET -50

α_a 110 . PAN
 100
 160
 β
 가 . PP -60 β 10
 α_a 110 α_c 相當 .
 PP 70~120
 50
 ,
 T_g . PP 10
 가
 T_g 가 가 ,
 T_g 가 .
 ,
 .
 () ,
 ,
 α 가 β
 知見 .
 α_c 가 . PP 院外 PET, PAN
 가 40%

乾熱
 濕熱
 가
 가
 PAN
 3> 水中
 $\omega_0 \tau(H, T) = 1$
 (H), (T)
 6 PAN 70 가
 PAN
 가
 PET
 가 PP 가



< 3>

가 ,

T_g 가 .

T_g 가 , 가

. , E''

Nomex 225 300 , Kaynol 150 225 2

가 T_g

가 .

1.

,

, - 諸機械的

.

,

가 支配 .

. , ,

. 地面關係上 가

.

< 4> PP

(110

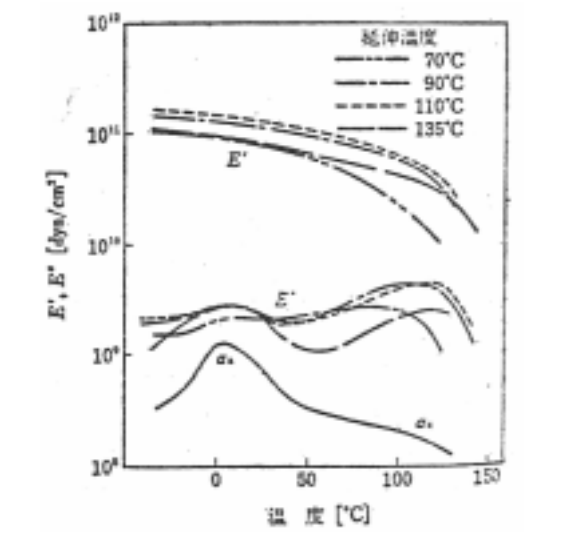
, 2)

가 . 가

. 가

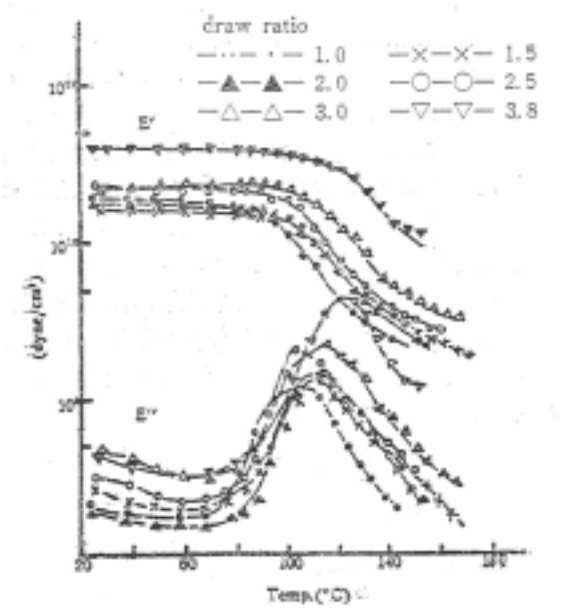
緩和

가



< 4> PP

, < 5> < 6> PET



< 5> PET

가 E'' 가

a

가 α_a

E'

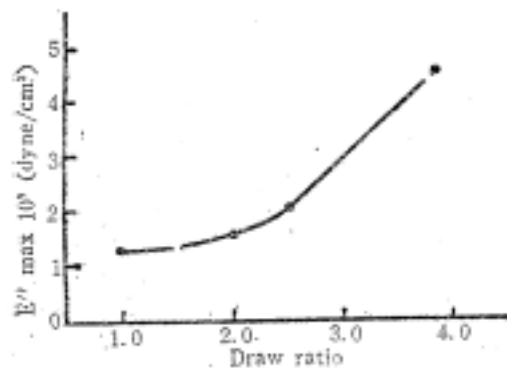
α_a

圖示 < 6>

2.0

가 , 2.5

2.0~2.5 가



< 6> α_a

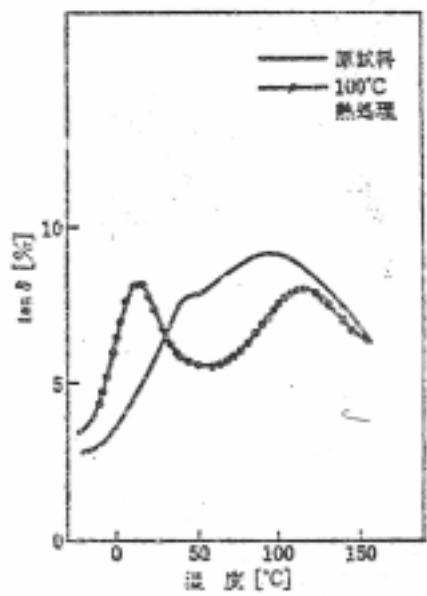
2.

< 7>

가

가

，
 ．
 가 T_g
 ，
 ．
 WLF PET



< 7> PP tan δ

< 8> PP
 X- 回折 (9) ，

가

X-

X-

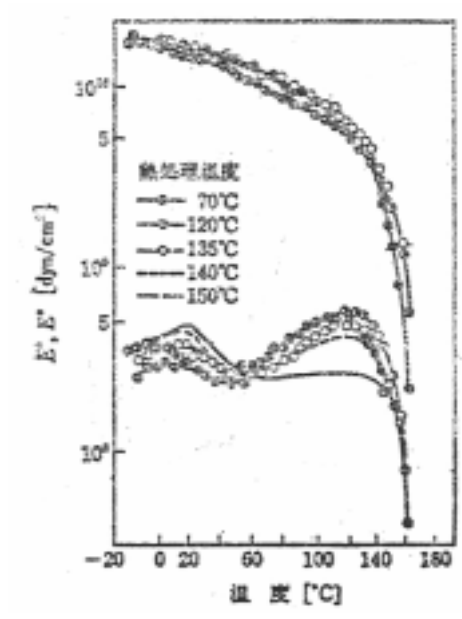
高柳

單

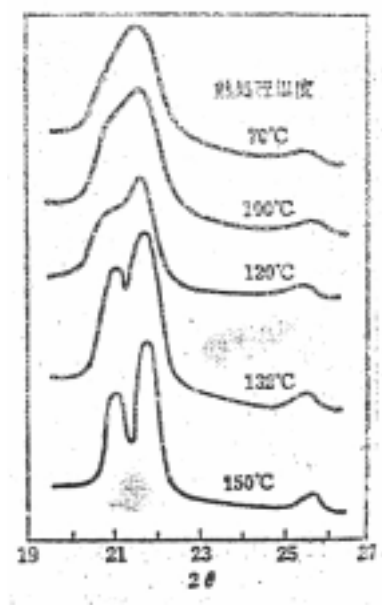
厚化

厚化

運動



< 8> PP E', E''

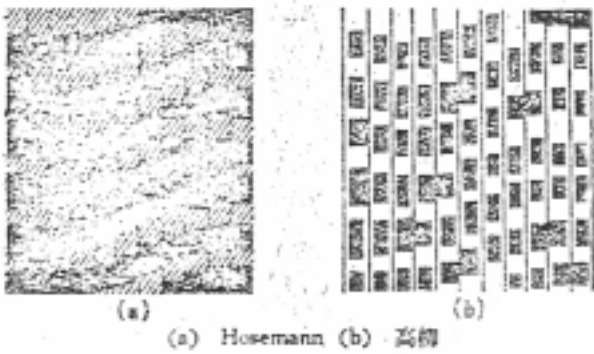


< 9> 8 X-

가

< 10> Hosemann
高柳

가



< 10> PE

< 11> Peterlin

가

%

가

가

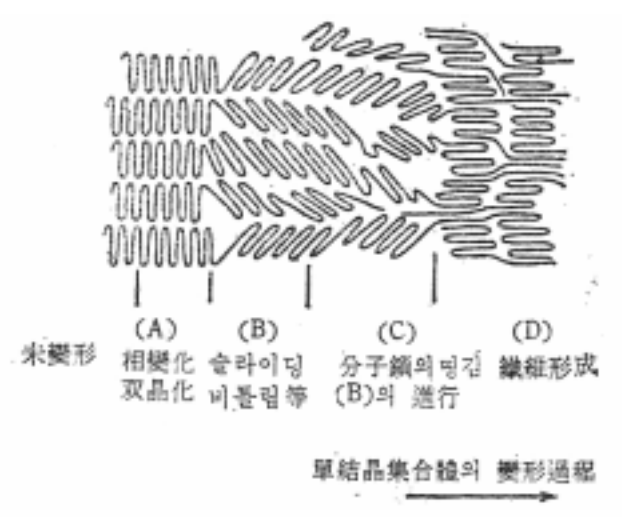
가 가 < 11>

가 . Buckly

가

(tie-link)

Keith



< 11> usgud

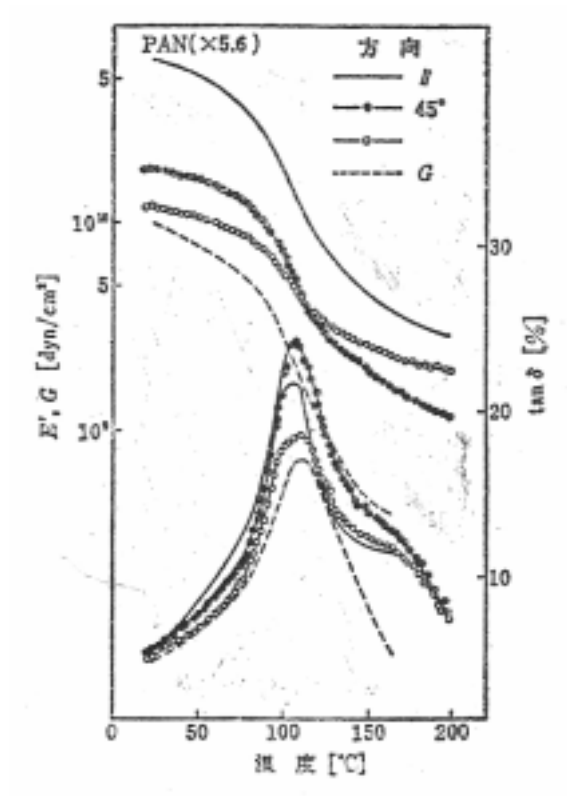
< 12>

5.6 PAN

10

. PAN

E'



< 12> PAN 異方性

，
，
가
가 가

가