

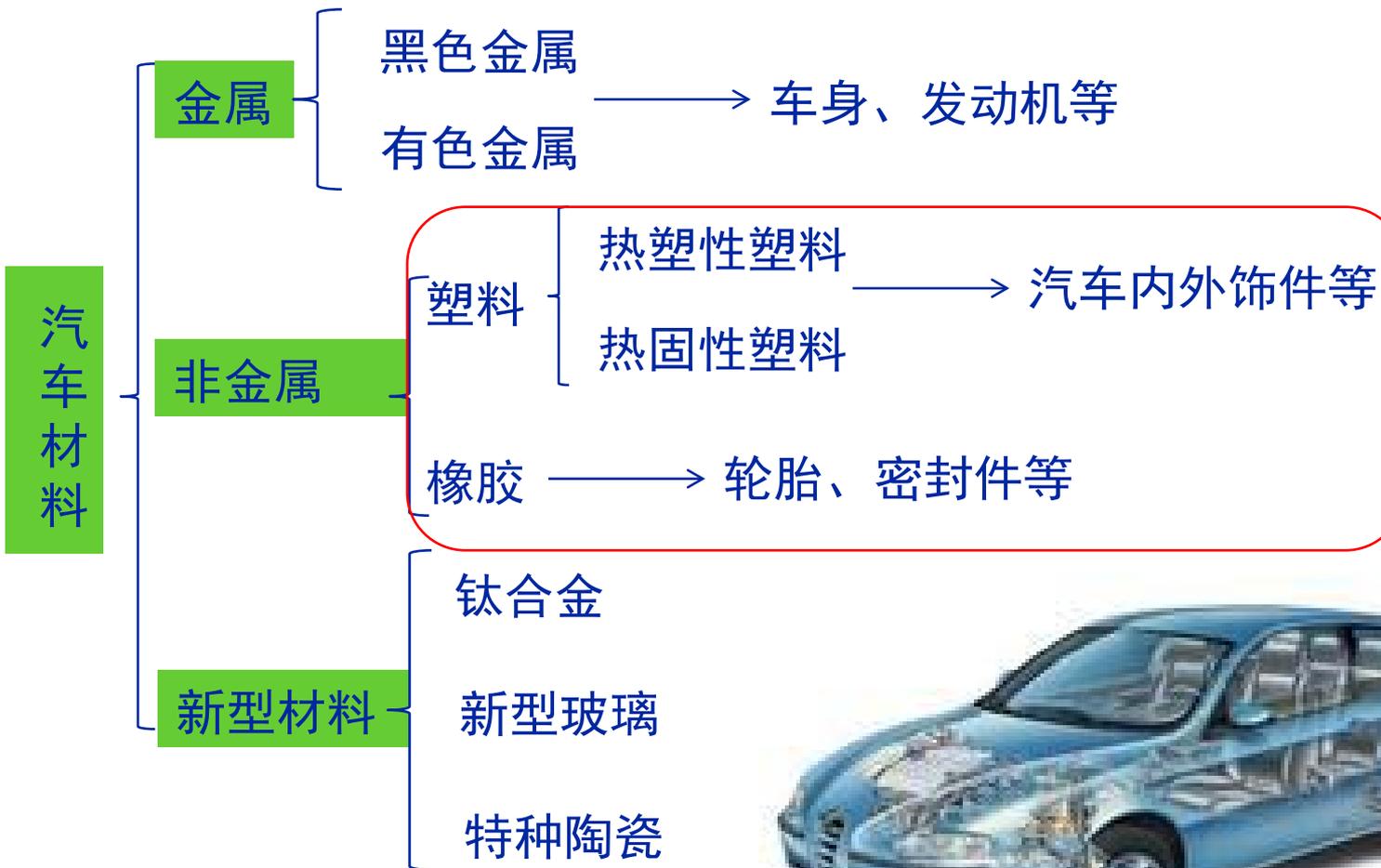
热分析在汽车行业的应用



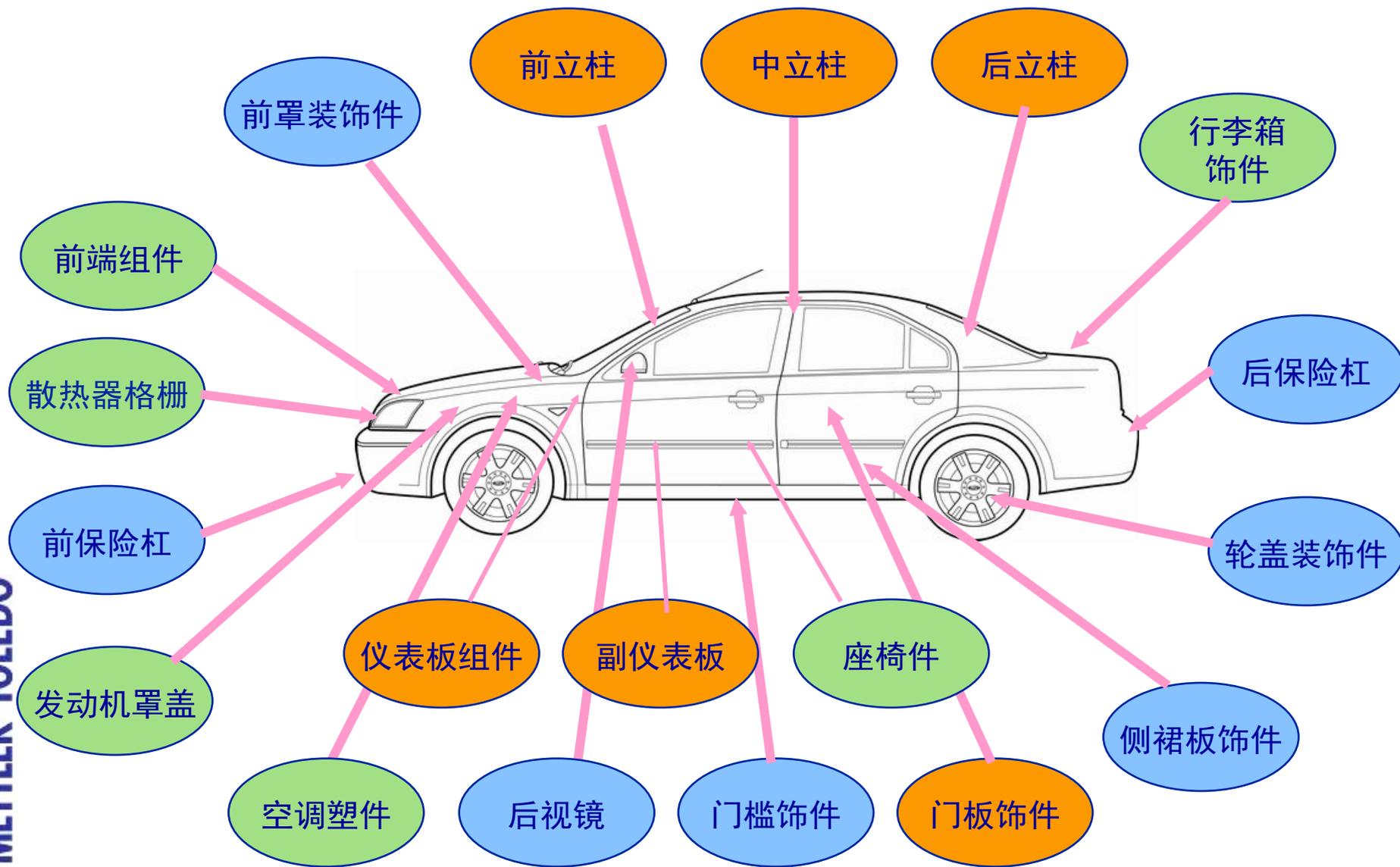
梅特勒-托利多
孔鹏飞

METTLER TOLEDO

汽车材料



汽车塑料件



热分析在汽车材料的应用



应用领域

- 生产 (→ 需要提供热分析数据)
- 质量控制 (→ “指纹图谱”)
- R&D

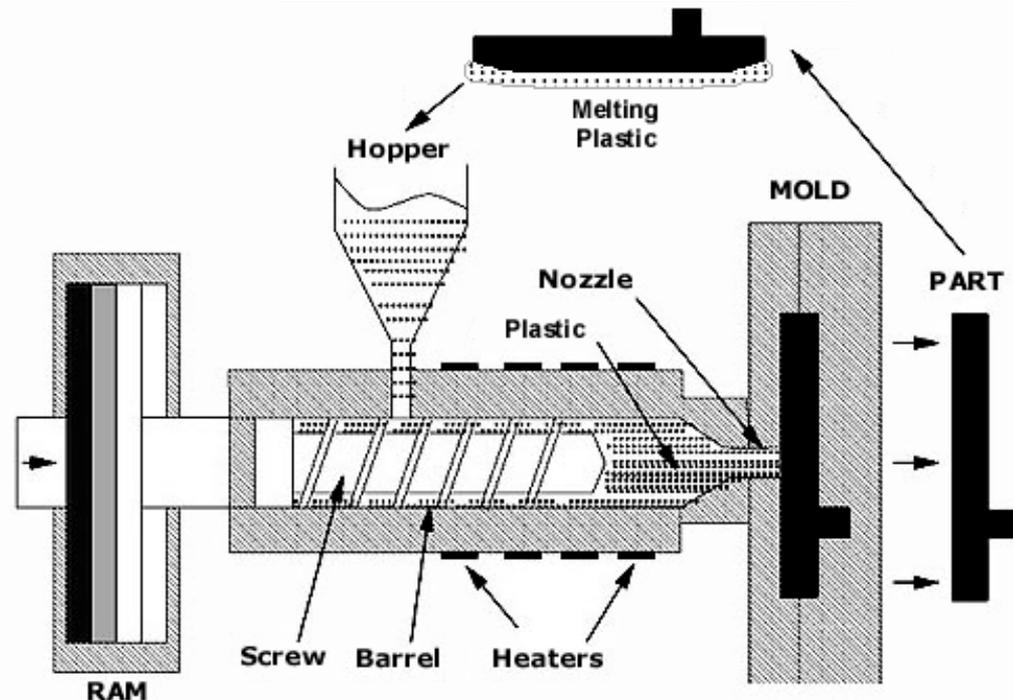


主要测试的材料特性

机械性能

(→ 结晶, T_g , 蠕变)

- 热塑性塑料改性 (→ 添加剂)
- 长期行为 (化学稳定性和机械稳定性)



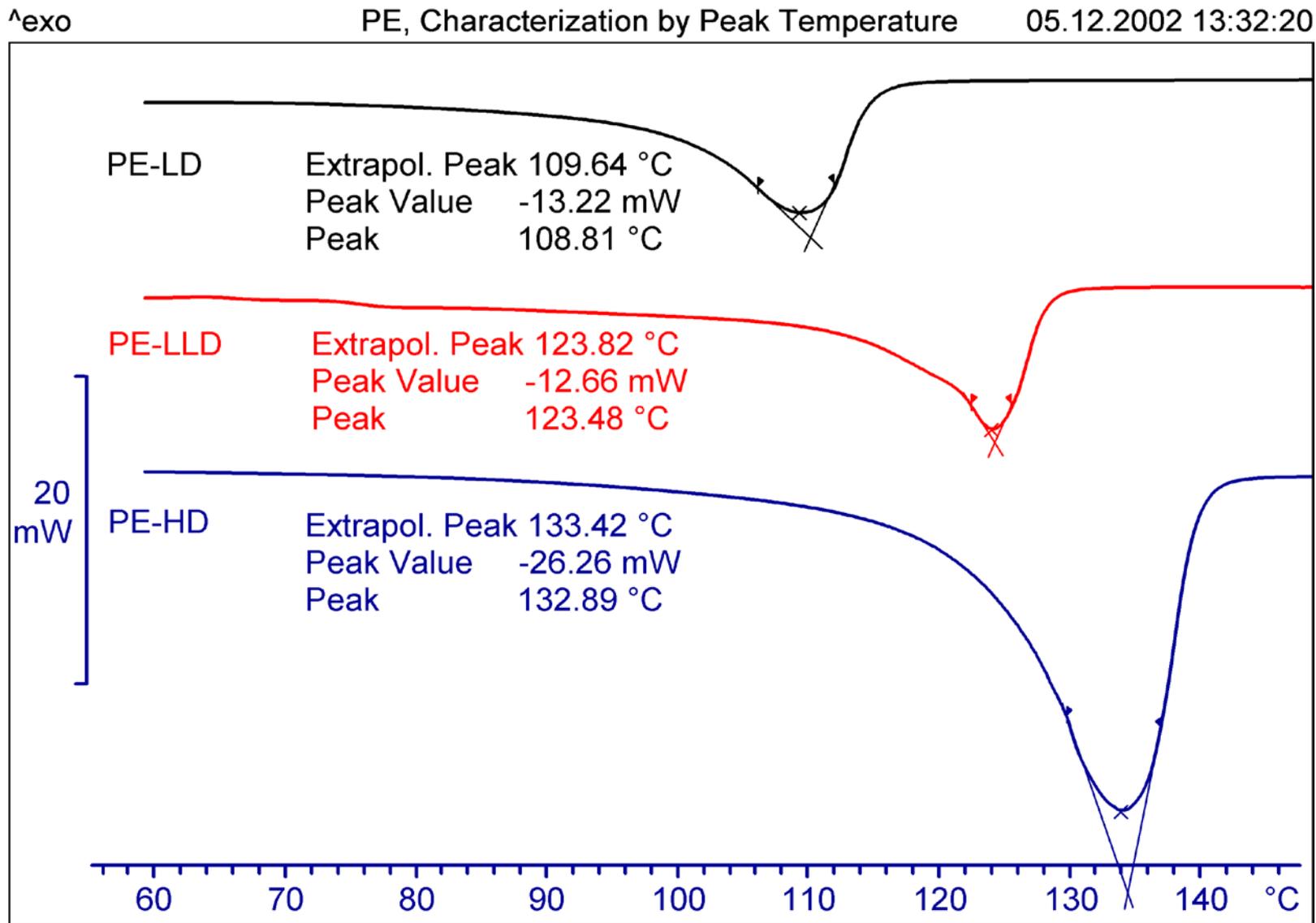
汽车常用塑料——聚乙烯



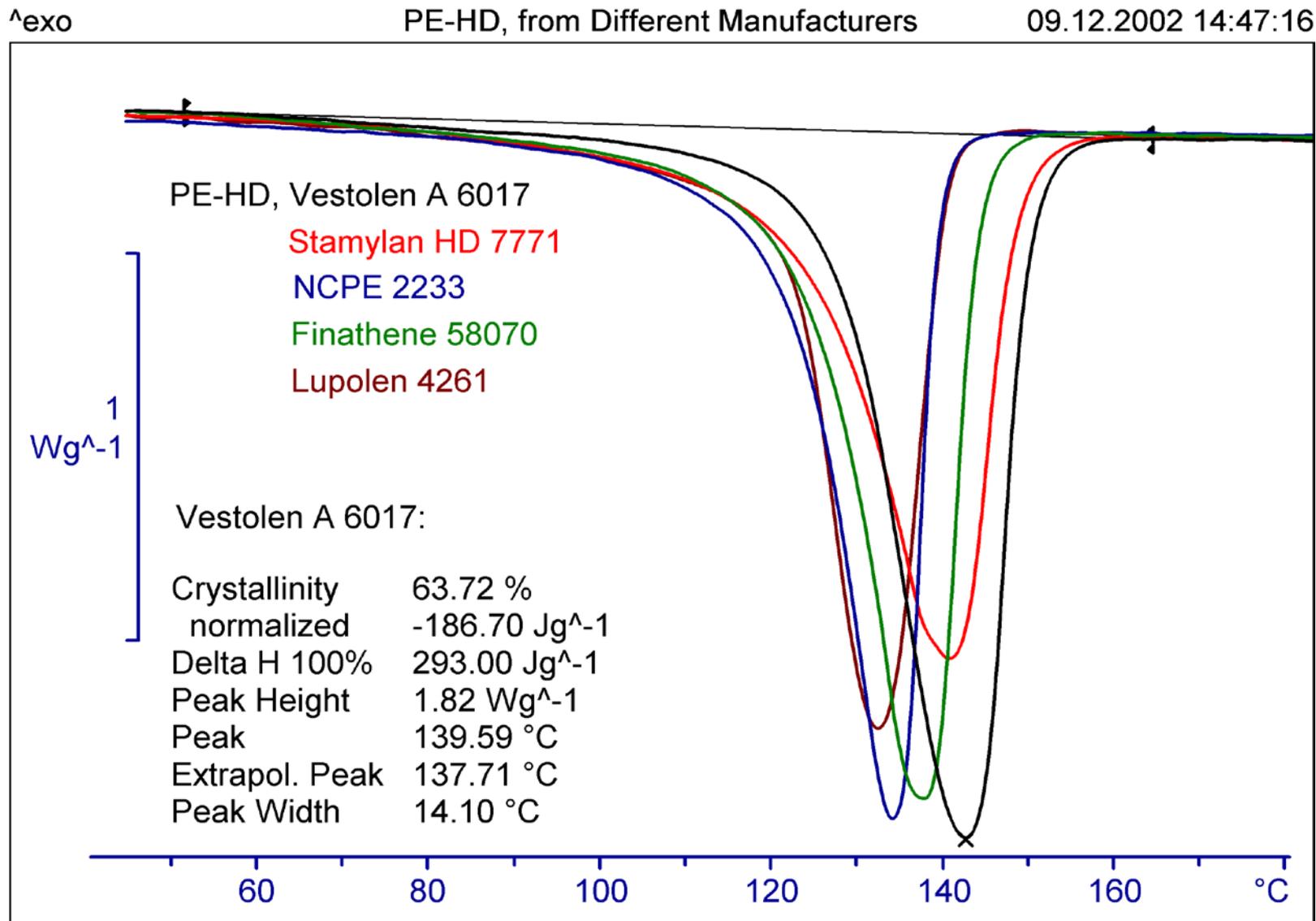
用途：汽油箱、挡泥板、手柄、风扇嵌条、内锁按钮、轿车保险杠等



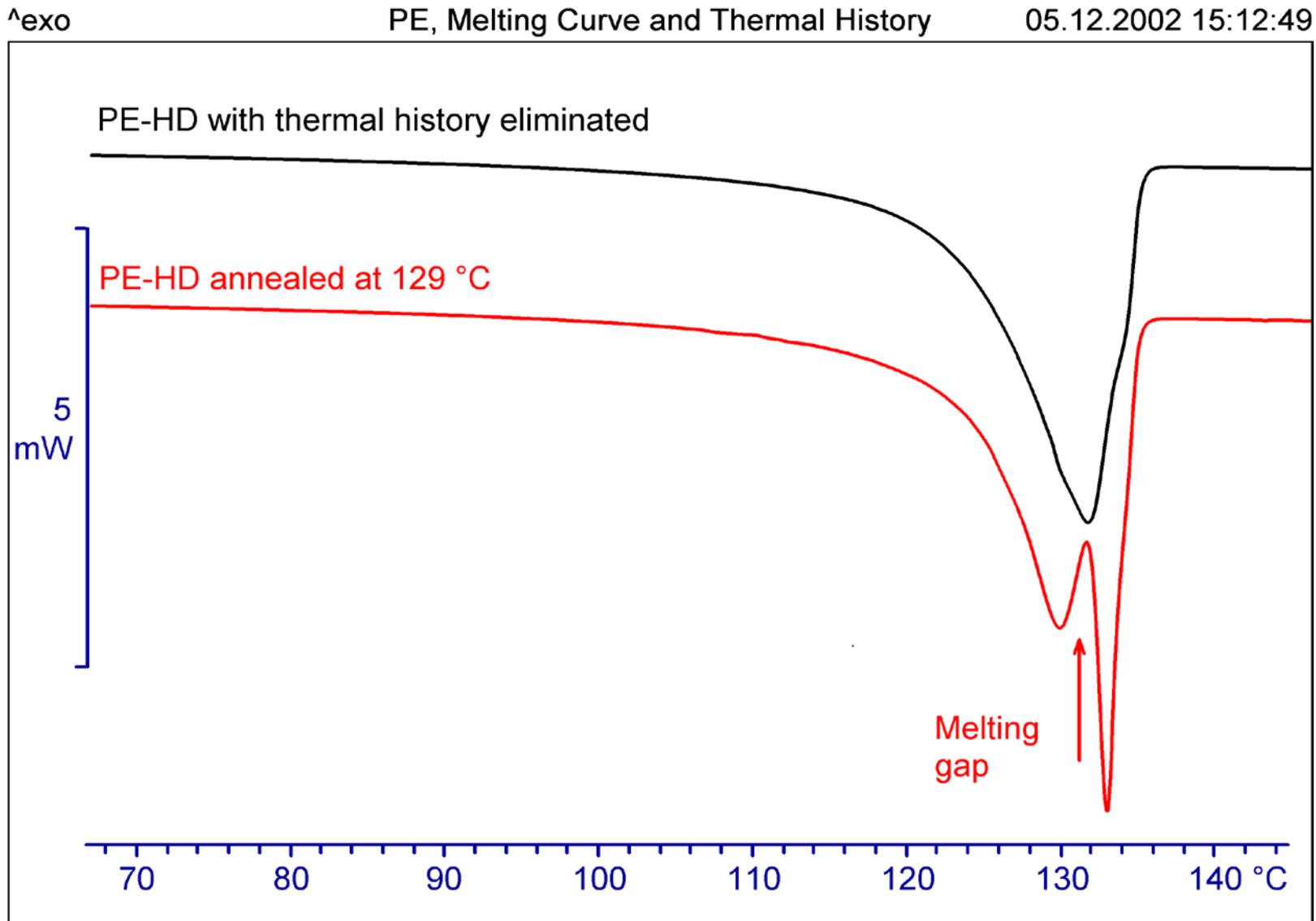
聚乙烯：熔融



不同HDPE的熔融行为



聚乙烯：热历史影响熔融行为



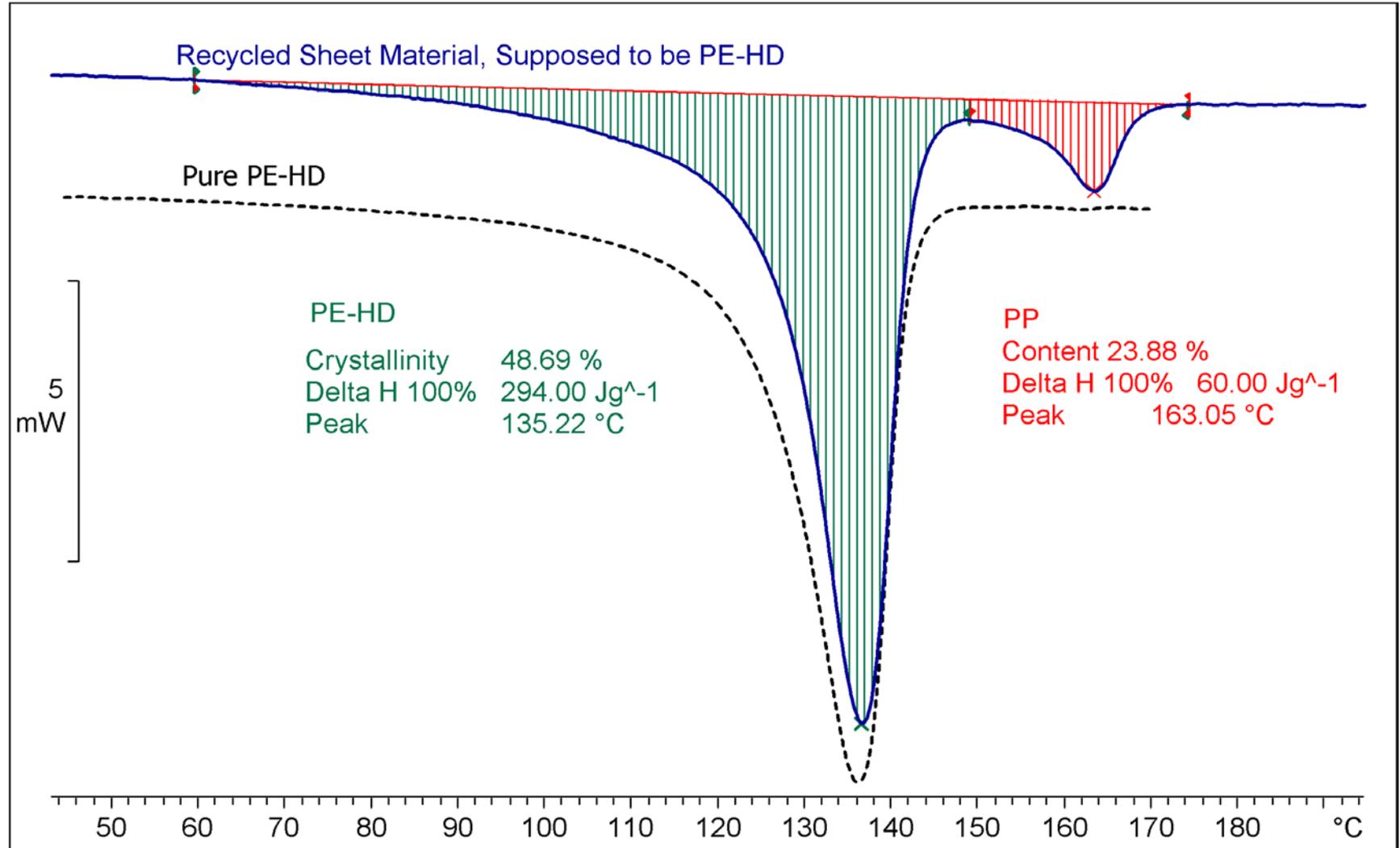
PE产品鉴别



^exo

Rework Said to be PE-HD (8)

20.11.2002 12:23:07

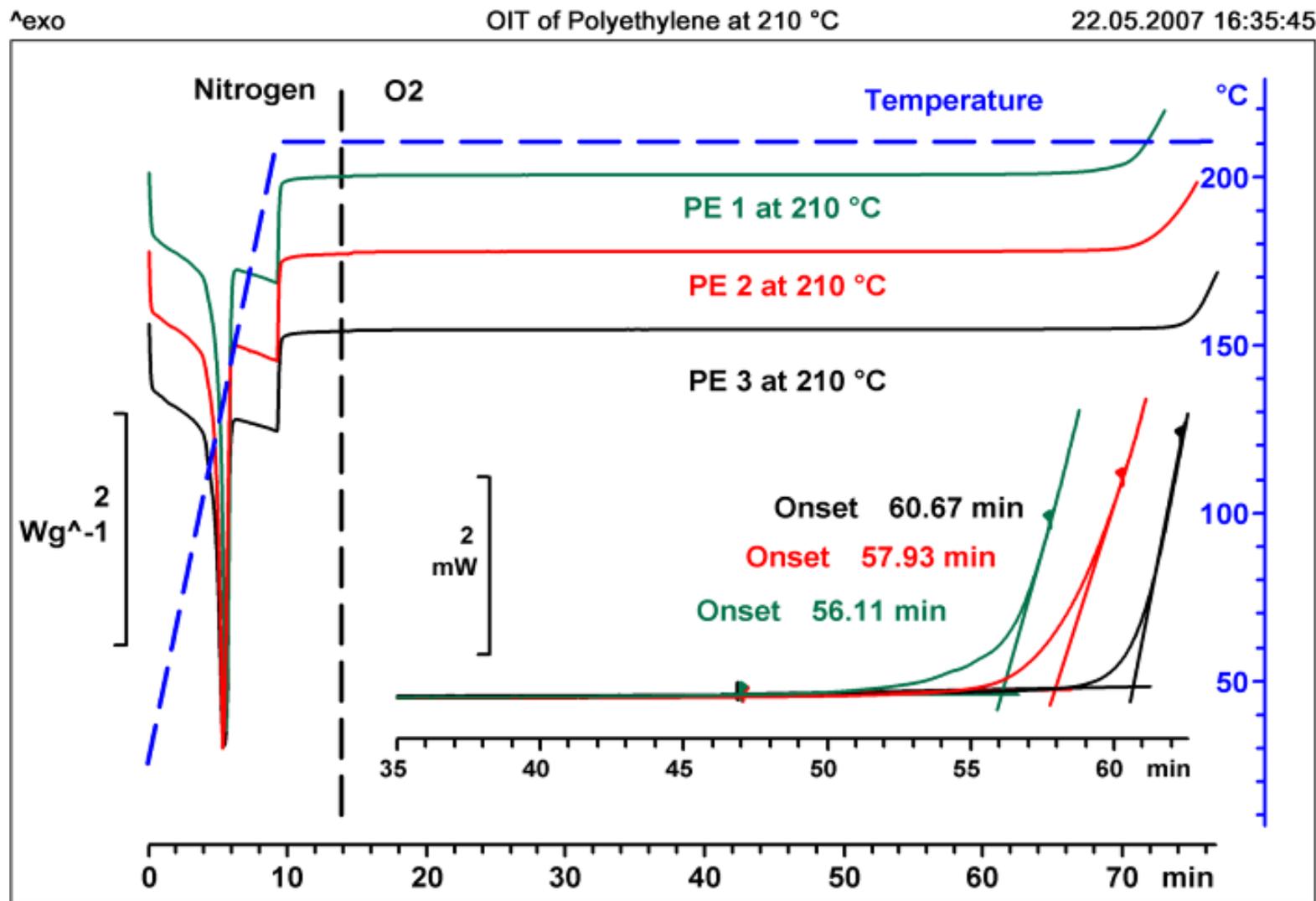


Lab: METTLER

Not signed

STAR^e SW 9.01

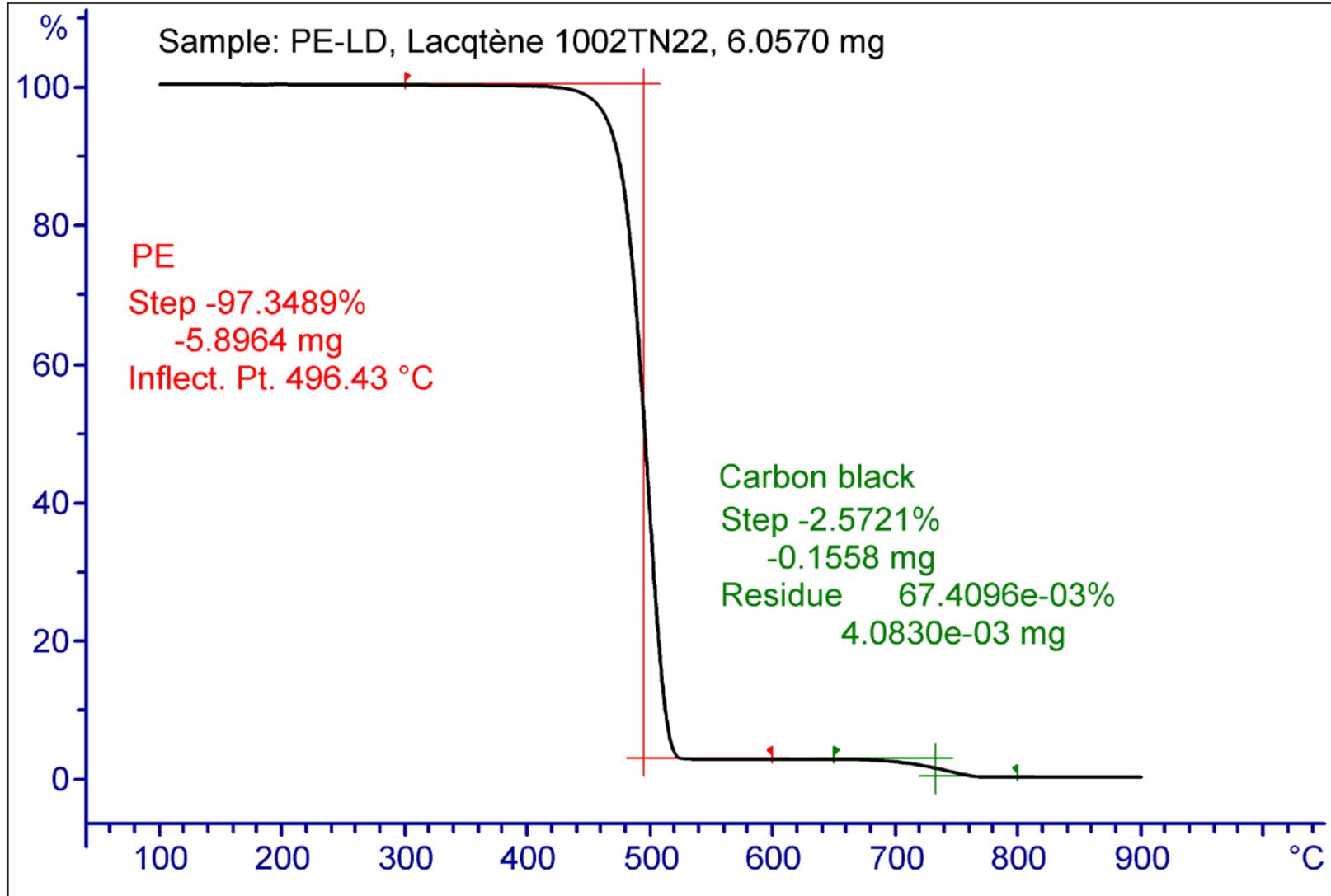
PE的氧化稳定性 (OIT)



PE的组分分析

PE, Compositional Analysis by TGA

06.12.2002 18:11:03



汽车常用塑料——聚丙烯



用途：仪表盘、杂物盒、立柱、门板主体、保险杠表皮等



仪表盘



杂物盒



车门主体

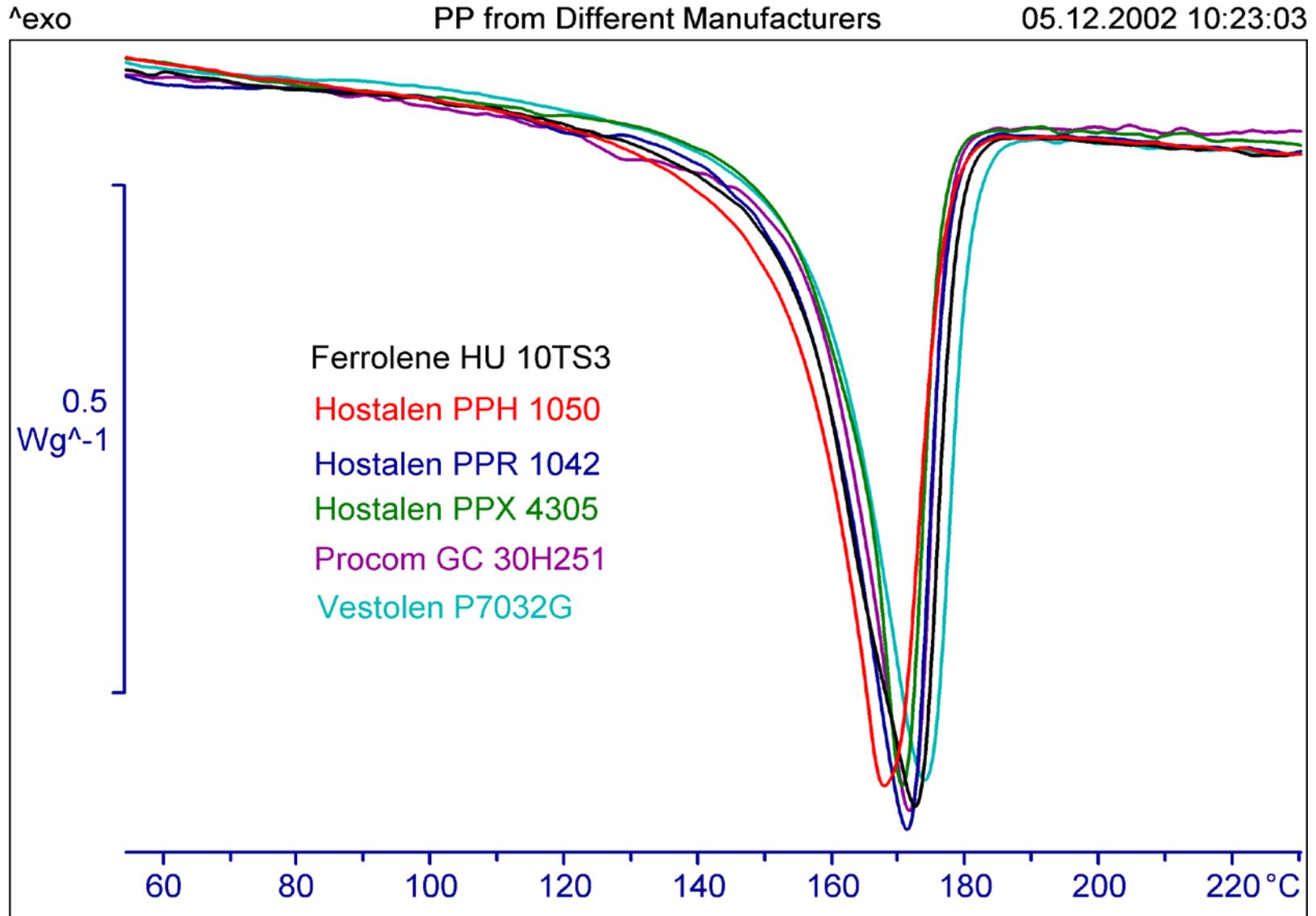


汽车立柱

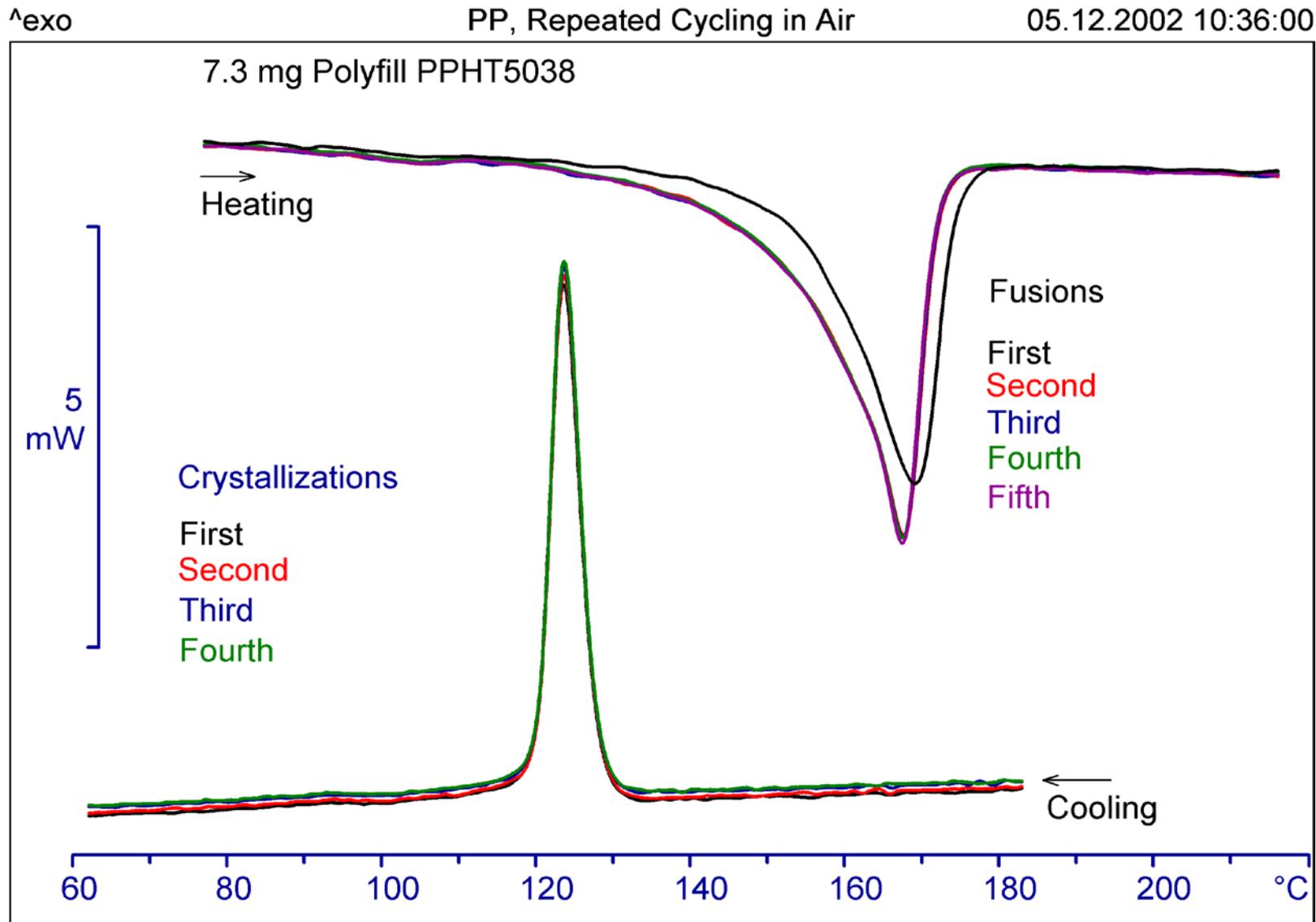


保险杠表皮

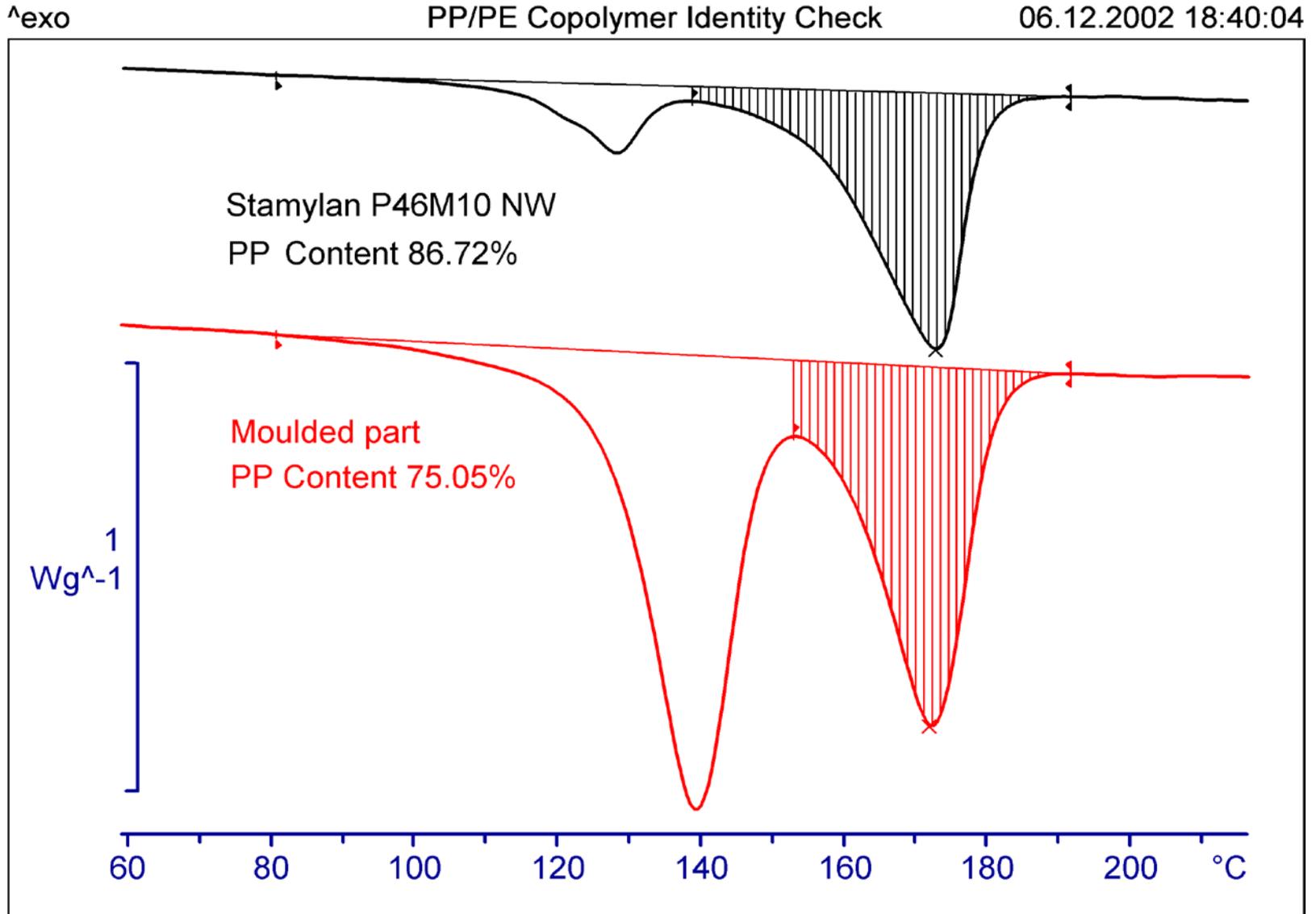
PP的熔融



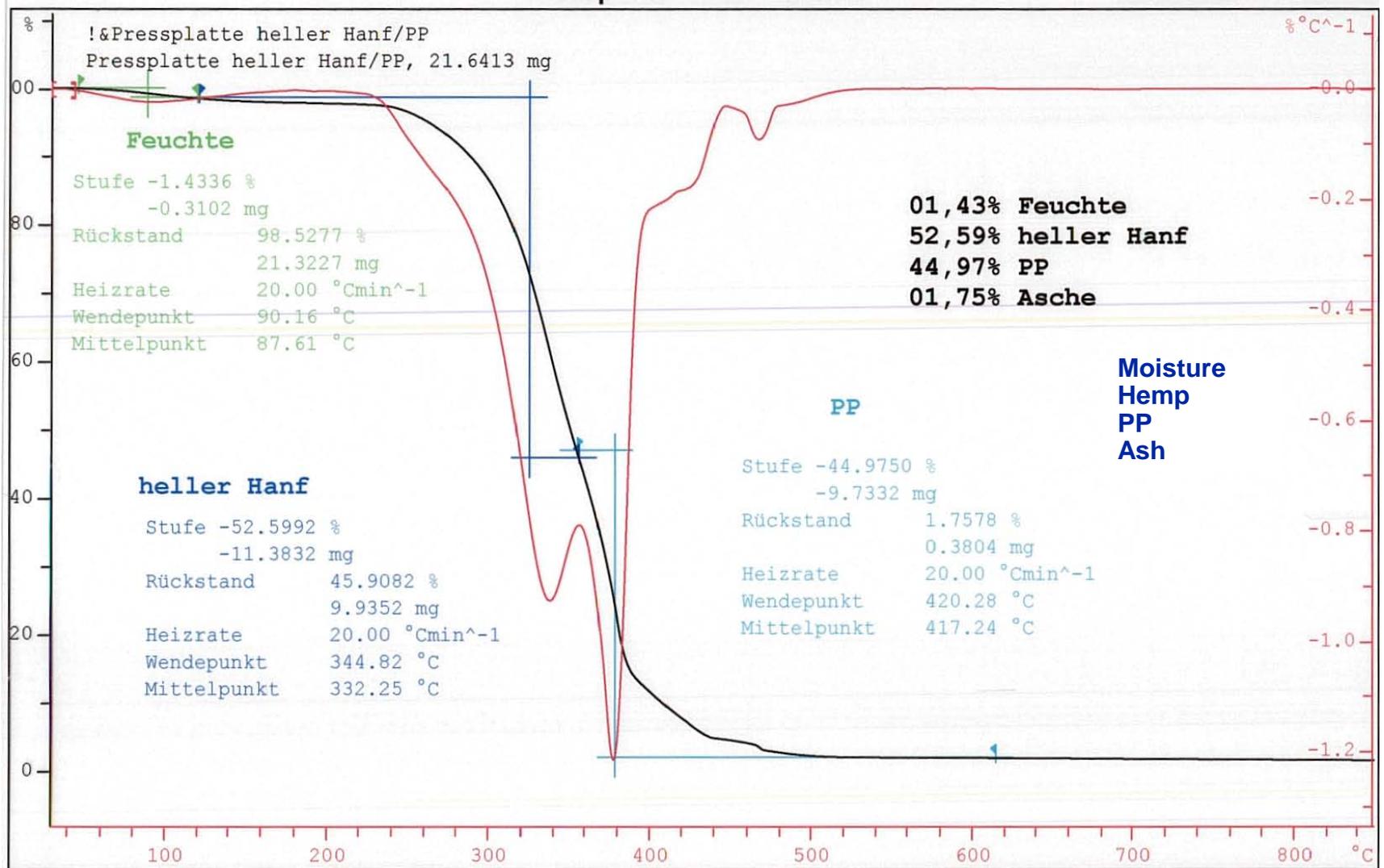
PP重复测试



PE/PP共聚物鉴别



TGA 测试PP/hemp复合材料



汽车常用塑料



名称		应用举例
一般结构零件	聚苯乙烯	各种仪表外壳、汽车灯罩、电讯零件等
	ABS	转向盘、仪表盘总成、挡泥板、行李箱、小轿车车身等
	聚碳酸酯	安全玻璃、车灯反光镜等
	有机玻璃	油标尺、油杯、遮阳板、后灯灯罩等耐磨减磨零件



转向盘

车灯罩及反光镜

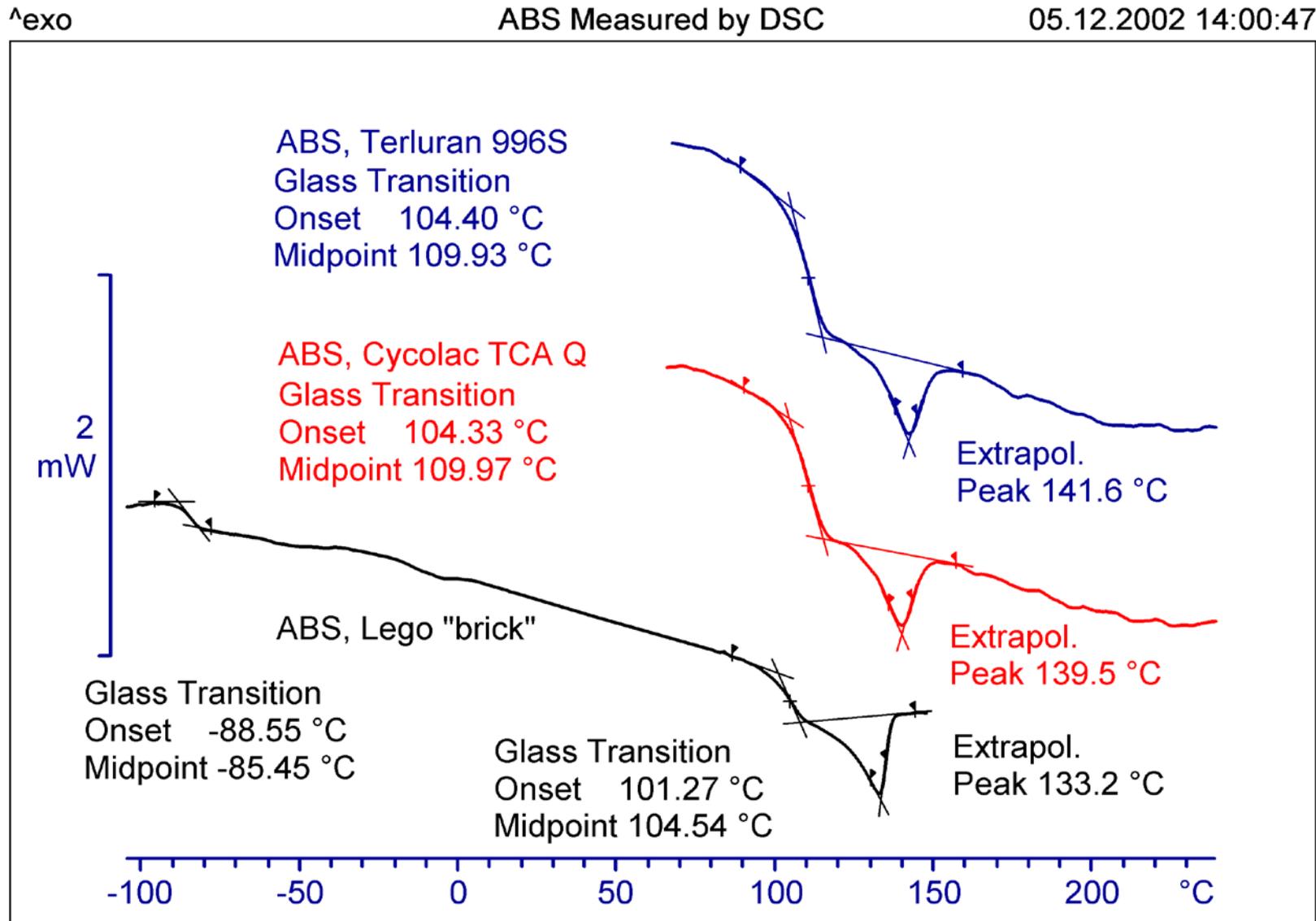


安全玻璃

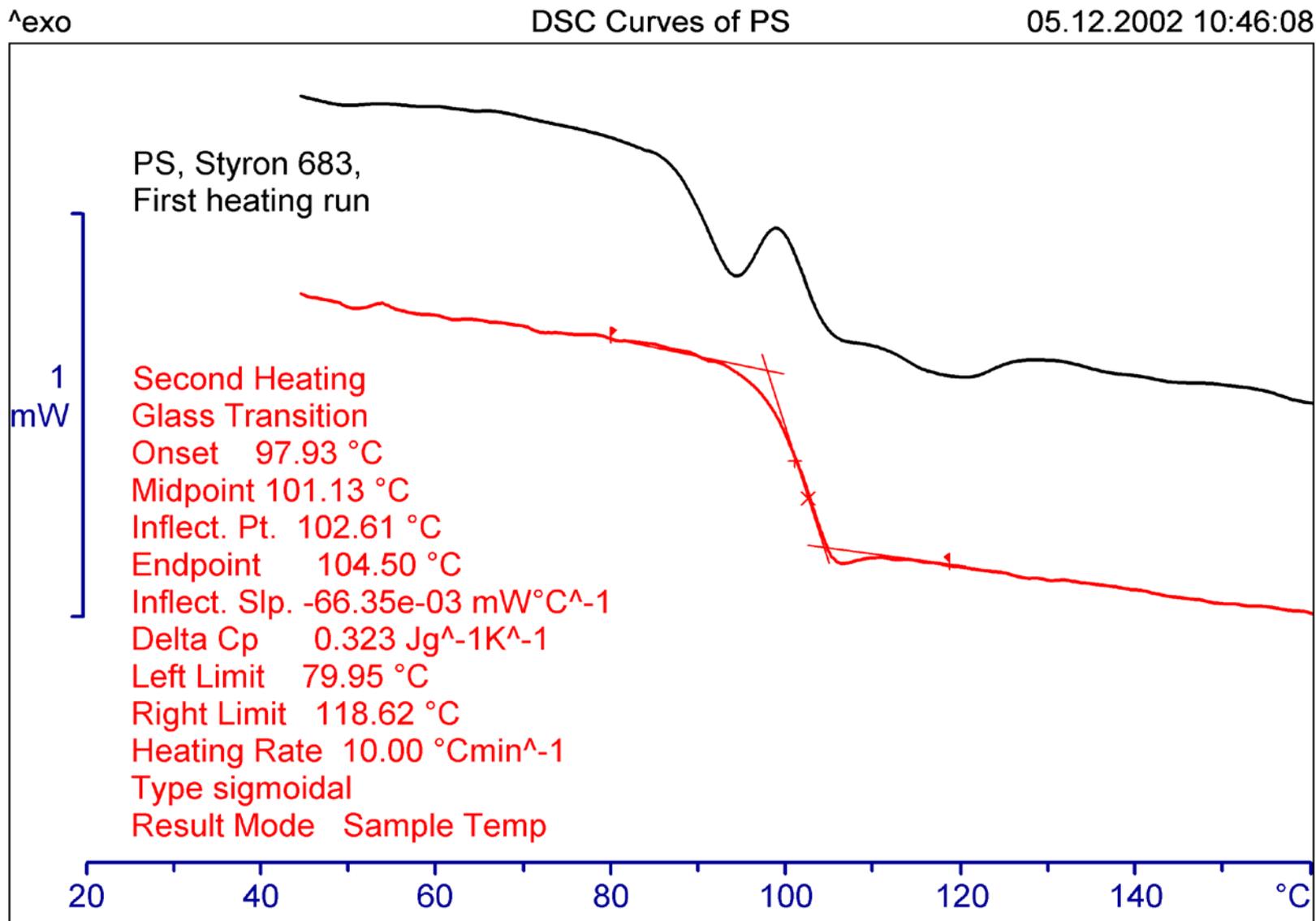
遮阳板



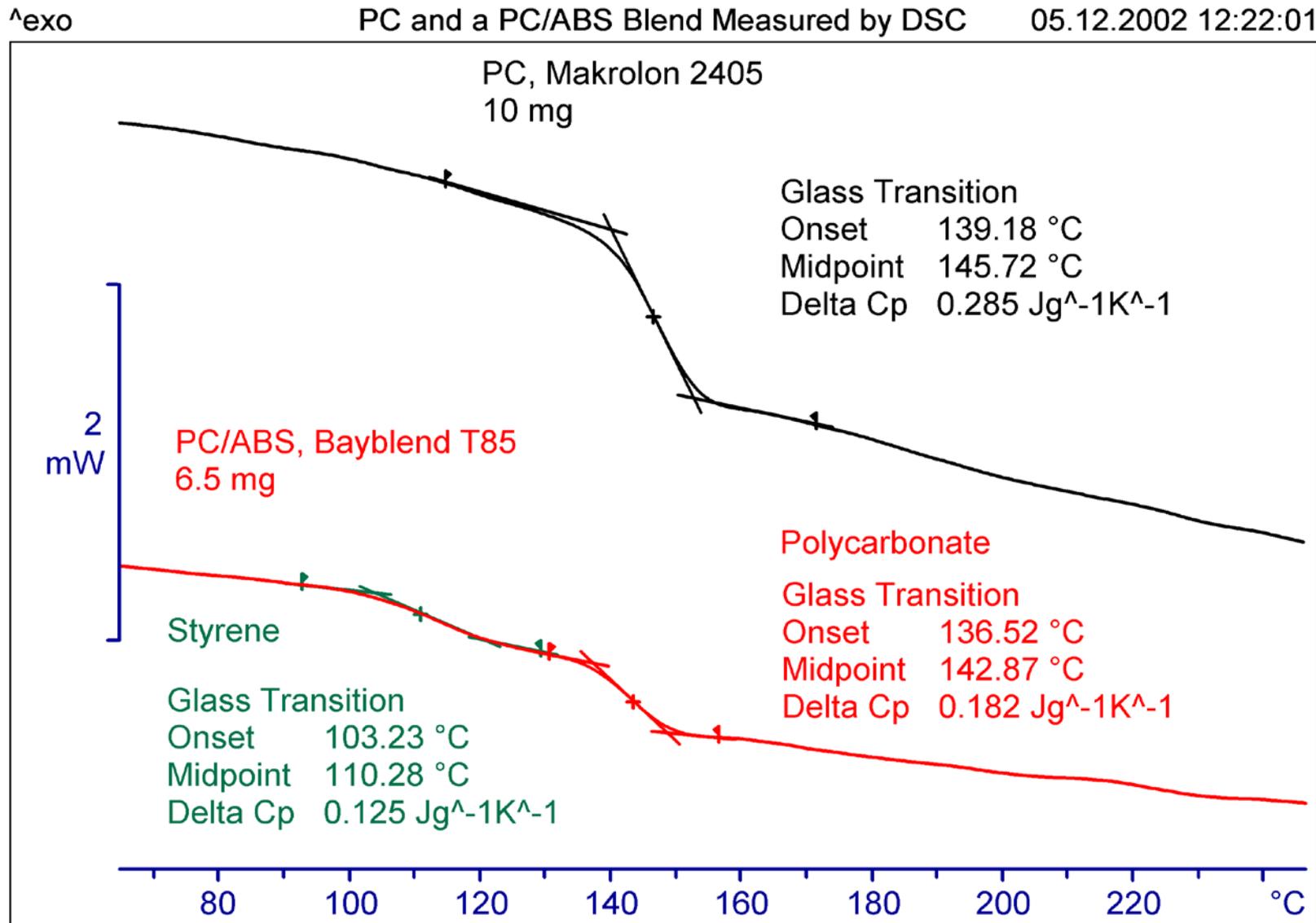
ABS: 玻璃化转变温度测定(PAN峰明显)



聚苯乙烯：玻璃化转变温度测定



PC和PC/ABS共混物：玻璃化转变温度



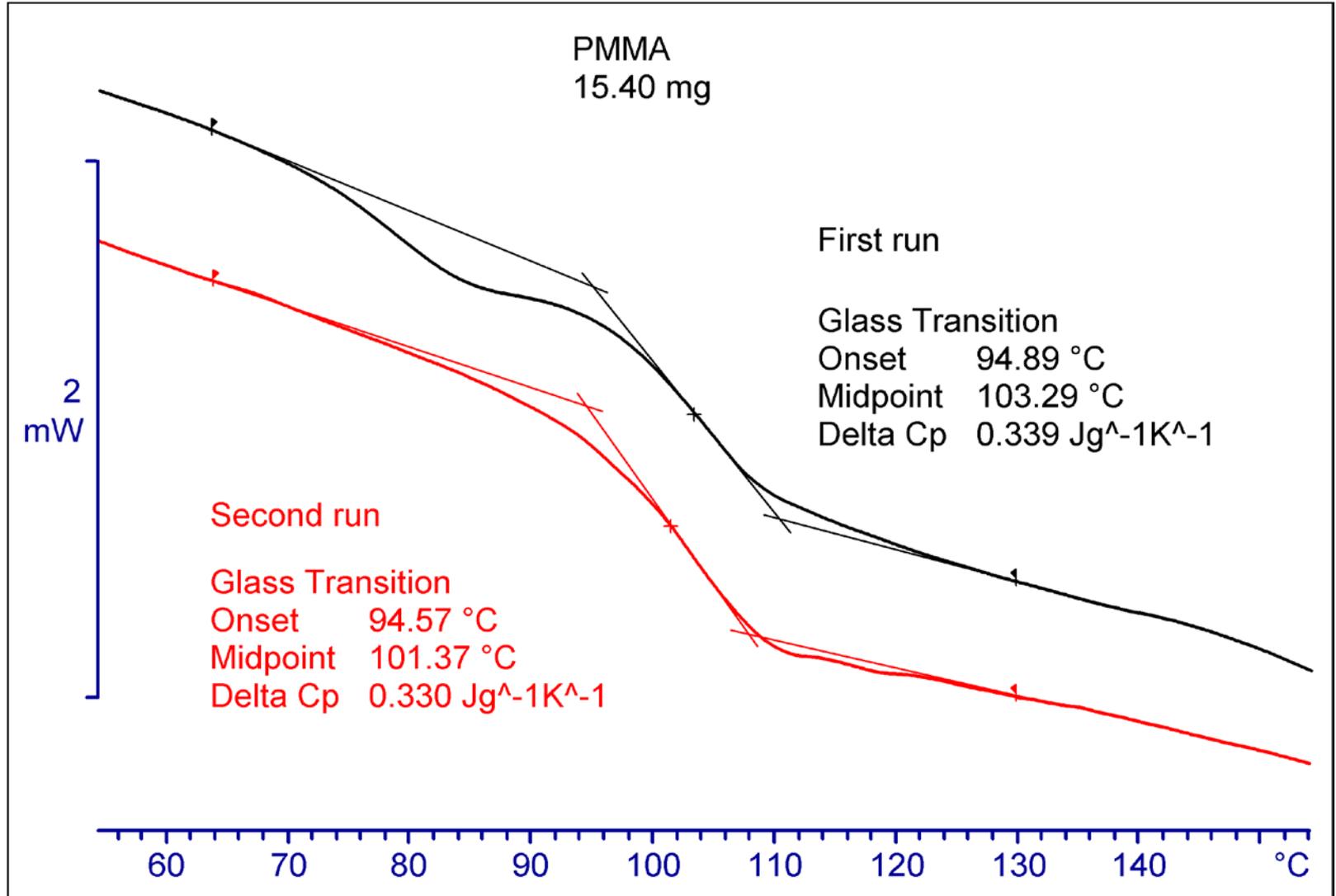
PMMA的玻化转变



^exo

PMMA, Glass Transition

05.12.2002 16:03:19

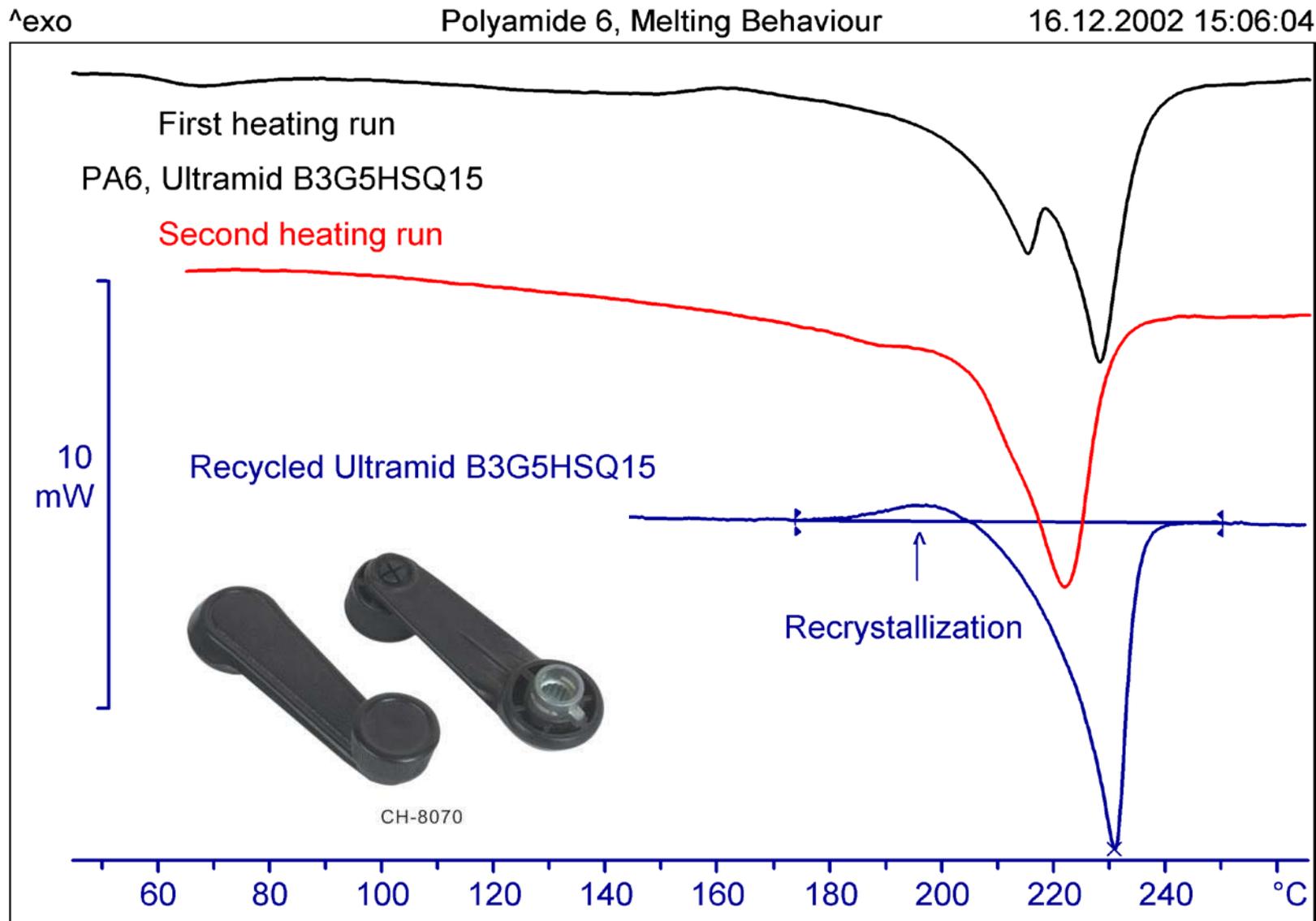


汽车常用塑料



名称		应用举例
耐磨减磨零件	聚酰胺(尼龙)	车窗摇手、风扇叶片、里程表齿轮、输油管、球头碗、衬套等
	聚甲醛	万向节轴承、半轴和行星齿轮垫片、汽油泵壳、转向节衬套等
	聚四氟乙烯	汽车各种密封圈、垫片等
耐高温零件	聚苯醚	小型齿轮、轴承、水泵零件等
	聚酰亚胺	密封圈、冷却系密封圈等
隔热减震零件	PA/PET	汽车内饰材料、坐垫、仪表盘、扶手、头枕等
	聚氯乙烯泡沫塑料	各种内装饰覆盖件、密封条、垫条、驾驶室地毯等

PA6的熔融行为

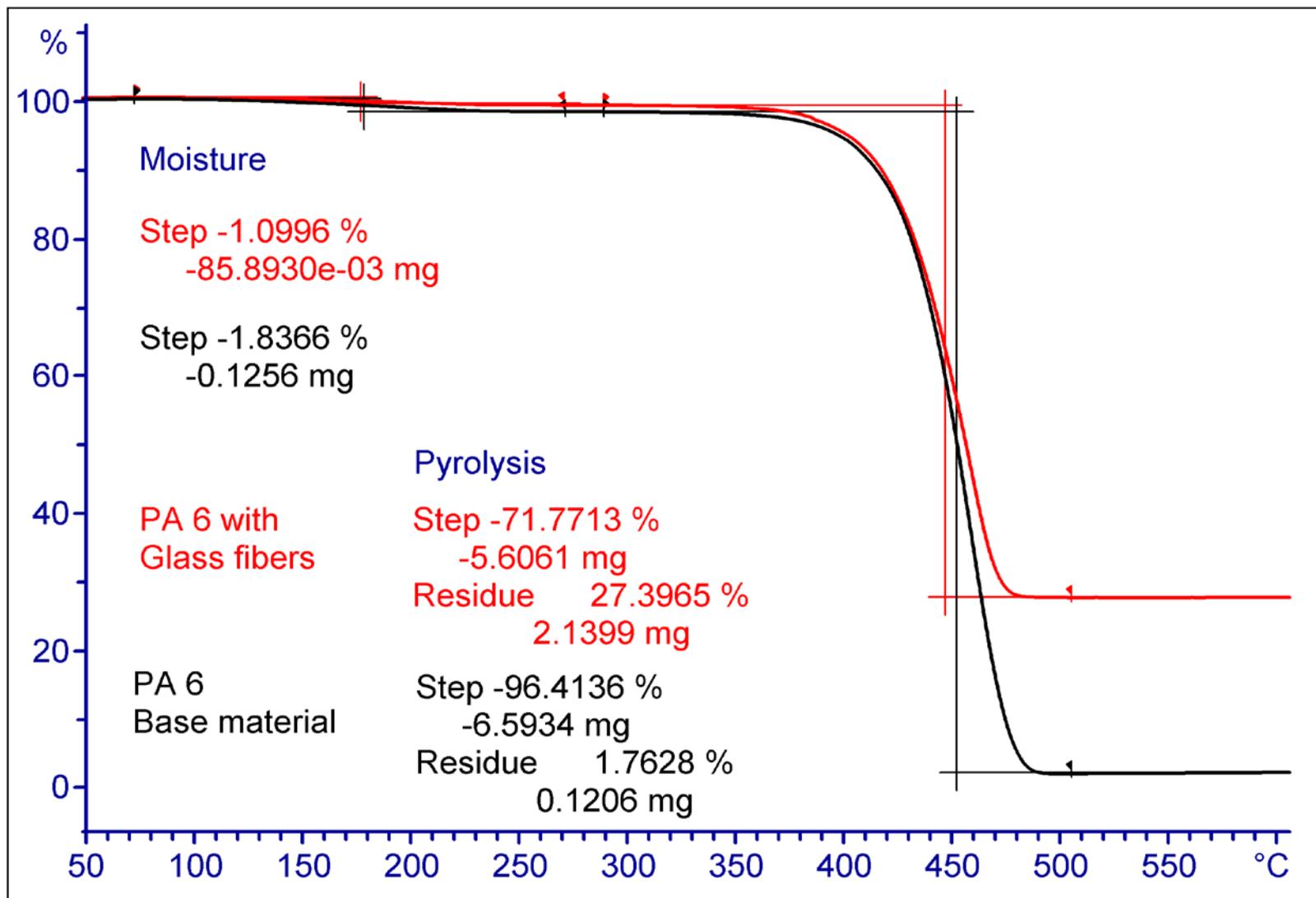


PA6中的玻璃纤维含量测定



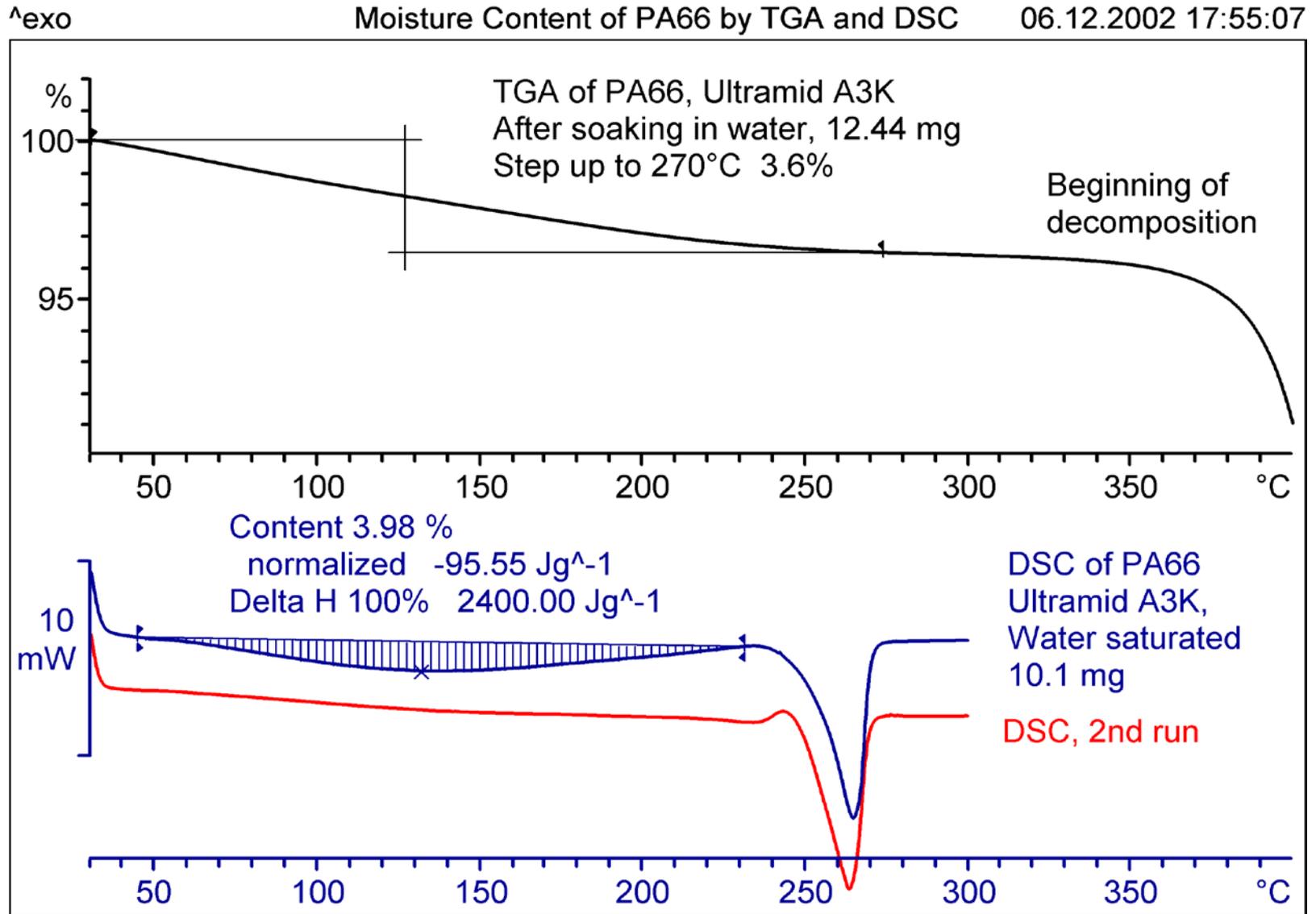
Determination of Glass Fiber Content

06.12.2002 17:48:07

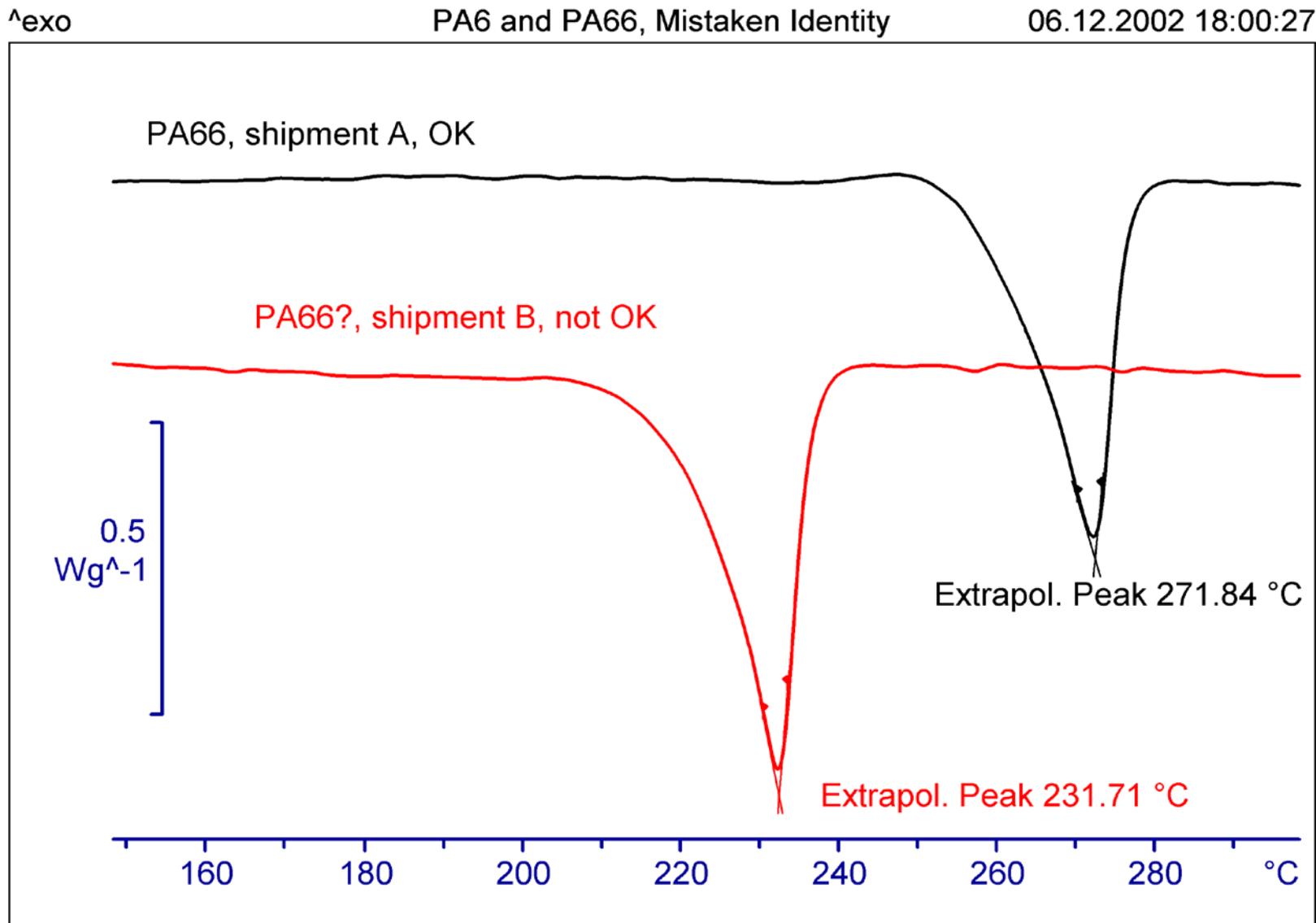


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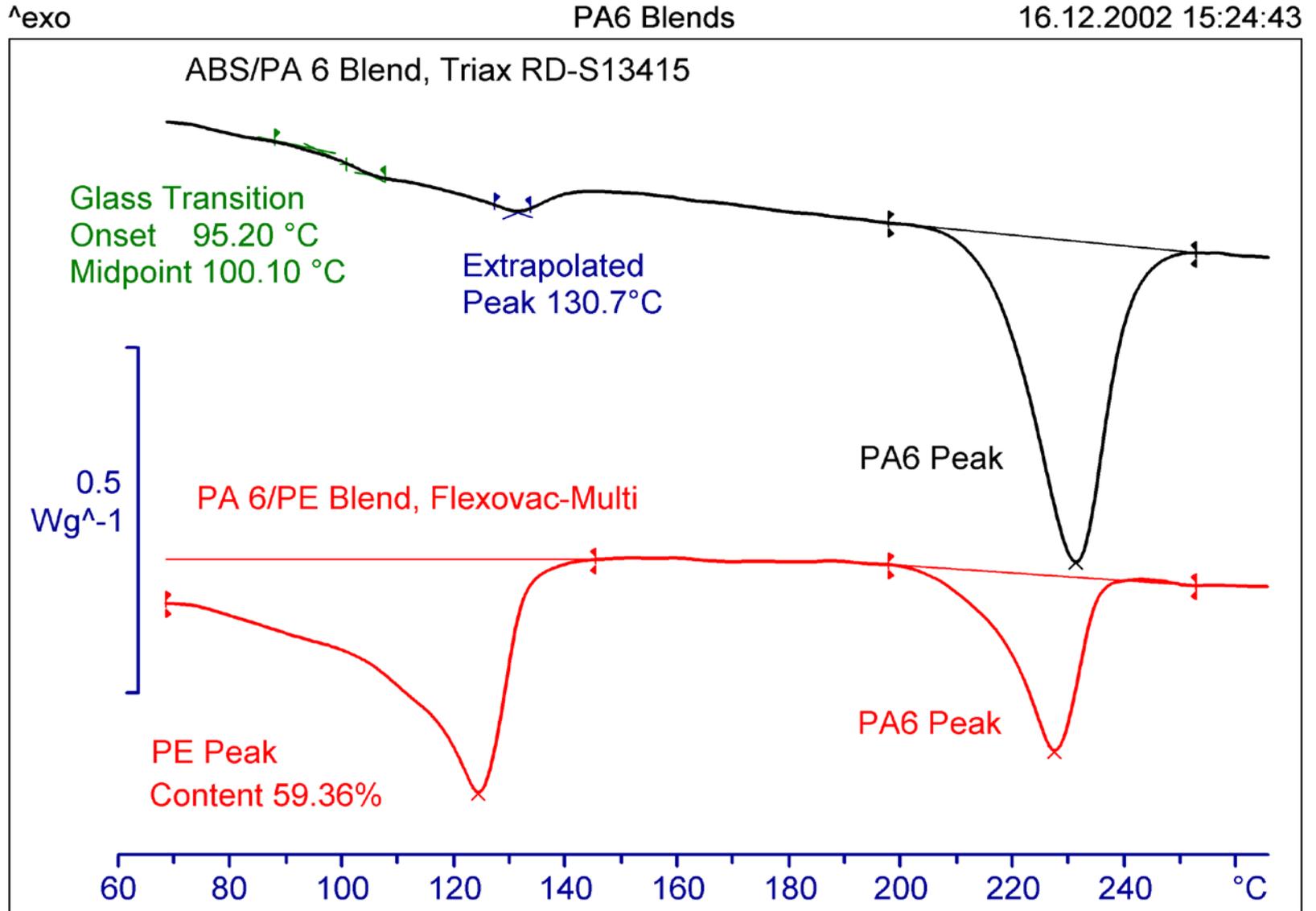
聚酰胺66：TGA与DSC测定水分的比较



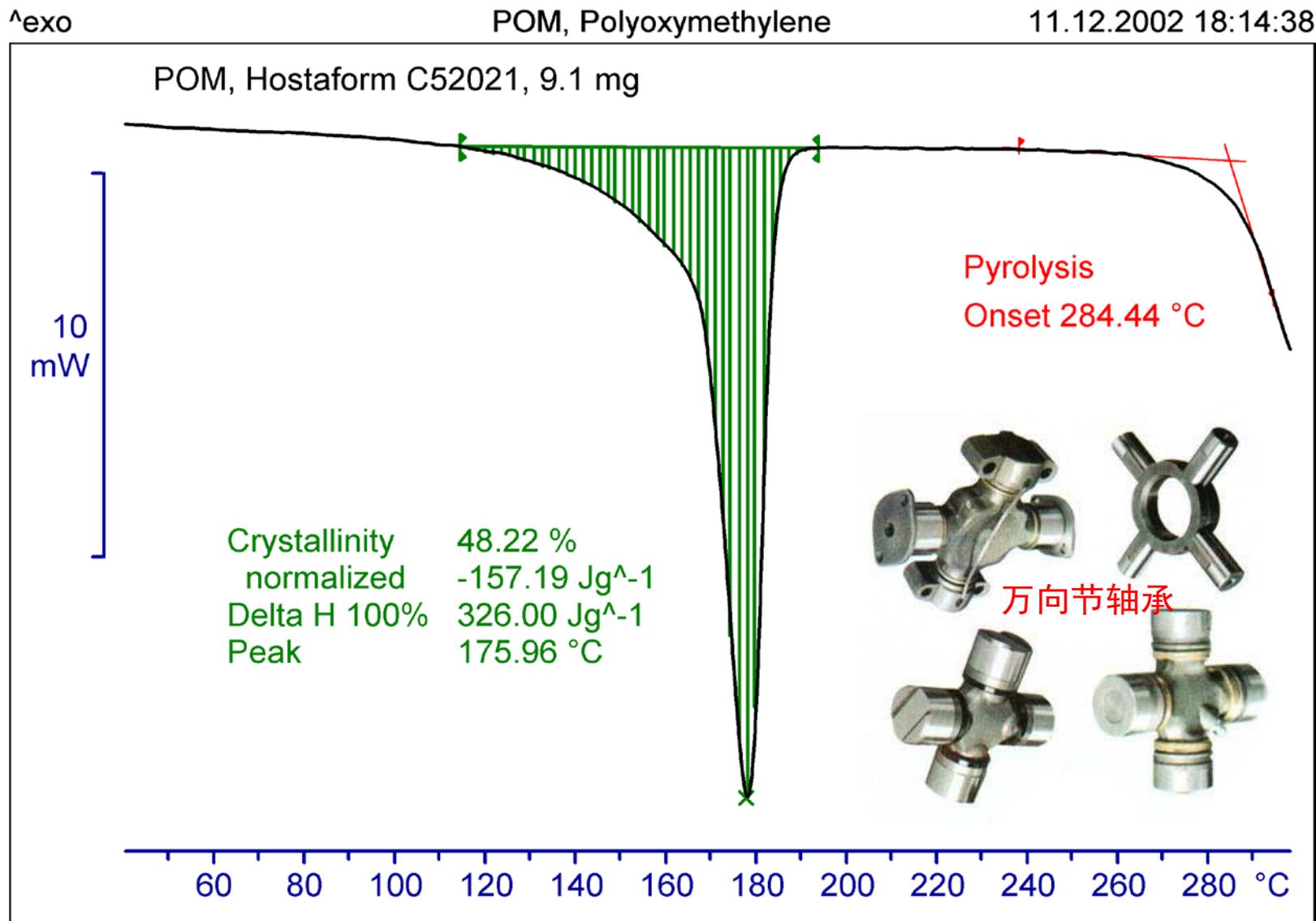
聚酰胺6与聚酰胺66：峰温鉴定



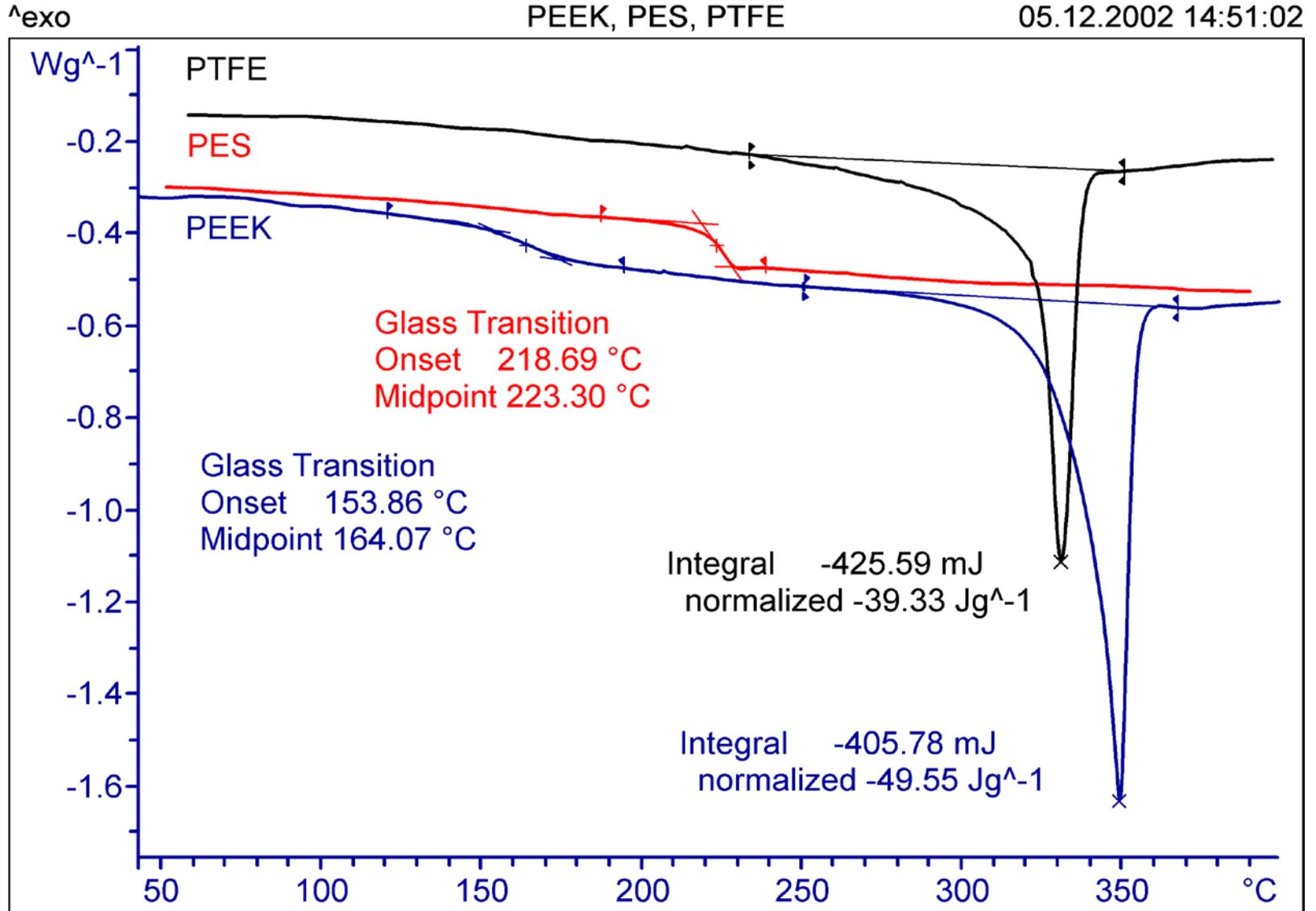
PA6共混物



聚甲醛：高结晶聚合物的熔融及分解



高温聚合物



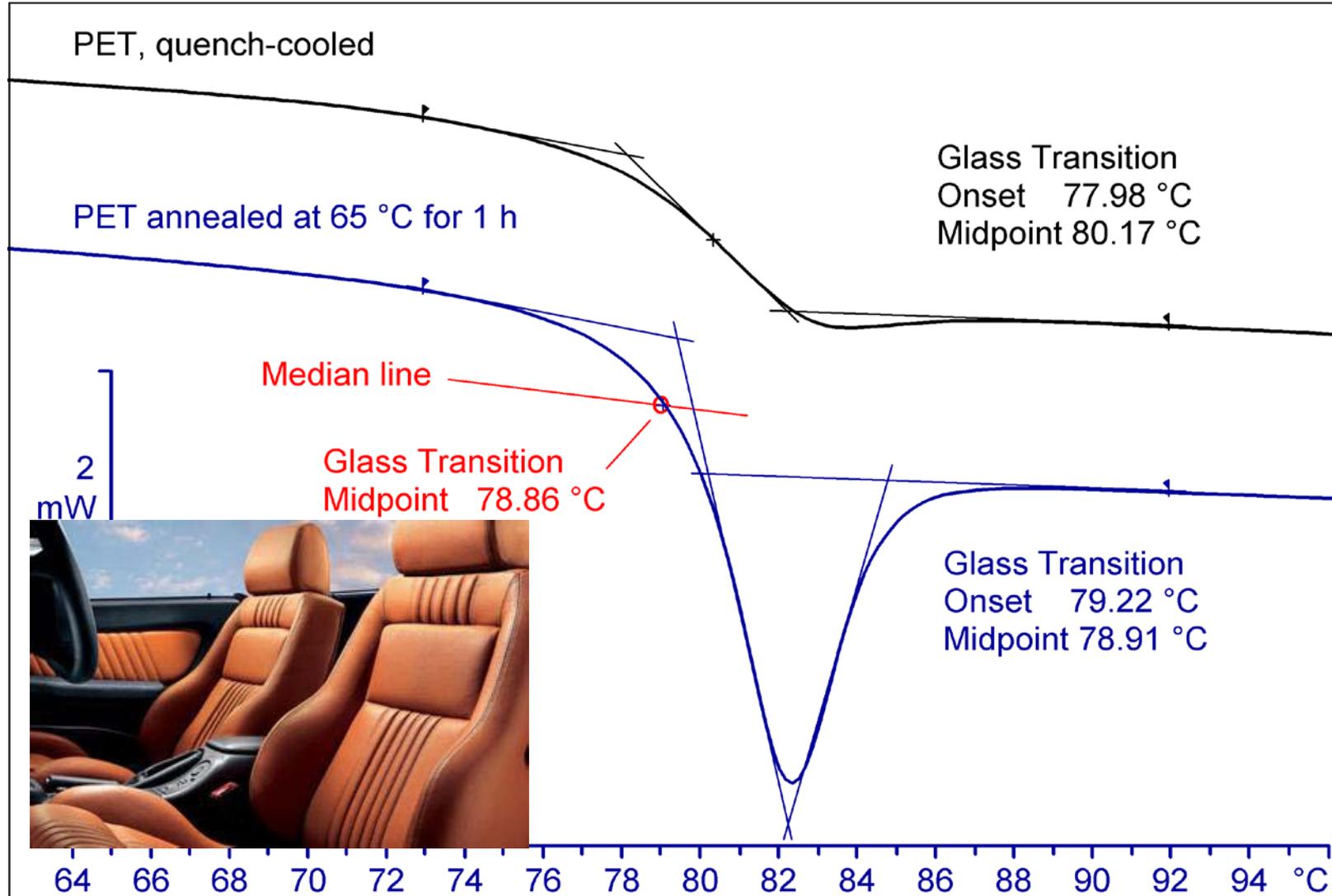
PET玻璃化转变



^exo

PET, Evaluating Glass Transitions

16.12.2002 15:35:51



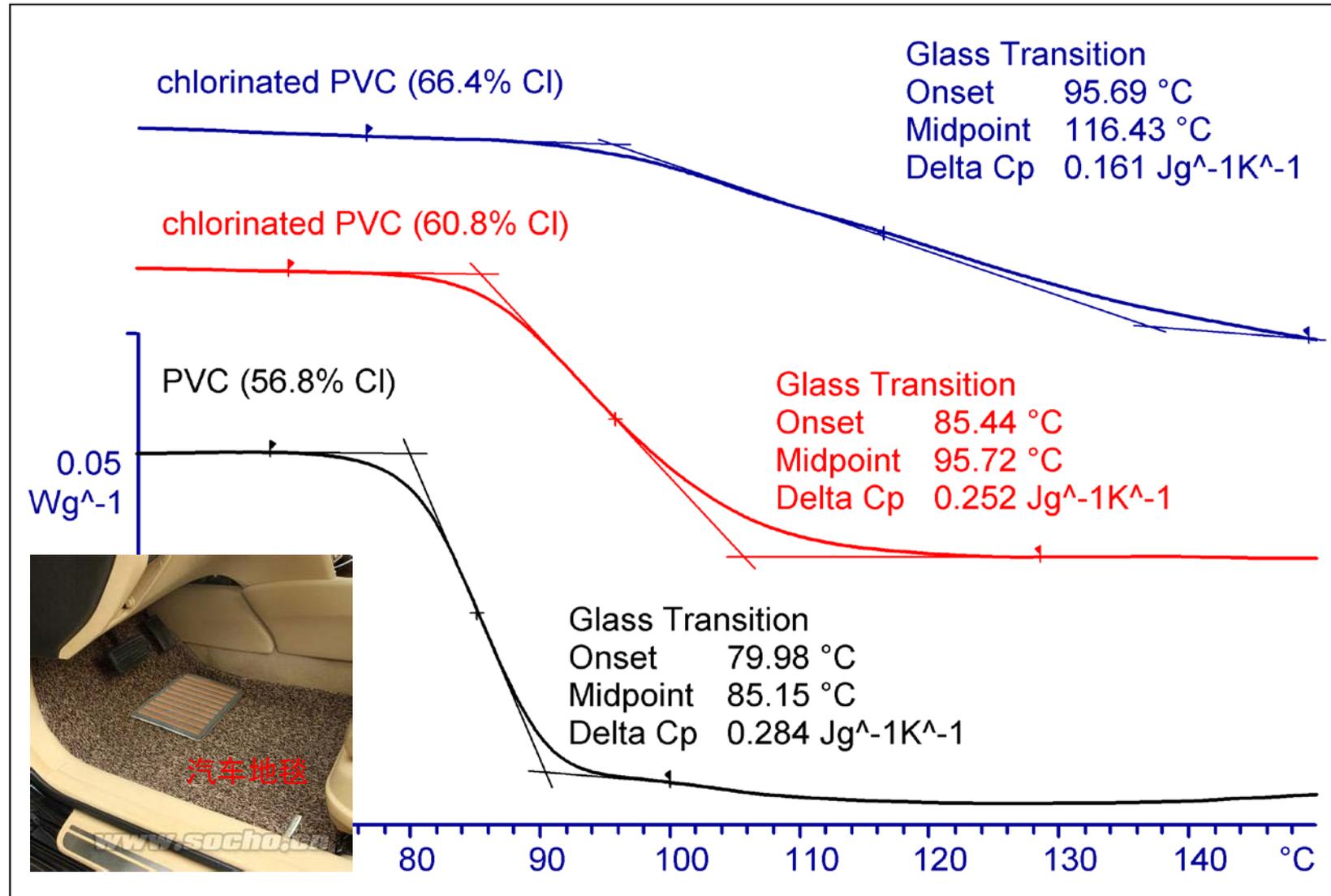
PVC和氯化PVC的玻璃化转变



Δ exo

Glass Transition of PVC and PVCC

05.12.2002 10:21:30



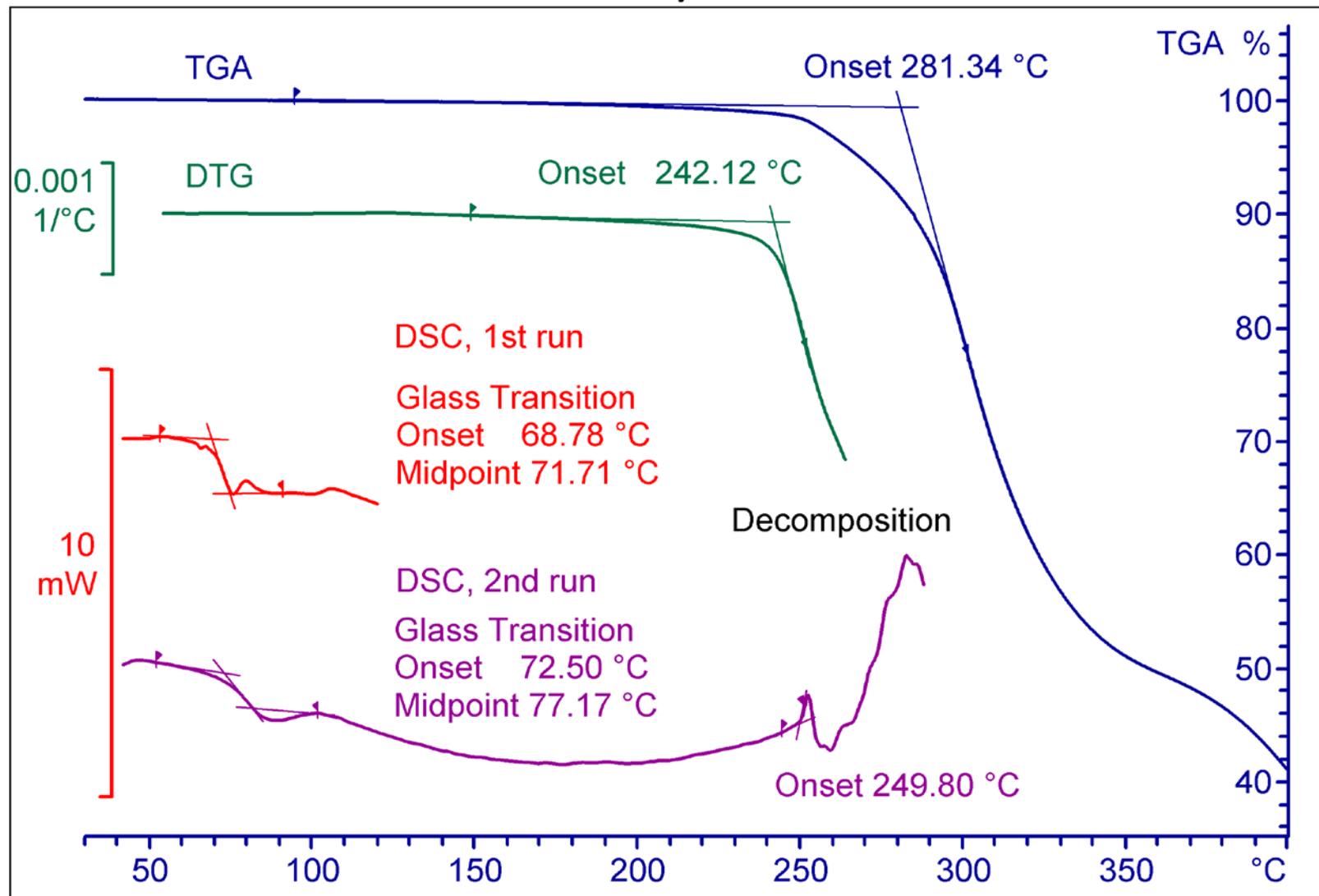
PVC测试



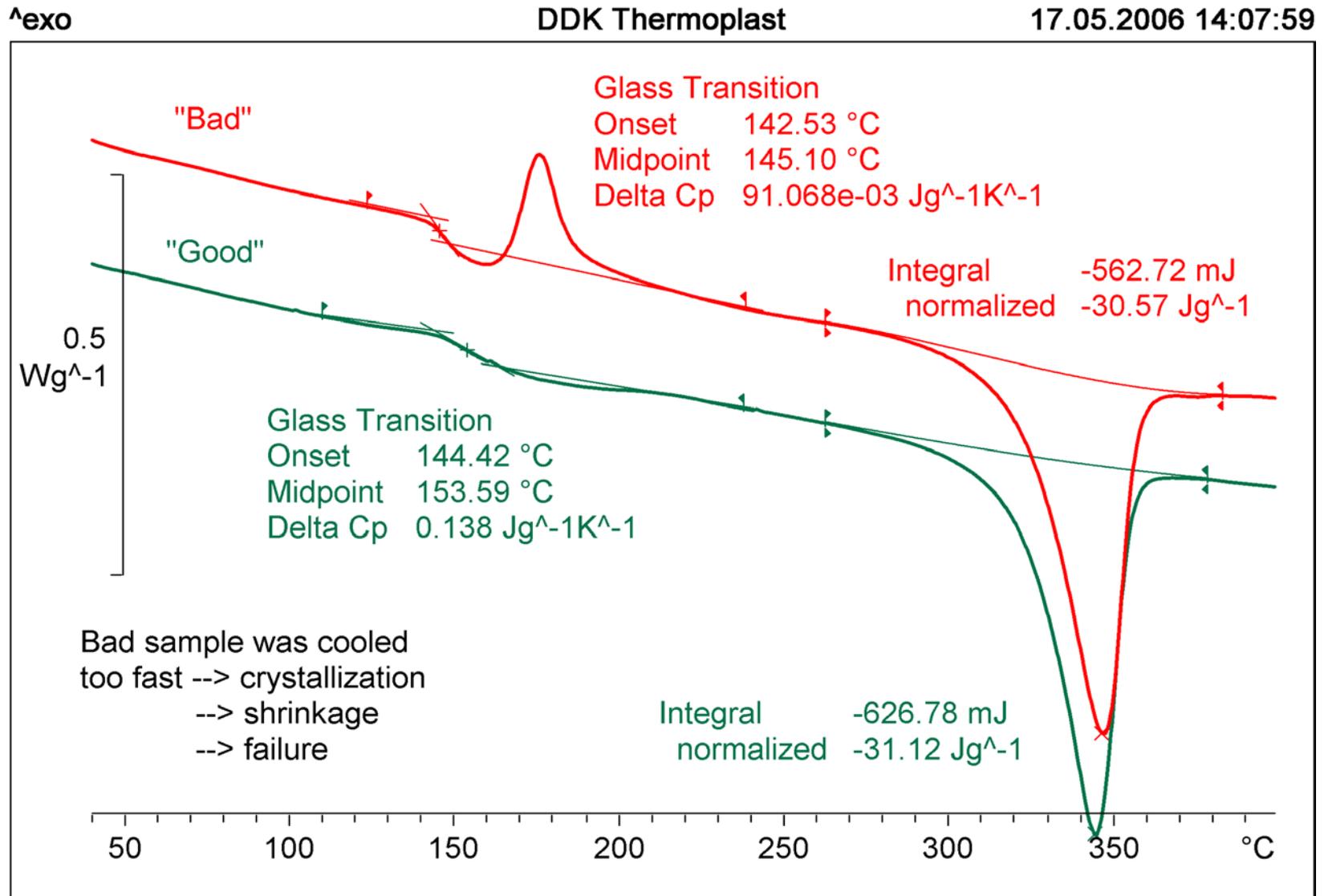
^exo

PVC Measured by DSC and TGA

06.12.2002 18:17:48



产品故障分析



Lab: METTLER

STAR^e SW 9.01

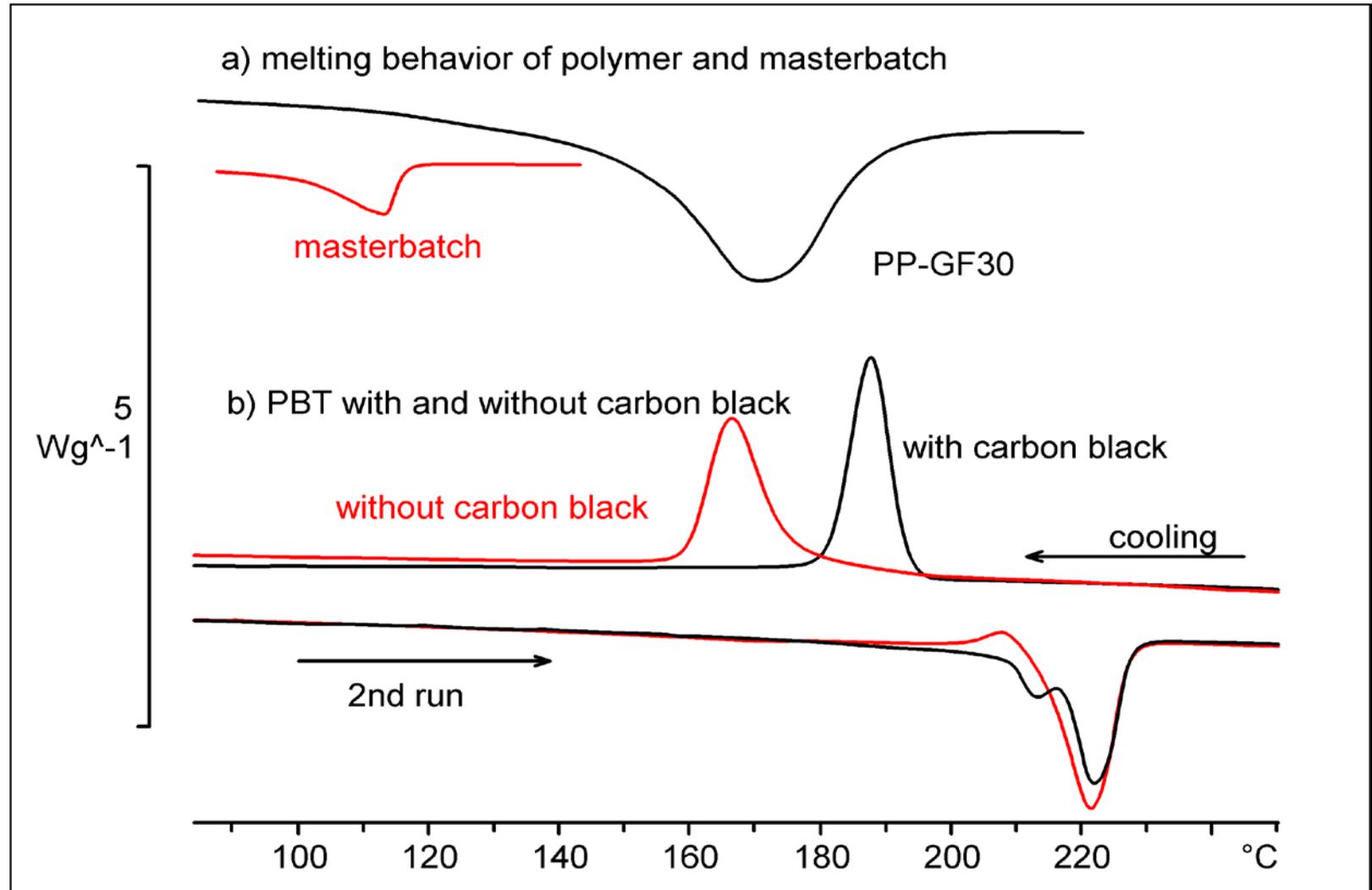
染料的影响



^exo

Influence of Color Additives

20.03.2004 12:49:38



DEMO Version

Not signed

STAR^e SW 8.01

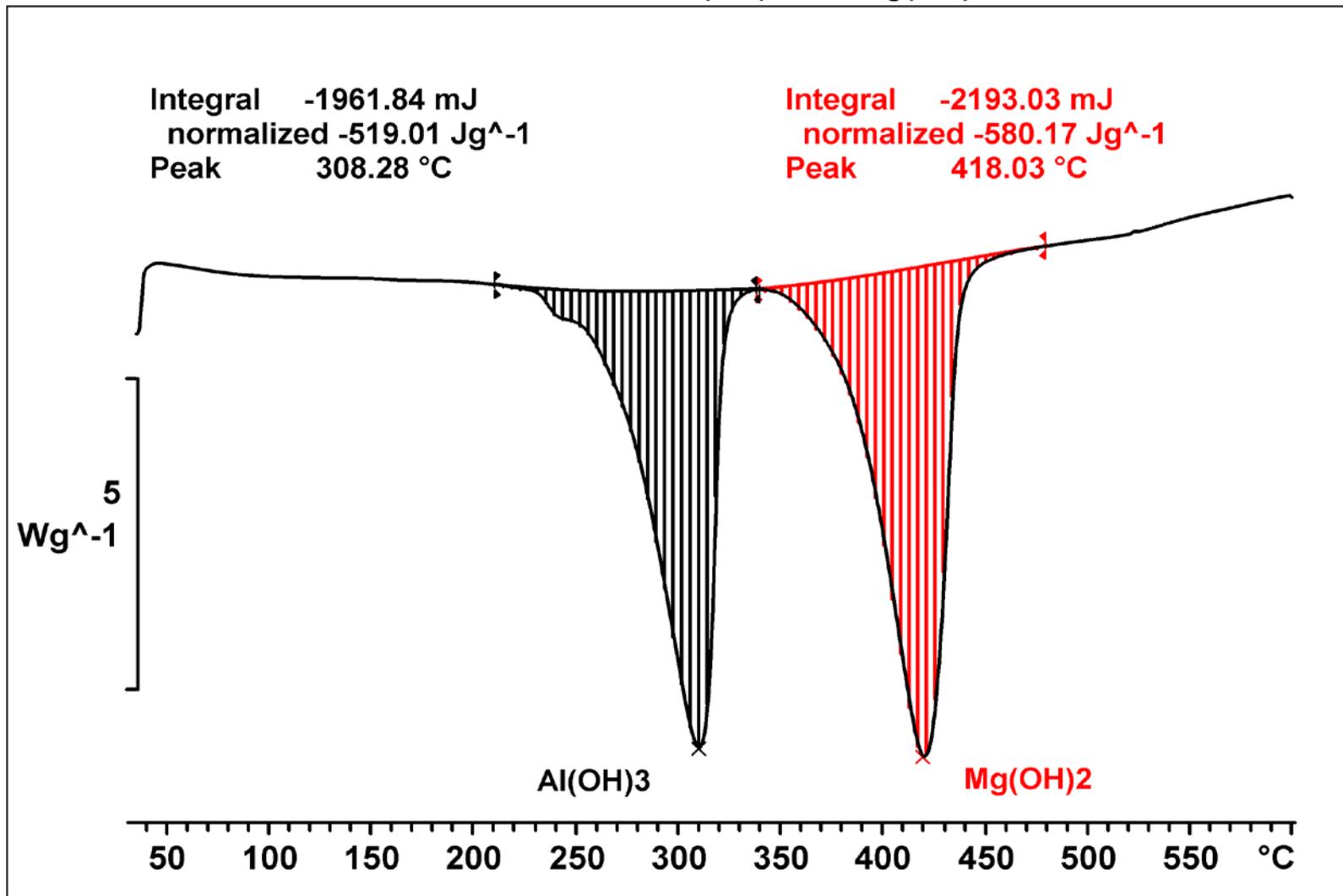
阻燃剂分析



^exo

DSC of a Mixture of Al(OH)₃ and Mg(OH)₂

11.10.2005 18:05:34



DEMO Version

Not signed

STAR^e SW 9.00 T9/T10

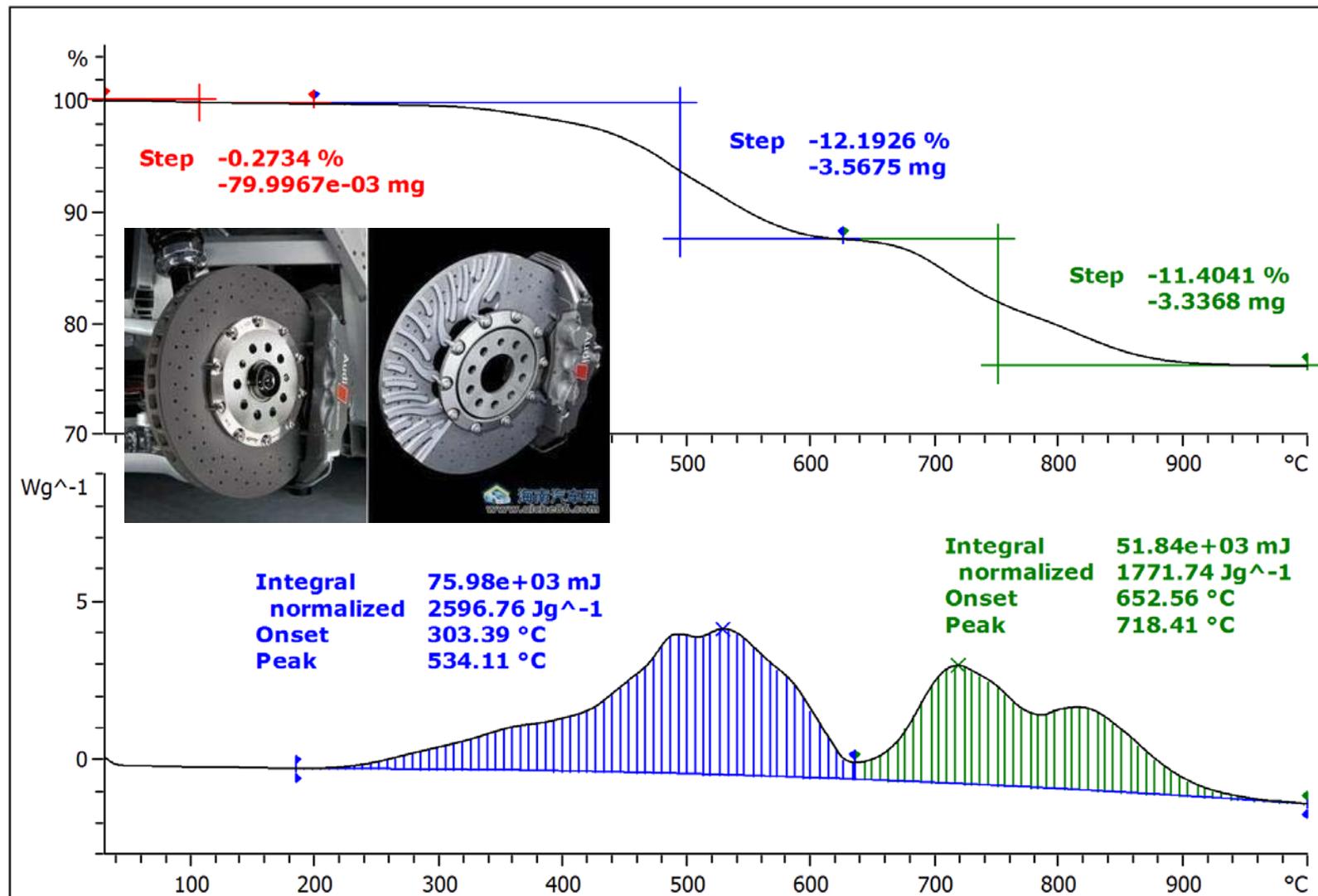
汽车刹车片——酚醛树脂



^exo

刹车片 YF612

27.07.2012 02:07:51



海特汽车网
www.haiter.com.cn

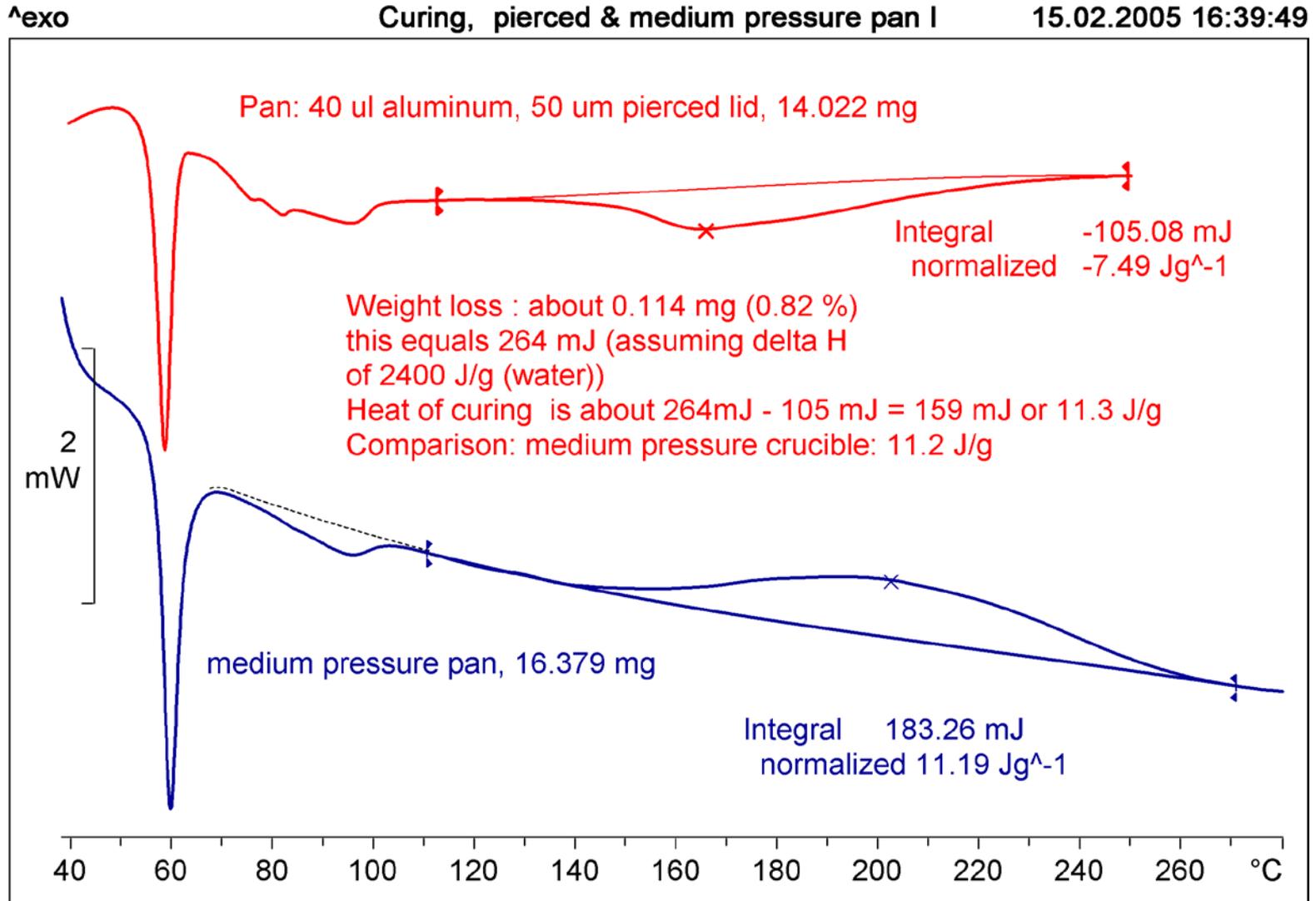
METTLER TOLEDO

DEMO Version

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STAR[®] SW 10.00

汽车粉末漆固化



MS: METTLER

STAR^e SW 8.10

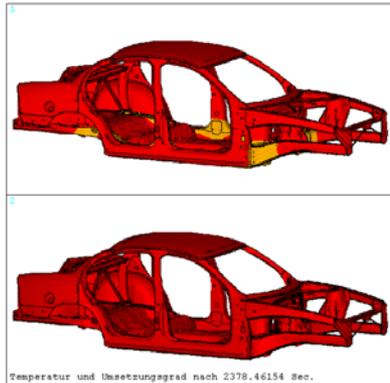
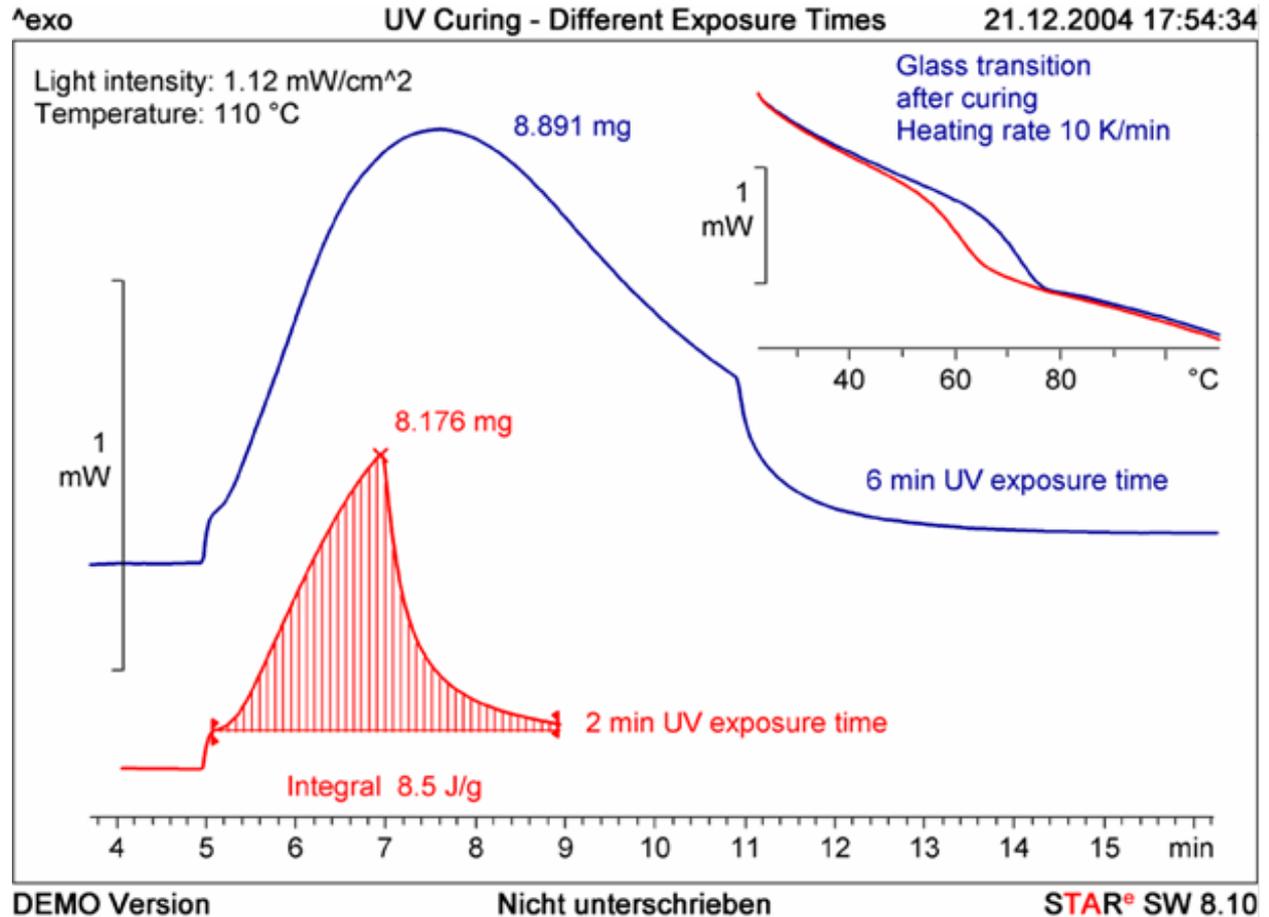
汽车粉末漆UV固化



DSC与紫外光源组合，可研究在一定波长、光强度、
 温度和时间下对光引发反应的影响。汽车行业用于粉
 末漆的固化生产模拟研究。



光量热DSC



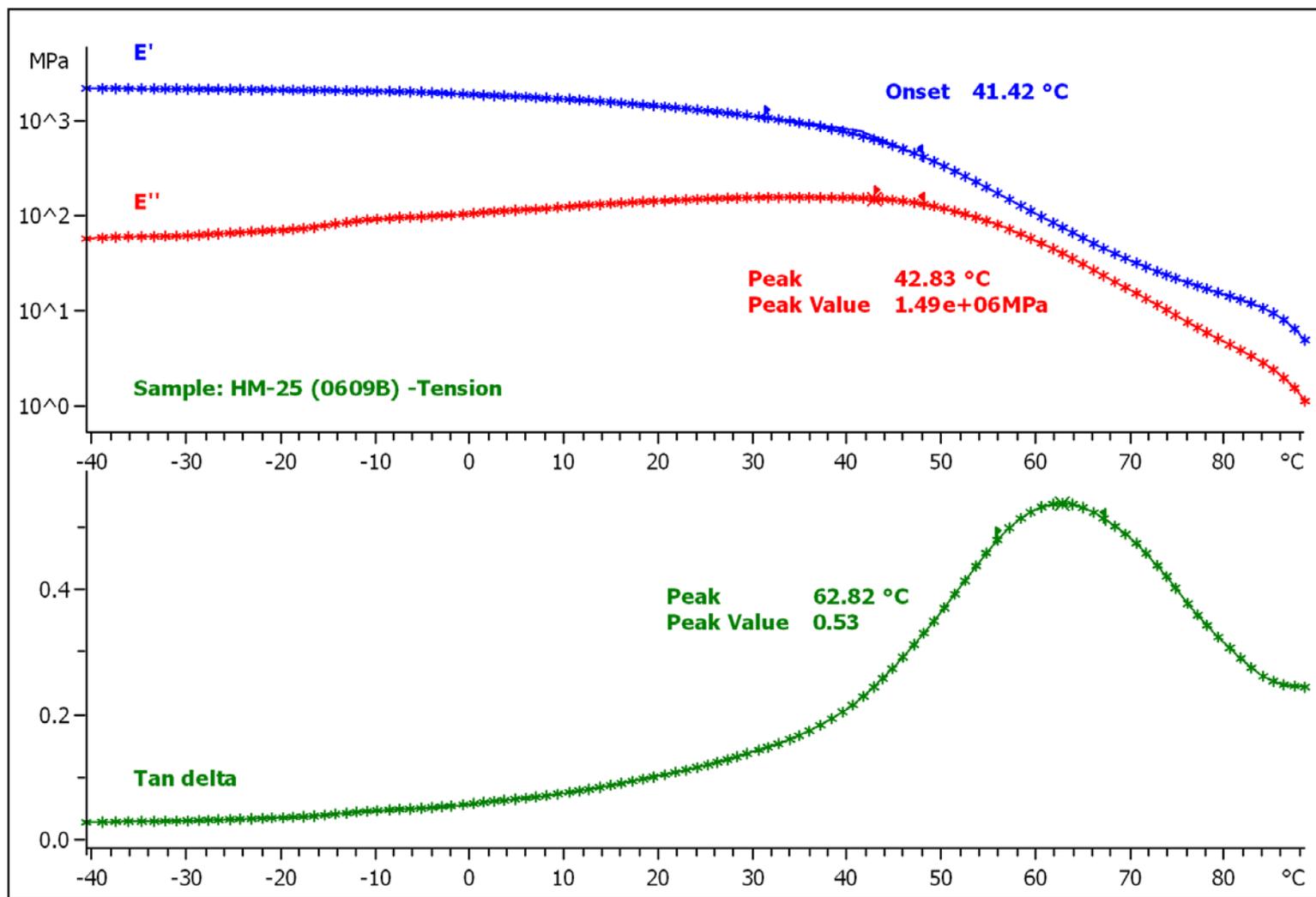
METTLER TOLEDO

汽车烤漆的性能测试——玻璃化温度



HM-25 (0609B)-Tension

11.07.2013 20:56:54



DEMO Version

Not signed

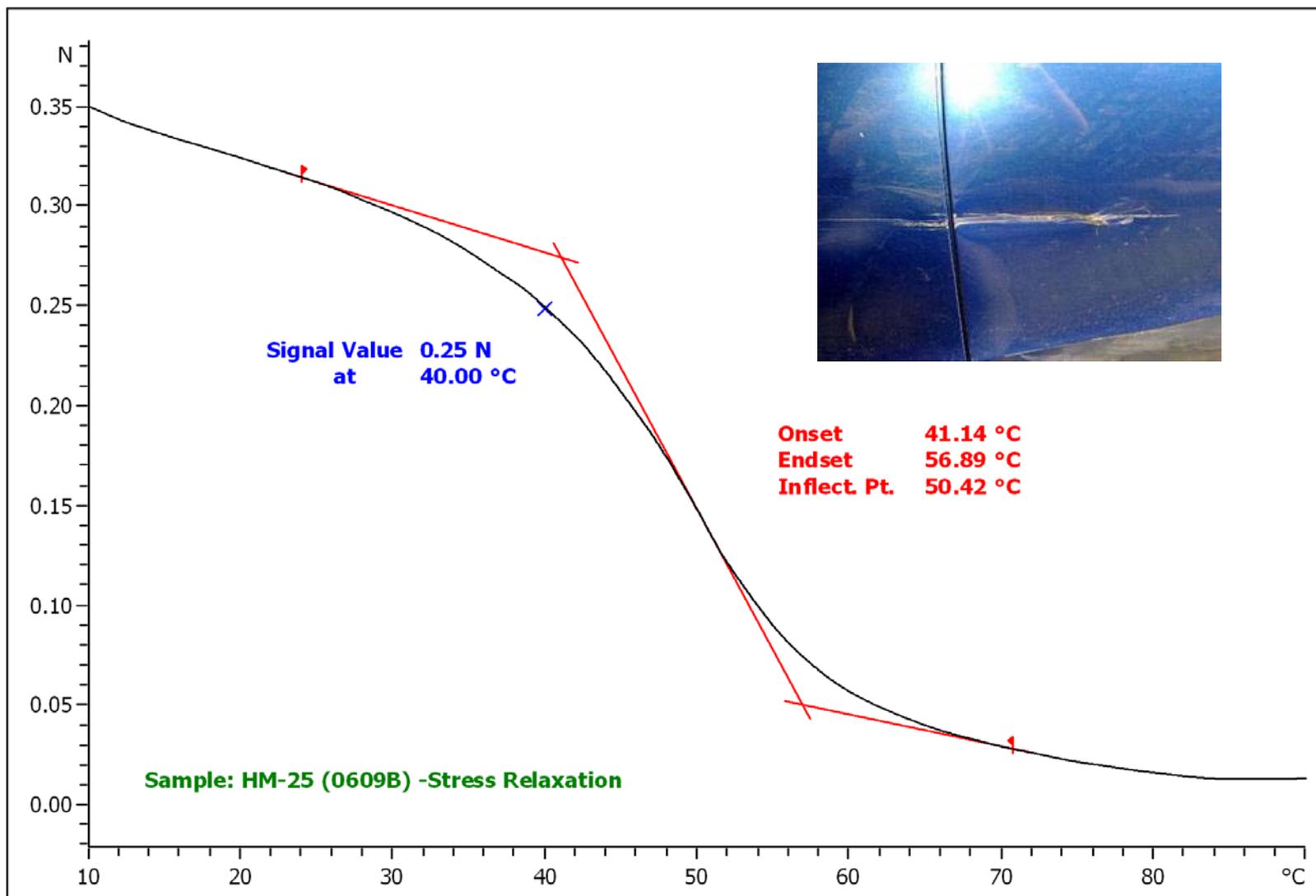
STAR^e SW 12.00

汽车烤漆的性能测试——应力松弛



HM-25 (0609B) -Stress Relaxation

11.07.2013 21:03:19



METTLER TOLEDO

DEMO Version

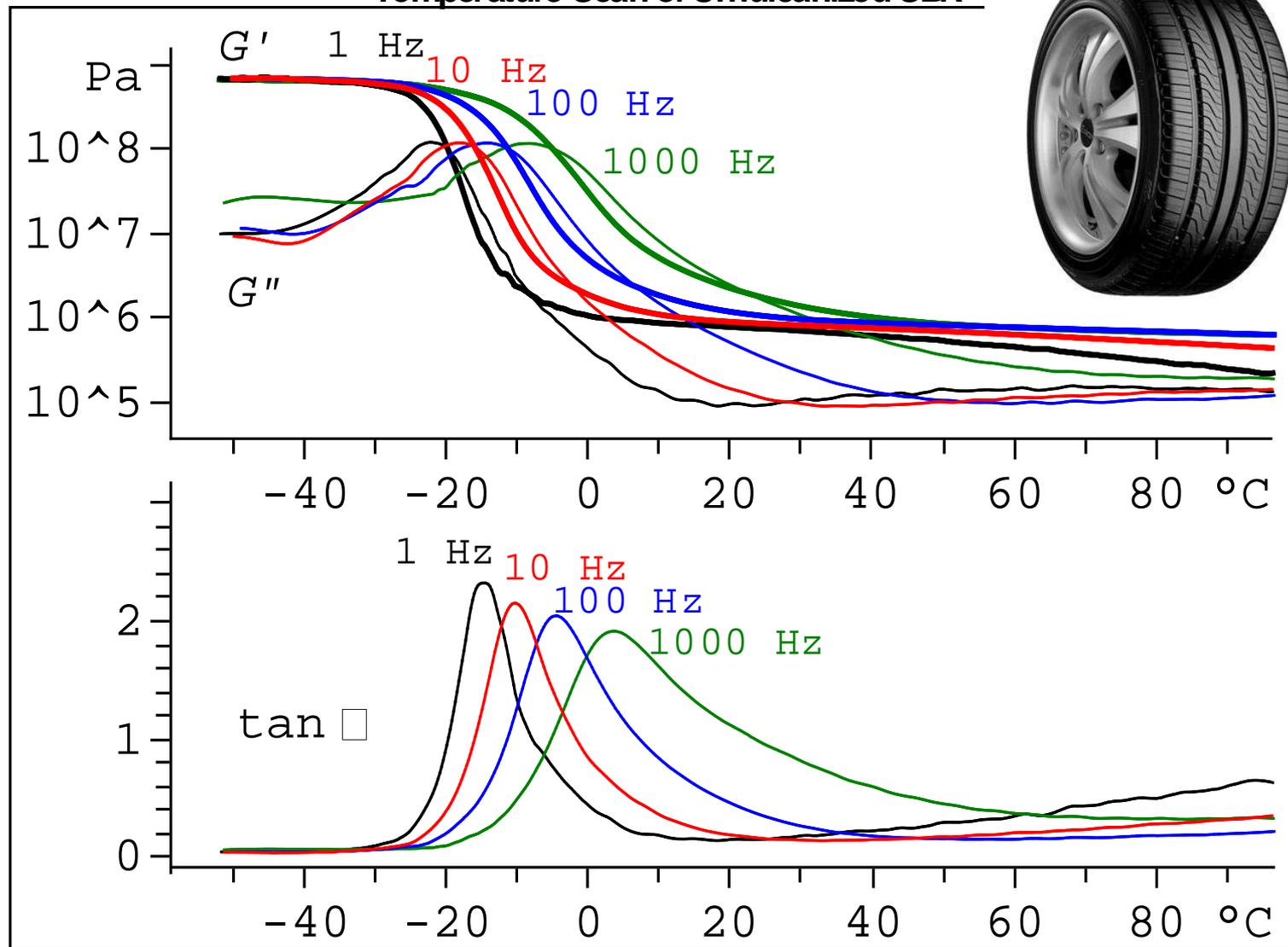
Not signed

STAR^e SW 12.00

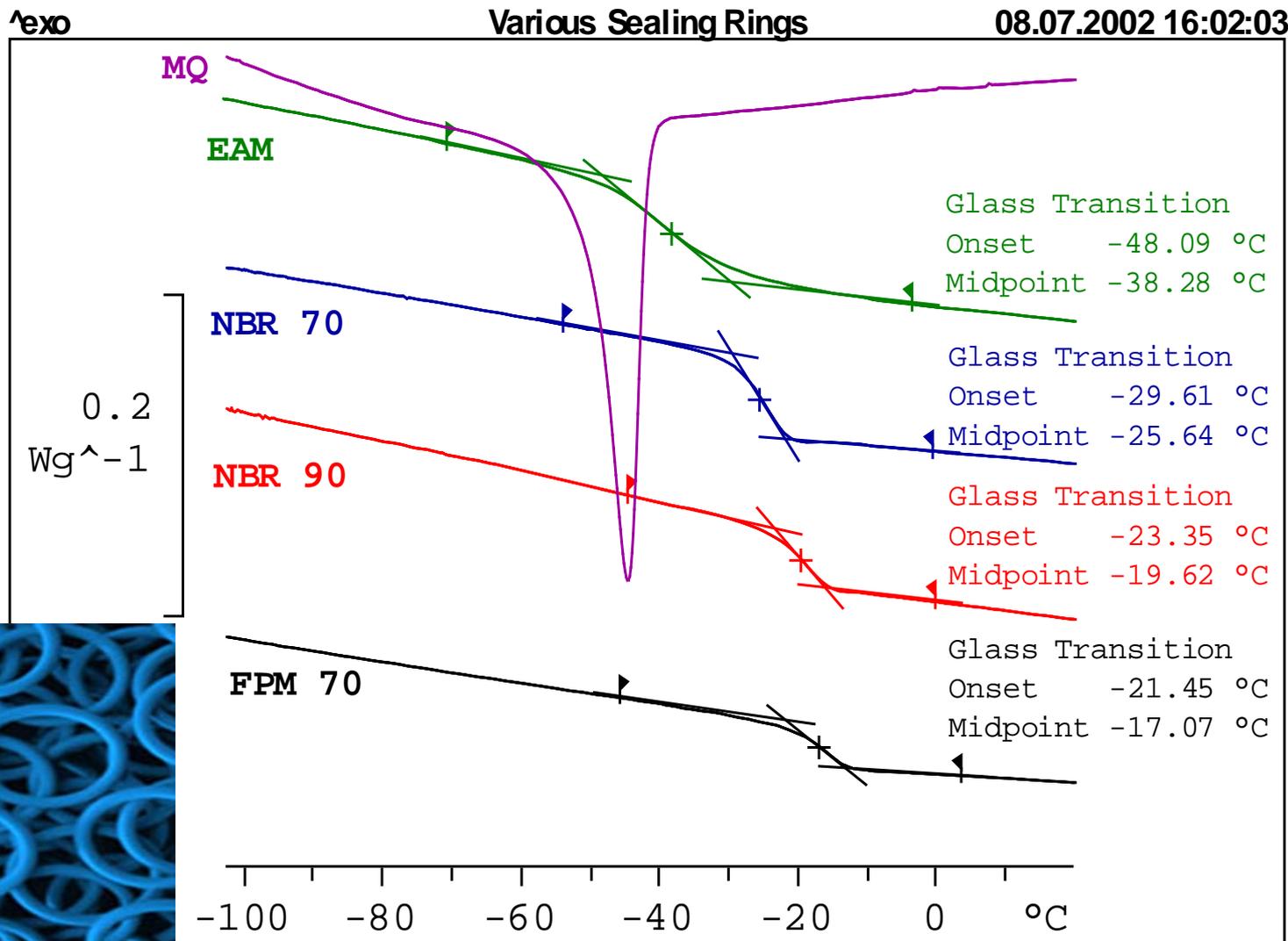
轮胎的动态热机械分析 (DMA)



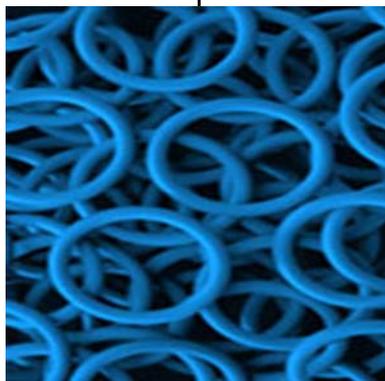
Temperature Scan of Unvulcanized SBR



密封圈——适用温度范围

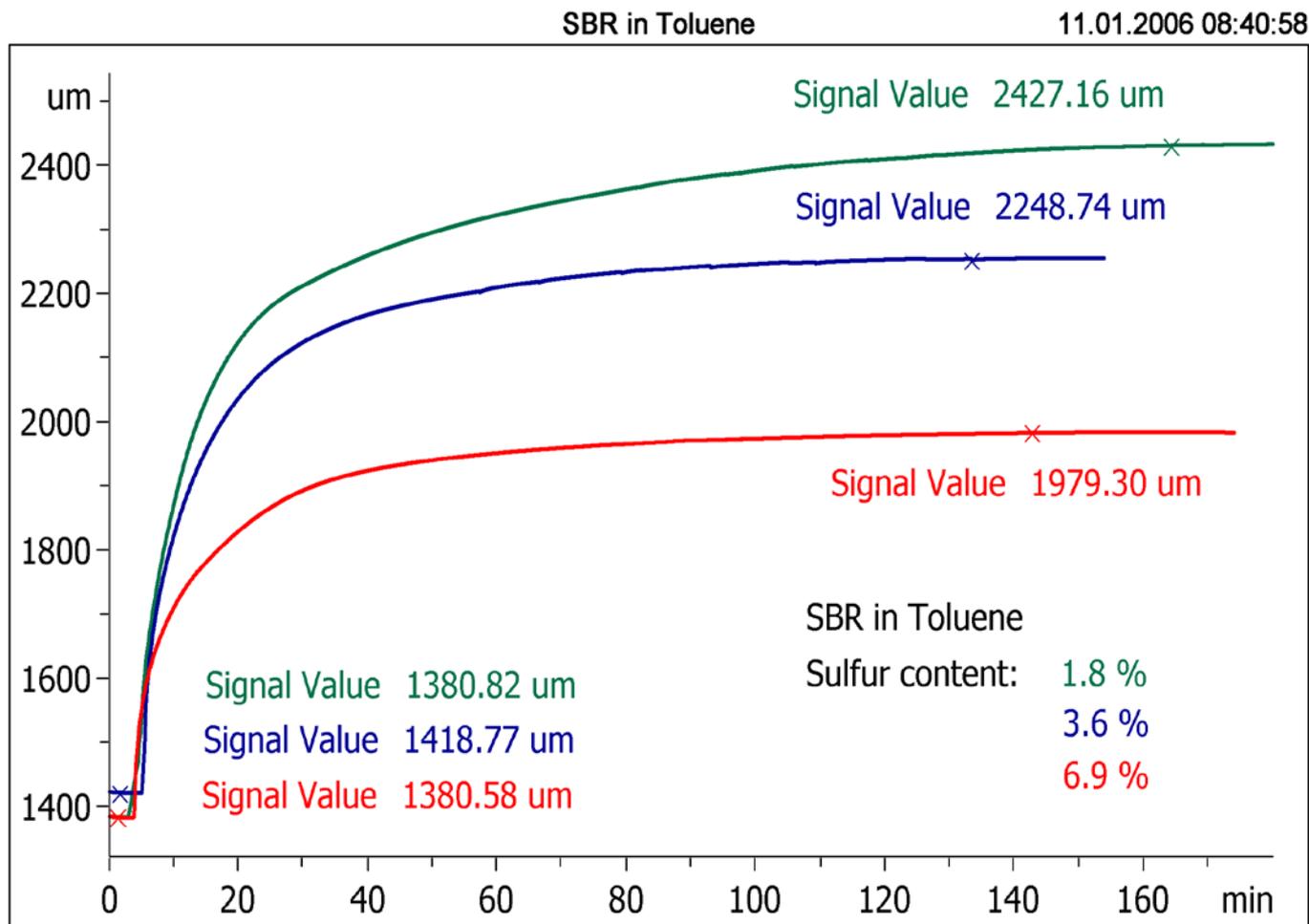


METTLER TOLEDO



密封圈——溶胀

不同硫化度的SBR在甲苯中的溶胀



Thank You



METTLER TOLEDO

