

The Origin of Double - Melting Peaks of PBT in DSC

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Poly (butylene terephthalate) crystallized non - isothermally from the melt shows double melting endotherms in their differential scanning calorimetry (DSC) curves.

When the heating rate is increased, the low temperature melting peak increases in size, but melting temperature does not change ; Contrarily , the high temperature melting peak decreases in size, and melting peak shifts to lower temperature. As the cooling rate at non-isothermal crystallization is increased for the same heating rate, the low temperature melting peak decreases in size and shifts to the lower temperature but the high temperature melting peak increases in size and dose not shift.

This double melting behavior can be explained as follows ;
The low temperature endotherm is the melting of crystals produced during the original cooling, and the higher temperature endotherm is the melting of crystals formed by simultaneous melting and recrystallization during the DSC heating scan. This recrystallization may involve crystal perfection and/or thickening.