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## Effect of Nanoclay on the Nonisothermal Crystallization of Poly(propylene) and its Blend with Poly[(butylene succinate)-co-adipate]

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### **Abstract:**

The non-isothermal crystallization behaviour and kinetics of neat poly(propylene)(PP), PP/poly[(butylene succinate)-co-adipate] (PP/PBSA) blend and its composite with nanoclay was studied by differential scanning calorimetry at six different cooling rates. Various models, namely the Avrami, the Ozawa and the combined Avrami-Ozawa, were applied to understand the kinetics of the non-isothermal crystallization. All analyses revealed that the rate dependent crystal growth mechanism of neat PP changes after preparation of blend with PBSA and in presence of nanoclay particles in blend composite. Polarized optical microscopy was used to support this conclusion. The activation energy for the non-isothermal crystallization of neat PP, PP/PBSA blend and nanoclay modified PP/PBSA blend composite samples was evaluated by using Kissinger and Augis-Bennett methods. The results showed that the absolute value of the activation energy for the PP matrix crystallization was increased in the case of PP/PBSA blend and this value was dramatically increased in presence of nanoclay. This indicates the slower crystallization kinetics of the PP matrix in presence of nanoclay.