

## Study on influence of cooling processing of melting polypropylene and electron beam (10 MeV) on the change of their crystallinity

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(Received: 20/5/2011, in revised form: 24/10/2011)

**Abstract:** In this research, the effects of cooling rate and high energy electron beam irradiation on the change of crystallinity of polypropylene was investigated. For this work, samples of polypropylene heated to 230 °C and then rapidly cooled with different speed of cooling. Crystallinity of samples were determined by differential scanning calorimetry and infrared spectroscopy. It was shown that percentage of crystallinity depends on the cooling rate; therefore in higher cooling rate will be less crystallinity. Effect of electron beam on the samples that cooled in air by applying different radiation doses in 5-40 kGy was investigated. Gel content of each sample that shows the amount of chain crosslink between the transverse area Amorphous by using Xylene and percentage of crystallinity determined by using of DSC, FTIR and XRD spectra. The effect of radiation dose on crystallinity of samples revealed that the amount of crystallinity increases by increasing dose to about 30 kGy then decreases with increasing radiation dose.

**Keywords:** *Polypropylene; electron irradiation; cooling rate; crystallinity; DSC; FTIR; XRD.*

متن فارسی اصل مقاله از صفحه ۶۱۳ تا ۶۲۲ در این شماره به چاپ رسیده است.

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