

**Experiment title:**

Role of microstructure on the melt crystallization of propylene/4-methyl-1-pentene copolymers from isospecific single site catalysts

Experiment number:
MA2597

Beamline:

BM26

Date of experiment:

from: 04/05/2015 to: 07/05/2015

Date of report:

24/06/2016

Shifts: 6**Local contact(s):** Giuseppe Portale*Received at ESRF:***Names and affiliations of applicants** (* indicates experimentalists):Dario Cavallo^{1*}, Paola Stagnaro²¹ University of Genoa, Italy² Insitute Macromolecular Science, CNR, Italy**Report:**

In these experiments we have investigated the crystallization/melting behavior of propene/4-methyl-1-pentene copolymers in a wide composition range. Some examples of the room temperature patterns obtained after the crystallization are given in Figure 1, for propene rich polymers. While an overall decrease of the degree of crystallinity is observed with the inclusion of the bulky 4M1P copolymers along the chain, the polymorphic structure of the polymer only shows minor changes. For the highest 4M1P concentration considered, a small peak centered around 21° of two theta rises, indicating the crystallization of the gamma orthorombic form, along with the usual monoclinic alpha modification.

Unfortunatly, unexpected problems were encountered. Some of the copolymers synthesized with metallocene catalysts have low molecular weight. As a result, they could not withstand their own weight, when placed in the sample cell of the beamline in vertical position. Therefore, especially for the 4M1P rich polymers, data in the whole temepature range could not be collected. More experiments with lab diffractometer are now being carried on to elucidate the dependence of crystallinity and crystal structure on chain architecture.

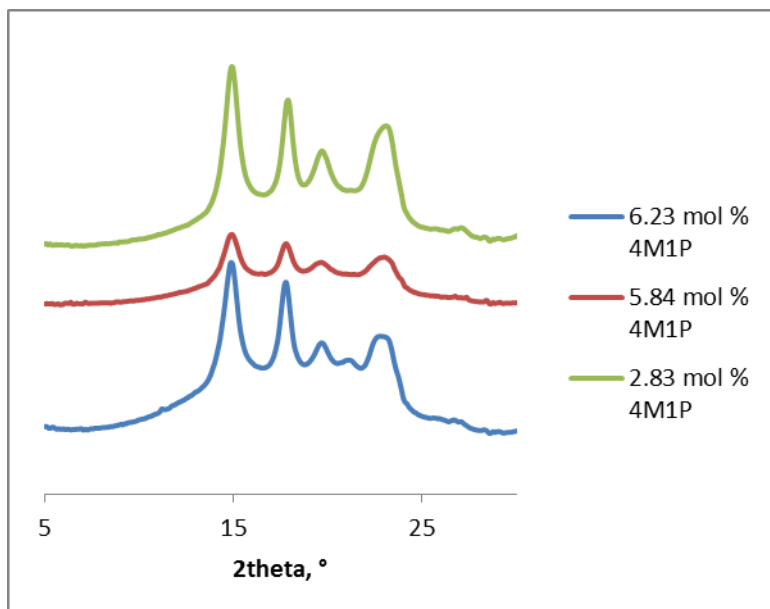


Figure 1: WAXD patterns of propene/4M1P copolymers with different composition