	Experiment title: The role of nucleating agent on flow induced crystallization of iPP.	**Experiment number**: *26-02-454*
Beamline: BM26B	**Date(s) of experiment**: *18/09/2008 to 22/09/2008*	**Date of report**: *25/10/2008*
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Report: (max. 2 pages)

We make use of a commercial isotactic polypropylene (iPP) with M_w of 365 kg/mol and a polydispersity *Mw*/*Mn* of 5.4, blended with different amounts of special nucleating agents such as sodium 2,2-methyl-ene-bis (4,6-di-*tert*-butylphenyl) phosphate, NA11 provided by Borealis and also with different amounts of a new innovative nucleating agent, melt-soluble into the polymer, labeled IRGACLEAR XT 386, provided by Ciba Company.

Morphology behavior of neat polymer as well as polymer blend has been investigated during quiescent conditions and under the effect of short-term shear protocol. in a Linkam Shear Cell (CSS-450) modified with Kapton windows.

In the matter of iPP-NA11 blends, flow induced crystallization (FIC) was studied by means of SAXS experiments to investigate how molecular chain orientation is influenced in the presence of NA11 on cooling after applying a shear of 100 in isothermal step at high temperature, above the polymer melting point (T_{shear}≥165°C), as at lower temperature, as already looked into on molecular level in the previous FIC experiments by making use of WAXD technique. As a result, high molecular orientation can be gained with increase of NA11 amount in iPP compared to pure iPP, in which any orientation is produced on cooling when shear is applied at high temperature (T_{shear}>145°C), see figure 1.

Regarding to IRGACLEAR XT 386,various experiments were carried out to sketch the phase behaviour of nucleating agent in the matrix of isotactic polypropylene as well as to study its influence on crystallisation temperature of neat polymer, see figure2. Moreover, shear flow experiments with a shear of 180 were carried out to apply shear prior and after crystallization of the nucleating agent analysing its influence on structure development of iPP, see figure 3.

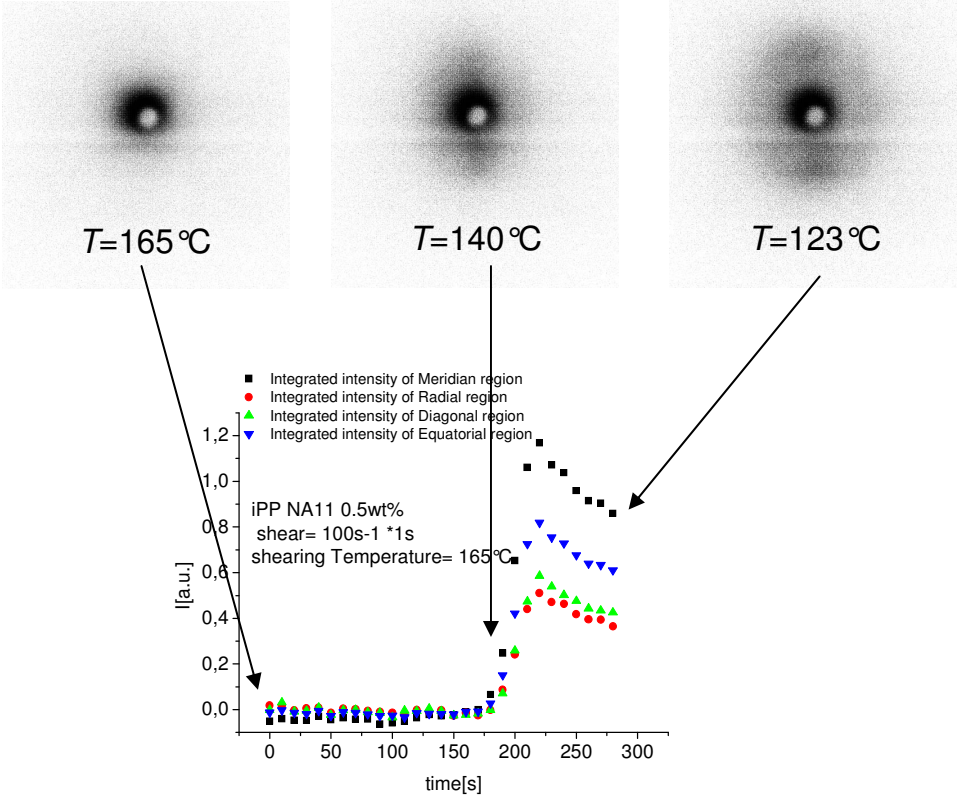

Figure1.2DSAXS images and integrated intensity of iPP-NA11 0.5wt% as a function of time after applying a shear of 100 ($100s^{1}$ for 1 s) at *T*=165°C.

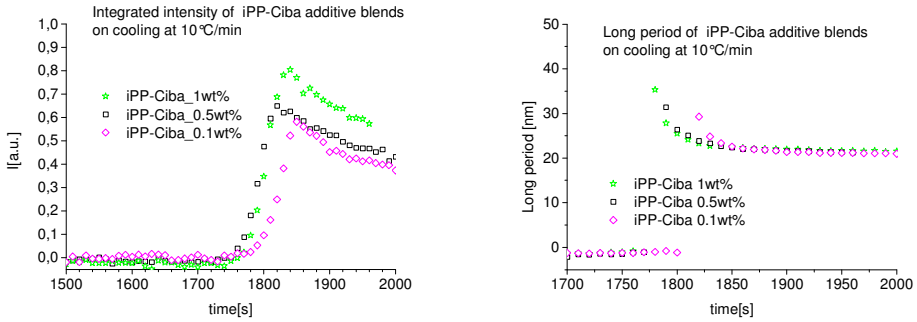

Figure2. Integrated intensity (left) and long period (right) of iPP-Ciba blends as a function of time after cooling at 10°C/min during quiescent conditions.

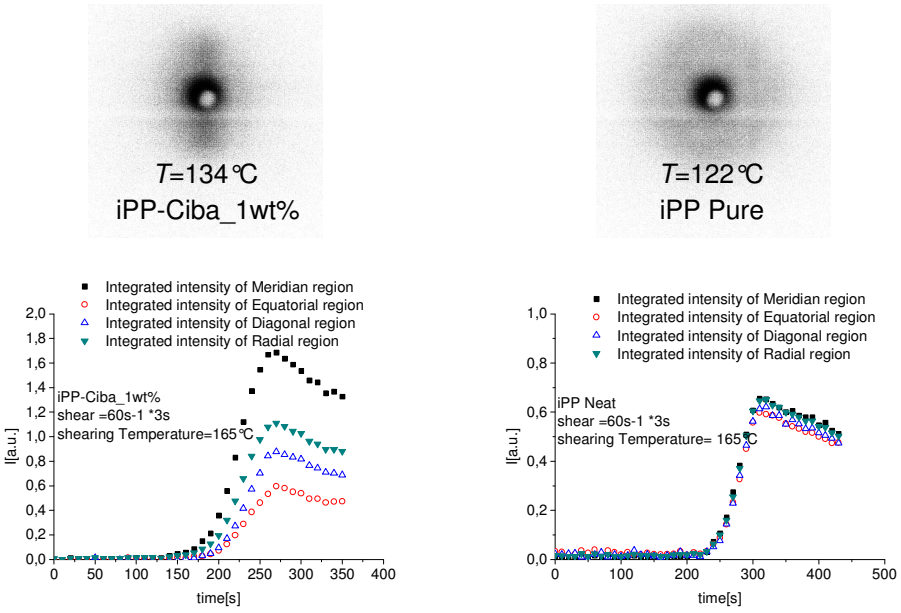

Figure3.2DSAXS images and integrated intensity of iPP-Ciba 1wt% and pure iPP as a function of time after applying a shear of 60 ($60s^{-1}$ for 3 s) at *T*=165°C.