

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Crystallization behavior of nanocomposites based on poly(L-lactide) and layered double hydroxides – Unbiased determination of the rigid amorphous phases due to the crystals and the nanofiller. ANDREAS SCHOENHALS, JING LENG, Bundesanstalt für Materialforschung und -prüfung (BAM), ANDREAS WURM, CHRISTOPH SCHICK, Universität Rostock — Semicrystalline polymers have to be described by a three phase model consisting of a mobile amorphous (MAF), a crystalline (CF), and a rigid amorphous fraction (RAF). For nanocomposites based on a semicrystalline polymer the RAF is due to both the crystallites ($\text{RAF}_{\text{crystal}}$) and the filler ($\text{RAF}_{\text{filler}}$). In most cases a separation of both contributions is not possible without further assumptions. Here polymer nanocomposite based on poly(L-lactide) and layered double hydroxide nanofiller were prepared. Due to the low crystallization rate of PLA its crystallization can be suppressed by a high enough cooling rate, and the RAF is due only to the nanofiller. The MAF, CF, and RAF were estimated by Temperature Modulated DSC. For the first time CF, MAF, $\text{RAF}_{\text{crystal}}$, and $\text{RAF}_{\text{filler}}$ could be estimated without any assumption. Two different systems with a different degree of exfoliation were prepared and discussed in detail.

Andreas Schoenhals
Bundesanstalt für Materialforschung und -prüfung (BAM)

Date submitted: 11 Nov 2016

Electronic form version 1.4