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PHENOMENOLOGICAL REVIEW OF LCP/PET DROPLET FIBRILLATION BY REPEATED EXTRUSION FOR NANOFIBER FORMATION

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LCP(Liquid Crystal Polymer) is a high strength polymer which shows characteristics that are the rigid main chain and molecule's arrangement which has directivity. LCP and PET blending is noted in the blend. Because of they have the similar melting temperature and structure. In the LCP and PET blending, the droplet size and dispersion are important point. Therefore understanding of the droplet behavior is very important for the after process. In case of the blended chips supply to make product, once more the chips are extruded from the extruder. So droplet control in the repetitive extrusion is important. But until now, the droplet behavior analysis was not conducted in the repetitive extrusion. Also, droplet behavior change by extrusion number of times was observed that in the process of analysis on blending condition and weight ratio. The droplet behavior change is supposed that relate with flow property, miscibility, surface property of LCP and PET. If nanofiber is manufactured depending on LCP, there is every possibility of utilizing in a higher value-added industry. Although there are some processes to produce nanofiber such as electricity spinning and sea-island type, it still has difficulties that electricity spinning has a low output and sea-island type is restricted to reduce fiber diameter. It will be effective to solve the existing problems as mentioned above that if material of droplet shape is able to become consecutive fiber morphology through stretching process. The research that deal with making continuity through the way to regulate size of droplet has not yet been achieved in existing dissertations of manufacturing of fibers related to droplet stretching method. This study is planned to verify control of droplet via study of its behaviors that are influenced by repetitive extrude LCP and PET blend substance and confirms size changes of droplet while it is extrude repeatedly. These changes show size growth according to increase number of extrusion and changes of droplet's location are checked as well. Distributions of droplets were observed to LCP and

PET blending process for conjugate spinning. Droplets were distributed relatively evenly in the initial extrusion process. But the secondary and third the size of the droplet was increased and the phenomenon was founded that the droplet was gathered in the center. This phenomenon was assumed that the miscibility of LCP/PET and the flow characteristics correlate with the phenomenon, so conducted the analysis. In this study, to analyze distribution and component of droplet was conducted. Also miscibility of LCP/PET was analyzed.



Figure 1: Test equipment for LCP/PET droplet behavior by repeated extrusion

Recent Publications

1. C.H. Song and A.I. Isayev, LCP droplet deformation in fiber spinning of self-reinforced composites [J], Journal of Polymer, 2001, 42(6) : 2611-2619
2. W.N. Kim and M.M. Denn, Properties of blends of a thermotropic liquid crystalline polymer with a flexible polymer(Vectra/PET) [J], Journal of Rheology, 1992, 36, 1477-1498
3. W.G. PERKINS, The Effect of Blending Temperature, Composition, and Shear Rate on PET/Vectra A900 LCP Blend Viscosity and Morphology [J], Journal of Applied Polymer Science, 43, 329-349

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4. P. MAGAGNINI, On the Use of PET-LCP Copolymers as Compatibilizers for PET/LCP Blends [J], *Journal of Polymer Engineering and Science*, 1996, 36(9), 1244-1255
5. K. NAKAYAMA, Structure formation and miscibility of sheets from PBT and LCP blends [J], *Journal of Materials Science*, 2001, 36, 3207-3213

Biography

Deanna Prof. Han-Yong Jeon, geosynthetics/technical organic materials researcher and he was the 32nd President of Korean Fiber Society (2014~2015). He has published more than 845 proceedings in domestic and international conferences. He wrote 20 texts including 'GEOSYNTHETICS' and also published 143 papers in domestic & international journals. He has awards of Marquis Who'sWho - Science and Engineering in 2003~2017 and also, he got the 33rd Academy Award of Korean Fiber Society in 2006 and "Excellent Paper Award of 2012" by The Korean Federation of Science and Technology Societies.

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