

Abstract Submitted
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3D Analysis of Lattice Defects in the Gyroid Network Structure of a Block Copolymer/Homopolymer Blend SATOSHI AKASAKA, TETSURO OKAMOTO, VINCENT H. MAREAU, HIROKAZU HASEGAWA, Department of Polymer Chemistry, Kyoto University — The bicontinuous microdomain structures known as gyroid cubic phase ($Ia\bar{3}d$) can be observed in a narrow composition region of a block copolymer system. In the study of the casting process of the polystyrene-block polyisoprene (SI)/homopolystyrene (hS) blend with a particular composition from toluene solution, we observed that sponge phase, an irregular network structure, transformed into gyroid phase by expelling excess hS outside of the gyroid grains. During the growth of the gyroid grains, a variety of interesting lattice defects appear due to the remaining excess hS in the grains. Such defects may be useful in designing photonic band-gap devices based on gyroid cubic phase if we can control them. However, the analysis of the defect structures in gyroid network is not easy since gyroid network itself is too complex. So, we employed a novel technique, electron tomography, to visualize the 3D defect structures in gyroid network. In this presentation, we demonstrate how useful it is and clarify the defects structures in 3D

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