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利用課題名(日本語) : ナノフォーム
Program Title (English) : Nanofoam
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1. 概要(Summary)

In this project, we have investigated the cell structure of nanocellular foams using the SEM at Nanohub. Thin films of PMMA-b-PtBA were prepared by solution casting. Nanocellular foams were created within the thin film by UV-induced chemical foaming, where isobutene is created from side chain cleavage of the polymer. The effects of the polymer specifications on the cell structure was studied

2. 実験(Experimental)

【利用した主な装置】

超高分解能電界放出形走査電子顕微鏡, 走査型プローブ顕微鏡システム, 分光エリプソメーター

【実験方法】

The self-assembled morphology was observed by SEM with 10 kV accelerating voltage and 1 μ A electron current. Prior to the measurement, the approximately 1 nm of Pt was spluttered on the sample.

3. 結果と考察(Results and Discussion)

The effect of the polymer specification on the UV-induced chemical foaming process was studied. In this experiment PMMA-b-PtBA films with PMMA:PtBA of 1:1 with $M_n = 73800, 117300$ and 233200 were casted with 5 wt% PAG. Self-assembled lamella morphologies with $l_0 = 40, 70$ and 130 nm were obtained. The films were foamed by a UV-induced chemical foaming process at UV dosage of 3600 mJ/cm² and heating at 80 °C

for 5 minutes. The SEM images of the nanocellular foams are summarized in Figure 1.

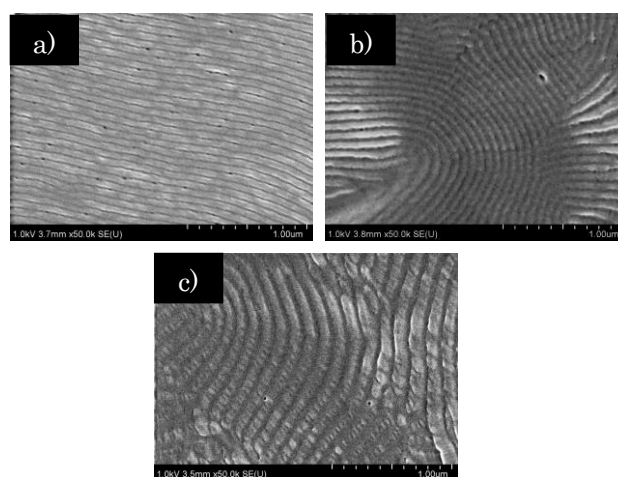


Fig. 1 SEM images of nanocellular foams from PMMA-b-PtBA with M_n of (a) 73800, (b) 117300 and (c) 233200.

4. その他・特記事項(Others)

論文 [1] P. Rattanakawin et al., J PHOTOPOLYM SCI TEC **31(5)**, 2018, 647

[2] P. Rattanakawin et al., J PHOTOPOLYM SCI TEC **32(5)**, 2019, 693

[3] P. Rattanakawin et al., ACS MACRO LETT. **9(10)**, 2020, 1433

学会発表 [1] P. Rattanakawin et al., FOAMS 2019 (October 2-3, 2019, Valladolid, Spain)

5. 論文・学会発表(Publication/Presentation) なし。

6. 関連特許(Patent) なし。