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Large-Scale Ordered Block Copolymer Gyroid Films by Solvent Evaporation Annealing

Introducing block copolymer self-assembly using a terblock copolymer and solvent evaporation annealing method. Dissolving the polymer in a volatile and nonvolatile solvents divides the nucleation and growth steps during the microphase separation. Speeding up the process by spin coating and evaporation of the volatile component up to the onset of nucleation and minimizing the nucleation rate from there onwards. The slow evaporation of the nonvolatile component then promotes growth which leads to large scale homogeneous ordered domains.
The method allows stable results and control over the self-assembled domains; voiding and replicating components of the block copolymer result in well ordered large scale metamaterial films.

Primary author: ISELI, René (Adolphe Merkle Institute)

Presenter: ISELI, René (Adolphe Merkle Institute)

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