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Diblock copolymers as templates for semiconductor nanostructure fabrication

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**Abstract content
 (Max 300 words)**

The self assembly of diblock copolymers (DbC) has received much attention due to its potential for producing nanostructure fabrication masks with features on a scale less than 22 nm [1]. This allows for the fabrication of semiconductor nanostructures beyond what is currently possible.

The precise and repeatable control of these DbC nanostructure masks is a great challenge due to the many variables involved in creating the required morphologies. In this paper the conditions required to obtain perpendicular orientated lamellae in a thin film of the diblock copolymer polystyrene-*b*-poly(methyl-methacrylate) (PS-*b*-PMMA) on a Si substrate, using a solvent evaporation technique, have been investigated. It is demonstrated that with the correct film thickness on a deoxidized Si substrate and appropriate annealing conditions in vacuum, perpendicular lamella can be produced in the thin film. However the uniformity across the substrate ($\pm 1\text{cm}^2$) is unsatisfactory, with differing morphologies present. Experiments on the neutralization of the silicon surface using a random (r) diblock copolymer of the same constituent monomers, i.e. PS-*r*-PMMA, and the use of multiple spin coatings, in order to improve the morphology of the diblock film will also be reported.

[1] A. Andreozzi, E. Poliani, G. Seguni, M. Perego, Nanotechnology 22 (2011) 185304

**Apply to be
 consider for a student
 award (Yes / No)?**

Yes

**Level for award
 (Hons, MSc,
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Hons

**Main supervisor (name and email)
and his / her institution**

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No

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