

Controlled Anisotropic Dewetting with SAMs

장세규, 양승만*
한국과학기술원
(smyang@kaist.ac.kr*)

Polymeric nano- and micro-scale structures are very useful for many applications such as optics, bio-sensing, and catalysis, etc. Especially, self-assembly of polymer is simple and low cost process to make valid structures. For decades, polymer dewetting has been investigated because of its importance for coating industry. However, recent researches have focused on the creating of useful pattern with many polymers. Several years ago, Lee et al introduced the phenomena of anisotropic dewetting which is dewetting of polymer thin film in the channel. They showed that thin polymer films in the channel above T_g , deformed into mountain-shape due to capillary force between side wall and polymer. Then, sufficient heating duration can stimulate the capillary instability and dewetting of polymer in channel will be initiated. By using this phenomena, isolated polymer lines can be obtained with large area. However, these lines are randomly arranged and have little use. It is because of property of self-assembly. This nature of anisotropic dewetting should be controlled to be used for applications. In our work, we controlled the arrangement of anisotropic dewetting structure with heterogeneous pattern of SAMs and different surface property of patterned substrate is enough to lead the ordered dewetting of PS thin film.