**Figure S1.** Top-down SEM images of PS-\textit{b}-PMMA (95k-\textit{b}-92k) ultrathin films on non-patterned area and chemical patterns with $L_s = 80$ nm. The films were annealed in chlorobenzene, toluene, and carbon disulfide vapor for 12 h.
Figure S2. Top-down SEM images of PS-\textit{b}-PMMA (95k-\textit{b}-92k) ultrathin films on substrates grafted with PS-OH, PS$_{57\%}$-\textit{r}-PMMA-OH, and PMMA-OH. The films were annealed in acetone vapor for 1.5, 5, and 44 h. The films on substrates grafted with PS$_{57\%}$-\textit{r}-PMMA-OH (middle row) were imaged after the PMMA block was removed by exposing the film to extreme ultraviolet and soaking in acetic acid.
Figure S3. Top-down SEM images of PS-\textit{b}-PMMA (52k-\textit{b}-52k) ultrathin films on chemical patterns with $L_s = 80$ nm. The films were annealed in acetone vapor for 1.5 and 5 h.
Figure S4. Top-down SEM images of PS-\(b\)-PMMA (95k-\(b\)-92k) ultrathin films annealed in acetone vapor for 5, 10, and 46 h on chemical patterns with \(L_S = 70\) nm. The PMMA block was removed by exposing the film to extreme ultraviolet and soaking in acetic acid.