Multisegment line patterning via combined lithographic method

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Nano-scale linepattern array can provide us distinct electronic, optical, chemical properties due to their fine dimension of pattern. Also the nanowire which consisted of alternatively arranged metal segments are very attractive to explore novel functionality and phenomena, offering opportunuties for a range of application, including nano-scale devices. There are several common ways to fabricate the multisegment nanowire such as crystal growth with precursor and electrochemical deposition that normally used with Anodic aluminum oxide (AAO) template. These methods has disadvantage that final products are dispersed in solution, hard to make nanowires arranged on substrate.
In this research, however, we report novel method to fabricate multiple segments linepattern through Capillary Force Lithography (CFL) combined with photolithography. First, simple metal line patterns were formed by photolithography. Before lift-off the secondary material was deposited to plug up the PR line patterns. then CFL is conducted on metal patterns in perpendicular direction. Our approach offers very effective way to produce highly arranged nanowires with high throughput and facile manner.