

Control over shapes and feature sizes of metal nanopatterns by double imprint approach

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Here, we show that the various shaped gold patterns can be generated from the polydimethylsiloxane (PDMS) mold using line patterns by capillary force lithography (CFL) process which is a kind of nanoimprint methods following two-cycle method. After fabrication of micro or nano sized line patterns as a first cycle, the patterned substrate is used again as a substrate for the second cycle of CFL. When the other stamp is placed on the pattern formed with this second stamp rotated by a certain angle with respect to the first stamp, only overlapped parts are remained that the pattern is like diamond shaped after etching process. The various shapes and sizes of patterns can be produced by controlling the CFL condition such as polymer thickness, reactive ion etching (RIE) time, and degree of rotation angles. The successful applications of large-area periodic patterns are nano-electronic devices, nanoelectromechanical system (NEMS) and biosensors also template is the master of nanoimprint lithography (NIL) and stamp fabrication in soft lithography.