

Analysis of stabilities for Slippery Liquid Infused Porous Surfaces from ZnO nanowire arrays using various method

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ZnO nanowire (NW) arrays were synthesized using a hydrothermal method and surface chemistry modification methods by Teflon spin coating and lubricant impingement. The volume of ammonia solution and growth time affect the length of ZnO NW. As fabricated SLIPS ZnO NWs shows water contact angle of 115° regardless of NW length. For analysis of stability of SLIPS, the spin coating and underwater experiment are conducted. The stability test of spin coating was conducted by changing rotation velocity. The stability of spin coating condition decreased as the rotation velocity surpass the 4000 rpm. The contact angle and contact angle hysteresis show the decrease of stability. The stability test of underwater SLIPS of ZnO NWs arrays was conducted by changing submerging time. The stability of SLIPS in underwater conditions decreased exponentially as submerging time increased. There are no difference in contact angle after underwater. But, contact angle hysteresis increased after underwater experiment. This study on fabrication and modeling of spin coating and underwater stability of SLIPS ZnO NW arrays will help in designing highly stable SLIPS and broadening fields of SLIPS applications.